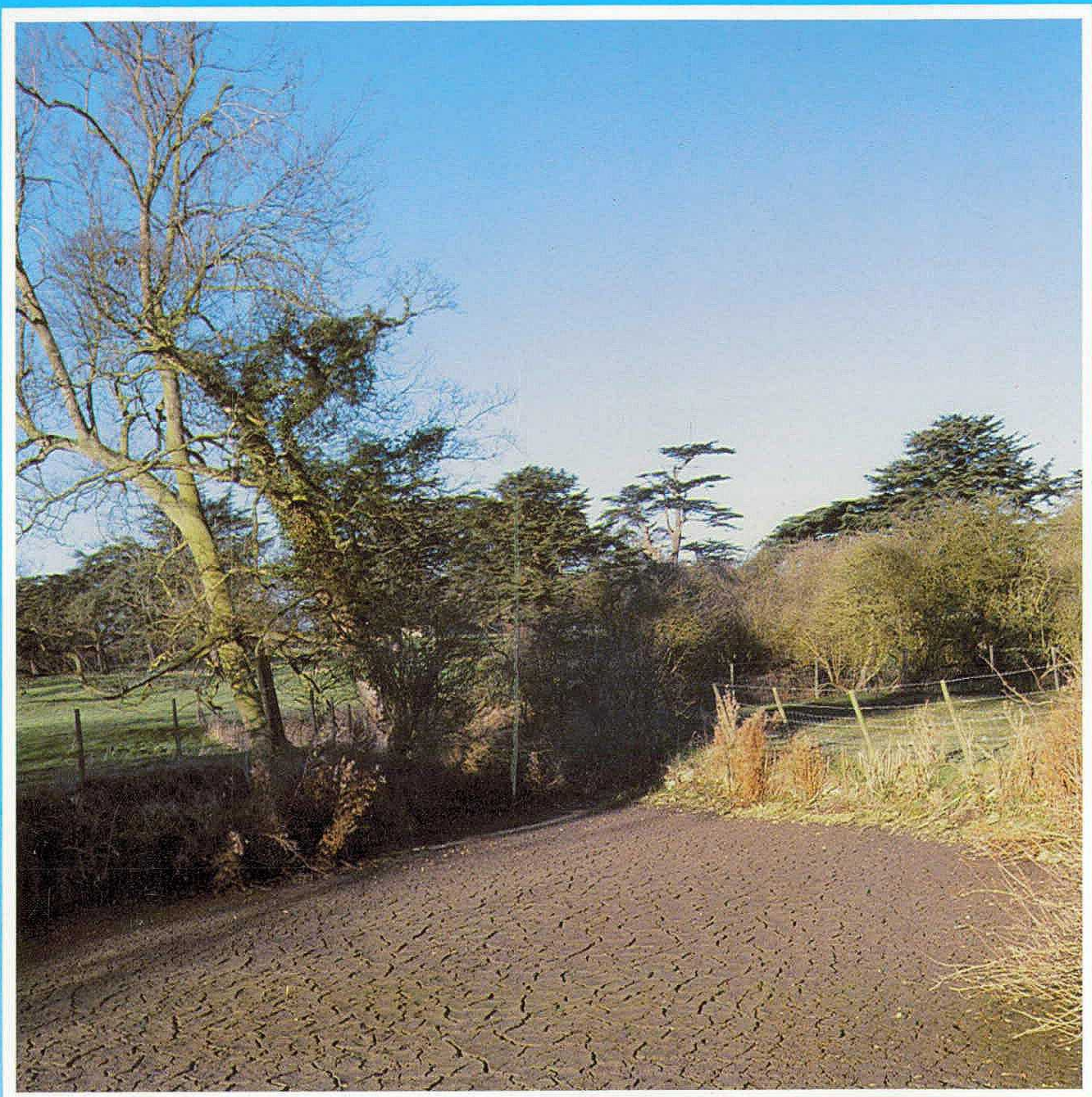
Hydrological data UK



1989 YEARBOOK

INSTITUTE OF HYDROLOGY • BRITISH GEOLOGICAL SURVEY

HYDROLOGICAL DATA
UNITED KINGDOM

1989
YEARBOOK

An account of
rainfall, river flows, groundwater
levels and river water quality
January to December 1989

Institute of Hydrology

British Geological Survey

Published by the Institute of Hydrology,
Wallingford, Oxon OX10 8BB

ISBN 0 948 540 25 7

Design: P A Benoist

Graphics: J J Carr

Typeset and printed by Burgess & Son (Abingdon) Ltd.

Cover: A Spring below the escarpment of the Chiltern Hills.

Photograph: Mike Lowing

FOREWORD

1989 saw the completion of a major re-organisation of the water industry in England and Wales. The creation, under the Water Act 1989, of the National Rivers Authority and the Water Service PLCs coincided with a period of significant hydrological stress with drought conditions affecting much of eastern and southern Britain through the latter half of the year. The persistent rainfall deficiency over the last couple of years, and the notably wet episodes which have punctuated the drought, have attracted unprecedented media attention and public interest. Not least this reflects a growing awareness of hydrological issues and concern regarding the possible impacts of climate change on river flow regimes and water resources in the United Kingdom.

A principal function of the Hydrological data UK series is to document and disseminate information relating to contemporary hydrological conditions and to provide both a perspective within which to examine the recent exceptional events and a benchmark against which any future changes may be assessed.

The Hydrological data UK series of Yearbooks and reports was launched in 1985 as a joint venture by the Institute of Hydrology (IH) and the British Geological Survey (BGS); both organisations are component bodies of the Natural Environment Research Council (NERC). Such a collaborative enterprise arose naturally from the close liaison maintained between those responsible for the management of the national Surface Water Archive, at IH, and their counterparts at BGS concerned with the national Groundwater Archive. The work is overseen by a steering committee which includes representatives of Government departments, the National Rivers Authority and the water industry from England, Wales, Scotland and Northern Ireland.

The published series includes an annual yearbook and, every five years, a catalogue of river flow gauging stations and groundwater level recording sites together with statistical summaries. These six volumes of the 5-year cycle are available individually but are also designed to be inserted in a ring binder. Further details of these arrangements are given on page 199.

Professor W.B. Wilkinson
Director, Institute of Hydrology

National Rivers Authority region or River Purification Board boundary
Hydrometric area number and boundary
HIGHLAND R.P.B.
NORTH EAST R.P.B.
TAY R.P.B.
FORTH R.P.B.
CLYDE R.P.B.
TWEED R.P.B.
SOLWAY R.P.B.
NORTHUMBRIAN
NORTHERN IRELAND
NORTH WEST
YORKSHIRE
SEVERN-TRENT
ANGLIAN
WELSH
THAMES
WESSEX
SOUTHERN
SOUTH WEST
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
101
102
103
104
105
106
107
108
202
204
pt 201
pt 203
205
pt 235
pt 236
pt 226
pt 206

CONTENTS

	Page
INTRODUCTION	1
SCOPE AND SOURCES OF INFORMATION	2
Rainfall and climatological data	2
HYDROLOGICAL REVIEW	3
Summary	3
Rainfall	6
Evaporation and soil moisture deficits	9
Runoff	12
Groundwater	21
1989 Hydrological diary	24
THE 1988/89 DROUGHT - A Hydrological Review	27
RIVER FLOW DATA	45
Computation and accuracy of gauged flows	45
Scope of the flow data tabulations	45
Gauging station location map	50
Daily flow tables	52
Monthly flow tables	102
THE SURFACE WATER DATA RETRIEVAL SERVICE	143
List of surface water retrieval options	143
Concise register of gauging stations	154
Summary of archived data	160
GROUNDWATER LEVEL DATA	169
Background	169
The observation borehole network	169
Measurement and recording of groundwater levels	169
Index borehole location map	171
Observation well hydrographs 1987-89	172
Register of selected groundwater observation wells	174
Network changes	178
Hydrographs of groundwater level fluctuations	174
The Register	178
THE GROUNDWATER DATA RETRIEVAL SERVICE	181
List of groundwater retrieval options	181
SURFACE WATER QUALITY DATA	185
Background	185
Data retrieval	185
Scope of the water quality data tabulations	186
Water quality data tables	188
DIRECTORY OF MEASURING AUTHORITIES	196
PUBLICATIONS in the Hydrological data UK series	199
ABBREVIATIONS	200

INTRODUCTION

The 1989 Yearbook is the first edition since responsibility for the publication of data, upon which assessments of water resources in England and Wales may be made, was transferred (under the Water Act 1989) from the Department of the Environment to the National Rivers Authority.

This volume is the ninth Yearbook in the Hydrological data UK series and the fourth volume in the second five-year publication cycle (1986-90).

The 1989 Yearbook represents the thirtieth edition in the series of surface water publications which began with the 1935-36 Surface Water Yearbook. As a result of the incorporation of groundwater data in the Yearbook, this volume is also the fourteenth edition in the series of groundwater data publications which began with the 1964-66 Groundwater Yearbook.

Apart from summary information, surface water and groundwater data on a national basis were published separately prior to the introduction of the Hydrological data UK series. In common with the earlier editions, the 1989 Yearbook brings together the principal data sets relating to river flow, groundwater levels and areal rainfall throughout the United Kingdom. Also included are water quality data for a selection of monitoring sites throughout the UK. A comprehensive hydrological review of the year is presented and a feature article reviews the 1988/89 drought within a hydrological framework

A description is given of the surface water and groundwater archives together with illustrative examples of the standard data retrieval options developed to service user requirements.

Publication of river flow data for Great Britain started with the series of Surface Water Yearbooks. The first edition, which was published in 1938 for the water year (October-September) 1935-36, also included selected data for the previous fifteen years; the edition for 1936-37 followed in 1939. Both these publications were prepared under the direction of the Inland Water Survey Committee. Assisted by the Scottish Office, the Committee continued to publish hydrological data after the Second World War; the Yearbook for the period 1937-45 was published as a single volume in 1952. Due to economic stringency, the Survey was suspended in 1952 for a period of two years but was then reformed as the Surface Water Survey Centre of Great Britain. A Yearbook covering the years 1945-53 was published in 1955.

In 1964 the Survey was transferred to the Water Resources Board where it remained until the Board was disbanded in 1974. The work of collecting and publishing surface water information in England and Wales then passed to the newly created Water Data Unit of the Department of the Environment (DOE). Yearbooks were published jointly each year by these organisations and the Scottish Office for the water years 1953-54 to 1965-66; thereafter information for the five calendar years 1966 to 1970 was published in one volume in 1974. Following editions were renamed 'Surface Water: United Kingdom' to mark the inclusion of the first records from Northern Ireland and in recognition of the move away from single year volumes. Two volumes of Surface Water: United Kingdom, covering the years 1971-73 and 1974-76 were published jointly by the Water Data Unit, the Scottish Development Department and the Department of the Environment for Northern Ireland.

Following the transfer of the Surface Water Archive to the Natural Environment Research Council in 1982, the final edition of Surface Water: United Kingdom, for the years 1977-80, was prepared by the Institute of Hydrology at the request of the Water Directorate of the Department of the Environment, and published in 1983.

The 1981 and 1982 Yearbooks were prepared concurrently and were, in 1985, the first Yearbooks published by the Natural Environment Research Council. Further Yearbooks - the editions for 1983 to 1988 - were published over the following four years.

A compilation of 'Groundwater levels in England during 1963', which was produced by the Geological Survey of Great Britain prior to its incorporation into the Institute of Geological Sciences, was the precursor to the publication of groundwater level data on a national basis. The more formal Groundwater Yearbook series was instigated by the Water Resources Board which published the inaugural edition, and a further volume for 1967, both covering England and Wales. In 1975 a third Yearbook, for 1968-70, was published by the Water Data Unit. The Groundwater: United Kingdom series was introduced in 1978 with the production of the 1971-73 volume, also published by the Water Data Unit.

Following the transfer of the Groundwater Archive to the Institute of Geological Sciences (now the British Geological Survey), the second edition of Groundwater: United Kingdom, covering the period 1974-80, was prepared by the Institute of Hydrology at the request of the Water Directorate of the Department of the Environment. Subsequently, groundwater level data have been included in the Hydrological data UK publications.

SCOPE AND SOURCES OF INFORMATION

The format of the 1989 Yearbook follows that of the recent editions in the Hydrological data UK series. The rainfall, runoff and groundwater review material - compiled in separate sections prior to 1986 - is incorporated in a single hydrological review of the year. Data presentation in the water quality section is consistent with the established Yearbook pattern - data are given both for the featured year and, to provide a suitable perspective, for the preceding period of record.

Emphasis is placed upon ready access to basic data both within the Yearbook and through the complementary data retrieval facilities.

A companion publication to the individual Yearbooks - the 'Hydrometric Register and Statistics' volume provides a comprehensive reference source for hydrometric information which does not change materially from year to year; the first edition (for 1981-5) was published in 1987, see page 199.

The Yearbook contents have been abstracted primarily from the Surface Water and Groundwater Archives. Water quality data have been provided from the Harmonised Monitoring Archive which is currently maintained by Her Majesty's Inspectorate of Pollution (DOE). Similar data from Northern Ireland have been provided by the Dept. of the Environment (NI).

Much of the data for England and Wales featured in this volume were assembled, initially, under the aegis of the former regional Water Authorities. From the 1st September 1989 their regulatory and river management functions passed formally to a new body, the National Rivers Authority (NRA). The NRA is now responsible for the initial collection and processing of most river flow and groundwater level data. The new Water Service PLCs have assumed responsibility for a small number of important monitoring sites for which historical - and a few contemporary - data sets are held on the Surface Water and Groundwater Archives. The seven River Purification Boards (RPBs) are responsible for most hydrometric data acquisition in Scotland. In Northern Ireland responsibility is shared between the Departments of Environment and Agriculture. These organisations also supplied valuable material relating to significant hydrological events during 1989.

The majority of the rainfall data, and some of the material incorporated in the hydrological review, has been provided by the Meteorological Office. For historical comparisons of the rainfall over England and Wales, a data set based upon the homogeneous series derived by the Climatic Research Unit of the University of East Anglia has been used.

Additional material has been provided by various research bodies and public undertakings.

Most of the rainfall data published in the Hydrological data UK series are in the form of monthly rainfall totals for catchment areas (see page 47). For details of monthly and annual rainfalls associated with individual raingauge sites reference should be made to the 'RAINFALL' series published regularly by the Met. Office. Brief details of the contents and availability of this publication, together with a short description of other rainfall and climatological data sets published by the Met. Office, are given below.

The National Environment Research Council acknowledges and extends its appreciation to all who have assisted in the collection of information for this publication.

Rainfall and Climatological Data

The Meteorological Office maintains the national archives of rainfall and climatological data at its headquarters at Bracknell. Specific items, such as daily and hourly rainfalls from gauges and radar (from the PARAGON system) may be obtained by application to the Commercial Services Division. Summaries of the data are also published regularly and a list of current titles is given below:

1. *RAINFALL 19__/__*
   This contains monthly and annual rainfall totals for some 5000 raingauges and is available approximately one year after the title year at a cost of £8.50 (for the 1989 edition).
2. *Snow Survey of Great Britain 19__/__*
   This contains the daily and monthly reports of snow conditions from selected stations covering the winter and costs about £4.
3. *Monthly Weather Report*
   This is published monthly and contains climatological means for more than 550 UK observing stations, in addition an introduction and annual summary are produced yearly. The publication should be available six to nine months after the month concerned, costs around £2 and is available only from Her Majesty's Stationery Office (HMSO) or their stockists.
4. *M.O.R.E.C.S. (Meteorological Office Rainfall and Evaporation Calculation System).*
   This is a weekly issue of maps and tables of evaporation, soil moisture deficit, effective rainfall and the weather variables used to calculate them. The data are used to provide values for 40 km squares and various sets of maps and tables are available according to customer requirements.

Further information about these and other publications may be obtained from:

Meteorological Office, Commercial Services,
London Road, Bracknell,
Berks RG12 2SZ Tel: (0344) 420242

HYDROLOGICAL REVIEW

Summary

Climatologically 1989 was an extraordinary year in the United Kingdom. Sunshine hours were the highest on record for England and Wales and very warm conditions prevailed throughout much of the year; for central England it was the warmest year in a series extending back to 1659. Hydrological conditions were notable also. Over the UK as a whole 1989 was the driest year since 1976 but more remarkable were the variations - both temporal and spatial - in rainfall and runoff amounts through the year. Sustained dry periods were a feature of the 1989 UK weather in most regions, especially during the summer half-year and many parts of lowland Britain experienced their most severe drought since 1976. There were, however, several very wet interludes particularly in the spring and in December when the contrast in hydrological conditions within the month was extreme.

Potential evaporation (PE) rates were well above average for extended periods and soil moisture deficits (SMDs) were notably high early in the year, in the late summer and again at the autumn/winter transition. Broadly speaking these deficits served to inhibit actual evaporation (AE) rates in the lowlands but, elsewhere, evaporative losses at the catchment scale were amongst the highest on record.

A substantial number of rivers recorded unprecedented annual runoff totals in 1989 - several catchments in north-west Scotland established new annual maxima, many more - predominantly in eastern Britain - registered totals below the previous minimum. Low, to very low, flows characterised most of lowland Britain throughout much of the latter half of the year and, in the more maritime regions, the notable low flows recorded during the 1984 drought were closely approached and, in some catchments, eclipsed. Many record monthly low flows were superseded and daily flows were often very depressed - particularly in July and December. Flood events were relatively rare being confined largely to Scotland, especially in February, but spate conditions were widespread in southern Britain over the Christmas period.

Having, in a number of regions, declined from near record levels in the spring of 1988, groundwater levels began and, in the east, ended 1989 at low or very low levels. In the interim the continuing benefit of the moderate - but late - recharge in the spring kept water-tables above historical minima. Recharge to western aquifers generally recommenced in October but, elsewhere, groundwater recessions continued unabated and levels in a number of wells and boreholes, especially in the Chalk of eastern England, were extremely depressed at the year-end.

The Drought

Following below average rainfall in the autumn of 1988, a significant drought developed over southern and eastern Britain through the 1988/89 winter. By early February the drought was of a substantial magnitude but sustained spring rainfall caused a marked amelioration. Subsequently, however, the drought re-intensified as evaporation rates climbed into the dry, hot summer. The water resources outlook became a matter of concern when rates of runoff and recharge failed to increase as evaporation rates declined into the autumn. By October severe droughts (with associated return periods exceeding 50 years) could be recognised in southern Britain and along the north-eastern seaboard. Substantial rainfall deficits characterised all regions apart from the north-west. Very large soil moisture deficits also existed in all but western coastal areas - these served to limit the effectiveness of the significant October and early November rainfall. This wet episode was followed by an extremely dry spell which, by early December, resulted in many rivers recording their lowest winter (December-February) daily mean flow on record; in a few catchments absolute minima were established. Groundwater levels were similarly depressed. The water-table response to the spring rainfall had been only moderate over wide areas, and barely discernible along parts of the eastern seaboard. The ensuing groundwater recessions continued through the summer and - in the east - the autumn such that, by the beginning of winter, groundwater levels stood close to, or below, the lowest on record (for the time of year) over wide areas. In a few eastern wells and boreholes, new minima were established in records exceeding 100 years. Heavy and sustained rainfall from mid-December served to change the complexion of the drought in southern and central Britain but rainfall deficiencies in some, mostly central and eastern districts, remained considerable. With recoveries in groundwater levels needing to be generated from a very low base the water resources outlook remained fragile at the turn of the year.

A comprehensive review of the 1989 drought is presented on pages 27 to 44

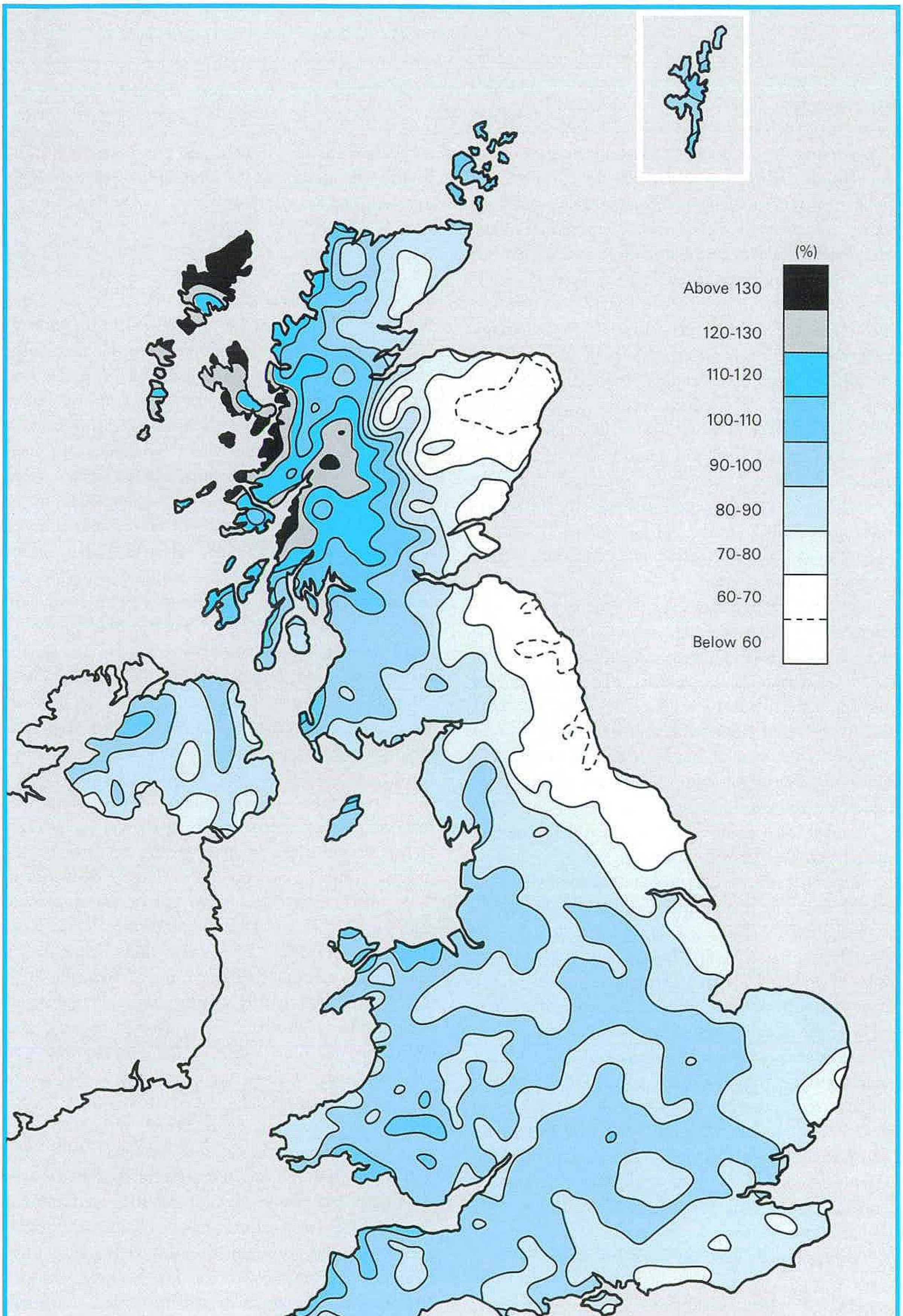


Figure 1. Annual rainfall in 1989 as a percentage of the 1941–70 average. Source: Meteorological Office

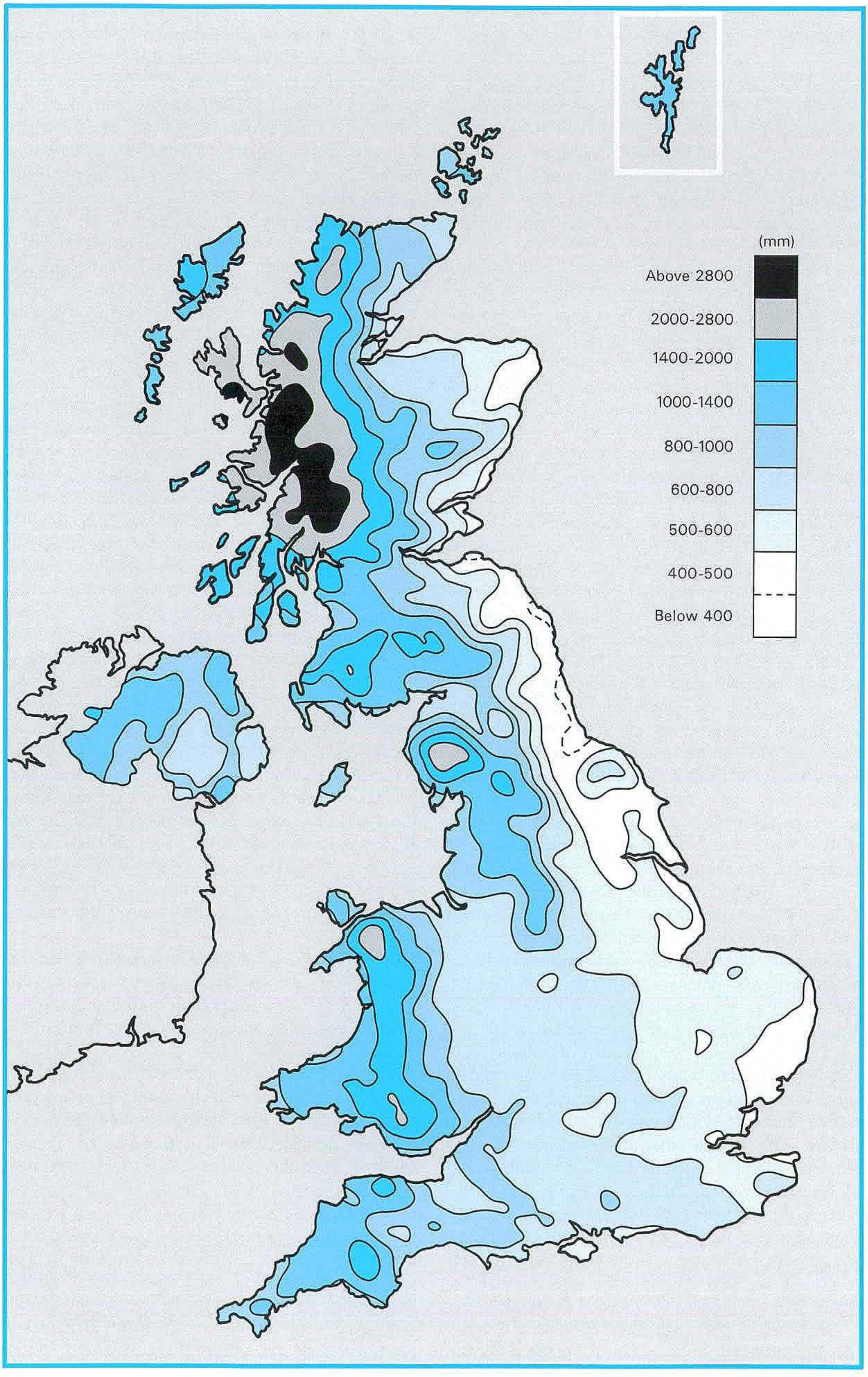


Figure 2. Annual rainfall in 1989.

Source: Meteorological Office

Rainfall

United Kingdom rainfall in 1989 totalled 1045 mm, a little below the 1941-70 average. Scotland was somewhat wetter than average, Wales a little drier and Northern Ireland and England appreciably so. With the exception of western Scotland all regions registered below average rainfall in 1989 - commonly the annual total was the lowest since 1975 or 1976. A tendency for the normal west-to-east rainfall gradient to be exaggerated was also evident. The rainfall pattern throughout the United Kingdom in 1989 relative to the 1941-70 average is illustrated in Figure 1; Figure 2 shows actual rainfall totals. Both in absolute and percentage terms the illustrated ranges are notable and in some areas extreme. The area bounded by the 600 mm isohyet in Figure 2 is the most extensive since 1975. 1989 rainfall totals below 450 mm were relatively common in eastern coastal districts from the Humber to Aberdeen. Annual totals of this magnitude represent only about 60 per cent of the 1941-70 average rainfall; such deficiencies might be expected, on average, perhaps little more than once every 100 years. Figure 2 suggests a modest reinforcement of the normal easterly rainfall gradient over southern Britain. To the north this tendency was greatly strengthened leading to exceptional rainfall contrasts along a transect from the western Highlands to the Grampian coast. Over a distance of little more than 100 km annual rainfall totals decreased from well in excess of 4000 mm to below 500 mm inland from Aberdeen. Even at sea level the westward increase in precipitation was remarkable - the Kinloch Hourn raingauge (altitude 5 metres) registered a rainfall total of 3772 mm in 1989. In large part, this total testifies to the influence of the adjacent mountains on local rainfall amounts; the orographic effect was, as in 1988, enhanced in many maritime areas during 1989 - a reflection of the predominance of westerly rain-bearing systems across north-western Britain. Elsewhere, their failure to penetrate to the eastern seaboard - except as greatly weakened systems - tended to produce very moderate rainfall totals.

Table 1 provides a breakdown of monthly and half-yearly rainfall totals in 1989 both on a countrywide basis and according to the major administrative divisions within the water industry (see frontispiece). In 1989 the principal features of the temporal distribution were: an early reinforcement of significant rainfall deficiencies which had developed in the latter-half of 1988 throughout much of England and Wales, a notably wet spell in the late-winter and early-spring; a very dry sequence of months from May to the early autumn and an erratic monthly pattern to conclude the year.

In Scotland persistent and heavy rainfall commenced earlier in the year than in southern Britain and the January to March period was the wettest in a rainfall series extending back to 1869. Precipitation - which fell mostly as rain - was particularly abundant in the western Highlands. Glenshiel Forest recorded 1000 mm in January which is equivalent to the combined 1988 and 1989 rainfall total over large tracts of eastern Britain. For Scotland as a whole, February was substantially wetter, the monthly total being the highest, for February, in the 121-year general rainfall series. Flooding was widespread and common especially early in the month when a number of 'very rare' daily rainfall totals were recorded (see Table 2). From mid-month, vigorous rain-bearing systems penetrated into the remainder of the UK, causing some localised floodplain inundation - flooding was somewhat more extensive in western catchments.

Notwithstanding this wet spell, winter (December-February) rainfall totals were well below average throughout southern and eastern Britain - the return periods associated with the winter precipitation for parts of the English lowlands are in excess of 50 years. Whilst similar deficiencies had developed in restricted areas of eastern Scotland, for the country as a whole winter rainfall was greatly in excess of the average. The December to February precipitation total for Scotland was the highest this century by a considerable margin. Wet conditions persisted into March throughout the British Isles and again the Scottish rainfall total was outstanding. Notwithstanding a relatively dry conclusion to 1988, Scotland extended a remarkable sequence of wet winter half-years. Eight of the fifteen wettest, in a series beginning in 1869, occur in the decade commencing 1979/80 - over this period the October-March Scottish rainfall was 20 per cent above the 1941-70 average. By contrast, in England and Wales the February and March rainfall was insufficient to make up the October 1988 - January 1989 shortfall and the 1988/89 winter half-year was the driest for thirteen years, albeit considerably wetter than 1975/76.

Dry conditions became re-established in the latter half of April and May which was exceptionally hot and dry - some districts in central and southern England recording less than 5 mm of rainfall. The shortage of rainfall in the late spring was most significant over eastern and southern areas where long term rainfall deficiencies, often extending back to the spring of 1988, could be recognised. The incipient drought intensified through the summer, and by the end of August moderate to severe drought conditions existed in all regions remote from the north-west of Scotland. For the UK as a whole, the summer (June-August) rainfall was significantly below average but still within the normal range. Over the summer half-year (April-September) rainfall deficiencies of a considerably greater magnitude characterised all regions of mainland Britain and Northern Ireland, typically accumulated rainfall totals were between 60 and 80 per cent of the long term average.

TABLE 1 1989 RAINFALL IN MM AND AS A PERCENTAGE OF THE 1941-70 AVERAGE

1989													D	Year	Oct-Mar Rainfall 1988/89	Apr-Sep Rainfall 1989
United	mm	100	138	125	78	32	62	42	102	59	129	60	118	1045	628	375
Kingdom	%	96	117	179	113	43	86	48	99	58	122	54	104	95	108	74
England and	mm	47	89	92	83	20	55	38	58	41	98	61	133	815	412	295
Wales	%	55	137	156	143	30	90	52	65	49	118	63	149	89	86	68
Scotland	mm	206	239	188	63	53	76	49	184	96	187	60	96	1497	1051	522
	%	150	230	204	70	58	83	44	143	70	126	42	62	105	135	80
Northern	mm	72	99	121	104	33	59	42	115	52	143	49	72	961	577	405
Ireland	%	69	132	173	153	45	75	45	112	49	134	48	63	87	101	77
North West	mm	75	142	144	87	37	82	33	116	29	145	84	100	1074	667	384
(NRA)	%	67	175	200	113	45	99	32	93	24	123	69	83	88	107	65
Northumbrian	mm	31	85	63	58	22	51	19	77	20	71	35	75	607	407	247
(NRA)	%	39	129	121	105	34	84	25	76	25	95	37	100	69	92	56
Severn-Trent	mm	34	67	66	91	25	53	40	44	38	82	52	135	727	300	291
(NRA)	%	49	126	127	175	39	95	62	54	57	126	66	193	94	77	75
Yorkshire	mm	27	70	78	78	19	69	43	41	20	77	45	98	665	367	270
(NRA)	%	35	109	147	139	31	119	61	46	28	112	51	132	80	86	66
Anglian	mm	30	36	49	75	14	56	41	35	30	41	36	98	541	224	251
(NRA)	%	58	86	123	188	30	114	72	55	58	79	58	185	89	74	81
Thames	mm	34	61	66	79	14	39	37	44	28	65	37	141	645	271	241
(NRA)	%	55	130	143	172	25	75	62	63	45	102	51	214	92	76	70
Southern	mm	30	69	76	81	5	41	28	29	37	79	50	142	667	310	221
(NRA)	%	39	121	146	169	9	82	47	40	52	101	53	175	84	71	62
Wessex	mm	43	94	90	77	21	32	37	43	49	101	58	165	810	383	259
(NRA)	%	51	159	155	143	31	59	60	52	62	123	60	183	93	81	65
South West	mm	66	146	126	87	12	40	31	62	107	148	100	196	1121	596	339
(NRA)	%	51	162	150	123	14	62	37	61	103	131	75	145	94	87	67
Welsh	mm	88	150	165	98	25	67	48	91	62	180	109	199	1282	670	391
(NRA)	%	65	156	190	114	27	82	51	76	50	140	76	137	96	91	65
Highland	mm	319	355	233	60	68	90	65	222	118	258	79	109	1976	1437	623
R.P.B.	%	195	267	204	53	66	82	51	150	75	139	47	56	115	149	82
North East	mm	52	113	83	54	59	57	25	84	55	87	29	54	752	503	334
R.P.B.	%	57	153	134	89	77	81	27	79	63	90	28	53	73	95	68
Tay	mm	156	197	173	45	42	58	30	140	83	136	51	86	1197	901	398
R.P.B.	%	132	214	211	60	44	70	29	119	72	111	43	64	95	135	68
Forth	mm	133	158	151	44	36	64	27	144	69	112	39	79	1056	730	384
R.P.B.	%	134	205	219	65	43	85	28	124	64	106	36	72	95	129	70
Clyde	mm	232	262	229	82	46	90	63	252	120	244	73	107	1800	1220	653
R.P.B.	%	144	232	218	80	47	87	48	177	69	133	44	58	108	133	87
Tweed	mm	71	105	105	48	43	51	23	113	47	68	30	78	782	492	325
R.P.B.	%	76	152	181	79	57	75	26	99	51	77	29	87	78	98	65
Solway	mm	139	157	195	87	35	71	42	176	77	145	59	119	1302	882	488
R.P.B.	%	99	169	214	99	38	79	38	135	51	101	41	79	91	115	74
Western Isles	mm	236	230	180	71	64	63	73	169	110	188	75	107	1566	1064	550
Orkney and Shetland	%	173	223	196	85	94	83	75	180	87	131	55	70	121	139	103

TABLE 2 'VERY RARE' DAILY RAINFALL TOTALS IN 1989

Date (Rain-day)	Raingauge Number	Name	County	Grid Reference	Amount (mm)	Return Period (1 in X years)*
05.02.89	692560	Clunes Forest	Highland	NN 186896	136.6	250
05.02.89	705926	Kinloch Hourn, The Garden	Highland	NG 951066	185.5	600
05.02.89	713544	Kinlochewe, Estate Manager's Office	Highland	NH 032623	160.1	940
05.02.89	713571	Kinlochewe	Highland	NH 024630	170.4	1430
05.02.89	781338	Cassley Power Station	Highland	NN 396232	145.0	500
05.02.89	798224	South Laggan	Highland	NN 299978	128.9	190
06.02.89	692560	Clunes Forest	Highland	NN 202886	148.8	440
06.02.89	697289	Fort William, The Factory No 2	Highland	NN 130751	131.7	270
06.02.89	798224	South Laggan	Highland	NN 299978	132.2	230
24.05.89	337068	Swallowcliffe	Wiltshire	ST 973267	110.4	390
11.09.89	365364	Slapton, Ley Field Centre	Devon	SX 824449	98.2	190
11.09.89	366134	Holsome	Devon	SX 732558	123.5	340
30.10.89	729865	Scalpay; Secondary School	Western Isles	NG 215967	102.5	460

* Based on the methods and findings of the Flood Studies Report Vol[1] (as implemented on the Meteorological Office Computer[2]) whereby a return period can be assigned to the catch at a particular raingauge. Those exceeding a 160 year return period are classified as 'very rare' events (the return periods in Table 2 have been rounded to the nearest 10 years).

[1] Flood Studies Report 1975. Natural Environment Research Council (5 vols)

[2] Keers, J.F. and Wescott, P. 1977. A computer-based model for design rainfall in the United Kingdom: Meteorological Office Scientific Paper No. 36.

Regional variations in drought severity – which were somewhat muted during the summer were strongly reinforced during September and, especially, October. Significant rainfall in western and northern Britain lowered the intensity of the meteorological droughts in these regions. Conversely, rainfall deficiencies increased moderately in the east and the water resources situation deteriorated as a result of the very limited hydrological effectiveness of the early autumn rainfall. Sustained rainfall across much of the United Kingdom early in November provided a realistic prospect of a general termination to the drought, but the subsequent re-establishment of anticyclonic conditions heralded a further remarkably dry episode. Some districts recorded little or no rainfall in the four or five weeks ending around the 9th of December and the prospect of a second successive dry winter was a matter of considerable concern in relation to water resources. However, a further abrupt change in weather patterns brought widespread and persistent rainfall to southern Britain. The passage of the most vigorous of a series of active cyclonic systems – on the 13th – resulted in the highest daily rainfall over England and Wales for three years. Rainfall accumulations over the period ending around Boxing Day were remarkably high; in some parts of lowland England this very wet spell accounted for up to a quarter of the rainfall over the rest of the year.

Rainfall in the 1980s

Placed in the perspective provided by the 1980s as a whole, 1989 was very atypical in terms of annual precipitation amounts but the distribution of rainfall – in space and in time – displayed rather more affinity with the rest of the decade. United Kingdom rainfall in the 1980s was the highest for any decade this century; only 1987 and 1989 recorded below average annual totals relative to the 1900–79 mean. Notwithstanding the preponderance of wet years, the decadal average rainfall remained less than five per cent greater than the preceding mean – testimony to the limited variability of rainfall within this time-frame. The positive anomaly for the 1980–89 period mainly reflects the abundant precipitation in Scotland which experienced its wettest decade on record by an appreciable margin; the 1980–89 annual average of 1526 mm is about 15 per cent greater than the preceding average (from 1900).

A tendency for the west-to-east UK rainfall gradient to be accentuated was a feature both of 1989 and the 1980s as a whole. This is particularly true of Scotland where the western Highlands have been persistently wet and the eastern lowlands somewhat drier than in the preceding decades. Also of significance in relation to water resources is the tendency for a greater proportion of the overall rainfall to be concentrated within the winter half-year. This achieved an extreme expression in some Highland areas where, over the ten years, winter rainfall was 30 per cent greater than the average whereas the 1980–89 April-September rainfall was somewhat below the long term mean. As a consequence the mild seasonality, which characterises much of the UK, was reinforced in the 1980s with some of the more maritime and mountainous districts (mostly in Scotland) registering up to two-thirds of their rainfall over the winter half-year. For England and Wales, seasonal contrasts were much less exaggerated but relatively low rainfall in the summer half-year, especially over the July-September period, together with above average winter rainfall enables a modest seasonality to be identified in most regions.

The ratio of winter rainfall (1979/80 – 1988/89) for England and Wales to that of the ensuing summer is 1.34; substantially greater than the long term average – in the 19th century decadal values close to unity were typical – and continues a sequence (beginning with 1977) of years with winter rainfall in excess of that for the summer half-year. The present 14-year sequence is without precedent and the average for the 1980s is the highest for any decade in the general England and Wales rainfall series. The greater hydrological effectiveness implied by such a pronounced tendency for precipitation to occur at times of low evaporative loss is reflected in the elevated runoff totals which typified large parts of northern Britain (see below). By contrast, in much of lowland Britain – where the potential benefits of increased winter rainfall to water resources are considerable – little or no appreciable departure from the long term half-yearly means was evident for the 1980s as a whole.

Evaporation and Soil Moisture Deficits

Weather conditions throughout the greater part of 1989 were particularly conducive to high rates of evaporation; temperatures and sunshine hours were both remarkably high. Potential evaporation (PE) totals were well above average, substantially so in many districts, both for the year as a whole and on a seasonal basis. In some mountainous western areas, especially the Scottish Highlands and the Lake District, actual evaporation totals were also notably high. Elsewhere the persistence of large soil moisture deficits (SMDs) were an important inhibiting factor, particularly in the latter two-thirds of the year; with the exception of the hills of north-western Britain, soils remained at or close to field capacity for a very truncated period. As a result actual evaporation (AE) losses were typically within the normal range and somewhat below average throughout the greater part of lowland England. Soil moisture deficits were unusually high early in the year and in eastern districts remained significant well into the winter of 1989/90.

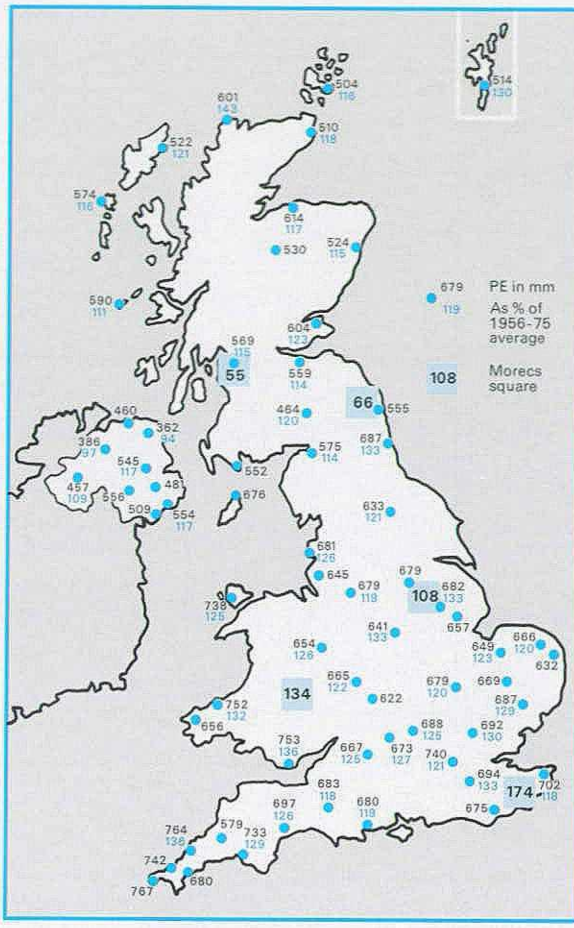


Figure 3. Potential evaporation in 1989—in mm and as a percentage of the long term average.

Figure 3 shows 1989 potential evaporation totals for a network of climate stations throughout the UK together with the corresponding percentage of the 1956–75 mean (percentages are omitted where the historical record is incomplete). With the exception of a few localities in Northern Ireland, the 1989 PE values are well above average with record, or near record, totals common; totals appreciably above 700 mm are rare in the UK. Generally the 1989 totals comfortably exceed those registered in 1988 – another exceptionally warm year – and are somewhat greater than the corresponding totals for 1976. In terms of potential evaporation, 1989 provided a suitable climax to a notable decade with above average PE being registered in all but one or two years in most regions.

Of greater hydrological significance than the elevated PE totals in 1989 were the very large shortfalls of actual evaporation relative to PE. Shortfalls were modest in the hills of the maritime west but increased in a south-easterly direction (see map on page 34) and most regions registered their largest difference between calculated PE and AE totals since 1976. The large geographical variation in the shortfall implies that – even more than in a typical year – actual evaporation losses diverged considerably from the pattern suggested by Figure 3. The SE-NW trend towards lower PE totals was largely counterbalanced by the effect of SMDs and regional variations in actual evaporative losses were very modest – annual totals for most regions falling in the range 450–550 mm. However, significant positive anomalies occurred in north-west Scotland and AE losses were five per cent or more below average throughout the English lowlands. Considering the decade as a whole actual evaporative losses were marginally greater than for the preceding record. This was particularly true of eastern Britain but generally the decadal difference with the 1970s could be largely attributed to the very low actual evaporation totals for 1976.

There was a considerable divergence from the normal seasonal growth and decay of SMDs during 1989 reflecting the unusual climatological conditions. Figure 4 illustrates the variation in PE, AE and SMD for five MORECS (Meteorological Office Rainfall and Evaporation Calculation System – see page 2) squares; the locations of the featured squares are indicated on Figure 3. In some eastern lowland districts, significant deficits existed throughout the year and exceptionally high deficits were registered in the summer and autumn. SMDs in eastern and southern regions reached their highest levels since 1976. In the west the peak values registered during the 1984 drought were commonly exceeded.

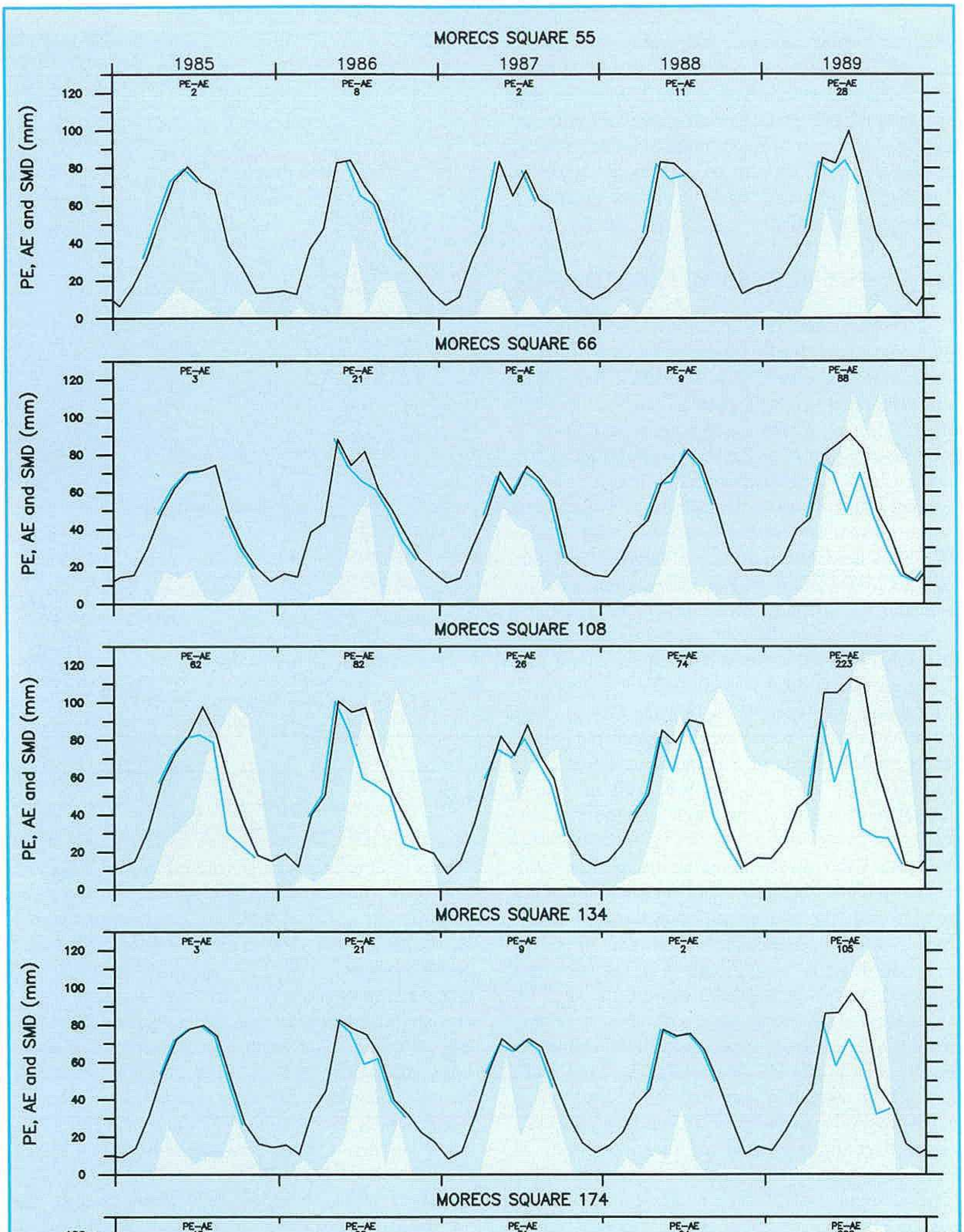


Figure 4. The variation in potential evaporation, actual evaporation and soil moisture deficits for five MORECS squares. (The location of the featured grid squares is shown on Figure 3.)

TABLE 3 1989 WATER BALANCES FOR SELECTED CATCHMENTS IN GREAT BRITAIN

Station Number	River and Station Name			Rainfall	Runoff	Loss	Runoff as % of Rainfall 1989	Runoff as % of Rainfall lta	Abstractions* and Discharges
12001	Dee	Woodend	1989 mm	932	609	323	65	74	N
			as a % of lta	83	72	115			
15006	Tay	Ballathie	1989 mm	1509	1236	273	81	77	SPIH
			as a % of lta	105	111	84			
19001	Almond	Craigiehall	1989 mm	807	424	383	52	54	PEI
			as a % of lta	91	87	95			
21012	Teviot	Hawick	1989 mm	1094	750	344	68	68	N
			as a % of lta	92	92	93			
23004	South Tyne	Haydon Bridge	1989 mm	940	517	423	54	64	N
			as a % of lta	79	68	99			
27002	Wharfe	Flint Mill Weir	1989 mm	1009	521	488	51	62	SRPI
			as a % of lta	87	71	113			
27041	Derwent	Buttercrambe	1989 mm	539	157	382	29	43	P
			as a % of lta	66	44	84			
28008	Dove	Rocester Weir	1989 mm	943	504	439	53	57	GE
			as a % of lta	90	84	98			
29003	Lud	Louth	1989 mm	535	143	392	26	39	
			as a % of lta	76	51	93			
30001	Witham	Claypole Mill	1989 mm	573	124	449	21	30	P
			as a % of lta	91	65	10			
31002	Glen	Kates Br. and King St.	1989 mm	590	40	550	6	17	G
			as a % of lta	95	36	107			
37005	Colne	Lexden	1989 mm	529	115	414	21	24	RPI
			as a % of lta	91	81	95			
38003	Mimram	Panshanger Park	1989 mm	602	104	498	17	19	GI
			as a % of lta	92	81	94			
39020	Coln	Bibury	1989 mm	813	275	538	33	49	GE
			as a % of lta	101	69	133			
40003	Medway	Teston	1989 mm	623	153	470	24	37	SPG
			as a % of lta	81	53	98			
42010	Itchen	Highbridge + Allbrook	1989 mm	765	329	436	43	54	RPG
			as a % of lta	89	71	112			
43007	Stour	Throop Mill	1989 mm	818	300	518	36	45	PGE
			as a % of lta	95	76	111			
45001	Exe	Thorverton	1989 mm	1188	684	504	57	65	SRPGEI
			as a % of lta	93	81	115			
54029	Teme	Knightsford Bridge	1989 mm	765	288	477	37	45	PN
			as a % of lta	92	76	106			
56001	Usk	Chain Bridge	1989 mm	1391	950	441	68	69	S
			as a % of lta	100	98	103			
67018	Dee	New Inn	1989 MM	1907	1598	309	83	94	N
			as a % of lta	98	87	279			
72004	Lune	Caton	1989 mm	1337	936	401	70	74	SRP
			as a % of lta	90	84	107			
76007	Eden	Sheepmount	1989 mm	1031	593	438	57	57	SP
			as a % of lta	86	86	87			
79002	Nith	Friars Carse	1989 mm	1462	983	479	67	68	SP
			as a % of lta	96	94	99			
85001	Leven	Linnbrane	1989 mm	2205	1793	412	81	81	S
			as a % of lta	106	107	105			
94001	Ewe	Poolewe	1989 mm	2886	2556	330	88	83	N
			as a % of lta	119	126	83			

lta = long term average

* For an explanation of the code letters see page 48.

The dry and mild 1988/89 winter prevented any return to field capacity over large areas of lowland Britain. Significant SMDs (relative to the winter average), albeit still modest in numerical terms, were maintained, for instance, over much of Lincolnshire, the lower Trent Valley and the area around the Thames estuary. In eastern Kent the MORECS deficit (for grass) at the end of January was the highest on record, comfortably exceeding the corresponding figure for 1976. The spring rainfall generally eliminated the deficits carried over from 1988 but in a few eastern districts field capacity was not reached and SMDs subsequently increased sharply as the cool April conditions gave way to a persistent spell of hot and dry weather. Very steep increases occurred in May and maximum deficits (approximately 125 mm for grass) were maintained over large areas of lowland Britain from late June until September. By the end of the summer SMDs exceeded the long term average by 20–80 mm and remained substantial well into the autumn. The maximum SMDs for 1989 occurred, typically, in September. A brisk decline in the west during October had no real counterpart in the eastern lowlands and extraordinarily high deficits, approaching 100 mm in a few eastern coastal localities, persisted into December. The heavy end-of-year rainfall led to a rapid decline but appreciable deficits were still carried over into 1990 throughout much of southern and eastern Britain. In some districts there had been no return to field capacity since the end of the 1987/88 winter.

Broadly speaking a similar picture to that described for evaporation emerges from the geographical pattern of catchment losses presented in Table 3. Because of the effect of natural and artificial storages which disturb the relationship between rainfall and runoff in many catchments, annual losses may not equate closely to computed totals of annual evaporation. Where baseflow is limited however, and the net impact of abstractions and discharges is negligible, the loss may be regarded as a reasonable guide to annual AE totals especially in those areas where SMDs are modest at year-end. The essentially conservative nature of annual catchment losses is revealed by Table 3, most catchments registering percentages in the 90–100 range. Figures for a few of the wetter catchments appear anomalous e.g. on the Rivers Dee and Ewe. Such data need to be treated with caution in view of the substantial impact on losses which result from even minor systematic errors in the assessment of rainfall and runoff totals.

Runoff

Runoff in 1989 for the United Kingdom totalled approximately 630 mm, the lowest since 1976 but still only a little below the 1961–88 average. 1987 is the only other year to record below average runoff since 1978. Whilst on a nationwide basis the annual total was well within the normal range, the spatial and temporal variations in runoff were very unusual.

Figure 5 provides a guide to 1989 runoff totals expressed as a percentage of the 1961–88 average. The map is least precise in northern Scotland, the Welsh mountains and some of the coastal lowlands of eastern England where the gauging station network is sparse or where data availability was limited. In these areas assessments of residual rainfall (rainfall minus evaporation) totals were used to help delineate isopleths. Insufficient confirmatory flow data exist for the Scottish islands to allow the drawing of runoff isopleths with any confidence. The range of annual percentage runoff illustrated on Figure 5 is without recent parallel; percentage runoffs outside the 50–150 band are normally confined to regions of very low runoff where small absolute differences from year to year produce relatively large percentage changes. The wider range of runoff percentages for 1989 compared to those for rainfall (see Figure 1) serves to emphasise the greater hydrological sensitivity of the eastern lowlands to limited rainfall. With evaporative losses being relatively stable a shortfall in rainfall of, say, 200 mm has a disproportionate impact on annual percentage runoff in regions where residual rainfall even in a normal year is modest. Such an effect was clearly evident in 1989 when areas of low runoff, in actual and percentage terms, tended to coincide.

The broadly meridional pattern of isopleths on Figure 5 testifies to a very notable exaggeration in the normal west-to-east runoff gradient across Great Britain. An extreme expression of this tendency may be identified along a NW-SE transect across mainland Britain. The 1989 runoff for the Poolewe gauging station, which monitors the outflow from Loch Maree in Wester Ross, just exceeded the previous maximum established in 1983, whereas the Kent Stour, for example, recorded a new annual minimum runoff total (in a 26-year record).

In water resources terms the most important feature of Figure 5 is the large area with runoff below 70 per cent of the average – a significant proportion of eastern catchments recorded runoff below half the long term mean. One important consequence was that the 1989 drought bore most heavily on those regions characterised by concentrations of population, commerce and intensive agriculture. Such areas are associated with high, and increasing, water demand and the drought's potential impact was therefore considerable. An obvious contrast may be drawn with those districts where resources are abundant and total demand constituted only a minor proportion of the available runoff. Runoff totals in western Scotland were often exceptionally high and exerted an appreciable influence on the overall UK runoff total; a number of gauging stations recorded their highest annual runoff on record. Perhaps more remarkable are the catchment contrasts within Scotland itself. Those rivers sustained by headwaters in the western Highlands and the Cairngorms often registered unprecedented runoff totals. To the east, runoff rates declined dramatically so that catchments located mainly in the eastern lowlands recorded new minimum annual runoff totals, examples include the catchments of the Rivers Ugie and Dee; they represent the northerly extension of a zone of extreme runoff deficiency along the eastern seaboard of Great Britain. In southern and eastern England, where runoff is normally only around 10 per cent of that in the western Highlands, new minimum annual runoff totals were established for a relatively large number of rivers.

Whilst the main features of Figure 1 may be recognised on Figure 5, the correlation with the rainfall map is less compelling in eastern and central England. This reflects the greater importance of evaporation in southern Britain, the effect of substantial SMDs carried-over from 1988 and, importantly, geological and pedological contrasts between catchments which influence their ability to store and release water. The relatively depressed levels of water-tables entering 1989 ensured that runoff totals for the year benefited only modestly from infiltration occurring in the autumn and early winter of 1988/89. This tended to increase catchment losses over a calendar year accounting period. In some lowland catchments, losses were further accentuated by the inhibiting influence of seasonally high SMDs towards the end of the year when the contrasting ability of rivers draining permeable and impervious catchments to respond to the exceptional December rainfall was also very evident. For this reason the 1989 percentage runoff is commonly somewhat lower in high baseflow rivers and the influence of the

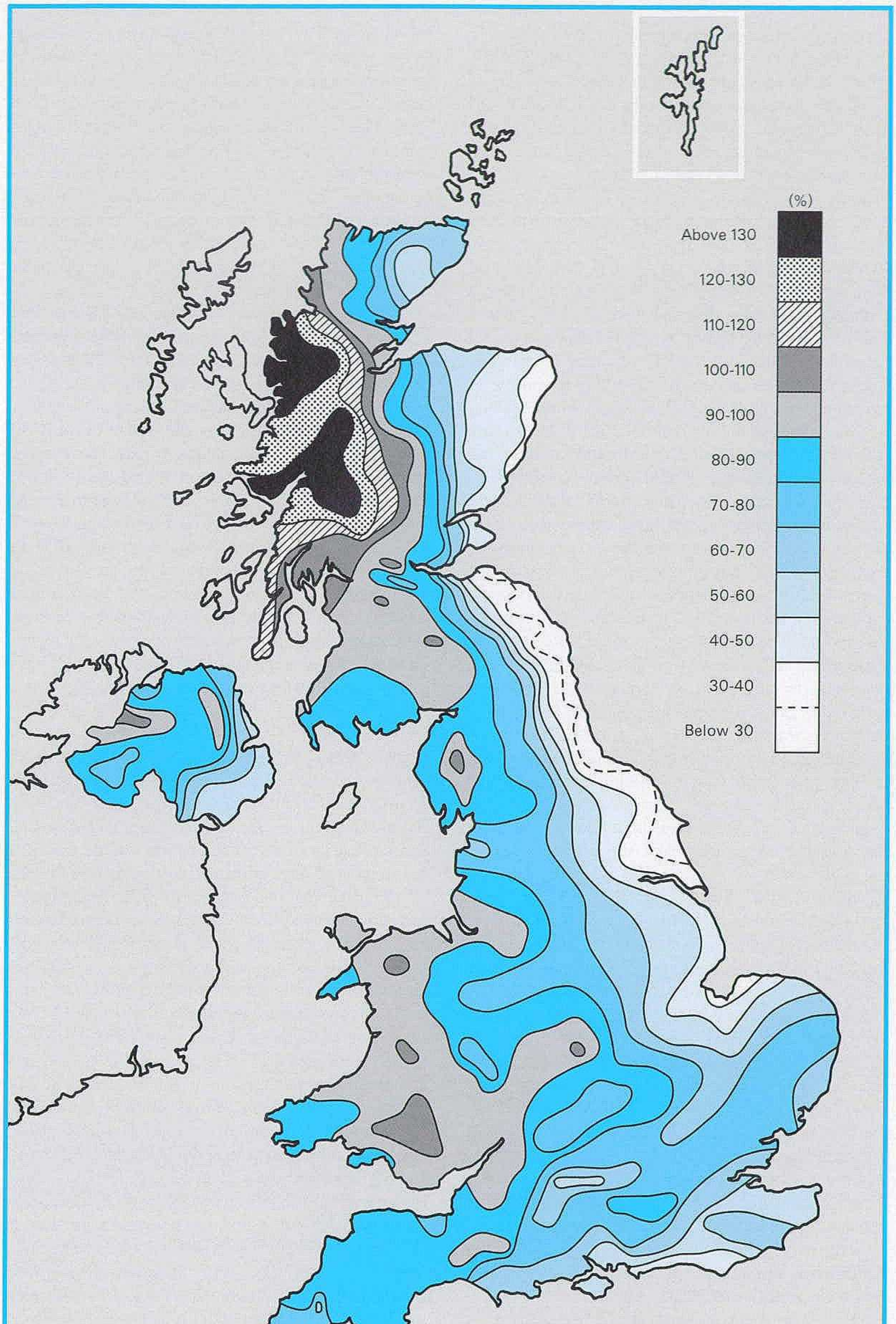


Figure 5. A guide to 1989 runoff expressed as a percentage of the 1961–88 average.

chalk and limestone outcrops may be discerned in the percentage runoff patterns exhibited on Figure 5 (the outcrop areas are shown in Figure 17).

With the notable exception of the Scottish floods early in the year, flood events of significant magnitude were uncommon in 1989. Spate conditions were, however, widespread in western catchments in February and March, and again in October when particularly high flows were recorded in Northern Ireland. Localised flooding was also common in southern Britain around Christmas but the great majority of the many new hydrometric records established through the year related to low flows. Table 4 provides a summary of river flow and runoff records established in 1989 at primary gauging stations. Entries are confined to monitoring sites having at least 15 years of data on the Surface Water Archive; stations in the annual runoff section are listed in numerical order, the monthly, daily and peak flow sections are ordered chronologically. New minimum annual and monthly runoff totals are very common – representing the most widespread extension of low flow records since the 1976 drought. Of particular note is the margin by which some of the previous minima have been superseded, especially for rivers in the north-east of England. A number of entries in Table 4 may be subject to revision particularly as low flow stage-discharge relations are reviewed in the light of recent current meter gaugings – in many rivers, weed-growth had a major impact on water levels over the summer half-year.

The regional diversity in runoff amounts implicit in Figure 5 is less evident in relation to the pattern of flows through the year. A reasonable uniformity regarding runoff distribution may be recognised but considerable departures from the normal seasonal cycle are also evident. Figure 6(a-d) illustrates the variation in flows through 1989 for four representative gauging stations in Scotland, England, Wales and Northern Ireland. Data featured for the Kingston gauging station have been adjusted to account for the major water supply abstractions from the Thames above London. Daily and monthly hydrographs are shown for each monitoring site together with the corresponding extremes for the preceding period of record. The monthly hydrograph shows the 1989 flows as a solid black line and the blue line represents the 30-day running mean for the pre-1989 record. A common feature of the daily flow hydrographs are the notable low flows – relative to the seasonal average – early in the year, in the late summer and, most remarkably, in early December. In a more typical year periods of significantly reduced flow are largely confined to the summer months when evaporation losses are at their maximum.

Except in north-western Britain, the recovery in runoff rates following the summer of 1988 was inordinately delayed and only in the mid-February to mid-April 1989 period did flow rates reach the winter average in many catchments. In Scotland however spate conditions became established earlier in the year. Flows on the Tay – the UK's largest river in discharge terms – remained very high until late March; the accumulated January to March runoff being the third highest for any three-month period in a record from 1958. This wet interlude was succeeded by prolonged summer recessions which resulted in exceptionally low summer discharge rates in relatively impervious catchments. In lowland England where – in many catchments – baseflow provides a substantial proportion of low flows, the continuing benefit of spring recharge commonly postponed the minimum flows until well into the autumn.

October minima were common in the South-East at a time when some seasonal upturns were occurring to the west. Rather more unusual were the November minima, for example in Sussex (on the Ouse) and the absolute minimum (after allowing for artificial augmentation) registered on the Itchen towards the middle of December. In large part the delayed seasonal increase in river flows was a consequence of the very substantial SMDs which served to restrict the runoff response to the October rainfall in all but the more maritime areas. Hydrologically the situation was then exacerbated by the onset of the remarkably dry four-week period beginning in mid-November which led to sustained recessions throughout the UK – in a few western catchments these recessions were steep but more generally they represented a further decline from already depressed runoff rates. Over the majority of the UK, early December flows were, as in 1988, more typical of the summer and a number of new minimum December flows were established. In some eastern catchments accumulated runoff totals for the year stood well below the previous annual minimum and with soils extraordinarily dry – for the winter – there was little expectation of any substantial upturn before the end of the year. In the event, the transformation in hydrological conditions, especially in central southern districts, over the next three weeks was very dramatic. Flows in a number of rivers increased from the lowest (for the winter) to bankfull in less than a fortnight; moderate flooding occurred in the Severn and Thames Valleys. The unusual distribution of runoff throughout 1989 is emphasised by the fact that this very wet episode accounted for up to half the yearly total in some central southern catchments.

The flow duration curves illustrated in Figure 6 allow the proportion of time that river flows fell below a given threshold to be identified. In 1989 low flows (those exceeded for 95 per cent of the time) were below average in all but a few catchments in north-west Scotland. Typically the 95 per cent exceedance flows were the lowest since 1984 in the more maritime regions of Britain and the lowest since 1976 elsewhere; for a few mostly eastward draining rivers, notably the Dee and the Yorkshire Derwent, new period-of-record minima were established. Similarly, the 50 per cent exceedance flow was normally considerably below the long term median value but in most areas well above the corresponding figure for 1976.

TABLE 4 RIVER FLOW AND RUNOFF RECORDS ESTABLISHED IN 1989

Station Number	River and Station Name		First Year of Record	New Record (mm)	Pre-1989 Record (mm)	Year
Highest Annual Runoffs						
4001	Conon	Moy Bridge	1947	2073	1942	1981
6007	Ness	Ness Side	1973	1865	1755	1983
94001	Ewe	Poolewe	1970	2556	2542	1983
Lowest Annual Runoffs						
2001	Helmsdale	Kilphedir	1975	496	545	1976
8004	Avon	Dalnashaugh	1952	513	576	1971
9001	Deveron	Avochie	1959	289	374	1972
9002	Deveron	Muiresk	1960	249	294	1972
9003	Isla	Grange	1969	231	234	1972
10002	Ugie	Inverugie	1971	201	286	1972
11001	Don	Parkhill	1969	219	265	1973
11002	Don	Haughton	1969	268	324	1973
11003	Don	Bridge of Alford	1973	331	519	1975
21027	Blackadder Water	Mouth Bridge	1973	134	201	1975
22009	Coquet	Rothbury	1972	263	374	1975
24005	Browney	Burn Hall	1954	139	150	1973
25004	Skerne	South Park	1956	75	104	1975
25005	Leven	Leven Bridge	1959	110	125	1964
25019	Leven	Easby	1971	177	305	1975
25020	Skerne	Preston le Skerne	1972	57	120	1973
25021	Skerne	Bradbury	1973	50	123	1982
26002	Hull	Hempholme Lock	1961	87	114	1973
27038	Costa Beck	Gatehouses	1970	1601	2066	1973
27041	Derwent	Buttercrambe	1973	157	233	1975
27042	Dove	Kirkby Mills	1972	307	341	1973
27044	Blackfoss Beck	Sandhills Bridge	1974	91	146	1975
27048	Derwent	West Ayton	1972	43	48	1974
27049	Rye	Ness	1974	217	313	1975
27050	Esk	Sleights	1970	228	389	1971
27051	Crimple	Burn Bridge	1972	269	323	1973
27054	Hodge Beck	Cherry Farm	1974	298	496	1983
27055	Rye	Broadway Foot	1974	254	353	1975
27056	Pickering Beck	Ings Bridge	1974	177	304	1976
27057	Seven	Normanby	1974	182	389	1983
27058	Riccal	Crook House Farm	1974	137	160	1975
28040	Trent	Stoke on Trent	1968	277	301	1984
33006	Wissey	Northwold	1956	128	138	1976
33007	Nar	Marham	1953	144	146	1964
40003	Medway	Teston	1956	153	190	1962
41003	Cuckmere	Sherman Bridge	1959	104	105	1973
44009	Wey	Broadwey	1975	847	865	1976
47013	Withey Brook	Bastreet	1973	816	901	1987
48004	Warleggan	Trengoffe	1969	760	778	1983
48007	Kennal	Ponsanooth	1968	363	411	1976
48011	Fowey	Restormel	1961	632	651	1964
49004	Gannel	Gwills	1969	376	386	1973
52014	Tone	Greenham	1967	400	403	1987
84023	Bothlin Burn	Auchengeich	1973	489	542	1975
97002	Thurso	Halkirk	1972	392	399	1972
203017	Upper Burn	Dynes Bridge	1970	278	335	1983
205005	Ravernet	Ravernet	1972	303	308	1983

Station Number	River and Station Name		First Year of Record	New Record (mm)	Month	Pre-1989 Record (mm)	Month/ Year
Highest Monthly Runoffs							
43009	Stour	Hammoon	1968	139	DEC	133	OCT 76
Lowest Monthly Runoffs							
25018	Tees	Middleton in Teesdale	1971	26	MAY	26	JUN 88
82002	Doon	Auchendrane	1974	18	JUN	20	MAY 84
20002	West Peffer Burn	Luffness	1966	0.2	JUL	0.4	AUG 74
21012	Teviot	Hawick	1963	5.6	JUL	6.1	AUG 83
22009	Coquet	Rothbury	1972	5.0	JUL	5.0	AUG 76
76002	Eden	Warwick Bridge	1966	9.0	JUL	9.2	AUG 76
80001	Urr	Dalbeattie	1963	1.9	JUL	1.9	JUL 84
82001	Girvan	Robstone	1963	2.8	JUL	3.3	AUG 84
84003	Clyde	Hazelbank	1956	8.9	JUL	9.4	AUG 84
201005	Camowen	Camowen Terrace	1972	5.4	JUL	6.4	SEP 72
201006	Drumragh	Campsie Bridge	1972	3.3	JUL	3.8	AUG 76

TABLE 4—(continued)

Station Number	River and Station Name		First Year of Record	New Record (mm)	Month	Pre-1989 Record (mm)	Month/Year
Lowest Monthly Runoffs (continued)							
203024	Cusher	Gambles Bridge	1971	1.0	JUL	1.2	AUG 76
40013	Darent	Otford	1969	2.7	AUG	2.9	JUL 76
41010	Adur W. Branch	Hatterell Bridge	1961	0.3	AUG	0.3	AUG 76
41017	Combehaven	Crowhurst	1969	0.9	AUG	1.5	AUG 82
2001	Helmsdale	Kilphedir	1975	10	SEP	11	AUG 76
27049	Rye	Ness	1974	6.8	SEP	7.7	AUG 76
27055	Rye	Broadway Foot	1974	8.3	SEP	9.1	AUG 76
28040	Trent	Stoke on Trent	1968	6.3	SEP	7.6	JUL 84
28061	Churnet	Basford Bridge	1975	9.5	SEP	11	AUG 76
39042	Leach	Priory Mill Lechlade	1972	1.0	SEP	1.7	AUG 76
42011	Hamble	Frog Mill	1972	2.3	SEP	2.4	AUG 76
48007	Kennal	Ponsanooth	1968	3.9	SEP	6.0	AUG 84
52017	Congresbury Yeo	Iwood	1973	8.2	SEP	9.7	SEP 87
68004	Wistaston Brook	Marshfield Bridge	1957	6.2	SEP	6.9	AUG 77
71010	Pendle Water	Barden Lane	1971	9.6	SEP	15	JUN 75
23002	Derwent	Eddys Bridge	1954	2.5	OCT	3.4	AUG 59
40004	Rother	Udiam	1962	2.0	OCT	2.3	AUG 76
27038	Costa Beck	Gatehouses	1970	113	NOV	125	AUG 82

Station Number	River and Station Name		First Year of Record	New Record (m^3s^{-1})	Day/Month	Pre-1989 Record (m^3s^{-1})	Day/Month/Year
Highest Instantaneous Flows							
15011	Lyon	Comrie Bridge	1972	315	06 FEB	271	15 NOV 78
94001	Ewe	Poolewe	1970	248	07 FEB	180	31 DEC 83
6007	Ness	Ness Side	1973	801	08 FEB	619	02 JAN 84
76001	Haweswater Beck	Burnbanks	1953	30.8	09 MAR	27.1	09 MAR 82
76015	Eamont	Pooley Bridge	1970	72.4	09 MAR	72.1	21 DEC 85
86002	Eachaig	Eckford	1968	112	20 SEP	95.4	11 SEP 78

Station Number	River and Station Name		First Year of Record	New Record (m^3s^{-1})	Day/Month	Pre-1989 Record (m^3s^{-1})	Day/Month/Year
Highest Daily Mean Flows							
18003	Teith	Bridge of Teith	1957	227	06 FEB	208	21 DEC 85
65001	Glaslyn	Beddgelert	1961	86.3	09 MAR	85.9	27 OCT 80
65004	Gwyrfai	Bontnewydd	1970	28.7	09 MAR	27.1	18 OCT 87
36013	Brett	Higham	1971	6.02	16 MAR	4.62	30 MAR 88
55026	Wye	Ddol Farm	1937	199	28 OCT	147	03 DEC 80
Lowest Daily Mean Flows							
82002	Doon	Auchendrane	1974	2.00	19 JUN	2.14	01 AUG 74
14002	Dighty Water	Balmossie Mill	1969	0.133	08 JUL	0.134	15 SEP 75
21012	Teviot	Hawick	1963	0.437	24 JUL	0.509	15 JUL 78
80001	Urr	Dalbeattie	1963	0.058	24 JUL	0.076	21 JUL 78
72005	Lune	Killington New Bridge	1969	0.331	25 JUL	0.395	25 JUL 84
76002	Eden	Warwick Bridge	1966	2.94	25 JUL	3.35	29 AUG 76
17003	Bonny Water	Bonny Bridge	1971	0.151	26 JUL	0.152	20 SEP 78
14001	Eden	Kemback	1967	0.575	04 AUG	0.638	30 AUG 73
15010	Isla	Wester Cardean	1972	0.977	04 AUG	1.098	27 AUG 84
20002	West Peffer Burn	Luffness	1966	0.001	04 AUG	0.002	22 AUG 74
73008	Bela	Beetham	1969	0.294	07 AUG	0.300	20 AUG 84
19007	Esk	Musselburgh	1962	0.671	08 AUG	0.675	31 MAY 82
60005	Bran	Llandovery	1968	0.003	08 AUG	0.019	03 JUL 76
33031	Broughton Brook	Broughton	1971	0.003	07 SEP	0.016	13 JUL 76
39042	Leach	Priory Mill Lechlade	1972	0.020	09 SEP	0.035	26 AUG 76
57004	Cynon	Abercynon	1957	0.252	12 SEP	0.283	23 AUG 76
68004	Wiston Brook	Marshfield Bridge	1957	0.127	14 SEP	0.147	02 SEP 84
34012	Burn	Burnham Overy	1966	0.054	19 SEP	0.064	10 OCT 74
35008	Gipping	Stowmarket	1964	0.048	23 SEP	0.053	26 AUG 73
27055	Rye	Broadway Foot	1974	0.364	02 OCT	0.395	27 AUG 84
28040	Trent	Stoke on Trent	1968	0.090	04 OCT	0.095	25 JUL 84
27049	Rye	Ness	1974	0.558	05 OCT	0.596	26 AUG 76
44009	Wey	Broadwey	1975	0.056	08 OCT	0.060	04 NOV 84
40004	Rother	Udiam	1962	0.083	14 OCT	0.113	01 NOV 69
41017	Combehaven	Crowhurst	1969	0.004	18 OCT	0.010	29 AUG 82
41026	Cockhaise Brook	Holywell	1971	0.008	18 OCT	0.019	29 JUN 76
27038	Costa Beck	Gatehouses	1970	0.322	21 NOV	0.341	02 OCT 85
11001	Don	Parkhill	1969	3.55	15 DEC	3.91	27 AUG 76
11002	Don	Haughton	1969	2.43	15 DEC	2.85	27 AUG 76
11003	Don	Bridge of Alford	1973	1.76	15 DEC	2.12	26 AUG 76

Note: Highest daily mean flows are only featured where no corresponding highest instantaneous flow record occurred.
Only the highest or lowest value is featured where more than one record was established at a station during the year.
In some instances, rounding causes the new record runoff value to equal the pre-1989 value.

15006 TAY AT BALLATHIE 1989

Previous record: 1953-1988 Catchment area: 4587·1km²

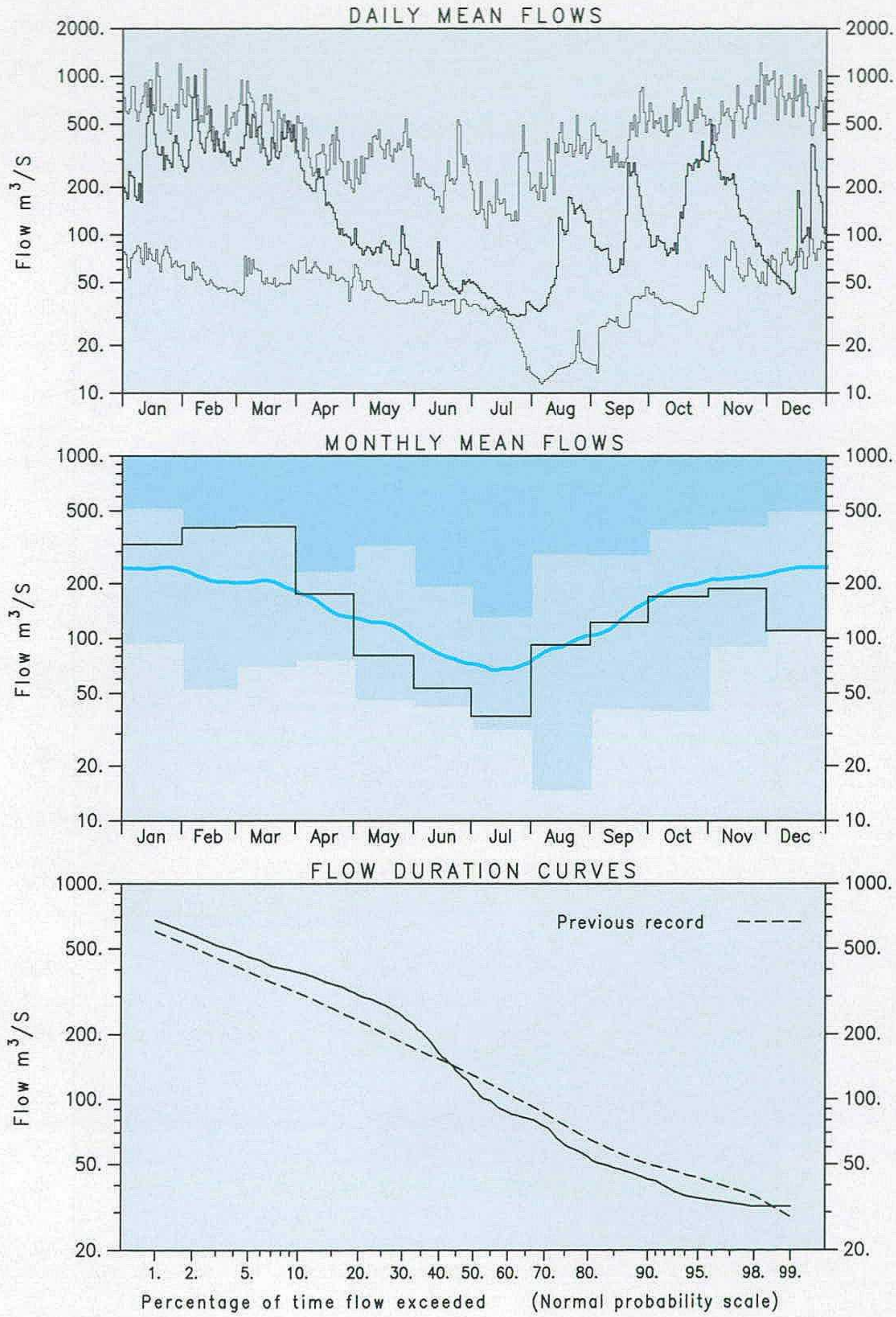


Figure 6(a). River flow patterns: Tay at Ballathie.

39001 **THAMES AT KINGSTON** **1989**
(Naturalised)

Previous record: 1883-1988 Catchment area: 9950·0km²

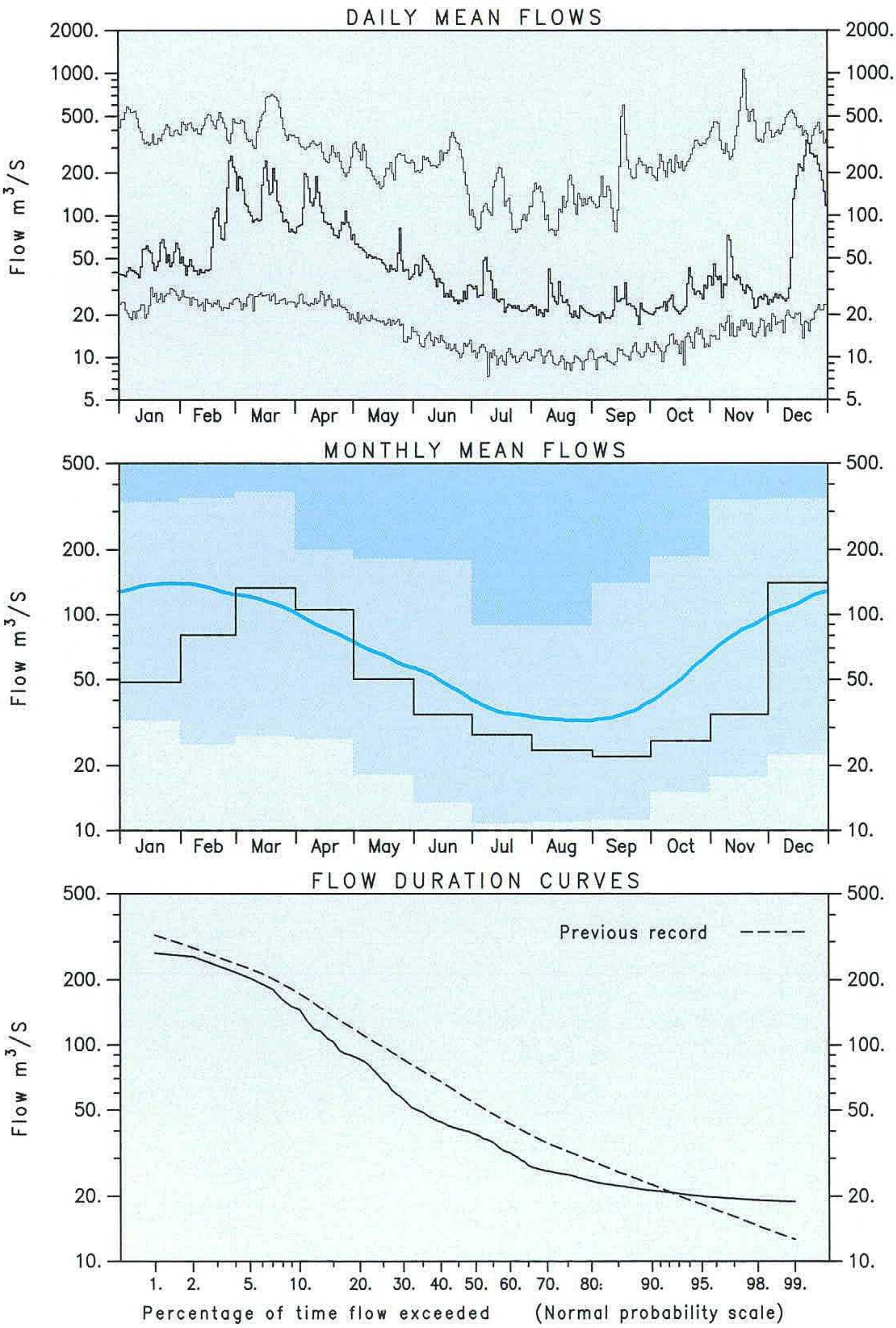


Figure 6(b). River flow patterns: Thames at Kingston.

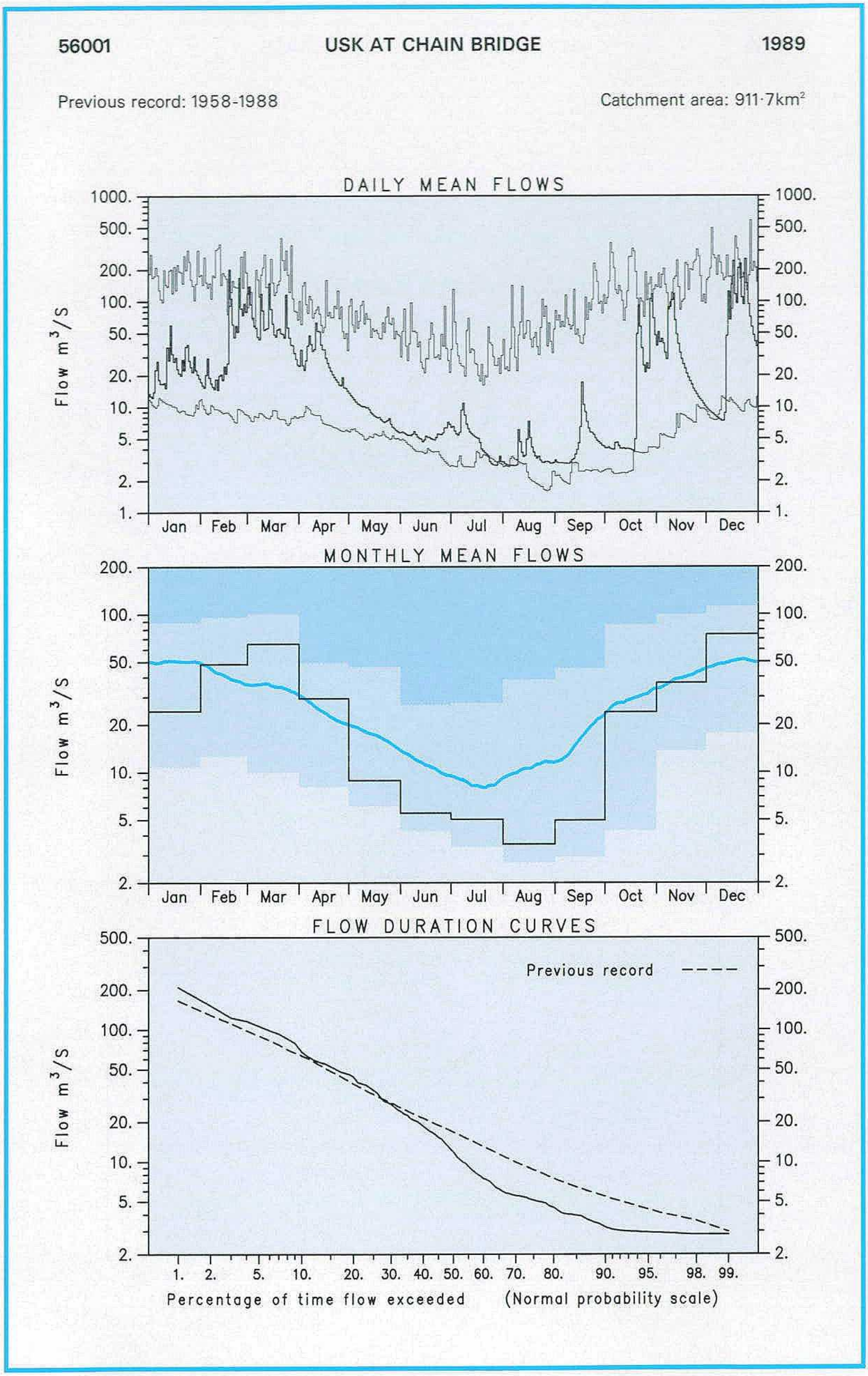


Figure 6(c). River flow patterns: Usk at Chain Bridge.

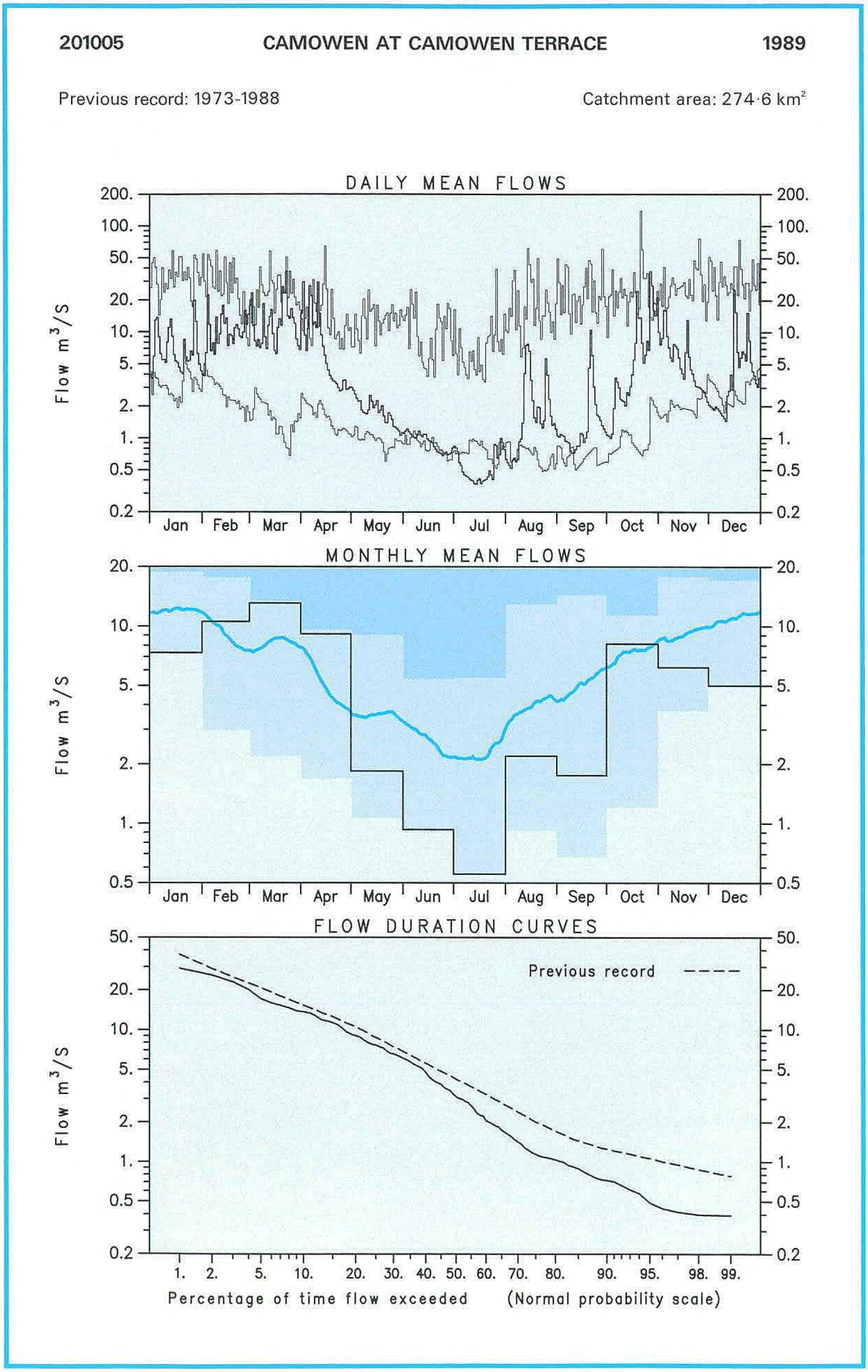


Figure 6(d). River flow patterns: Camowen at Camowen Terrace.

Runoff in the 1980s

For the greater part of the decade beginning in 1980, runoff rates have been above the preceding average especially in northern Britain. The result of the dry phase which began, over large parts of the country, in the spring of 1988 has been to produce catchment runoff totals for the 1980s which are broadly similar but still somewhat greater than those for the preceding period of record. In runoff terms the positive anomalies were largest in western Scotland but appreciable percentage increases also occurred in England and Wales. Rather more substantial differences emerge where the preceding record is of limited duration; in part this reflects the relative dryness of the decade commencing in 1970. Many rivers in Scotland, including the Tay, Tweed and Nith, registered runoff totals over the 1980-89 period more than 20 per cent greater than that recorded for the 1970s. Further south such differences are less apparent and in a few southern catchments, including the Kent Stour and Hampshire Test the decadal mean flow in the 1980s fell a little short of that for the preceding record. More typically a modest increase in runoff may be identified and, at least in western catchments, this may be attributable to the enhanced hydrological effectiveness of the rainfall consequent upon an appreciable change in its seasonal distribution. The benefit, in runoff terms, resulting from a greater proportion of annual precipitation falling in the winter half-year is greater for some catchments (e.g. the Nith and the Clyde) than the corresponding increase in catchment rainfall between the 70s and 80s.

In broad terms the 1980s may be categorised as having enhanced runoff relative to the previous two decades. This is especially true of northern Britain and principally reflects high runoff in the winter and spring periods. Some evidence also exists to indicate that seasonal runoff has been more variable in the 1980s. Prior to 1960 the gauging station network was relatively sparse but sufficient long term records exist - supplemented by rainfall and groundwater data - to demonstrate that the 1980s were less outstanding when viewed in the context of the century as a whole[1]. On the River Thames, for instance, runoff in the 1980s was a little above that for the preceding decade but some 15 per cent below that registered in the decade commencing in 1910.

A discernible departure from the mean distribution of runoff through the year was a feature of the 1980s. The limited record lengths and significant year-on-year variability constrains the deductions that can be drawn but these departures are consistent with the rainfall distribution through the years. In many areas however, precipitation contrasts have been moderated by the effects of aquifer storage - enhanced March to June rainfall (a feature of many eastern catchments) leading to increased baseflow support for rivers through the summer and into the autumn. Snowmelt accumulations (which can delay the impact of additional winter precipitation especially in Scotland) can have a similar effect in the spring. In a few high baseflow catchments, for instance the Witham in Lincolnshire, the lag effect has served to somewhat reduce the within-year range of flows compared to the pre-1980 average. More commonly a modest increase in the range of flows occurred during the 1980s. Using the 10 per cent exceedance and 95 per cent exceedance flows as yardsticks, high flows in Scotland were a little above the preceding average and low flows marginally below; in the context of the normal decadal variability neither change is particularly significant. A similar picture emerges in northern England and parts of Wales. Many catchments in the Midlands and central southern England recorded 10 per cent and 95 per cent exceedance flows very close to the preceding average. In the eastern lowlands, however, notable increases in low flows could be recognised. The drought conditions experienced in 1983, 84 and 89 were more than counterbalanced by the enhanced low flows recorded during the rest of the decade. In assessing the implications of such an overall increase in low flows, it is necessary to take account of the dominant influence of 1976 flows on the 95 per cent exceedance flow; it is not unexpected that runoff rates would increase in relation to conditions experienced during such an extreme drought.

Groundwater

Following the drought of 1976, when unprecedentedly low groundwater levels were recorded throughout both major and minor aquifers, water-tables generally remained close to, or a little above, average levels until the autumn of 1987. Abundant recharge over the 1987/88 winter half-year then resulted in peak levels - in the spring of 1988 - well above the seasonal mean. As a consequence bourne flows broke in some districts where they had not been seen for up to twenty years and, more generally, groundwater levels stood at their highest level since at least 1977.

The contrast of the effects of the winter recharge of 1988/89 compared to that of the previous winter is striking. This contrast was accentuated by the subsequent recessions which persisted well into the winter of 1989/90 and resulted in very depressed water-tables at the end of 1989. The groundwater level decline over the preceding 24 months has no recent parallel in many areas (see page 40).

The very low rainfall totals over the three months commencing in November 1988 effectively delayed the onset of groundwater recoveries until late in February. The exceptionally late upturn is well illustrated in most of the groundwater hydrographs illustrated on pages 174 to 177. Prior to the spring upturn, the water level at the Dalton Holme site in Humberside was near to the seasonal minimum recorded. At the south-western extremity of the Chalk outcrop, in east Devon, the Lime Kiln Way borehole registered new period-of-record

(1969–88) minimum levels for January and February. Elsewhere levels in the Chalk were very low, especially in Kent, but somewhat less severely depressed – see the hydrographs for Little Brocklesby, Washpit Farm and Fairfields for example. Inland from the east coast, along the south coast and in the south-west of England, the hydrographs show groundwater levels rather closer to the seasonal norms – see the traces for Rockley, The Holt and Alstonfield.

Recharge rates increased through the early spring and, generally, significant infiltration continued until towards the end of April. The cessation of the recharge season was signalled by the widespread lack of rainfall during May, when only in Scotland did the monthly rainfall values exceed 50 per cent of the mean. In the 'Hydrometric Register and Statistics 1981–85' (see page 173), a method was proposed which both permitted comparisons between groundwater levels in different observation wells and related those fluctuations to aquifer replenishment expressed as a percentage of the long term average. Using this same method, the apparent replenishment for the winter of 1988/89 has been estimated and is shown in the Register of Observation Wells (pages 178 to 180). The figures are intended as a guide only and because of the particular difficulties associated with the interpretation of very limited amounts of recharge, no differentiation is attempted between recharge percentages in the range up to ten per cent. Over the greater part of the major aquifers, recharge through the 1988/89 winter half-year was the lowest since 1975/76 when recharge was negligible throughout much of central southern England and, until the late autumn, water-tables remained well below the levels recorded in 1989. In interpreting the recharge percentages listed in the Register, account should be taken of the period over which the mean annual range of fluctuation has been established; for example, the substantial 1987/88 recharge would appear less impressive for observation wells whose records commenced during the sequence of wet winters following the 1975/76 drought. Long term changes in rainfall may also cause variations; the mean annual range of fluctuation calculated for a period of record of over 100 years may differ substantially when determined over a period of, say, 30 years.

A map (Figure 7) showing the generalised areal recharge was prepared for the principal outcrop areas of the Chalk and Upper Greensand aquifer based upon the 1988/89 replenishment percentages detailed in the Register. Using the same figures, combined with the mean annual replenishment values cited in Monkhouse and Richards[2], the recharge to the major aquifers of England and Wales has also been calculated (Table 5). This confirms that below average recharge was a characteristic of all regions with particularly modest groundwater recoveries in eastern aquifer units.

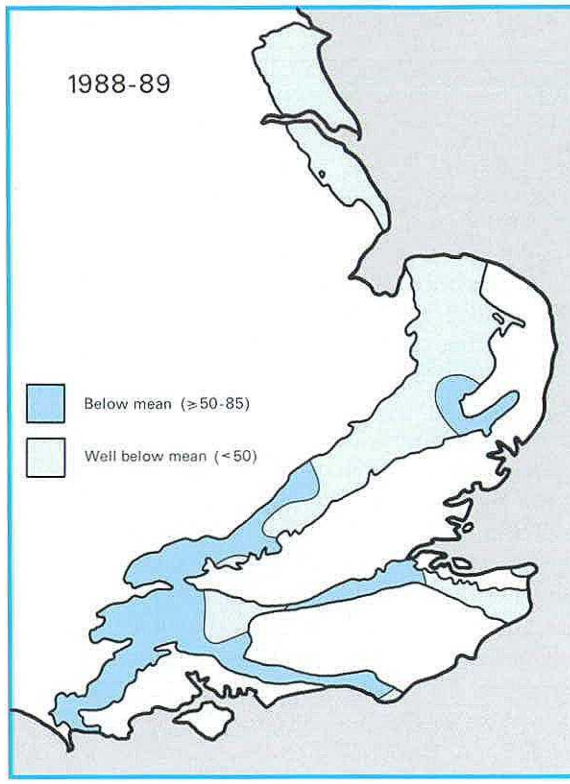


Figure 7. Generalised percentage of the mean annual replenishment to the main outcrops of the Chalk and Upper Greensand aquifer for 1988/89.

Whilst recoveries were very modest in 1989 – commonly the peak recorded over the half-year was the lowest since 1975/76 – the limited magnitude of the peak was, in part, offset – with regard to water resources – by its lateness. Thus in many areas groundwater levels were rising during April whereas, in a more typical year, a recession would have become established. Consequently, water-tables often stood close to, or above, average levels in the late spring and remained within the normal range through the summer. Little recharge normally takes place through the summer months. Even in aquifers such as the Jurassic Oolites (typified by the Ampney Crucis site) and the Carboniferous Limestone (typified by the Alstonfield site), where groundwater levels generally respond rapidly to short periods of intense rainfall even in the summer, the recession of 1989 continued steadily. By the end of November, levels had fallen to near-1976 values in Humberside (Dalton Holme) and were still falling generally with the exception of Northern Ireland where levels appeared to be rising (at the Dunmurry and Killyglen sites). In most regions it was not until the end of December that the recession generally ceased and levels began to rise. Some sites are known to exhibit a lag between the onset of infiltration and the consequent rise in groundwater levels; of these, Therfield Rectory (a lag of about three months) and Fairfields (a lag of about one month) are examples.

TABLE 5. ANNUAL REPLENISHMENT TO THE MORE IMPORTANT AQUIFERS IN ENGLAND AND WALES FOR THE YEAR 1988/89

NRA Region	Mean annual replenishment	1988-89 replenishment
Chalk and Upper Greensand aquifer		
Anglian	953	345 (36)
Southern	1231	651 (53)
South West	202	93 (46)
Thames	975	483 (50)
Wessex	947	719 (76)
Yorkshire	322	89 (28)
Total	4630	2380 (51)
Lincolnshire Limestone aquifer		
Anglian	86	46 (53)
Permo-Triassic sandstones aquifer		
Northumbrian	123	54 (44)
North West	331	149 (45)
Severn-Trent	528	297 (56)
South West	205	109 (53)
Welsh	27	14 (52)
Wessex	39	14 (36)
Yorkshire	301	117 (39)
Total	1554	754 (49)
Magnesian Limestone aquifer		
Northumbrian	80	52 (65)
Severn-Trent	40	15 (37)
Yorkshire	127	32 (32)
Total	247	99 (40)

(Units in $m^3 10^6$. Percentages of the annual mean in parentheses)

In such wells, the upturn in groundwater levels was delayed into 1990.

At the start of the 1989/90 recharge period, groundwater levels appear everywhere to have been below average, and in many places severely so. At Dalton Holme, levels were below their seasonal 1976 equivalents, and, indeed, at their lowest recorded values in a 100-year period of record. Along the east coast as far as eastern Kent, in the eastern Midlands and along much of the south coast, levels were close to, or at, the seasonal recorded minima. Although infiltration rates increased rapidly in December only very modest recoveries were recorded in many eastern aquifer units. Fissured aquifers - the Middle Jurassic Limestone (Ampney Crucis), the Lincolnshire Limestone (New Red Lion) and the Permo-Triassic sandstones responded smartly and by year-end levels were well within the normal range. To the east, throughout most of the Chalk and Upper Greensand aquifer the December levels were the lowest (for the month) on record. Whilst the rapid decline in soil moisture deficits through December created an expectation of significant recharge early in 1990, the widespread exceptionally low groundwater levels remained a matter of concern regarding the water resources outlook in eastern and some southern areas.

Groundwaters Levels in the 1980s

The very large, often unprecedented, decline in water-tables over the 1988-89 period provides a clear counterpoint to the healthy groundwater levels recorded throughout most of the 1980s. Although winter recharge totals rarely approached those which immediately followed the 1976 drought, above average recharge was a feature of most years in the 1980s - notably in 1983/84 and 1987/88. Some moderately low groundwater levels were recorded in the autumns of 1982-84 but water-tables remained relatively depressed for only a very brief period; winter recoveries tended to be brisk and sustained. Whilst regional variations have been important, the record of levels at the Rockley borehole, which penetrates the Chalk and Upper Greensand aquifer near Marlborough, is broadly representative of the major aquifers in England. Following the 1976 drought - during which the borehole was dry for a period of almost twelve months - levels recovered dramatically and the late winter/early spring peak levels were well above average in 1977-79. Subsequently the water-table remained relatively close to the seasonal mean - although levels were substantially below average in the autumn of 1984 - until the highest level in the decade was recorded in February 1988. By December 1989 the borehole was dry, albeit for a short period only.

Winters during recent years have tended to be very mild, and in consequence the evaporative losses have been higher albeit still modest in absolute terms; this is likely to have caused a small reduction in the annual aquifer replenishment. The recharge calculated for 1985/86, 1986/87 and 1987/88 (using the method outlined above) was, in most areas, rather below average, whilst the winter rainfall was typically rather above average. While it is possible that the difference may lie within the limits of error, it is feasible that the method of calculation may, to some degree, underestimate the annual replenishment, and some refinement will be necessary in the future. However, the determinations for 1988/89 (Table 5) do seem to equate well with the rainfall and evaporation data.

References

1. Arnell, N. W., Brown, R.P.C. and Reynard, N. S. 1990. Impact of climatic variability and change on river flow regimes in the UK. Report to the Department of the Environment. Institute of Hydrology, NERC. 170 pages.

2. Monkhouse, R. A. and Richards, H. J. 1983. Groundwater resources of the United Kingdom. Commission of the European Communities, pub. Th. Schaeffer druckerei GmbH, Hanover. 252 pages.

1989 Hydrological Diary

January

11th-16th: A series of active depressions following a north-easterly track around a persistent anticyclone over Europe brought several heavy rainfall episodes to northern Scotland. In the upper Spey valley, a total of 148 mm fell over four days at Glenshero - an estimated return period in excess of 100 years was ascribed to this event. Further downstream at Kingussie precipitation was particularly heavy on the 13th when 71 mm was recorded over eight hours. The intense rainfall on already saturated catchments caused rapid runoff and flooding throughout a large part of the central Highlands; in the uplands meltwater contributed significantly to the spate conditions. Return periods of about 15 years were attributed to the floods in the headwater tributaries of the River Spey. The Inverugie gauging station (on the River Ugie) registered its second highest flow in a 37-year record. Peak flows on the Rivers Nevis and Lochy were unprecedented; on the latter a flow in excess of 1400 m^3s^{-1} was recorded at Camisky. Several rivers in the Highland Region recorded their highest January peak discharge on record; the Conon, gauged at Moy Bridge, registered a peak flow which greatly exceeded its previous January maximum. Inundation of agricultural land was widespread and transport disruption severe At Spean Bridge near Fort William, the railway track was undermined as floodwaters washed out ballast leaving the track unsupported over a considerable length.

February

5th-8th: On the 5th, a vigorous depression intensified over Iceland and an associated warm front tracked across Scotland followed by a cold front on a strong south-westerly airstream. Rainfall was extremely heavy and prolonged in parts of Scotland. Several 'very rare' daily rainfalls were recorded in the Highland Region (see page 8). On the 5th, 170 mm fell at Kinlochewe - a return period of greater than 1000 years was associated with the event. Further south at Kinloch Hourn, the total rainfall during the 5th and 6th was 306 mm - the highest 2-day rainfall ever recorded in Britain. Notable 2-day rainfalls of 285 mm and 261 mm were also recorded at raingauges close to Loch Lochy. Return periods ascribed to these 2-day events were well in excess of 1000 years. The rainfall combined with snowmelt resulted in some exceptional discharges - a peak flow of 704 m^3s^{-1} was registered on the Conon (at Moy Bridge), some 230 m^3s^{-1} greater than the existing February maximum. Severe flooding occurred in Strathconon and residents in low-lying properties along the lower Conon were evacuated; many roads were blocked by landslides. At Inverness, flows in the River Ness exceeded 700 m^3s^{-1} and the 127-year old Ness railway viaduct collapsed isolating the railway network north of the river. The following day a peak flow of 801 m^3s^{-1} was recorded; the highest peak discharge recorded on the Ness - by 180 m^3s^{-1} - since flow gauging was instigated at Ness-side in 1953. Emergency sandbagging limited the overbank flow and contained the threat of a severe fluvial/tidal inundation. In the headwaters of the River Tay some of the highest discharges since the development of the hydro-electric power schemes were recorded. The River Lyon, gauged at Comrie Bridge, and the Tummel, gauged at Port-na-craig, both recorded new maximum peak flows - in records extending back to 1972 and 1973 respectively. The close coincidence of flood peaks on the Tay and Tummel resulted in widespread inundation of agricultural land and damage to property downstream of the confluence. Near the estuary, the high tide exacerbated the situation and contributed to localised flooding in Perth.

17th: A complex frontal system associated with an Atlantic depression moved over western areas of the British Isles. Rainfall was especially heavy in South Wales and many rivers draining the Brecon Beacons recorded their highest February flow on record.

24th: An Atlantic depression tracked eastwards across southern England. In Devon the Rivers Axe and Otter both registered maximum peak February flows - in records extending back more than 26 years.

March

4th-10th: Frontal systems associated with a complex area of low pressure in the Atlantic crossed the British Isles bringing widespread, heavy rainfall to the western regions. More than 50 mm was recorded on the 8th at Nantmoor, subsequently the River Glaslyn registered its highest daily mean flow in a record commencing in 1961. Just to the north, the River Gwryrfai also recorded a new maximum daily mean flow. In Cumbria, new maximum discharges were measured on the Haweswater Beck and the River Eamont and, in the headwaters of the Tweed, the Rivers Teviot, Ale Water and Tima Water established new instantaneous peak flows for March in records extending back 27, 18 and 17 years respectively.

14th: Many places received heavy rainfall as Atlantic depressions moved rapidly eastwards across the UK. In Princetown (Devon), a daily rainfall of 54 mm was recorded. The Rivers Lynher, gauged at Pillaton Mill and the Yealm, gauged at Puslinch, recorded new maximum March discharges - both records commence in 1963.

22nd-24th: A sequence of active frontal systems brought heavy rainfall to much of Scotland. In Lothian, the North Esk (at Dalkeith Palace) registered a peak discharge greater than twice the previous highest March maximum - in a 13-year record.

April

Unsettled weather conditions and several episodes of prolonged steady rainfall helped to further ease the water resources situation which had been gradually improving since mid-February.

May

High temperatures and exceptionally low rainfall during the month caused the drought to re-intensify. A new minimum monthly flow (for any month) was registered on the Tees at Middleton-in-Teesdale (in a 19-year record) and the Yorkshire Derwent closely approached its lowest May runoff total in 16 years of record.

19th: A strengthening anticyclone centred over the North Sea with a residual front close to the Scottish Borders resulted in hot, overcast conditions in the Pennines. As warm humid air developed south of the front an intense and very localised storm was experienced in the headwaters of the River Calder above Halifax. At 1500 BST a storm occurred in the vicinity of the Walshaw Dean Reservoir and lasted around two hours. A single daily raingauge, on a rather exposed site close to Walshaw Dean Lodge, filled to capacity; equivalent to about 193 mm - the largest rainfall of that duration ever registered in the UK (as with the great majority of large magnitude events reservations have been expressed over the accuracy of this measurement but geomorphological and other evidence testify to a storm of extraordinary magnitude[1,2]). The storm tracked south-eastwards towards Halifax and a second remarkable fall was recorded at Northowram - 83 mm in two hours which has an estimated return period of greater than 1000 years. Generally however, storm totals in the area were modest - four km to the south-west of Walshaw Dean Reservoir a daily total of only 7 mm was measured. Headwater streams were particularly affected - a peak discharge rate of 29 m^3s^{-1} was estimated for a 4.8 km^2 catchment adjacent to Walshaw Dean drained by the River Clough - equivalent to a runoff of 26 mm per hour, which would qualify the event as one of the most notable floods in the UK. Levels in the Hebden Water rose dramatically to spate conditions carrying away trees and demolishing foot-bridges. The Luddendon Brook rose 3.5 m in 20 minutes and flood damage was severe in the village of Luddendon - surface drainage was unable to cope with the extreme conditions and vehicles were washed away as the brook engulfed the main street. In Halifax similar problems occurred as the Hebble Brook overtopped its banks. Overall the flood damage was estimated at several million pounds.

June

Hot and dry conditions prevailed during much of June and in those catchments with little natural storage, river flow recessions, which had been established since April, continued unabated. Rivers draining much of lowland England continued to benefit from significant baseflow support following aquifer recharge in the spring.

July

Several rivers in northern England, southern Scotland and Northern Ireland registered new minimum monthly flows.

6th: An area of low pressure moved northwards into southern Britain giving rise to heavy thunderstorms. At Aldermaston, Berkshire, over 75 mm of rain fell during the night of the 5th/6th. Two ornamental lakes burst their banks and several properties were flooded. Daily rainfall totals of 85 mm and 64 mm were recorded at Oswestry (Shropshire) and at Yeovilton (Somerset) respectively causing extensive surface flooding.

30th: A cold front moved south-eastwards crossing the whole of the UK; its passage resulted in heavy rainfall in a number of areas. In Humberside over 50 mm fell in 15 hours causing local flooding. Suffolk and Essex were also affected and surface runoff produced modest flow increases in a few East Anglian rivers.

August

Frontal systems on the western seaboard brought abundant rainfall to western Scotland and north-west England during the month. River flows in these areas rose in response. Elsewhere flows continued their seasonal decline.

September

10th-14th: Low pressure moved slowly northwards into southern England bringing unsettled weather with severe localised thunderstorms. Rainfall, particularly in the South-West, exceeded the infiltration capacity of the soil and caused river levels to rise dramatically. Flows in the River Dart, gauged at Austins Bridge, for example, exceeded 21 m^3s^{-1} on the 14th; six days earlier it had recorded its lowest daily mean flow of the year (0.835 m^3s^{-1}). Drainage systems were overloaded in many parts of southern Britain and localised flooding was common.

October

A sequence of depressions and associated frontal systems affected the UK during the month, particularly from the 20th onwards, bringing heavy rainfall mainly to northern and western areas. The River Wye at Ddol Farm recorded a daily mean flow, on the 28th, over 50 m^3s^{-1} greater than its previous maximum - in a record which extends back to 1937. In Northern Ireland many rivers recorded their highest daily mean flow for the year during the month. Floodplain inundation was widespread and transport disruption severe. By way of contrast, in the Southern NRA region flows on the Rother (at Udiam) fell below the previous minimum - in a 28-year record - for ten days in the first half of the month. More notably, the River Combehaven (at Crowhurst), which has a 20-year record, remained below the pre-1989 minimum flow for 51 days during the period from the 9th of August to the end of October.

November

From the 10th, high pressure extending from western Europe dominated weather patterns over the UK and steep recessions once again characterised relatively impermeable catchments. Several rivers, particularly in the east of the UK, recorded their lowest November runoff on record. In Yorkshire, the Costa Beck registered a new minimum monthly flow (in a 20-year record) at Gatehouses. Groundwater levels in the South and East continued to fall and many monitoring boreholes recorded levels close to, or below, their minimum for late November.

December

Anticyclonic conditions persisted for the first 10 days of the month - substantial river flow recessions, continuing from November were evident over wide areas of the country. Many rivers recorded their lowest December daily mean flows on record. The River Severn, gauged at Bewdley since 1921, recorded 10 days below its minimum December flow.

10th-26th: A series of vigorous Atlantic fronts crossed much of the UK resulting in persistent and heavy rainfall. The 15 days up to the 24th were the second wettest such sequence at Wallingford in a 28-year record; prior to the 10th, no rainfall had been received for 30 days. Rivers exhibited abrupt increases in flow and groundwater levels began a late seasonal upturn. In Berkshire the Kennet, which registered new December minima for the first 11 days of the month, recorded a daily mean discharge on the 21st which is unsurpassed in December since 1972. Floodplain inundation was common in the south of Britain and transport disruption considerable.

1 Acreman, M.C (1989). Extreme rainfall in Calderdale, 19 May 1989. Weather, 44, pp 438-444.

2. Collinge, V.K., Archibald, G.J., Brown, K.R. and Lord, H.G. (1990). Radar Observations of the Halifax storm, 19 May 1989. Weather, 45, pp 354-365.

THE 1988/89 DROUGHT
A Hydrological Review

M. L. LEES, S. J. BRYANT and T. J. MARSH
Institute of Hydrology

The very dry and exceptionally warm late autumn and early winter in 1988 gave rise to considerable concern regarding the water resources outlook. In order to chart the progress of the developing drought and to assess regional variations in its intensity, the Department of the Environment requested that the Institute of Hydrology and the British Geological Survey undertake a hydrological monitoring programme and provide monthly reports dealing with rainfall, river flows and groundwater levels throughout England and Wales (coverage was subsequently extended to include Scotland). Hydrometric data for these reports are provided principally by the regional divisions of the National Rivers Authority (NRA) and the River Purification Boards (RPBs). Rainfall, evaporation and soil moisture information are provided by the Meteorological Office. Monthly Hydrological Summaries have been provided routinely since January 1989 and much of the material featured in the following article was assembled initially as part of the monitoring programme.

Over wide areas, the drought was well into its development phase by January 1989 and underwent a sharp amelioration at the end of the year. Unusually therefore, the calendar year provides a productive, if incomplete, timeframe within which to examine the drought's extent and severity. Consequently the 'Hydrological review of 1989' (pages 3 to 29) constitutes a valuable source of additional material; reference to various figures and tables in the review is made in the following article.

Hydrological Background

For its size, the UK experiences large regional variations in rainfall. The higher rainfall totals are associated with the maritime west, with the east - within the lee of the rain shadow from the Scottish Highlands, Pennines and Welsh mountains - becoming progressively drier with decreasing elevation. Annual average rainfalls vary from about 500 mm around the Thames estuary to more than 4000 mm in parts of the Scottish mountains, the Lake District and Snowdonia. Whilst in a global context UK rainfall may be considered to be evenly distributed, seasonal contrasts are appreciable, especially in the west where heavier falls are experienced through the winter, the wettest months being November to January. The contrasts are less strong in the drier areas, where August or November are typically the wettest months and spring the driest season.

A substantial proportion of the rainfall is accounted for by evaporative losses. Evaporation may occur directly from the soil, from open water surfaces, or as transpiration from plants. Knowledge of the soil moisture status and evapotranspiration rates are essential factors in any evaluation of water resources. Potential evaporation (PE) is the maximum evaporation which would occur from a continuous vegetative cover amply supplied with moisture. PE is a function of solar radiation, temperature, windspeed and humidity. It is most strongly influenced by radiation and temperature and the pattern is distinctly cyclical, with a peak normally in June or July. Typically, only 10-20 per cent of evaporation occurs during the winter half-year (October - March). In a normal year annual potential evaporation totals would be between 350 and 550 mm, and be greatest in the south and east of the country, especially in coastal areas where windspeed is an important factor. A decrease is seen northwards and with increasing altitude; 350 mm being typical over the Scottish mountains. The ability of evapotranspiration to proceed at its potential rate is reduced as a result of drying soil conditions, the ability of vegetation to take up water and the measures plants take to restrict transpiration under such conditions. Thus in the absence of favourable soil moisture conditions, actual evaporation (AE) will fall below PE.

The change in evaporation rates through the year imposes a marked seasonality upon river flows, reservoir replenishment and groundwater recharge, each is concentrated in the winter and early spring. During the late spring and summer, the high evaporation demand causes a decline in river flows and leads to a progressive drying of the soil profile and the creation of what is termed a Soil Moisture Deficit (SMD); surface runoff and infiltration to aquifers is greatly reduced. When plant activity and evaporation slackens in the autumn, the higher rainfalls wet-up the soil profile and the cycle begins again.

It is arguable that Great Britain's geology and weather patterns are in harmony as regards the provision of water supply. Thus the older, more indurated lithologies characterising the west and north-west, with their relief and flashy runoff response from predominantly impermeable bedrock, are graced with substantial and regular amounts of precipitation from Atlantic frontal systems. The relief affords opportunities for natural or artificial impoundment to protect against supply difficulties during unusually long recessions. In eastern, south-eastern and southern areas, many of the more youthful lithologies are less tectonically disturbed, have been less well-cemented and show favourable water transmission characteristics; examples include the Jurassic and Cretaceous limestones and the Triassic, Cretaceous and Tertiary sandstones. These ensure more moderate river responses and a longer delay between seasonal aquifer recharge and baseflow to rivers, plus the opportunity for direct abstraction from aquifers, independent, as it were, of the obtaining meteorological conditions. The significantly lower rainfall in these areas may be separated into a winter component - providing aquifer recharge and insurance for the following summer via river and spring flow - and the summer half-year rainfall, the principal impact of which is in controlling the soil moisture conditions.

As a consequence of the geographical contrasts, regional susceptibility to drought varies considerably. In the west, very low rainfall for two or three months encourages steep recessions and leads to very low river flows; large rainfall deficiencies over longer periods of, say, five to seven months starting in the spring, puts stress upon reservoir systems (usually full at the end of the winter), excepting the largest. In the east, such deficiencies may normally be borne more easily (although the strains upon soil moisture conditions and plant growth may be severe). A substantial reduction in winter recharge can provoke more stress, leading to reduced baseflows during the following summer and a lower base to commence the next recharge cycle. Such a winter drought could also be a problem in the west but as winter rainfall depths are considerable even in a dry year, reservoirs are still likely to fill to acceptable levels which should provide supplies through all but severe spring and summer droughts.

The water industry, faced with the likely problems associated with the above drought scenarios, has developed a range of storage mechanisms and operational strategies to maintain levels of service linked to the probabilities of various drought intensities. Extending the role of reservoirs from direct supply impoundments to river regulators, the development of pumped storage schemes, increased networking of supply sources, cross-basin transfers, the integration of groundwater and surface water supply schemes and the evaluation of stand-by emergency sources together provide a flexible range of options to combat the effect of droughts. It follows therefore that the relationship between rainfall deficiencies, stress on water resources and impacts on the community is not a direct one.

The 1988/89 Drought in Summary

Following a wet winter and early spring in 1988, rainfall amounts were generally below average until the end of the year. A very wet July was limited in its hydrological effectiveness owing to high evaporative demand. The resources situation in the autumn was thus rather worse than the year's rainfall accumulation implied. Rainfall from August was modest through until the end of the year and, as a result, the anticipated strong seasonal increase in runoff and recharge rates failed to materialise. The winter of 1988/89 was exceptionally dry and by mid-February the English lowlands and the easternmost areas of Scotland were suffering from a notable drought. River flows were unseasonably low, groundwater levels had registered no appreciable seasonal upturns and the mild nature of the winter admitted record, or near record, evaporation rates creating large, persistent soil moisture deficits. A late-winter/early-spring interlude of substantial rainfall allowed reservoirs to fill, river flow rates to increase and some recharge of groundwater storage, whilst not satisfying all SMDs. Subsequently, the year to September was characterised by substantial hydrological recessions in most of the UK, a continuation of record evaporation levels and the widespread development of large SMDs. October rainfall lessened drought conditions in the west but deficiencies continued elsewhere into early December, when the conditions in many areas were those of severe drought. A distinct recovery generally took place in December but the water resources outlook in the east entering 1990 was fragile and the prospect of a second dry winter was a daunting one, especially in those areas predominantly dependent upon ground-water supplies.

Details of the development, extent and intensity of the 1988/89 drought are presented below within a hydrological framework.

Rainfall

The National Perspective

Whilst the seeds of the 1989 drought were sown in the late spring of 1988 in the lowlands, for England and Wales as a whole the rainfall deficiency beginning in August was more significant. By the middle of autumn, an incipient drought could be recognised but a general intensification occurred through the early winter. Table 6 shows four periods which best characterise the development of the 1988/9 drought. The ranking relates to the England and Wales rainfall series from 1766.

The November to January rainfall total was the lowest since 1879 and eclipsed the twentieth century record established during the 1933/34 drought. Particularly notable 1988/89 rainfall deficiencies may also be recognised over the seven and 13-month periods ending in November 1989. Within both timeframes - which broadly represent the duration over which the drought achieved its greatest intensity - the drought of 1920/21 may be seen as more

TABLE 6 ENGLAND AND WALES RAINFALL FOR SELECTED PERIODS

Rank	Aug.-Jan.		Nov.-Jan.		May-Nov.		Nov.-Nov.	
	mm	Year	mm	Year	mm	Year	mm	Year
1	325	1784/5	91	1879/80	344	1921	690	1920/1
2	328	1854/5	120	1857/8	355	1947	697	1853/4
3	343	1834/5	126	1829/30	371	**1989**	736	1780/1
4	345	1933/4	135	1780/1	385	1978	740	1933/4
5	349	1788/9	140	1788/9	391	1919	743	1802/3
6	364	1904/5	142	**1988/9**	395	1884	744	1857/5
7	371	1879/80	147	1812/3	399	1964	777	**1988/9**
8	376	1975/6	150	1783/4	402	1959	781	1784/5
9	377	1972/3	156	1933/4	406	1975	791	1892/3
10	379	**1988/9**	160	1834/5	410	1803	793	1863/4

For the Great Britain series beginning in 1869, the accumulations and rankings for1988/9 are:

	572	35th	248	10th	487	9th	1076	27th

severe; over the longer duration the 1933/34 drought was also more intense. Considering intermediate and longer durations there are a substantial number of droughts which were more severe and/or of longer duration than the 1989 event. 1975/76 is outstanding in this regard but, taking as a yardstick the 1988/89 November to November accumulated rainfall total for England and Wales, there have been about 35 occasions this century on which lower 13-month rainfalls (starting in any month) have been recorded; the droughts of 1920/21, 1933/34, 1938, 1944, 1949 and 1955/56, as well as 1975/76, figure in this category.

A Regional View

Figures 8 and 9 show maps of rainfall, expressed as a percentage of the 1941–70 average, over the UK for November 1988 to November 1989 and May-November 1989. As with most droughts, a distinct regional dimension to the 1988/89 event is readily apparent. Certain common features may be recognised in both figures and also the annual percentage rainfall map (Figure 1 – see page 4). The largest areas of maximum rainfall deficiency are found along the eastern seaboard from the Wash to the Aberdeen coast; large deficiencies also typify the south-eastern corner from Great Yarmouth to Chesil Beach, the Eden valley in Cumbria and the Solway Firth, and the Welsh Borders around Herefordshire, all of which remained dry or relatively dry. In contrast, rainfalls were generally higher in Leicestershire and Northamptonshire, within a wetter band extending from the Bristol Channel to north Norfolk, with a

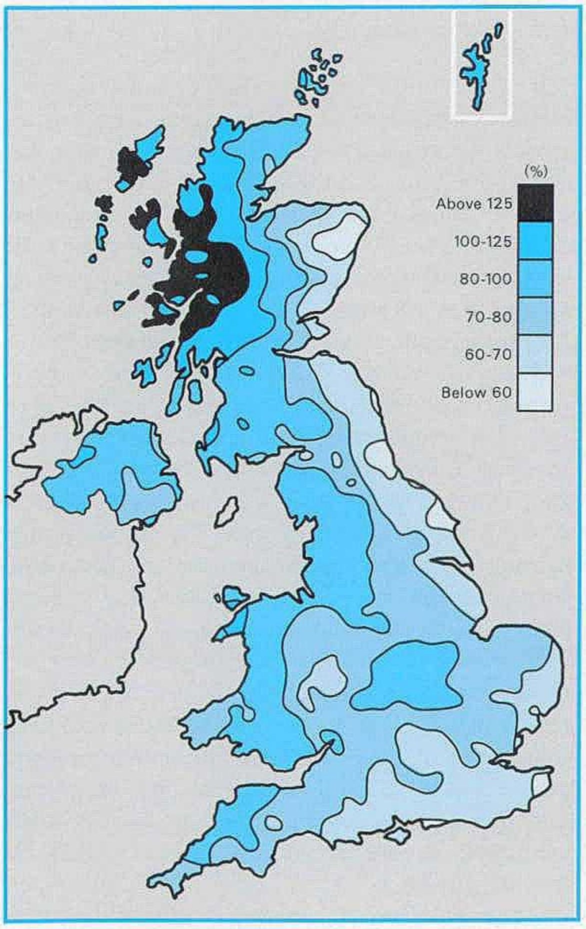


Figure 8. Rainfall from November 1988 to November1989 as a percentage of the thirteen-month (1941–70) mean.

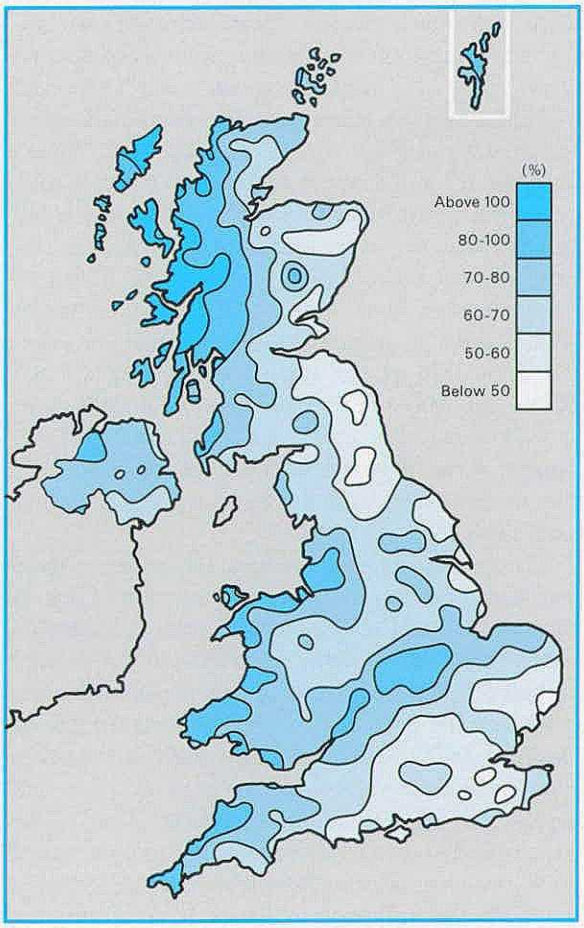


Figure 9. Rainfall from May to November 1989 as a percentage of the seven-month (1941–70) mean.

spur extending to the south-east Essex coast. Two-thirds of the UK recorded less than 70 per cent of average rainfall for the May to November period, with a further quarter below 80 per cent. The only area which was above average for all of the periods was western Scotland.

Table 7 provides national and regional rainfall statistics with estimates of return periods for a selection of durations corresponding to the periods of greatest drought severity and the wet period February to April 1989. In terms of rainfall anomalies over the widest area, the drought showed its greatest severity over the duration May-September 1989. Return period estimates are based on tables provided by the Meteorological Office; the tables reflect rainfall variability over the period 1911-70 only and assume a sensibly stable climate. The quoted return periods refer to the specified range of months only; the return period for *any* 'n' month sequence (as opposed to a particular sequence) would be about an order of magnitude less[1].

It is understandable that the extent of the deficiencies at the end of January provoked comparison with the droughts of 1933/4 and 1975/6 in central southern England. Although the greatest deficiencies over the November to January period were in these areas, it was notably dry along the whole of the eastern seaboard from the Grampian coast southwards. Western Scotland was experiencing very different conditions with a substantial steepening of the rainfall gradient towards the east.

The onset of heavy rainfall (from January in Scotland, mid-February in England and Wales) dispelled fears of a repeat of the 1975/6 winter half-year (the driest since 1879/80), although rainfall was not as heavy in the east, particularly the north-east of Scotland. The late spring saw a further transformation with the hot and dry conditions, which were a feature of the weather in May, persisting through the summer. Over England and Wales, the May to September period in 1989 ranks second driest, behind 1959, in the record from 1766; notably severe droughts could be recognised in both the northernmost and the Southern NRA regions (see Table 7).

From October through into December, rainfall was very much more abundant in the west of Britain than in the east. Rainfall accumulations of increasing rarity characterised many areas close to the eastern seaboard. Of particular note are the Northumbria NRA and the Tweed and North East RPB areas for the May to November period - each of the seven months falls were below average in these areas - and given the easterly rainfall gradient it is to be expected that even more extreme deficiencies would have developed in some low-lying coastal districts.

With the exception of parts of Scotland, the sustained, heavy rainfall which began in mid-December brought about a cessation of severe drought conditions; the dry weather continued in eastern Scotland through to the end of the year but rainfall in January and, especially, February effectively terminated the drought over all but a few extreme eastern districts of great Britain.

As regards the overall magnitude of the drought, the Southern NRA region registered the longest return periods for the widest range of durations; in England and Wales only the Northumbria region was comparable. In Scotland, the drought achieved its greatest severity over durations ending in December. Indeed, the Tweed and North East RPB areas recorded only two months above average rainfall in the period November 1988-December 1989, establishing a number of very large rainfall deficiencies associated with exceptionally long return periods, as presented below:

	Duration	Rainfall % lta	Return period years
North East RPB	Apr.89 - Dec.89	63	180 - 220
	May 89 - Dec.89	61	180 - 220
	Nov.88 - Dec.89	71	>200
Tweed RPB	Apr.89 - Dec.89	64	180 - 220

Catchment Rainfall

The rarities of the 1988/89 regional rainfall accumulations discussed above are supported by areal rainfall figures for catchments above gauging stations (see Table 8 - the location of most of rivers may be found on Figure 16). Of 102 catchments examined from Hydrometric Areas 9 through to 83 (see Frontispiece), with record lengths generally greater than 20 years, 72 recorded new November-January minima; 17 were of rank 2, 5 of rank 3 and 8 had less exceptional falls. For May-September, 54 recorded new minima and 24 ranked second. Given that the weight of a 'driest' ranking should be moderated by the length of record and that the stations selected are those which personify best the drought conditions during 1988/89, the uniformity of the 'driest' rankings for the four 'dry' accumulations provide evidence of a substantial drought embracing much of lowland England, with significant rainfall deficiencies extending north, west and north-east into Scotland. Of the regions not well represented by catchments in Table 8, the area from Leicestershire and Northamptonshire eastwards generally had more than 50 per cent of average rainfall but, for November 1988 to January 1989, catchment accumulations were, mostly, still the lowest on record.

The February to April period of heavy rain (January to March in Scotland) is seen to be amongst the wettest on record for these three months, with new maxima being recorded along the south coast

TABLE 7 NATIONAL AND REGIONAL RAINFALL ACCUMULATIONS FOR SELECTED DURATIONS WITH ESTIMATES OF RETURN PERIODS

		11/88 to 1/89	R.P. (yrs)	2/89 to 4/89	R.P. (yrs)	5/89 to 9/89	R.P. (yrs)	5/89 to 11/89	R.P. (yrs)	11/88 to 11/89	R.P. (yrs)
England and	mm	142		264		212		371		777	
Wales	%lta	52	20–50	145	20–50	57	20–50	67	20–50	77	20–50
NRA Regions											
North West	mm	261		373		297		526		1160	
	%lta	74	5–10	162	50–100	58	50-100	70	20–50	87	5–10
Northumbria	mm	158		206		189		295		659	
	%lta	63	10–20	119		49	>200	54	>200	68	180–200
Yorkshire	mm	129		226		192		314		669	
	%lta	54	20–50	131	5–10	55	50–100	62	50–100	73	30–70
Severn-Trent	mm	105		224		200		334		663	
	%lta	48	20–50	143	10–20	60	20–50	70		78	10–20
Anglian	mm	87		160		176		253		500	
	%lta	52	20–50	131	5–10	65		66	20–50	74	20-50
Thames	mm	78		206		162		264		548	
	%lta	39	50–100	148	10–20	54	30 70	60	30–70	71	30–70
Southern	mm	81		226		140		269		576	
	%lta	32	100–200	144	10–20	45	100–200	56	80–120	65	100–200
Wessex	mm	98		261		182		341		700	
	%lta	36	50–100	153		53	20–50	65	20–50	72	20 50
South West	mm	180		359		252		500		1039	
	%lta	45	20–50	147	20–50	58	20–50	73	10–20	78	10-20
Welsh	mm	230		413		293		582		1225	
	%lta	54	20–50	154	20–50	57	50–70	74	10–20	83	5-10

		11/88 to 1/89	R.P. (yrs)	1/89 to 4/89	R.P. (yrs)	5/89 to 9/89	R.P. (yrs)	5/89 to 11/89	R.P. (yrs)	11/88 to 11/89	R.P. (yrs)
Scotland	mm	454		633		458		705		1649	
	%lta	104	2–5	190	>>200	82	5–10	83	10	105	2–5
RPBs											
Highland	mm	664		907		563		900		2212	
	%lta	126	5-10	221	>>200	87	5–10	90		117	10–20
North East	mm	169		248		280		396		815	
	%lta	57	20–50	109		65	20–50	63	100–200	72	100–200
Tay	mm	334		526		353		540		1289	
	%lta	90		180	>200	69	10–20	72		94	
Forth	mm	291		442		340		491		1135	
	%lta	92		180	>>200	71	10–20	71	20-50	93	
Tweed	mm	189		281		277		375		822	
	%lta	66	10–20	128	5-10	63	20–50	59	180–220	74	50–100
Solway	mm	361		491		401		605		1405	
	%lta	83		152	20–50	70	10–20	70	20-50	89	
Clyde	mm	538		723		571		888		1999	
	%lta	105	2–5	191	>>200	88	2–5	89	2–5	109	2–5

R.P. = Return Period — lta = long term average

TABLE 8 CATCHMENT RAINFALL AND RUNOFF FOR SELECTED DURATIONS IN 1988/89

River/ Station name	Rainfall 11/88 to 1/89		Rainfall 2/89 to 4/89		Rainfall 5/89 to 9/89		Rainfall 11/88 to 11/89		Runoff 11/88 to 1/89		Runoff 2/89 to 4/89		Runoff 5/89 to 9/89		Runoff 11/88 to 11/89	
	mm %lta	rank /yrs	mm %lta	rank /yrs	mm %lta	rank /yrs	mm %lta	rank /yrs	mm %lta	rank /yrs	mm %lta	rank /yrs	mm %lta	rank /yrs	mm %lta	rank /yrs
Ugie at	106	1	139	12	218	2	560	1	105	3	71	2	58	3	259	2
Inverugie	43	/28	86	/29	70	/29	63	/28	58	/18	54	/19	57	/19	51	/18
Whiteadder Water at	120	3	163	11	234	2	587	2	89	5	78	3	43	1	223	2
Hutton Castle	53	/28	93	/29	69	/29	66	/28	63	/21	57	/20	47	/20	51	/20
Leven at	103	1	137	10	185	2	524	1	60	4	46	2	30	2	147	1
Leven Bridge	49	/30	86	/30	59	/30	63	/30	50	/30	44	/30	48	/29	43	/29
Foston Beck at	90	1	150	=14	158	1	488	1	35	4	30	3	45	4	121	2
Foston Mill	41	/30	94	/30	56	/30	61	/30	40	/28	21	/29	35	/29	30	/27
Derwent at	104	1	163	7	173	1	549	1	68	2	65	2	42	1	191	1
Buttercrambe	47	/17	94	/18	56	/18	65	/17	60	/17	54	/16	51	/16	52	/16
Trent at	144	1	241	17	231	1	803	=1	74	1	104	8	45	1	278	1
Stoke on Trent	56	/21	124	/21	67	/21	83	/21	49	/22	86	/20	43	/22	63	/20
Lud at	90	1	149	9	155	1	501	1	46	7	46	3	53	4	156	3
Louth	45	/21	91	/22	56	/22	66	/21	71	/22	43	/21	59	/21	55	/21
Waveney at	93	1	158	21	151	2	462	1	29	5	53	15	15	2	102	4
Needham Mill	55	/26	124	/26	61	/25	71	/25	44	/25	93	/26	52	/26	59	/25
Thames at	79	1	210	93	165	3	566	3	37	12	83	50	42	31	178	18
Kingston (nat.)	38	/106	140	/106	57	/106	72	/106	42	/107	95	/107	73	/107	66	/106
Mole at	76	1	238	26	141	1	567	1	23	1	116	16	15	2	163	1
Gatwick Airport	30	/28	133	/28	45	/28	63	/28	15	/29	108	/28	24	/28	42	/28
Great Stour at	89	1	209	22	156	1	575	1	42	1	69	5	48	2	177	1
Horton	39	/25	131	/25	55	/25	69	/25	41	/25	72	/24	59	/24	54	/22
Ouse at	83	1	237	26	126	1	574	1	33	1	117	9	51	6	218	2
Gold Bridge	30	/29	129	/29	40	/29	60	/29	21	/29	91	/29	67	/29	50	/27
Lymington at	79	1	273	29	149	1	653	1	37	1	118	18	13	1	188	2
Brockenhurst Park	29	/29	149	/29	51	/29	71	/29	29	/29	109	/29	23	/28	54	/28
Itchen at	81	1	261	30	155	1	638	1	79	1	105	4	125	3	352	2
Highbridge/Allbrook	30	/29	142	/31	50	/31	67	/28	64	/32	71	/31	77	/31	70	/31
Taw at	188	1	343	30	280	2	1059	4	142	2	238	22	39	4	557	3
Umberleigh	48	/31	137	/31	72	/31	83	/31	44	/32	120	/31	37	/31	71	/31
Brue at	112	1	272	22	205	1	730	1	78	2	171	20	38	4	308	2
Lovington	42	/25	140	/25	58	/25	75	/25	43	/26	121	/25	44	/25	64	/25
Severn at	136	3	282	=63	204	4	793	8	88	3	176	54	40	1	350	4
Bewdley	48	/69	147	/69	57	/69	78	/69	47	/69	130	/68	42	/69	69	/68
Teme at	97	1	226	=25	182	1	671	=1	64	2	144	19	27	1	259	3
Tenbury	38	/33	117	/33	55	/33	71	/33	39	/34	103	/33	38	/33	59	/33
Frome at	76	1	166	13	179	1	569	1	26	2	76	4	28	2	138	2
Yarkhill	37	/21	104	/21	62	/21	73	/21	25	/21	74	/20	55	/21	49	/20
Cynon at	288	2	645	32	317	1	1678	4	220	2	536	31	83	1	1139	7
Abercynon	45	/32	164	/32	54	/32	83	/32	41	/32	164	/31	33	/31	82	/30
Lune at	364	5	509	27	322	1	1497	6	330	4	446	27	90	1	1091	7
Caton	79	/25	169	/27	57	/27	91	/25	75	/26	167	/27	30	/27	87	/25
Eden at	255	2	383	25	198	1	1041	1	204	3	302	24	46	1	645	5
Temple Sowerby	67	/25	159	/25	47	/25	81	/25	67	/25	158	/25	28	/25	78	/25

into Devon and Cornwall and a common occurrence in Wales and the North-West.

Generally, examinations of drought intensity are conducted in terms of departures from the average rainfall or comparisons with corresponding historical rainfall totals. However, in actual rainfall amounts some exceptionally low seven and 13-month accumulations were recorded in 1988/89. At the catchment scale - and this may serve to exclude some of the lowest coastal accumulations - the driest areas over the May-September period were the Sussex Ouse (126 mm) and the Medway (134 mm); for November 1988 to November 1989 the lowest falls were from the Ore in Suffolk (447 mm) and the Beam in Essex (449 mm).

For individual raingauges, some exceptionally rare accumulations were reported; mention should be made of three records in the North-East examined by Wheeler[2]. Thus Durham University (record starts 1850), Whittle Dean Reservoir (1850) and Sunderland (1859) all recorded their lowest calendar year totals on record, Sunderland by a substantial margin. Shown below are the annual totals, previous lowest and return period estimates (adapted from Wheeler).

Station	1989 total mm	%ita	Prev mm	Driest Year	Return Period in years
Durham	416	64	440	1959	100 - 150
Sunderland	353	55	417	1949	>>200
Whittle Dean	426	65	451	1959	>200

Evaporation and Soil Moisture Deficit

Evaporative Losses in 1989

Much of Great Britain registered annual mean temperatures for 1989 between 1 and 1.5 degrees Celsius greater than the 1951-80 average and the central England temperature series contains no warmer year in a 330-year record. High temperatures and a record number of sunshine hours encouraged high rates of evaporative loss in 1989. Figure 3 (page 9) shows the PE totals for a network of climatological stations throughout the UK. In south-western England some PE totals exceeded 750 mm; such totals are more typical of southern Europe. The MORECS (Meteorological Office Rainfall and Evaporation Calculation System)[3] model produces estimates of hydrological variables for a network of 40 km squares over Great Britain and uses a modified version of the Penman-Monteith equation to calculate PE for a range of surface covers. The model has been used retrospectively to produce a data series extending back to 1961. Examination of this dataset reveals that PE totals for 1989 were at record or near record levels over much of Britain. Annual PE totals generally exceeded those totals recorded in 1976. In Scotland and Wales, however, some 1989 PE totals fell short of those for 1984.

Figure 10 illustrates MORECS AE totals for 1989. AE is a conservative variable, generally constrained from very high values by the restrictions imposed by deficiencies in soil moisture and from very low ones by virtue of the limited period over which the soil moisture restrictions inhibit AE. Of particular interest is the effect the rainfall distribution in 1989 had upon AE estimates. The moist late-spring allowed evaporation close to the potential rate over wide areas, as significant shortfalls of AE to PE do not generally occur until SMDs exceed 60-70 mm. The rapid rise of SMDs through the late spring into the summer severely curtailed evaporation in the East and South-East and large shortfalls of AE below PE developed, the highest since 1976. The annual shortfall of AE below PE is illustrated in Figure 11; shortfalls were commonly in excess of 140 mm throughout lowland England, the north-eastern seaboard and in the South-West. In the MORECS square encompassing part of the River Itchen catchment in Hampshire, a shortfall of over 260 mm was recorded, some 220 mm greater than that recorded during 1988 - another very warm year.

Very high AE totals were recorded in the west in 1989 and generally totals decreased south-eastwards, although much of the south and north-east of Britain recorded values above 90 per cent of the 1961-88 average. The apparent inconsistency between the high percentage of average AE and the high summer shortfalls of AE below PE may be explained by the well above average evaporation rates in the winter of 1988/9 and the autumn and winter of 1989/90. For 1989 as a whole, variations in AE totals were subdued in comparison with 1976, as then the drier winter and spring allowed AE shortfalls to develop earlier. For comparison, 1989 AE totals were in the range 450-500 mm; those in 1976, 300-550 mm.

Evaporation and the Development of SMDs 1988/89

During the winter period - October 1988 to March 1989 - exceptionally mild temperatures gave rise to record or near record PE totals throughout much of Britain. PE totals for the winter period were in excess of 20 per cent of the average annual total. AE totals were similarly high, as water availability was such as to allow evaporation at, or close to, the potential rate.

Figure 4 (see page 10) shows the development of the shortfall of AE below PE throughout the year for 5 MORECS squares, compared with the more modest conditions over 1985 to 1988.

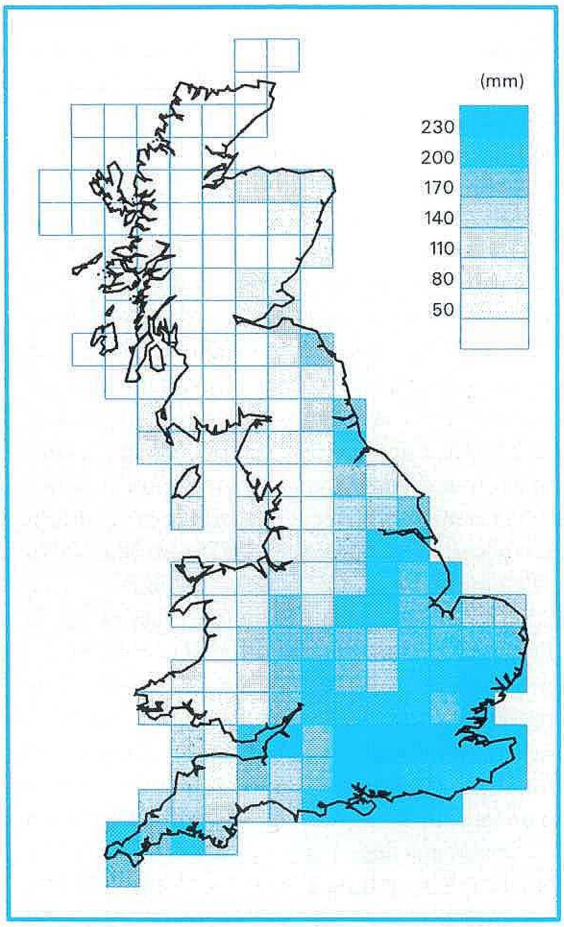


Figure 11 Shortfall (in mm) of actual evaporation (for grass) relative to potential evaporation for 1989.

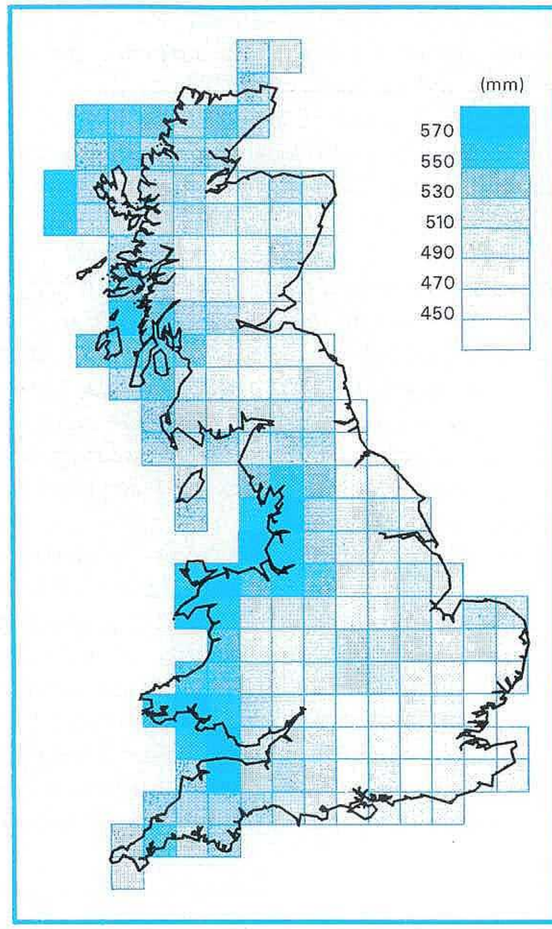


Figure 10 Actual evaporation (for grass) in mm for 1989.

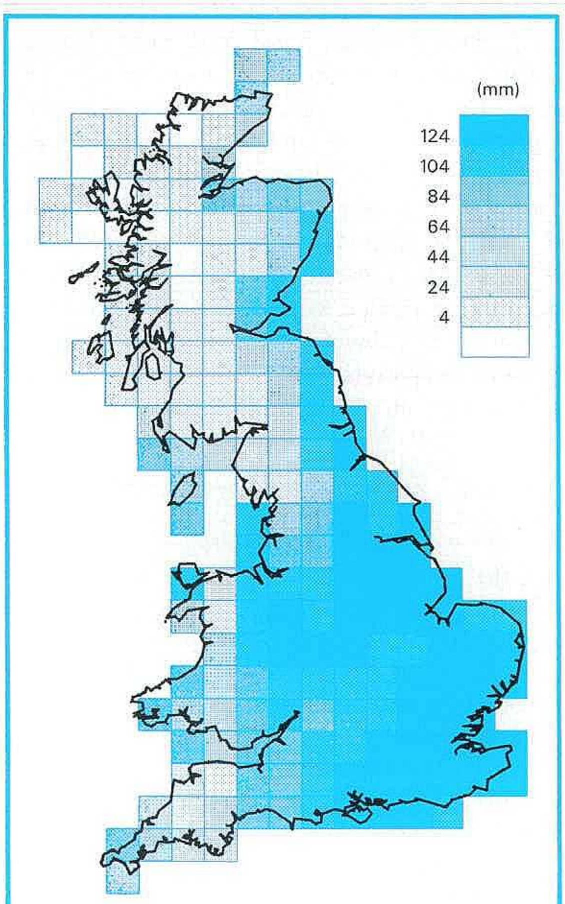


Figure 12. Soil moisture deficits for grass at the end of September 1989.

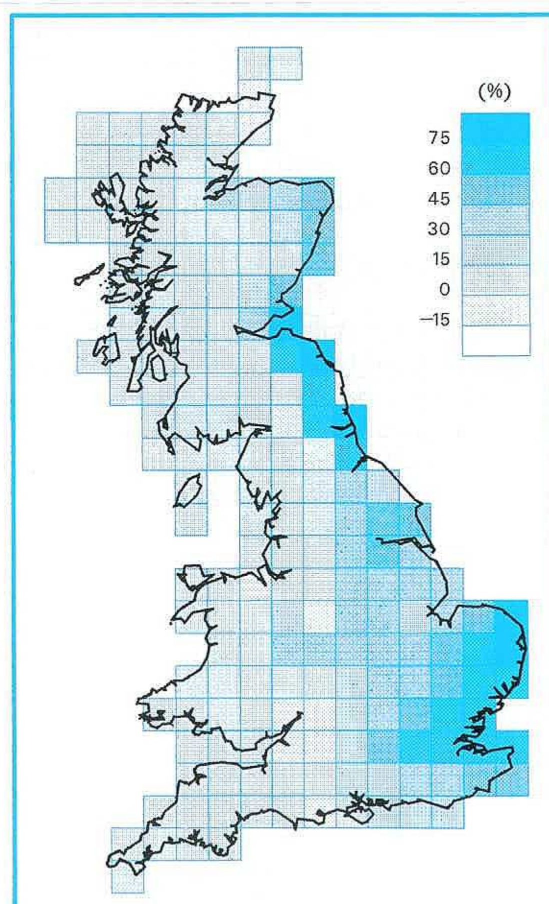


Figure 13. Soil moisture deficits at the end of November 1989 expressed as a percentage of the corresponding long term average.

Data Source: MORECS.

In the north-west of England and south-western Scotland (see Square 55 in Figure 4) the shortfall was high compared with the previous four years but fell below that of 1984. The remaining squares all demonstrate significantly greater shortfalls persisting late into the year.

The development of SMDs is also illustrated in Figure 4 (see page 10), again using standard MORECS data. Square 108, covering the Lower Trent valley, exhibited persistently high SMDs throughout the winter, a characteristic shared with other areas including Humberside, Lincolnshire, the Wash and the Lower Thames valley. The January-end deficit of 66 mm for grass (the SMD values presented here all relate to a grass cover - higher deficits would apply for a forest cover) was the highest estimated since the start of the record (1961); the previous maximum was 39 mm in January 1976. Despite a relatively wet spring significant SMDs existed throughout the year in some eastern locations and exceptionally high deficits were registered during the summer and autumn. In Kent (MORECS square 174), SMD remained above average for the whole year, with deficits above 100 mm being attained from June to September. Adjacent to the Thames estuary values exceeded 100 mm from May to November. Further north in Northumberland (MORECS square 66) SMDs reached above 110 mm for two months; previously only single months in a year had registered over 100mm (1976 and 1984). In the west of the country (MORECS square 134), a new maximum SMD value of 120 mm was recorded in August.

Over the summer months, June to August, calculated SMDs for most of southern Britain and the eastern seaboard exceeded the 1961 to 1988 mean by some 20–80 mm. In western Scotland and north-western England in particular, rainfall during June, and again in August, restrained the development of unusually large deficits. In southern England the maximum deficit of 125 mm (for the grass model) was reached as early as July. By the end of August, 48 of the 190 MORECS squares were registering such maxima. The areal extent of SMD maxima for grass, aggregated irrespective of the time of year, were almost identical for both 1989 and 1976, the pattern being similar to that illustrated on Figure 12 but extending westwards towards the Welsh Borders and south-westwards to Exeter. In August 1976, however, deficits considerably greater than 125 mm were calculated for ground cover other than grass and, in soil moisture terms, the drought was substantially more severe than in 1989. However, heavy rain early in the autumn of 1976 led to a brisk decline in SMDs whereas in 1989 soils remained very dry and the extent of the area at maximum deficit by the end of September was remarkable.

During October SMDs were reduced - substantially so in the west, where deficits were eliminated in some parts by the end of the month. However, as a result of anticyclonic conditions during November, SMDs began to build once more and achieved a very unusual magnitude entering the 1989/90 winter especially in the east. Figure 13 illustrates actual deficits for November expressed as differences from the 1961–88 average. The largest difference may be recognised in East Anglia and on the north-eastern seaboard, with a general reduction in anomalies moving westwards. Whilst a sharp decline in deficits occurred overall in December, many deficits remained above the December average in the east of Britain at year-end. In the MORECS square 66 (associated with the River Leven catchment), a December SMD value some 40 mm above the long-term average was calculated.

The atypically high temperature and evaporation levels in 1989 were instrumental in reinforcing a substantial rainfall deficiency. The associated growth and decay of SMDs followed an unusual pattern with very high deficits - relative to the seasonal average - both at the start and near the end of the year.

Runoff

Runoff from Great Britain as a whole was not significantly below average in 1989, principally reflecting the abundant runoff from the Scottish Highlands throughout a large part of the year. For England and Wales however, the annual runoff total was easily the lowest since 1976. Whilst spatial contrasts were subdued compared with Scotland, clear regional differences may be identified in Figure 5 (page 13), confirmed by the annual runoff section of Table 4 (page 15). The range of catchments recording new minimum annual runoff totals serves to delineate the zone of severe runoff deficiency quite effectively: along much of the eastern seaboard and the south coast to Dorset. Catchments in eastern Scotland and Northumberland south to Yorkshire feature prominently in Table 4, often displaying shortfalls of 40 per cent and above between the 1989 annual runoff totals and previous minima.

It is fortuitous for annual runoff totals to provide more than a general guide to a drought's intensity but the eight hydrographs for 1989 in Figure 14 enable the main features of the drought to be identified; the selected stations reflect the more seriously affected areas (the fainter envelopes are the daily maxima and minima from the previous record). The notable features are: the depressed runoff levels through into February; the higher proportional runoff in the South and West, compared with the East, as evidenced by the scale of the flow upturns during the spring; the duration within the year when the flows

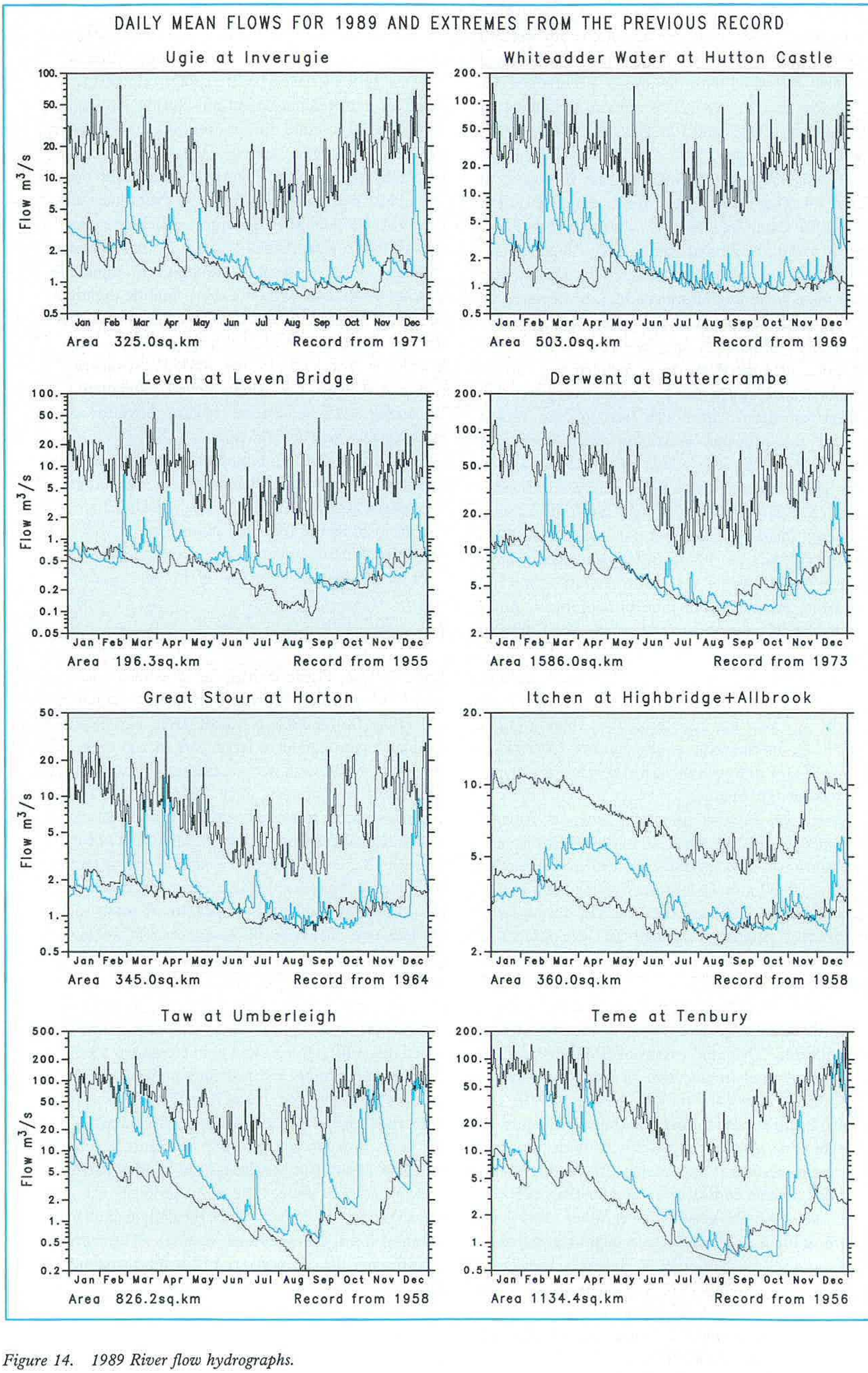


Figure 14. 1989 River flow hydrographs.

were around the minimum recorded; the recovery in the west in September and October; the singular November-December recession, followed by the sharp end of year upturn*.

In some catchments, the onset of below average flow conditions was established early in 1988 and continued substantially unaltered through to the end of 1989; thus the Medway recorded only two monthly flows above average during February 1988 to December 1989 and the Itchen registered 17 months below average from August 1988. The depressed flows at the start and the end of the year caused a loss of riparian amenity as headwaters in baseflow-fed streams contracted. As an example of an affected bourne stream, the Lavant, gauged at Graylingwell (Hampshire), near the Chilgrove borehole, (see also Figure 15) recorded its highest ever flow in February 1988 but was dry by August and remained dry through to the end of 1989, the longest dry sequence since 1973.

Regional and Catchment Runoff

Monthly runoff minima were superseded in 1989 over a wide area, notably in January, July, September and November; some new absolute minima were established (see Table 4, page 15). November commonly saw lowered monthly minima in some eastern Scottish and north-eastern English catchments and a number of annual minimum daily flows were recorded in November. A few were registered in December but, from the second week, some remarkable river flow recoveries occurred – the Wye in Buckingshamshire and the Quinn in Hertfordshire, for example, recorded their maximum daily flow of the year within 10 days of recording their minimum! Such transformations are rare in the UK and in southern England were somewhat reminiscent of the sharp upturn in runoff rates associated with the record November rainfalls which terminated the 1929 drought.

Table 8 contains runoff accumulations for selected durations and their rank within the period of record (alongside the corresponding rainfall data). In the South and the East, both responsive and baseflow-fed rivers registered record low flow accumulations for the three months beginning in November 1988, the responsive streams owing to the paucity of rainfall and the baseflow streams because of a combination of a long groundwater recession from the spring of 1988 and the lack of winter recharge.

* The use of logarithmic axes requires that caution is necessary when visually interpreting the varying flow ranges for the stations illustrated. The maximum flow on the Itchen, for instance, is greater than the least by a factor of five; for the Taw the factor is closer to 2000

In relatively few cases was the high rainfall of the February to April period translated into equivalently ranked runoff. This could be anticipated given the unusually dry antecedent conditions for early spring rainfall. Runoff accumulations encompassed a broad range from being among the driest on record (east Scottish coast, the North-East and baseflow rivers in much of lowland England) to being well within the normal range – wide areas of the Midlands, East Anglia and the South West. Only in those areas which tapped the wetter west did rivers record amongst their highest February to April flows. These included the Tay and the Tweed in eastern Scotland and rivers in western Wales, Lancashire and Cumbria.

The most exceptional accumulations for May-September 1989 were in the North-East, the Welsh Borders and north western England. Runoff from East Anglia and the East Midlands was below average but generally unremarkable. In southern and eastern Britain, the preponderance of second ranked entries in Table 8 is associated with the dominant influence of the 1976 drought on low flow records; even though 1976 saw heavy rainfall in September, it was not effective enough to generate a widespread runoff recovery. A comparable situation obtained in the east from Yorkshire through to the Grampian region, where many accumulations ranked behind the droughts of 1972/73 and 1964/65.

The combined effects of the very wet early spring and wet autumn in 1989 is noticeable in the 13-month accumulations in the north-west of England, moderating the often exceptionally dry early winter and summer conditions. Elsewhere, rather rarer 13-month totals were observed; East Anglia and the East Midlands recorded substantially below average totals. Many catchments close to the eastern seaboard and along the south coast registered their lowest, or second lowest, November-November runoff total; over half of more than 100 catchments examined were of rank 1 or 2.

As the catchments featured in the tables and hydrographs were chosen as being representative of their regions, some remarkable statistics have not been featured. The upper Leven – a tributary of the Tees – gauged at Easby since 1971, spent 180 days of 1989 below previous minimum daily values and recorded six new monthly minima in the process. The River Seven which drains from the North York Moors, had a 1989 mean flow less than half that of the previous minimum. The Foston Beck, on the Yorkshire Chalk, spent from April 1988 through to November 1989 in recession, recording new monthly minima for the last three months of 1989. The upper Trent at Stoke recorded new minima for a whole range of accumulations, including the calendar year 1989, and longer periods, for example from April 1988 to November 1989.

Low Flow Frequency Analysis

Whilst the tabulated rankings give a rough guide to the rarity of accumulations, it is possible to examine frequencies of occurrence of low flow periods within a more rigorous statistical framework. The measurement of low river flows is subject to many influences which may limit its accuracy, from the hydrometric aspects, such as imprecise stage-discharge relations owing to weed growth and/or insensitive controls, to the effects of artificial influences on the flow regime. It is unfortunate that it is not easy to quantify the latter effects for particular flow sequences and that more data sets are not available for rivers where the net impact of abstractions and discharges is minimal.

Frequencies of occurrence for low flow durations may be derived using the methodology recommended in the Low Flow Studies[4]. The estimation procedure needs to be approached with caution owing to: the accuracy of low flow measurements (see above); variation in record quality over time; and the inadequacies of short record lengths (and the associated need for uncertain extrapolation), the accomodation of outliers and the omission of historical droughts. Table 9 provides a guide to the likely frequency of river flows in a selection of catchments for a number of durations from 30 to 365 days. The method has the benefit of choosing the lowest sequences from the whole (or selected portion) of the record regardless of arbitrary month boundaries but sequences have to begin and end within the calendar year.

The Scottish and north-eastern English catchments show increasing return periods with longer durations, a feature common to the rainfall pattern, whilst in the west of England and in Wales the highest return periods are associated with the medium durations; the decrease in rarity for the long durations is a reflection of the wetter autumn in these areas. There is relatively little difference in the return periods estimates across the durations between the more responsive and the baseflow dominated catchments.

TABLE 9 LOW FLOW FREQUENCY ANALYSIS: RANKING OF VARIOUS LOW FLOW DURATIONS IN 1989 AND ESTIMATES OF ASSOCIATED RETURN PERIODS

Station	Duration (Days)															
Number	30		60		120		150		180		240		365		Record	Base Flow
	Rank	R P	Rank	R P	Rank	R P	Rank	R P	Rank	R P	Rank	R P	Rank	R P	Length	Index
10002	4	5	3	5-10	3	5-10	3	5-10	2	10	2	10-25	2	50-100	18	0.60
21022	4	5	4	5	3	5-10	2	10-25	2	10-25	1	10-25	2	10-25	20	0.52
25004	2	25-50	2	10-25	1	25-50	1	25-50	1	10-25	1	25	1	50	29	0.53
25005	3	10-25	2	25	3	10-25	2	10-25	2	10-25	2	10-25	1	50	29	0.43
26003	2	25-50	2	25-50	2	25-50	2	25-50	2	25-50	2	25-50	2	50	27	0.95
27041	2	10-25	2	25-50	1	25-50	1	25-50	1	25-50	1	25-50	1	25-50	16	0.68
28040	1	25-50	1	50-100	1	25-50	1	50	1	25-50	2	10-25	1	10-25	21	0.48
29003	3	10	3	5-10	2	10	2	10-25	2	10	2	10	3	10-25	21	0.90
34006	4	5-10	3	5-10	2	10-25	1	25-50	1	25	1	50	1	50	26	0.48
39001 nat.#	2	5-10	2	5-10	2	10-25	2	10-25	2	25	2	25-50	2	5-10	39	0.64
39054	2	10	3	10	3	10-25	3	25	2	10-25	2	25	2	10-25	28	0.25
40011	3	10-25	3	25-50	2	25	1	25-50	1	25-50	1	25-50	2	25-50	24	0.69
42003	3	10-25	3	25-50	3	25	2	25-50	2	25	2	25	4	10-25	28	0.36
42010	2	25	2	25-50	2	25-50	2	50	2	25-50	3	50	3	50	31	0.97
46003	3	5-10	3	10-25	4	10-25	4	5-10	5	10-10	6	5-10	5	5-10	31	0.52
50001	5	10	3	10-25	3	10	4	10	6	10	6	5-10	8	2-5	31	0.42
52010	2	5-10	2	10-25	2	10	2	10	2	5-10	1	25	2	10-25	25	0.47
54008	2	10-25	2	25-50	2	25-50	2	25	1	10-25	3	10-25	7	10-25	33	0.57
55018	2	10-25	2	25	2	25	2	25-50	1	25-50	2	25-50	4	5-10	20	0.50
57004	4	5-10	3	10-25	1	25	1	50	1	25-50	6	10	14	2	30	0.42
72004	3	10	7	5	3	10-25	2	10-25	2	10-25	2	10-25	8	5	27	0.32
76005	2	25-50	1	25-50	1	25-50	1	50	1	25-50	2	25	5	5-10	25	0.37

R.P. Return Period

Flow record from 1951 (when major structural improvement to the gauging weir was completed) only used in the analysis.

The featured stations monitor flows on the following rivers:
10002 - Ugie; 21022 - Whiteadder; 25004 - Skerne; 25005 - Leven; 26003 - Foston Beck; 27041 - Derwent (Yorks); 28040 - Trent; 29003 - Lud; 34006 - Waveney; 39001 - Thames; 39054 - Mole; 40011 - Great Stour (Kent); 42003 - Lymington; 42010 - Itchen; 46003 - Dart; 50001 - Taw; 52010 - Brue; 54008 - Teme; 55018 - Frome (Herefordshire); 57004 - Cynon; 72004 - Lune; 76005 - Eden.

Historical Comparisons

Because of the effect of natural and artificial storages in individual catchments, the frequencies of the low flow events for comparable periods may differ substantially from those derived from rainfall data. A major difficulty in providing a satisfactory historical perspective for the recent runoff variability is the dearth of long flows records to provide an adequate geographical coverage; the average record length on the Surface Water Archive is about 22 years. The flow frequency estimation procedure discussed above generally allows valid inter-drought comparisons at the shorter durations. As they increase beyond six months however, the procedure begins to favour drought profiles which fall within a calendar year and address less adequately those droughts which extend over periods substantially greater than one year. For the stations featured in Table 9, the drought of 1976 is widely ranked first for durations of 150 days and less and is still the dominant drought at 180 days, particularly in central and southern England. Return periods for 1976 flows are characteristically 25 to 50 years and above for these durations; for the Itchen and Thames, all durations bar the 365-day have return periods in excess of 100 years. From the Yorkshire coast northwards, 1976 is supplanted by 1972, 1973 and 1964 as the dominant event(s) at the shorter durations, although return periods are generally less than 100 years. In these areas at the longer durations, the 1989 data indicate a drought of notable severity.

Ranking runoff accumulations from lengthy station records provides a means of generally assessing the relative severity of historical drought events. Table 10 features three catchments, two representing the most affected areas in the east and one in the west. The River Dee record demonstrates that 1988/89 was one of the most significant droughts to have affected eastern Scotland. The effect of two exceptionally dry autumn periods is evident in the 13-month ranking for the Foston Beck and the primacy of the 1988/89 runoff accumulations for the Kent Stour serves to emphasise both the regional intensity and the persistence of the hydrological drought. As with the Foston Beck, a less extreme picture may have emerged had flow data been available for the 1959 drought and the sequence of very dry episodes in the 1940s.

Compared with previous droughts, 1988/89 over its widest compass is the most severe since 1975/76. As this compass is close to a calendar year (November 1988 to mid-December 1989), it is interesting to note that whilst runoff for 1989 in England and Wales is substantially lower than for the preceding 12 years, runoff in 1976, 1975 and 1973 (especially) was less than in 1989; the 1971 total was closely equivalent. Incorporation of the 1975/76, 1984 and 1988/89 data into the flow frequency analyses has shortened some of the return periods ascribed to the

TABLE 10 MINIMUM RUNOFF TOTALS FOR SELECTED GAUGING STATIONS

DEE AT WOODEND STARTS 1929		FOSTON BECK AT FOSTON MILL STARTS 1959		GREAT STOUR AT HORTON STARTS 1964	
		November 1988 - January 1989			
mm	year	mm	year	mm	year
168	1958/59	31	1964/65	42	**1988/89**
177	1975/76	32	1973/74	55	1971/72
178	1964/65	34	1972/73	59	1973/74
189	1969/70	35	**1988/89**	63	1972/73
195	1972/73	40	1962/63	73	1980/81
199	**1988/89**	43	1977/78	77	1978/79
May - December 1989		May - November 1989			
mm	year	mm	year	mm	year
279	**1989**	41	1973	68	**1989**
314	1937	56	**1989**	84	1972
324	1955	77	1976	85	1973
326	1971	85	1965	93	1985
340	1975	116	1971	99	1984
353	1933	123	1982	105	1965
November 1988 - December 1989		November 1988 - November 1989			
mm	year	mm	year	mm	year
685	1972/73	101	**1988/89**	178	**1988/89**
735	**1988/89**	121	1964/65	195	1972/73
755	1970/71	139	1962/63	213	1971/72
763	1963/64	282	1961/62	251	1975/76
827	1948/49	286	1970/71	264	1983/84
849	1964/65	291	1971/72	277	1980/81

1975/76 event, but for extent, severity and duration the 1975/76 event remains the dominant drought event in central and southern England. In the north-east of Great Britain, however, the 1988/89 drought should be considered as one of the most severe this century.

A remarkable feature of the 1988/89 runoff pattern is the two successive autumns where runoff rates have declined to very low levels. The protracted delays in the seasonal recovery in runoff rates have implications both for river amenity and for water resources.

Groundwater

In relation to groundwater resources the most salient feature of the 1989 drought was the dramatic contrast between standing water levels at the end-of-year and the near-record levels obtaining, over wide areas, during the spring of 1988. The singular magnitude of storage depletion over this period is illustrated in Table 11 which includes an assessment of the overall 1988/89 range of groundwater levels for selected boreholes together with its rank relative to other two-year declines in the water-table (from the peak of one recharge cycle to the minimum of the next cycle, typically 20–22 months). In most of the listed wells there is no precedent for the recent transformation. Equally, recharge over the 1988/89 winter half-year was notably modest and inordinately delayed. The delay was beneficial in the sense that groundwater levels in April were, generally, rising at a time when the spring recessions are normally well established. As a consequence water-tables were only moderately depressed through the summer but the fragility of the groundwater outlook through 1989 may be gauged by considering the implications of an even more protracted delay before rainfall rates increased in mid-February. A further delay of six to eight weeks would have robbed the rainfall of much of its hydrological effectiveness (as evaporation rates climbed) and made for a substantially more sombre resources prognosis.

Whilst a distinct seasonal cycle is the most pronounced feature of groundwater level time series, many display a considerable degree of persistence also – levels commonly remaining above, or below, the seasonal mean for extended periods. Annual recharge amounts are, clearly, the critical factor in determining water-table height (although pumping effects may be influential locally and regionally) but the level from which the winter recovery needs to be generated, together with the steepness and duration of the seasonal recessions are very important also. Natural groundwater base levels – below which no outflow via springs and streams will occur – may, in some aquifers, only be approached after recessions extending well beyond the normal six to eight months between recharge episodes.

Once groundwater levels become exceptionally depressed, even above average recharge may well not restore water-tables to their normal spring level. Thus, the very limited recharge experienced in 1989 needs to be considered in the perspective of the notably low levels registered in the autumn and early winter of 1988/89 and the sustained recessions following the cessation of infiltration in the spring. In western areas, where heavy October rainfall signalled the onset of the 1989/90 recharge season, the minimum 1989 groundwater levels were generally well within the normal range. By contrast, close to the eastern seaboard late-1989 levels approached the lowest on record and in some localities, from Kent to Northumberland, the December levels were unprecedented.

TABLE 11 1988/89 BOREHOLE LEVEL RECOVERIES AND 1989 MINIMA COMPARED WITH THE PERIOD OF RECORD

Borehole/ aquifer	First year of record	Average Recovery (m)	1988/9 recovery (% of average)	Long term minimum (m) and date	1989 Minimum (m) and date	Years with minimum < 1989 min	Range (m) 1988-89	Rank of 1988/89 depletion*
Dalton Holme Chalk and UGS	1889	7.10	40	10.73 14/12/89	10.73 14/12	None	11	
Little Brocklesby Chalk and UGS	1926			4.56 24/09/76	5.77 15/12	1 (1976)		
Washpit Farm Chalk and UGS	1950	2.95		41.24 24/11/78	42.13 04/12			
Rockley Chalk and UGS	1933	10.91		Dry	Dry			
Compton House Chalk and UGS	1894	21.76		27.62 14/10/76	28.30 20/12			
Little Bucket Farm Chalk and UGS	1971	21.09		56.77 01/11/76	57.81 06/12			
Lime Kiln Way Chalk and UGS	1969	0.92		124.09 01/10/76	124.27 09/12	1 (1976)		
New Red Lion Lincolnshire Limestone	1964	9.21		3.29 24/08/76	7.20 18/12	1 (1976)	17	
Llanfair D.C. Permo-Triassic sandstone	1972	0.74		78.85 01/09/76	79.25 23/10	1 (1976)	1	
Bussels No. 7A Permo-Triassic sandstone	1971			22.90 31/08/76	23.19 14/10			

UGS Upper Greensand

* 1 = min.

1989 Borehole Levels in Comparison to Historical Data

The Dalton Holme borehole, which penetrates the Chalk and Upper Greensand aquifer on the outcrop of the Yorkshire Wolds, is representative of monitoring sites in those districts where the 1989 groundwater drought achieved its greatest severity. As Table 12 indicates, the 1988/89 recharge was one of the lowest in the last 30 years and particularly meagre in the context of the post-1976 period. Nonetheless, appreciably lower recharge volumes (see page 173 for details of the procedures used to assess the annual replenishment) were recorded in the winters of 1904/05, 1913/14, 1948/49, 1964/65 and 1972/73. Only in 1964/65 however was the water-table, prior to the onset of the winter recharge, at the extremely depressed levels recorded at the end of 1988. Moreover, 1965 was blessed, especially in northern England, with an early autumn surge in recharge which rapidly brought levels up to the seasonal norm. 1989 witnessed merely a repeat of the excessive delay in the seasonal upturn which occurred the previous year. As a consequence of this combination of circumstances, groundwater levels at Dalton Holme – where routine monitoring began in 1889 – had, by early December declined to the lowest ever measured; only in 1905 were broadly similar end-of-year levels recorded. Figure 15 shows the variations in level over the 1988/89 period compared with the groundwater hydrographs for a selection of historical drought periods. The exceptional magnitude of the drought in this region is confirmed by the water-table levels for the Little Brocklesby borehole (south of the Humber); there is no parallel to the December 1989 minimum in a 64-year record. The water resources repercussions of these remarkably depressed levels may be felt for a number of years with the prospects for 1990 being especially brittle. That said, it should be noted that at Dalton Holme the two heaviest recharge episodes in recent years, those of 1965/66 and 1976/77, have both followed very severe droughts and generated two of the three greatest year-on-year recoveries this century.

TABLE 12 PERCENTAGES OF THE MEAN ANNUAL REPLENISHMENT FOR GROUNDWATER OBSERVATION WELLS IN ENGLAND AND WALES 1960/61 TO 1988/89

Site	Dalton Holme	Compton House	New Red Lion
Aquifer	Chalk	Chalk	Lincolnshire Limestone
1960/61	122	141	---
1961/62	73	75	---
1962/63	98	97	---
1963/64	74	96	---
1964/65	24	42	56
1965/66	148	132	150
1966/67	43	92	52
1967/68	58	86	50
1968/69	88	108	99
1969/70	105	100	91
1970/71	84	107	88
1971/72	103	94	84
1972/73	15	28	42
1973/74	77	107	68
1974/75	90	136	137
1975/76	27	<10	<10
1976/77	161	145	221
1977/78	103	95	95
1978/79	146	98	137
1979/80	125	97	111
1980/81	105	112	82
1981/82	73	77	60
1982/83	98	123	84
1983/84	136	95	100
1984/85	108	100	66
1985/86	112	83	80
1986/87	119	102	83
1987/88	120	144	91
1988/89	40	64	50

Late-1989 borehole levels in Humberside, Lincolnshire and a few other districts close to the east and south coasts, testified to a drought intensity rarely matched in the twentieth century. Elsewhere, the drought was less severe but late-autumn/early-winter levels throughout most of the principal aquifers had generally declined below any registered over the previous decade at least. In large part this reflects the healthy state of groundwater resources in the period following the 1976 drought; the annual percentage replenishments listed in Table 12 provide confirmation but serve also, in the case of the New Red Lion site, to underscore the wider range of departures from the mean to be expected in those areas when, even in a normal year, rainfall amounts exceed evaporative losses only by a small margin. In such situations, persistent SMDs through into the following year can severely restrict the time available for recharge before evaporation rates accelerate, once more, in the late spring.

The contrast between 1989 and the rest of the decade appears in sharp relief on the groundwater level hydrograph for the Woodhouse Grange borehole in the Permo-Triassic sandstones near Doncaster (see Figure 18) – all of the 1989 level data are below the minimum for the 1980–88 period. Levels at Woodhouse Grange are, however, somewhat atypical of the natural rise and fall of the water-table throughout most of England and Wales. Normally, annual minima are recorded in early autumn in the west and progressively later towards the east where the need to eliminate significant SMDs delays the recommencement of infiltration. Where recharge is largely through coarse fissures, water-table response is often rather more rapid but in some deep Chalk wells there may be a lag of several months whilst the infiltrate negotiates the unsaturated zone above the water-table. Thus comparisons of groundwater levels for an individual month need to be undertaken with caution. Notwithstanding the above effects, and with the exception of some of the deepest wells, there was an unusual measure of consistency in the timing of the 1989 minima throughout the Chalk and Upper Greensand aquifer (see Table 11); the great majority of the 1989 recessions continued well into December. Leaving aside 1988 in a few areas, there is no recent winter parallel to the levels registered prior to the 1989/90 upturn. Water-tables were depressed to a comparable degree in 1978 in parts of East Anglia (for example at the Fairfields and Washpit Farm sites) but for most observation boreholes commissioned in the last 25 years, the 1989 minimum ranks as the lowest (for December) on record.

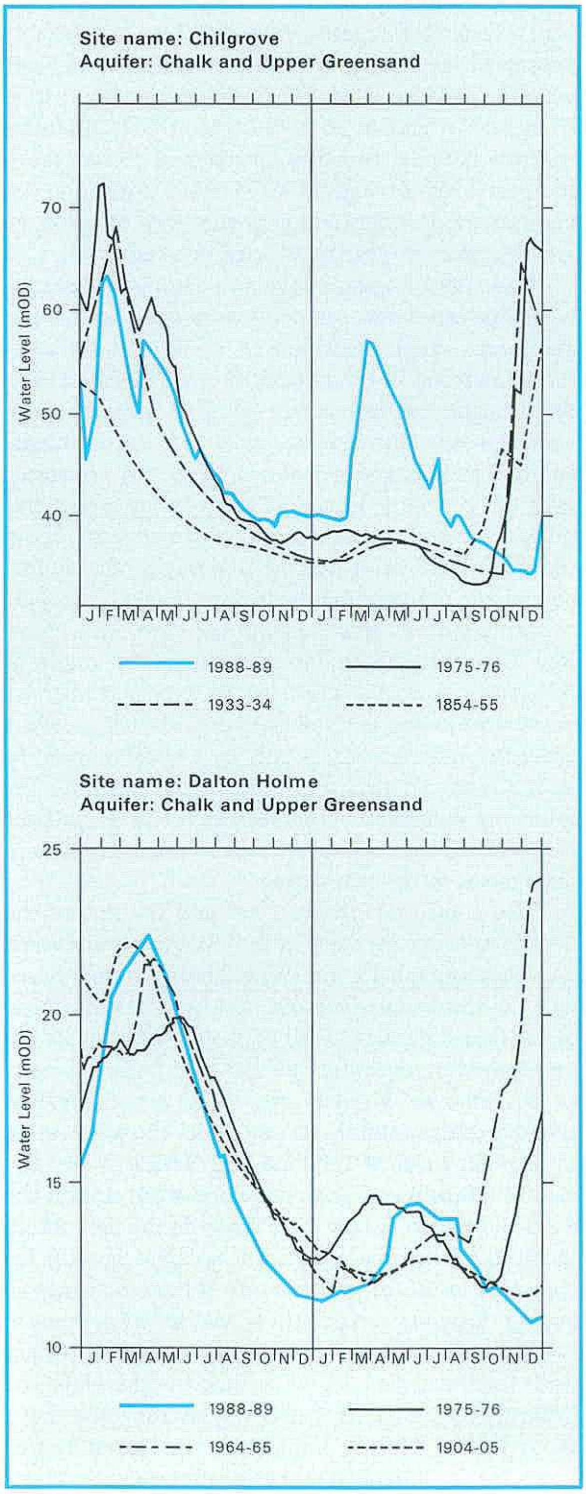


Figure 15. Groundwater levels in 1988/89 compared to those for other selected drought periods.

Where lengthier historical records are available, the late-1989 values are, mostly, seen to be less extraordinary but remain notable. At Rockley (near Marlborough), for instance, the borehole went dry (briefly) in December 1989 for the first time since the 1975/76 drought; routine monitoring began in 1933 and over the ensuing period the water-table also fell below the base of the well in 1945, 1943 and, probably, in 1938. Considering lowland England as a whole, late autumn/early winter levels similar to those of 1989 were recorded over wide areas in the 1959 and 1964 droughts but, in some southern areas, the December levels were almost as remarkable as those in the East Midlands and the North-East. There is no lower December minimum in the 96-year groundwater level record for the Chalk borehole at Compton in West Sussex than that registered in 1989, although it closely equates to that for 1973. 1989 levels at the nearby Chilgrove well were even more outstanding. The Chilgrove House site has the longest record for any borehole on the national groundwater archive – levels have been measured without significant interruption since 1836; this is thought to be the longest aquifer record in the world. Only in 1973, over this period, has an equivalent winter minimum to that of 1989 been recorded; the December 1989 levels fell to within a few centimetres of the absolute minimum (registered in 1976).

A significantly less severe picture of drought severity emerges from a nationwide examination of annual minimum levels. Of the index boreholes featured on Figure 17 (see page 171), only Dalton Holme recorded levels below the 1976 minimum which, typically, occurred in September or October. The substantially greater severity of the 1976 drought throughout much of central and southern Britain is evidenced by the much lengthier periods during which water-tables stood at extremely low levels. At Rockley, for instance, the borehole was dry for 12 months – longer than the combined dry periods throughout the rest of the record. Except in the extreme east, and some southern districts, lower levels than those experienced in 1989 were registered in the droughts of 1964 and 1959 and, more commonly in the 1940s when water-tables were depressed for extended periods. At the deep Therfield Rectory borehole, where the water-table responds only sluggishly to infiltration, levels remained below the unremarkable 1989 minimum from 1942 to 1951 with the exception of a short interlude in 1947. Interestingly, the heavy recharge responsible for the very high spring levels in 1947 heralded a prolonged recession, an episode of meagre winter recharge and depressed groundwater levels in the latter half of 1948; this probably constitutes the nearest analogue to the 1988/89 situation over a large proportion of England and Wales. Extending the historical perspective further, it is clear from the Chilgrove record that the 1850s was also a period of persistently low, to very low, groundwater levels.

Conclusion

A persistent tendency for active low pressure systems to follow a more northerly track was a major contributory cause of the 1989 drought which embraced much of Western Europe. Over the British Isles this synoptic background was associated with a strengthening of the normal west-to-east rainfall gradient and a reinforcement of rain-shadow effects. High temperatures and evaporation rates were exacerbating factors. Severe drought conditions were limited in extent and variable in duration, but significantly, the most intense runoff and recharge deficiencies were experienced in those parts of Great Britain which on average experience the driest conditions. Parts of eastern Scotland and Northumberland were afflicted by meteorological droughts with associated return periods in excess of 200 years (for seven or eight months starting in the spring). With a relatively small population and low demand, Scotland experienced no significant threat to water resources. In part this reflects the substantially lower drought intensity in the headwaters of many eastward-draining rivers from which public supplies are abstracted. In north-east England, storage in Kielder Reservoir - which provides security against all but the most extreme, and sustained, rainfall deficiencies - reached its lowest level since its construction in 1982 and other smaller reservoirs were heavily drawn down but few supply problems were reported.

In southern Britain the drought had a significant impact from the late spring through until the early winter. The imposition of hose-pipe bans was widespread in the South, South-West, South Wales and the Midlands affecting 12.5 million consumers by the end of August; bans were extended to Yorkshire in October. Not all hose-pipe bans were introduced principally in response to diminishing resources. Many, especially over the May-July period, were related to distribution frailties often associated with surges in peak demand arising from garden watering. Drought Orders to modify river abstractions or reduce compensation flows - requiring approval from the Secretary of State for the Environment - were in operation by the end of July in the South, South-West and North-West, extending to the Midlands and Yorkshire in September; Anglian Water applied for their only Drought Order of the year in December. The threat of stand-pipe deployment, to drastically limit demand, in North Cornwall was averted by the September rainfall.

Only in a few eastern districts did the 1989 drought approach the severity of the 1976 event when, over the 16 months beginning in May 1975, parts of central and southern England recorded only marginally more than half the average rainfall; by comparison the largest regional rainfall deficiencies in the 1989 drought were around 35 per cent over a 13-month period. In some regions more compelling comparisons may be made with the summer and autumn conditions experienced in 1964, 1972 and 1975. The drought in each of these years was the precursor of substantially more severe conditions in the following year arising in large part from the failure of the winter rain to replenish depressed water resources. The full significance of the 1989 drought may only become evident through, and possibly beyond, 1990.

The occurrence of any very notable hydrological event at a time of burgeoning scientific interest in climate change is bound to focus attention on possible causative links. Whilst it is possible to point to certain features of the 1989 drought - notably the elevated temperatures, persistently high soil moisture deficits and the disruption to the familiar seasonal variations in rainfall, runoff and recharge - as being consistent with a number of climate change scenarios, it would be premature to attribute the unusual conditions experienced in 1989 to the Greenhouse Effect. On the one hand the implications for rainfall and water resources of global temperature changes are poorly understood at the continental scale and, as yet, can be only dimly perceived at the national scale. On the other, the national variability of the UK climate is such that it is inappropriate to attempt to identify a trend based upon hydrological conditions experienced over only a few years. Concern regarding the adequacy of the UK's water resources have been expressed before, for instance in the 1930s and, especially, in the mid-1970s. This was an understandable response not only to the extraordinary drought of 1976 but to the less intense events of 1972, 1973 and 1975. Following the termination of the 1976 drought, however, the UK's weather entered a wet phase characterised by notably wet winters particularly in western and northern Britain.

Whether the recent abrupt, and dramatic, changes in weather patterns represent a volatile interlude within the wide range of normal variability or signal a move towards a more erratic climatic regime, remains to be determined. What the 1989 drought has demonstrated is the continuing vulnerability of those parts of the UK with the lowest rates of runoff and recharge to sustained rainfall deficiencies. With population, industry and intensive agriculture concentrated in such areas and water demand rising, the water industry faces a major challenge in restricting the community impact of future droughts especially if the evaporation rates and soil moisture conditions experienced in 1989 become more typical.

Acknowledgements

The continuing co-operation of the measuring authorities (see page 196) in the provision and validation of the hydrometric data upon which this report is based is gratefully acknowledged. Thanks are due also to Dr A. Gustard and Miss A. Wesselink who advised on the estimation of river flow return periods and Mr N. S. Reynard who developed the mapping system for use with the MORECS data. Mr R. A. Monkhouse and Miss P. Doorgakant (British Geological Survey) provided much of the groundwater data and advised on its interpretation.

References

1. Tabony, R. C. 1977. The variability & long duration rainfall over Great Britain. Scientific Paper No. 37. Meteorological Office.
2. Wheeler, D.A. 1991. Water supply problems in north-east England as a result of the 1989 Drought. Geography (in press).
3. Jones, P.D. and Hulme, M. 1989. Temperatures over the United Kingdom during the period November 1988 to April 1989 compared with previous years. In: The Mild Winter (Ed. M.G.R. Cannell). NERC.
4. Thompson, N., Barrie, I.A. and Ayles, M. 1981. The Meteorological Office rainfall and evaporation calculation system: MORECS, Hydrological Memorandum No. 45. Meteorological Office (HMSO).
5. Anon. 1981, Low Flow Studies. Institute of Hydrology.
6. Reynard, N.S., Arnell, N.W., Marsh, T.J. and Bryant S.J. 1990. Hydrological Characteristics of the Summer 1989 and Winter 1989/90. Institute of Hydrology (Report to the Institute of Terrestrial Ecology), NERC. 22 pages.

Computation and Accuracy of Gauged Flows

Gauged flows are generally calculated by the conversion of the record of stage, or water level, using a stage-discharge relation, often referred to as the rating or calibration. Stage is measured and recorded against time by instruments usually actuated by a float in a stilling well. The instrument records the level either digitally, on a solid state logger, less commonly on punched tape, or continuously by pen and chart. At well over half the gauging stations in the United Kingdom provision is made for the routine transmission of river levels directly to the processing centre, by telephone line or, less generally, by radio; on occasions satellites have been used to receive and re-transmit the radio signal. The rapid growth in the use of the public telephone network for the transmission of river level and flow data is enabling hydrometric data acquisition to proceed on a near real-time basis in many areas. Typically, levels are recorded at 15-minute intervals and stored on-site for overnight transmission to allow the initial processing to be completed on the following day. Normally, both digital and analogue recording devices are deployed at gauging stations to provide a measure of security against loss of record caused by instrument malfunction.

The stage-discharge relation is obtained either by installing a gauging structure, usually a weir or flume with known hydraulic characteristics, or by measuring the stream velocity and cross-sectional area at points throughout the range of flow at a site characterised by its ability to maintain the relationship.

The accuracy of the processed gauged flows therefore depends upon several factors:

i. accuracy and reliability in measuring and recording water levels,
ii. accuracy and reliability of the derived stage-discharge relation, and
iii. concurrency of revised ratings and the stage record with respect to changes in the station control.

Flow data from ultrasonic gauging stations are computed on-site where the times are measured for acoustic pulses to traverse a river section along an oblique path in both directions. The mean river velocity is related to the difference in the two timings and the flow is then assessed using the river's cross-sectional area. Accurate computed flows can be expected for stable river sections and within a range in stage that permits good estimates of mean channel velocity to be derived from a velocity traverse set at a series of fixed depths.

Flow data from electromagnetic gauging stations may also be computed on-site. The technique requires the measurement of the electromotive force (emf) induced in flowing water as it cuts a vertical magnetic field generated by means of a large coil buried beneath the river bed, or constructed above it. This emf is sensed by electrodes at each side of the river and is directly proportional to the average velocity in the cross-section.

British and International Standards are followed as far as possible in the design, installation and operation of gauging stations. Most of these Standards include a section devoted to accuracy, which results in recommendations for reducing uncertainties in discharge measurements and for estimating the extent of the uncertainties which do arise.

The Surface Water Archive exists to provide not only a central database and retrieval service but also an extra level of hydrological validation. To further this aim, project staff at the Institute of Hydrology liaise with their counterparts in the water industry on a regional basis and, by visiting gauging stations and data processing centres, endeavour to maintain the necessary knowledge of local conditions and problems.

Scope of the Flow Data Tabulations

River flow data are presented in two parts. In the first, daily mean gauged flows are tabulated for 49 gauging stations; daily naturalised flows (see page 101) are also tabulated for the River Thames at Kingston. Monthly flow data for a further 160 gauging stations are given in the second part. The featured gauging stations have been selected to give a broad geographical coverage and to typify a wide range of catchment types found throughout the United Kingdom. A map (Figure 16) is provided on page 50 to assist in locating the gauging stations featured in this section.

For each gauging station, basic reference information is given together with comparative average and extreme river flow and rainfall figures based upon the archived record.

Explanatory notes precede the two sets of tables and are provided to assist in the interpretation of particular items. The notes relating to the daily flow tables are given overleaf; those relating to the monthly data are given on page 102.

Part (i) – the daily mean flow tabulations

Station Number

The gauging station number is a unique six-digit reference number which serves as the primary identifier of the station record on the Surface Water Archive. The first digit is a regional identifier being 0 for mainland Britain, 1 for the islands around Britain and 2 for Ireland. This is followed by the hydrometric area number given in the second and third digits. Hydrometric areas are either integral river catchments having one or more outlets to the sea or tidal estuary or, for convenience, they may include several contiguous river catchments having topographical similarity with separate tidal outlets. In Britain they are numbered from 1 to 97 in clockwise order around the coastline commencing in north-east Scotland: Ireland has a unified numbering system from 1 to 40, commencing with the River Foyle catchment and circulating clockwise; not all Irish hydrometric areas, however, have an outlet directly on the coast.

The numbers and boundaries of the United Kingdom hydrometric areas are shown in the frontispiece.

The fourth, fifth and sixth digits comprise the number, usually allocated chronologically, of the gauging station within the hydrometric area.

Where the leading digit, or digits, are zero they may be omitted giving rise to apparent four or five-digit reference numbers.

Measuring Authority

An abbreviation referencing the organisation responsible for the provision of river flow data to the Surface Water Archive. Most stations designated with 'Water Authority' codes in previous yearbooks have been transferred to the National Rivers Authority (see page 196). A list of measuring authority codes together with the corresponding names and addresses for all organisations currently contributing data to the Surface Water Archive appears on pages 196 to 198.

Grid Reference

The initial two-letter and two-figure codes each designate the relevant 100 kilometre National Grid square or Irish Grid square; the standard six-figure map reference follows.

Note: Irish Grid references - which are italicised - have only one prefix letter but it is common practice to precede it with the letter I to make the identification clear.

Catchment Area

The surface catchment area, in the horizontal plane, draining to the gauging station in square kilometres. There are a few gauging stations where, because of geological considerations, or as a result of water transfers - for instance, the use of catchwaters to increase reservoir yields - the actual contributing area may differ appreciably from that defined by the topographical boundary. In consequence, the river flows whether augmented or diminished, may cause the runoff (as a depth in millimetres) values to appear anomalous.

First Year

The year in which the station started producing daily mean flow data, usually the first year for which data are held on the Surface Water Archive. Earlier data, often of a sporadic nature or of poorer quality, may occasionally be available from the measuring authorities or other sources.

Level of Station

The level of the station is, generally, the level of the gauge zero in metres above Ordnance Datum, or above Malin Head Datum for stations in Northern Ireland. Although gauge zero is usually closely related to zero discharge, it is the practice in some areas for an arbitrary height, typically one metre, to be added to the level of the lowest crest of a measuring structure to avoid the possibility of false recording of negative values by some digital recorders.

Maximum Altitude

The level to the nearest metre of the highest point in the catchment.

Table of daily mean gauged (or naturalised) discharges

The mean flow in cubic metres per second (abbreviated to m^3s^{-1} and sometimes also referred to as 'cumecs') in a water-day, normally 09.00 to 09.00. The naturalised discharge is the gauged discharge adjusted to take account of net abstractions and discharges upstream of the gauging station.

Peak Flow: The highest flow in cubic metres per second for each month. The day of peak generally refers to the water-day but the calendar day is also used, particularly in Scotland. Normally the peak flow corresponds to the highest fifteen-minute flow where water levels are recorded digitally, or the highest instantaneous flow associated with maximum stage where analogue recorders are used.

Runoff: The notional depth of water in millimetres over the catchment equivalent to the mean flow for the month as measured at the gauging station. It is computed using the relationship:

$$\text{Runoff in mm} = \frac{\text{Average Flow in Cumecs} \times 86.4 \times n}{\text{Catchment Area (km}^2\text{)}}$$

where n is the number of days in the month. The runoff total is rounded to the nearest millimetre.

Rainfall: The rainfall over the catchment in millimetres for each month. Except for the Institute of Hydrology's research catchments, each areal rainfall total is derived from a one kilometre square grid of rainfall values generated from all daily and monthly rainfall data available from the Meteorological Office. Validation procedures allow for the rejection of obviously erroneous raingauge observations prior to the gridding exercise. A computer program then calculates catchment rainfall by averaging the values at the grid points lying within the digitised boundary of the catchment.

Statistics of monthly data for previous record

Only complete monthly records are used in the derivation of the average, low and high values of river flow, runoff and rainfall. The rainfall and runoff statistics are normally directly comparable but full equivalence will not obtain where the pattern of missing data differs between the archived rainfall and runoff data sets.

Where applicable, a guide to the amount of missing data is given following the section heading. Some slight variations from the statistics held by the measuring authorities may occur; these may be due to the different methods of computation or the need for uniformity in presentation.

Summary statistics

Current year flow statistics are tabulated alongside the corresponding values for the previous record. Where appropriate, the current year figures are expressed as a percentage* of the preceding average.

Mean Flow: The average of all available daily mean flows during the term indicated.

Lowest Daily Mean: The value and date of occurrence of the lowest mean flow in cubic metres per second in a water-day during the term indicated. In a record in which the value recurs, the date is that of the last occasion.

River flow measurement tends to become more imprecise at very low discharges. Very low velocities, heavy weed growth and the insensitivity of stage-discharge relations combine with the difficulty of accurately measuring limited water depths to reduce the accuracy of computed flows. The reliability of both the lowest daily mean flow and the 95% exceedance flows (see below) as representative measures of low flow must, therefore, be considered carefully and the values used with caution in view of the increasing proportional variability between the natural flow and the artificial influences, such as abstractions, discharges and storage changes as the river flow diminishes.

* As a consequence of leap years the runoff and mean flow percentage may not be identical.

Peak: The peak flow in cubic metres per second during the term indicated. The date of occurrence, normally the water-day, is also indicated. Generally, the peak flows are derived from the record of monthly instantaneous maximum flows stored on the Surface Water Archive. As a result of particular flow measurement difficulties in the flood range, this peak flow series is often incomplete. Reference to Volume IV of the Flood Studies Report[1] should be made to check for historical flood events which may exceed the peak falling within the gauged flow record.

10% exceedance: The flow in cubic metres per second which was equalled or exceeded for 10 per cent of the specified term – a high flow parameter which, when compared with the mean may give a measure of the variability, or 'flashiness', of the flow regime. The 10 per cent exceedance value is computed using daily flow data only for those years with ten days, or less, missing on the Surface Water Archive.

50% exceedance: The flow in cubic metres per second which was equalled or exceeded for 50 per cent of the specified term – the median value. The same conditions for completeness of the annual records apply as for the 10 per cent exceedance flow.

95% exceedance: The flow in cubic metres per second which was equalled or exceeded for 95 per cent of the specified term – a significant low flow parameter relevant in the assessment of river water quality consent conditions. The same conditions for completeness of the annual records apply as for the 10 per cent exceedance flow.

Factors affecting flow regime

An indication of the various types of abstractions from, and discharges to, the river operating within the catchment which alter the natural flow is given by a standard set of abbreviated descriptions. In Part (ii) – the monthly flow data – each description is shortened to a code letter. An explanation of the abbreviated descriptions and the code letters is given overleaf. With the exception of the induced loss in surface flow resulting from underlying groundwater abstraction, these codes and descriptions refer to quantifiable variations and do not include the progressive, and difficult to measure, modifications in the regime related to land-use changes.

Except for a small set of gauging stations for which the net variation, i.e. the sum of abstractions and discharges, is assessed in order to derive the 'naturalised' flow from the gauged flow the record of individual abstractions, discharges and changes in storage as indicated in the code above is not held centrally.

[1] Flood Studies Report 1975 Natural Environment Research Council (5 vols.)

CODE	EXPLANATION	ABBREVIATED DESCRIPTION
N	Natural, i.e., there are no abstractions and discharges, or the variation due to them is so limited that the gauged flow is within 10 per cent of the natural flow at, or in excess of, the 95 per cent exceedance flow.	Natural within 10 per cent at the 95 per cent exceedance flow.
	Storage or impounding reservoir. Natural river flows will be affected by water stored in a reservoir situated in, and supplied from, the catchment above the gauging station.	Reservoirs in catchment.
	Regulated river. Under certain flow conditions the river will be augmented from surface water and/or groundwater storage upstream of the gauging station.	Augmentation from surface water and/or groundwater.
	Public water supplies. Natural river flows are reduced by the quantity abstracted from a reservoir or by a river intake if the water is conveyed outside the gauging station's catchment area.	Abstraction for public water supply.
	Groundwater abstraction. Natural river flow may be reduced or augmented by groundwater abstraction or recharge. This category includes catchments where mine-water discharges influence the flow regime.	Flows influenced by groundwater abstraction and/or recharge.
	Effluent return. Outflows from sewage treatment works will augment the river flow if the effluents originate from outside the catchment.	Augmentation from effluent returns.
	Industrial and agricultural abstractions. Direct industrial and agricultural abstractions from surface water and from groundwater may reduce the natural river flow.	Flow reduced by industrial and/or agricultural abstraction.
H	Hydro-electric power. The river flow is regulated to suit the need for power generation.	Regulation for HEP.

Station and catchment description

A short commentary providing a guide to the characteristics of the station, its flow record and the catchment it commands; refer to page 200 for an explanatory listing of the abbreviations and acronyms used. The principal objectives of this summary information are to assist data users in the selection of gauging station records appropriate to their needs and to assist in the interpretation of flow variability at individual gauging stations particularly where the natural flow pattern is significantly disturbed by artificial influences.

A comprehensive set of gauging station and catchment descriptions is provided in the 'Hydrometric Register and Statistics 1981–5' (see page 199). Further details of the net impact of abstractions and discharges on river flow patterns are given in: Gustard, A., Bullock, A. and Dixon, J.M. 1991. Estimating Low River Flows in the United Kingdom. Institute of Hydrology (in press).

Comment

A summary of any important factors influencing the accuracy of the current year's flow data specifically; for instance, the reconstruction of a gauging station or the use of extrapolated stage-discharge relations during periods of very low or very high flows.

STATIONS FOR WHICH DAILY OR MONTHLY DATA ARE GIVEN IN THE RIVER FLOW SECTION

STATION NUMBER	RIVER NAME AND STATION NAME	SEE PAGE
3003	OYKEL AT EASTER TURNAIG	103
4001	CONON AT MOY BRIDGE	103
7002	FINDHORN AT FORRES	103
D 8006	SPEY AT BOAT O BRIG	52
8007	SPEY AT INVERTRUIM	103
9001	DEVERON AT AVOCHIE	104
10002	UGIE AT INVERUGIE	104
11001	DON AT PARKHILL	104
D 12001	DEE AT WOODEND	53
13007	NORTH ESK AT LOGIE MILL	104
13008	SOUTH ESK AT BRECHIN	105
14001	EDEN AT KEMBACK	105
D 15006	TAY AT BALLATHIE	54
15011	LYON AT COMRIE BRIDGE	105
16003	RUCHILL WATER AT CULTYBRAGGAN	105
16004	EARN AT FORTEVIOT BRIDGE	106
17001	CARRON AT HEADSWOOD	106
17002	LEVEN AT LEVEN	106
18003	TEITH AT BRIDGE OF TEITH	106
18005	ALLAN WATER AT BRIDGE OF ALLAN	107
D 19001	ALMOND AT CRAIGIEHALL	55
20001	TYNE AT EAST LINTON	107
21006	TWEED AT BOLESIDE	107
D 21009	TWEED AT NORHAM	56
21012	TEVIOT AT HAWICK	107
21018	LYNE WATER AT LYNE STATION	108
21022	WHITEADDER WATER AT HUTTON CASTLE	108
D 22001	COQUET AT MORWICK	57
22006	BLYTH AT HARTFORD BRIDGE	108
23001	TYNE AT BYWELL	108
D 23004	SOUTH TYNE AT HAYDON BRIDGE	58
24004	BEDBURN BECK AT BEDBURN	109
24009	WEAR AT CHESTER LE STREET	109
D 25001	TEES AT BROKEN SCAR	59
25006	GRETA AT RUTHERFORD BRIDGE	109
25019	LEVEN AT EASBY	109
25020	SKERNE AT PRESTON LE SKERNE	110
26003	FOSTON BECK AT FOSTON MILL	110
26005	GYPSEY RACE AT BOYNTON	110
D 27002	WHARFE AT FLINT MILL WEIR	60
27007	URE AT WESTWICK LOCK	110
27025	ROTHER AT WOODHOUSE MILL	111
27030	DEARNE AT ADWICK	111
D 27035	AIRE AT KILDWICK BRIDGE	61
D 27041	DERWENT AT BUTTERCRAMBE	62
27042	DOVE AT KIRKBY MILLS	111
27043	WHARFE AT ADDINGHAM	111
D 27053	NIDD AT BIRSTWITH	63
27059	LAVER AT RIPON	112
27071	SWALE AT CRAKEHILL	112
D 28009	TRENT AT COLWICK	64
28018	DOVE AT MARSTON ON DOVE	112
28024	WREAKE AT SYSTON MILL	112
28026	ANKER AT POLESWORTH	113
28031	MANIFOLD AT ILAM	113
28039	REA AT CALTHORPE PARK	113
28067	DERWENT AT CHURCH WILNE	113
28080	TAME AT LEA MARSTON LAKES	114
28082	SOAR AT LITTLETHORPE	114
D 28085	DERWENT AT ST MARY'S BRIDGE	65
29003	LUD AT LOUTH	114
D 30001	WITHAM AT CLAYPOLE MILL	66
30004	PARTNEY LYMN AT PARTNEY MILL	114
31002	GLEN AT KATES BRIDGE (TOTAL)	115
31007	WELLAND AT BARROWDEN	115
32003	HARPERS BROOK AT OLD MILL BRIDGE	115
D 32004	ISE BROOK AT HARROWDEN OLD MILL	67
D 33002	BEDFORD OUSE AT BEDFORD	68
33012	KYM AT MEAGRE FARM	115
33013	SAPISTON AT RECTORY BRIDGE	116
33024	CAM AT DERNFORD	116
33032	HEACHAM AT HEACHAM	116
34001	YARE AT COLNEY	116
34003	BURE AT INGWORTH	117
D 34006	WAVENEY AT NEEDHAM MILL	69
35003	ALDE AT FARNHAM	117
D 36006	STOUR AT LANGHAM	70
37001	RODING AT REDBRIDGE	117
37005	COLNE AT LEXDEN	117
37010	BLACKWATER AT APPLEFORD BRIDGE	118
38001	LEE AT FEILDES WEIR	118
D 38003	MIMRAM AT PANSHANGER PARK	71
38018	UPPER LEE AT WATER HALL	118
38021	TURKEY BROOK AT ALBANY PARK	118
D 39001	THAMES AT KINGSTON	72
39002	THAMES AT DAYS WEIR	119
39005	BEVERLEY BROOK AT WIMBLEDON COMMON	119
D 39007	BLACKWATER AT SWALLOWFIELD	73
39014	VER AT HANSTEADS	119
39016	KENNET AT THEALE	119
39019	LAMBOURN AT SHAW	120
D 39020	COLN AT BIBURY	74
39021	CHERWELL AT ENSLOW MILL	120
39023	WYE AT HEDSOR	120
39029	TILLINGBOURNE AT SHALFORD	120
39049	SILK STREAM AT COLINDEEP LANE	121
39069	MOLE AT KINNERSLEY MANOR	121
D 40003	MEDWAY AT TESTON	75
40004	ROTHER AT UDIAM	121
40009	TEISE AT STONE BRIDGE	121
40011	GREAT STOUR AT HORTON	122
40012	DARENT AT HAWLEY	122
41001	NUNNINGHAM STREAM AT TILLEY BRIDGE	122
41005	OUSE AT GOLD BRIDGE	122
41006	UCK AT ISFIELD	123
D 41016	CUCKMERE AT COWBEECH	76
41019	ARUN AT ALFOLDEAN	123
41027	ROTHER AT PRINCES MARSH	123
42003	LYMINGTON AT BROCKENHURST PARK	123

continued on page 51

Figure 16. Gauging station location map.

RIVER FLOW DATA

STATION NUMBER	RIVER NAME AND STATION NAME	SEE PAGE
42004	TEST AT BROADLANDS	124
42006	MEON AT MISLINGFORD	124
42008	CHERITON STREAM AT SEWARDS BRIDGE	124
D 42010	ITCHEN AT HIGHBRIDGE AND ALLBROOK	77
D 43005	AVON AT AMESBURY	78
43006	NADDER AT WILTON PARK	124
43007	STOUR AT THROOP MILL	125
44002	PIDDLE AT BAGGS MILL	125
D 45001	EXE AT THORVERTON	79
45003	CULM AT WOODMILL	125
45004	AXE AT WHITFORD	125
46003	DART AT AUSTINS BRIDGE	126
D 47001	TAMAR AT GUNNISLAKE	80
47007	YEALM AT PUSLINCH	126
47008	THRUSHEL AT TINHAY	126
48004	WARLEGGAN AT TRENGOFFE	126
48005	KENWYN AT TRURO	127
48011	FOWEY AT RESTORMEL	127
49001	CAMEL AT DENBY	127
49002	HAYLE AT ST ERTH	127
D 50001	TAW AT UMBERLEIGH	81
50002	TORRIDGE AT TORRINGTON	128
D 52005	TONE AT BISHOPS HULL	82
52007	PARRETT AT CHISELBOROUGH	128
52010	BRUE AT LOVINGTON	128
53004	CHEW AT COMPTON DANDO	128
53006	FROME (BRISTOL) AT FRENCHAY	129
53007	FROME (SOMERSET) AT TELLISFORD	129
D 53018	AVON AT BATHFORD	83
D 54001	SEVERN AT BEWDLEY	84
D 54002	AVON AT EVESHAM	85
54012	TERN AT WALCOT	129
54019	AVON AT STARETON	129
54020	PERRY AT YEATON	130
54022	SEVERN AT PLYNLIMON FLUME	130
54029	TEME AT KNIGHTSFORD BRIDGE	130
54034	DOWLES BROOK AT DOWLES	130
54038	TANAT AT LLANYBLODWEL	131
55008	WYE AT CEFN BRWYN	131
55013	ARROW AT TITLEY MILL	131
55014	LUGG AT BYTON	131
55018	FROME AT YARKHILL	132
55023	WYE AT REDBROOK	132
D 55026	WYE AT DDOL FARM	86
D 56001	USK AT CHAIN BRIDGE	87
56013	YSCIR AT PONTARYSCIR	132
57008	RHYMNEY AT LLANEDERYN	132
58006	MELLTE AT PONTNEDDFECHAN	133
60002	COTHI AT FELIN MYNACHDY	133
60003	TAF AT CLOG-Y-FRAN	133
60010	TYWI AT NANTGAREDIG	133
D 62001	TEIFI AT GLAN TEIFI	88
64001	DYFI AT DYFI BRIDGE	134
64002	DYSYNNI AT PONT-Y-GARTH	134
D 65001	GLASLYN AT BEDDGELERT	89
65005	ERCH AT PENCAENEWYDD	134
66006	ELWY AT PONT-Y-GWYDDEL	134
67008	ALYN AT PONT-Y-CAPEL	135
D 67015	DEE AT MANLEY HALL	90
D 68001	WEAVER AT ASHBROOK	91
69002	IRWELL AT ADELPHI WEIR	135
69007	MERSEY AT ASHTON WEIR	135
69015	ETHEROW AT COMPSTALL	135
71001	RIBBLE AT SAMLESBURY	136
71004	CALDER AT WHALLEY WEIR	136
72002	WYRE AT ST MICHAELS	136
D 72004	LUNE AT CATON	92
73005	KENT AT SEDGWICK	136
D 73010	LEVEN AT NEWBY BRIDGE	93
74002	IRT AT GALESYKE	137
74005	EHEN AT BRAYSTONES	137
75002	DERWENT AT CAMERTON	137
D 76005	EDEN AT TEMPLE SOWERBY	94
78003	ANNAN AT BRYDEKIRK	137
78004	KINNEL WATER AT REDHALL	138
D 79006	NITH AT DRUMLANRIG	95
80002	DEE AT GLENLOCHAR	138
81003	LUCE AT AIRYHEMMING	138
82002	DOON AT AUCHENDRANE	138
83003	AYR AT CATRINE	139
D 84005	CLYDE AT BLAIRSTON	96
84012	WHITE CART WATER AT HAWKHEAD	139
84016	LUGGIE WATER AT CONDORRAT	139
85001	LEVEN AT LINNBRANE	139
85003	FALLOCH AT GLEN FALLOCH	140
90003	NEVIS AT CLAGGAN	140
D 93001	CARRON AT NEW KELSO	97
94001	EWE AT POOLEWE	140
95001	INVER AT LITTLE ASSYNT	140
96001	HALLADALE AT HALLADALE	141
101002	MEDINA AT UPPER SHIDE	141
D 201005	CAMOWEN AT CAMOWEN TERRACE	98
201007	BURN DENNET AT BURNDENNET BRIDGE	141
201008	DERG AT CASTLE DERG	141
D 203010	BLACKWATER AT MAYDOWN BRIDGE	
203012	BALLINDERRY AT BALLINDERRY BRIDGE	
203020	MOYOLA AT MOYOLA NEW BRIDGE	142
D 203028	AGIVEY AT WHITE HILL	100
205004	LAGAN AT NEWFORGE	142
205005	RAVERNET AT RAVERNET	142

A 'D' indicates that the featured station is in the daily flow section.

008006 Spey at Boat o Brig — 1989

Measuring authority: NERPB
First year: 1952

Grid reference: 38 (NJ) 318 518
Level stn (m OD): 43.10

Catchment area (sq km): 2861.2
Max alt (m OD): 1309

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	54.680	41.930	234.600	103.800	64.700	31.890	29.780	17.050	30.110	24.960	73.060	20.190
2	48.130	39.090	145.700	88.180	85.050	33.760	28.820	16.190	32.670	23.490	88.120	21.030
3	44.170	40.610	112.700	66.630	76.120	34.070	25.720	15.580	29.950	22.480	79.890	21.170
4	55.410	53.220	102.000	56.400	67.070	30.810	23.310	15.190	26.640	21.550	63.200	20.320
5	57.170	75.180	149.300	50.870	53.050	31.910	21.820	15.840	24.820	21.150	56.140	20.130
6	52.730	154.200	265.300	47.700	46.810	48.960	20.850	16.610	22.820	20.900	49.280	19.950
7	59.020	246.700	173.000	47.670	43.310	40.470	20.080	17.430	21.140	21.810	43.560	20.090
8	53.110	227.100	112.600	50.160	43.580	36.090	20.030	15.830	20.700	28.940	39.830	19.900
9	50.170	133.400	121.300	50.630	43.470	33.590	19.720	15.760	20.060	27.190	36.480	19.900
10	48.940	89.410	166.200	49.350	39.090	30.640	20.050	15.780	19.430	24.940	34.600	20.030
11	59.580	69.880	120.500	49.510	38.440	29.840	19.420	16.240	18.790	25.570	40.180	19.890
12	89.120	63.970	131.700	81.300	135.200	29.660	18.130	16.470	18.360	28.810	37.710	17.700
13	113.800	75.550	135.400	58.880	110.400	42.160	17.340	16.610	18.400	28.030	34.710	17.400
14	196.200	120.300	101.900	49.030	65.010	61.510	16.990	16.930	18.680	31.040	32.660	16.010
15	312.700	185.700	89.220	46.730	56.610	44.100	16.500	19.120	18.560	36.430	30.430	16.010
16	316.400	131.600	72.990	44.780	60.570	35.150	16.300	25.670	18.870	35.750	29.060	20.280
17	206.400	92.800	61.610	44.740	52.200	30.720	16.210	24.710	18.840	40.020	27.590	34.270
18	125.800	106.100	61.830	45.790	47.010	27.820	16.060	24.830	18.310	41.500	26.850	40.790
19	94.230	124.800	90.570	45.930	44.370	25.830	15.670	24.000	25.150	47.690	25.990	30.090
20	77.720	88.080	103.700	45.550	42.280	24.880	15.600	33.290	55.860	47.430	25.320	25.650
21	82.620	69.750	70.620	47.970	42.980	24.530	16.580	41.820	65.710	52.140	24.790	25.480
22	68.260	68.420	63.180	59.030	40.850	23.100	16.690	34.310	57.850	77.370	24.490	27.930
23	63.610	62.400	66.940	52.070	38.320	21.860	15.760	29.900	128.500	55.680	24.540	29.440
24	58.140	57.790	123.900	44.550	39.360	21.230	16.210	28.500	67.520	49.310	28.300	71.590
25	54.150	60.730	104.700	44.820	44.410	20.950	15.560	31.340	48.230	51.200	26.320	114.200
26	49.960	57.520	101.000	47.180	38.520	22.290	16.690	28.470	40.000	46.570	24.810	75.770
27	51.360	50.820	159.300	48.370	33.900	23.030	16.310	36.140	34.960	50.960	25.960	51.800
28	70.480	119.800	136.700	57.420	31.550	26.060	15.920	34.830	31.450	94.760	24.900	37.200
29	61.320		101.300	49.330	30.800	40.050	16.250	29.430	28.880	84.020	23.530	34.480
30	51.570		120.300	49.940	31.190	31.980	17.130	29.190	26.910	72.370	21.740	30.470
31	46.720		114.200		31.220		17.420	33.570		67.300		28.960
Average	89.470	96.670	119.800	53.980	52.010	31.960	18.670	23.760	33.610	41.980	37.470	31.230
Lowest	44.170	39.090	61.610	44.550	30.800	20.950	15.560	15.190	18.310	20.900	21.740	16.010
Highest	316.400	246.700	265.300	103.800	135.200	61.510	29.780	41.820	128.500	94.760	88.120	114.200
Peak flow	335.00	278.20	320.50	109.30	177.10	69.68	30.41	44.77	177.60	107.10	102.90	146.00
Day of peak	15	7	6	1	12	14	1	21	23	28	2	24
Monthly total (million cu m)	239.60	233.90	320.90	139.90	139.30	82.85	50.02	63.64	87.11	112.40	97.12	83.65
Runoff (mm)	84	82	112	49	49	29	17	22	30	39	34	29
Rainfall (mm)	131	212	133	53	59	67	37	97	67	113	30	57

Statistics of monthly data for previous record (Oct 1952 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	84.410	70.630	74.950	70.390	59.430	42.440	40.150	49.700	50.150	68.800	75.970	86.890
	Low	41.080	26.470	35.760	33.580	26.910	17.900	17.910	11.310	14.090	13.350	30.130	38.780
	(year)	1979	1963	1964	1974	1960	1961	1984	1955	1972	1972	1958	1976
	High	145.900	159.100	145.300	135.200	103.400	103.000	79.860	119.600	105.500	153.900	147.000	198.600
	(year)	1983	1962	1978	1979	1968	1966	1980	1956	1965	1981	1984	1954
Runoff	Avg	79	60	70	64	56	38	38	47	45	64	69	81
	Low	38	22	33	30	25	16	17	11	13	12	27	36
	High	137	135	136	122	97	93	75	112	96	144	133	186
Rainfall	Avg	109	70	83	64	77	73	88	99	96	116	114	118
	Low	38	26	29	19	24	23	20	21	21	30	33	46
	High	185	123	179	128	146	181	158	188	178	205	213	211

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	52.330		64.500		81
Lowest yearly mean			44.200	1972	
Highest yearly mean			82.810	1954	
Lowest monthly mean	18.670	Jul	11.310	Aug 1955	
Highest monthly mean	119.800	Mar	198.600	Dec 1954	
Lowest daily mean	15.190	4 Aug	9.311	16 Aug 1955	
Highest daily mean	316.400	16 Jan	1088.000	17 Aug 1970	
Peak	335.000	15 Jan	1675.000	17 Aug 1970	
10% exceedance	108.100		120.200		90
50% exceedance	39.770		50.200		79
95% exceedance	16.370		19.520		84
Annual total (million cu m)	1650.00		2036.00		81
Annual runoff (mm)	577		711		81
Annual rainfall (mm)	1056		1107		95
[1941-70 rainfall average (mm)			1184]		

Factors affecting flow regime

- Regulation for HEP

Station and catchment description

Lowest station currently operating on the Spey. Cableway rated 65m wide section with natural control, (limited stability) extreme floods bypass station on left bank. 380 sq km. developed for hydro-power with diversions and storage. Mainly granites and Moinian metamorphics. Some Dalradian and a little Old Red Sandstone. Mountain (includes all northern slopes of Cairngorms) moorland, hill grazing and some arable. Forestry.

012001 Dee at Woodend 1989

Measuring authority: NERPB
First year: 1929

Grid reference: 37 (NO) 635 956
Level stn. (m OD): 70.50

Catchment area (sq km): 1370.0
Max alt. (m OD): 1310

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	27 320	20 740	75.530	49 960	41 630	13 920	11.170	5.688	14.300	11 860	36 350	10 470
2	24 080	19 550	53 510	42.970	54.560	13 700	10 540	5 610	15 250	10.900	86 130	10 250
3	22 280	19 780	53 460	33 750	44 030	14 620	9 381	5 245	12 740	10 300	48.380	10 040
4	43 200	28 670	52.500	31.630	34 680	13 150	8.561	5.075	11.310	9 861	36 940	9 729
5	28.790	39 190	112 300	29 040	29 460	15 050	8 154	5 430	10 420	9.724	29.740	9 864
6	25 890	74 010	227 200	29 700	25 410	26 220	7.679	6.824	9 822	9 784	24 930	9 480
7	28 000	80 250	107 200	34 840	23 300	18 700	7 299	7 413	9 063	9 565	22 620	9 930
8	25.110	40 600	63 590	33 620	24 460	16 250	9 044	6 551	9 141	14 450	20 450	8 590
9	26 870	32 400	115 300	31 470	24 060	22 880	8 376	6 000	8 381	11 060	18 640	9 662
10	23 410	27 890	103 100	29 390	20 240	16 610	8 248	6 707	7 963	9 982	21.180	9 235
11	48 800	24 360	58 290	41.340	20 970	16 030	8 001	6 361	7 524	10 240	30 610	8 912
12	46 950	23 990	68 610	55 280	58 790	15 370	6 894	7 479	7 363	11 600	26 030	7 364
13	80 080	40 410	57 500	33.760	41 060	23 840	6 537	6 619	8 125	10 840	31 550	6 539
14	77 070	49 640	44 870	28 620	31 250	25 740	6 417	6.956	8 143	10 850	24 380	5 173
15	101 900	92 720	41 330	29 510	33 140	16 570	6 078	17 320	7 944	11 220	20 380	5 497
16	53 770	34 490	33 380	26 530	39 710	14 040	5 852	15 370	9 722	12 850	18 570	6 964
17	39 240	28 590	28 900	28 860	29 210	13 000	5 758	10 910	8 303	16 950	17 030	33 020
18	32 630	70 490	31 560	29 280	26 530	12 060	5 697	9 422	7 825	16 810	16 390	32 620
19	29 690	57 670	86 870	28 100	24 820	11 190	5 566	8 908	24 700	20 410	16 850	17 800
20	28 640	33 900	63 180	28 140	22 960	10 600	5 407	19 570	78 180	32 910	15 640	16 230
21	51 960	28 080	37 550	27 820	24 010	10 020	5 393	26 380	41 860	42 440	15 100	17 590
22	29 410	29 860	34 060	29 240	22 870	9 915	5 697	15 250	40 790	41 860	14 670	27 730
23	30 830	22 200	135 680	24 410	20 580	9 176	5 647	12 650	73 110	25 440	13 580	19 660
24	29 260	24 590	61 980	21 970	21 860	8 821	5 637	13 140	33 790	22 910	13 310	134 200
25	32 260	27 670	44 260	21 790	27 390	8 673	5 204	15 300	25 640	23 110	12 060	93 100
26	29 300	23 820	64 200	21 440	19 240	9 509	5 905	13 140	21 160	18 850	11 580	47 610
27	30 840	21 050	119 700	21 220	16 790	10 140	6 033	16 300	17 920	22 200	12 070	29 020
28	35 800	29 450	73 430	24 970	15 590	9 862	5 340	15 850	15 500	66 120	11 760	21 130
29	27 630		48 250	21 540	15 230	12 710	5 734	13 030	13 860	47 290	11 280	22 440
30	24 160		78 270	20 780	14 830	11 360	5 698	12 890	12 870	41 100	10 820	19 240
31	22 950		55 230		14 520		5 440	20 030		34 860		17 510
Average	37 360	37 360	68 740	30 370	27 840	14 320	6 851	11 080	19 090	20 910	22 970	22 150
Lowest	22 280	19 550	28 900	20 780	14 520	8 673	5 204	5 075	7 363	9 565	10 820	5 173
Highest	101 900	92 720	227 200	55 280	58 790	26 220	11 170	26 380	78 180	66 120	86 130	134 200
Peak flow	216 80	162 40	318 80	76 37	69 59	44 65	12 12	42 12	131 80	82 83	150 00	268 30
Day of peak	13	15	6	12	17	13	1	21	20	28	2	24
Monthly total (million cu m)	100 10	90 38	184 10	78 71	74 58	37 13	18 35	29 67	49 48	56 02	59 53	59 32
Runoff (mm)	73	66	134	57	54	27	13	22	36	41	43	43
Rainfall (mm)	82	155	133	58	58	48	22	98	67	99	35	77

Statistics of monthly data for previous record (Oct 1929 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	47 570	40 040	42 580	45 400	36 390	22 500	18 600	22 640	26 070	39 750	46 800	49 100
	Low	15 450	13 420	15 160	11 380	12 130	7 340	7 258	5 141	6 491	6 798	12 230	22 020
	(year)	1940	1947	1973	1938	1946	1940	1984	1984	1972	1972	1983	1976
	High	127 800	90 110	88 680	113 300	85 950	56 080	36 710	63 850	71 830	138 200	127 500	108 400
	(year)	1937	1945	1977	1947	1986	1948	1958	1948	1930	1982	1984	1954
Runoff	Avg	93	71	83	86	71	43	36	44	49	78	89	96
	Low	30	24	30	22	24	14	14	10	12	13	23	43
	High	250	159	173	214	168	106	72	125	136	270	241	212
Rainfall	Avg	120	75	77	69	81	67	90	95	94	119	114	119
	Low	36	10	16	12	21	16	24	13	13	8	22	43
	High	374	148	175	196	179	160	206	185	227	310	320	282

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	26 550		36 440		73
Lowest yearly mean			24 190	1973	
Highest yearly mean			49 050	1982	
Lowest monthly mean	6 851	Jul	5 141	Aug 1984	
Highest monthly mean	68 740	Mar	138 200	Oct 1982	
Lowest daily mean	5 075	4 Aug	3 536	27 Aug 1976	
Highest daily mean	227 200	6 Mar	648 500	24 Jan 1937	
Peak	318 800	6 Mar	1133 000	24 Jan 1937	
10% exceedance	53 580		72 530		74
50% exceedance	21 030		25 690		82
95% exceedance	5 773		8 452		68
Annual total (million cu m)	837 30		1150 00		73
Annual runoff (mm)	611		839		73
Annual rainfall (mm)	932		1120		83
(1941-70 rainfall average (mm)			1194)		

Factors affecting flow regime

- Natural to within 10% at 95 percentile flow

Station and catchment description

Cableway rated, fairly stable natural control. Present station, built in 1972, replaced earlier station (flow records from 1929, chart records from 1934) on same reach (Cairnton; c/m measurements at Woodend) - established by Capt McClean. Earlier staff gauge record dates from 1911. No regulation, little natural storage, minor abstractions. Dalradian and Moinian metamorphic along most of the valley, flanked by igneous intrusive. Mountain, moorland, forestry, pastoral and some arable in the valley bottom.

015006 Tay at Ballathie 1989

Measuring authority TRPB
First year 1952

Grid reference 37 (NO) 147 367
Level stn (m OD) 26 30

Catchment area (sq km) 4587 1
Max alt (m OD) 1214

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	199 000	270 400	303 600	339 600	109 700	60 750	50 530	35 180	98 870	100 000	339 000	66 360
2	185 300	250 600	293 100	304 800	86 470	70 280	49 010	34 280	96 410	83 700	496 000	63 540
3	168 600	265 800	358 600	262 700	82 930	57 910	47 810	33 860	83 410	84 630	371 700	60 580
4	250 900	344 800	350 200	254 500	81 880	56 280	46 200	33 000	84 090	85 340	330 300	58 310
5	235 600	395 300	424 100	215 700	74 660	55 520	44 400	32 830	81 300	98 240	307 600	56 770
6	230 600	737 600	659 800	208 000	79 850	57 200	43 000	34 060	79 350	92 070	253 100	55 040
7	175 200	1011 000	495 300	206 100	84 310	51 650	42 970	34 850	80 590	89 480	223 500	53 870
8	165 000	621 400	411 500	196 400	82 970	49 680	41 070	35 670	80 960	88 820	232 100	51 490
9	210 700	449 500	574 100	189 500	79 070	46 140	39 570	40 010	82 200	80 340	207 600	51 100
10	160 200	376 400	550 600	189 300	74 590	45 660	40 320	47 830	70 210	73 700	229 600	50 180
11	338 600	350 900	417 600	223 300	77 500	47 280	39 750	46 790	59 290	77 020	220 000	49 210
12	344 400	326 100	478 200	261 300	83 100	47 640	38 580	48 200	57 620	82 510	224 900	47 600
13	508 400	410 100	486 200	228 700	83 420	90 400	37 100	53 180	58 060	79 710	242 600	45 630
14	561 400	448 500	405 300	232 300	76 890	75 680	35 870	63 450	58 300	88 810	207 800	42 220
15	844 800	619 300	351 300	191 600	87 740	61 700	35 710	128 300	60 390	75 700	177 700	43 080
16	578 100	392 900	314 600	153 300	91 740	55 670	34 590	125 000	70 530	102 300	146 300	59 010
17	431 700	337 200	275 300	160 000	85 640	52 630	33 680	107 200	64 850	138 800	131 200	189 900
18	360 100	451 500	294 100	154 800	85 020	50 380	34 380	100 200	90 170	126 800	132 700	147 000
19	322 300	401 900	409 600	149 500	81 290	47 480	33 100	105 700	134 100	153 600	130 500	89 250
20	318 600	346 100	380 900	137 600	68 740	46 650	31 440	172 900	285 200	234 200	125 000	94 800
21	360 100	332 200	310 800	124 800	64 340	45 100	31 140	171 200	236 100	280 800	118 100	98 780
22	259 200	386 800	303 500	109 500	65 090	46 030	31 390	157 700	249 300	273 600	115 100	111 300
23	317 500	330 700	335 100	100 700	64 110	44 000	31 210	135 300	284 000	255 500	100 400	96 160
24	297 900	312 900	447 500	109 200	75 080	42 520	30 540	145 800	239 300	284 600	93 120	372 000
25	283 800	336 800	400 800	99 100	113 400	44 490	30 690	149 000	201 100	299 300	84 190	361 000
26	267 100	286 600	409 000	100 900	100 300	51 780	31 470	153 600	176 200	267 400	88 130	257 300
27	383 300	275 600	524 400	97 590	81 800	48 690	31 090	142 900	146 200	295 600	84 780	203 800
28	422 500	273 700	465 700	95 870	80 820	50 550	31 230	137 800	130 900	388 600	74 020	175 900
29	376 600		389 300	86 110	75 900	52 090	37 530	121 600	121 900	296 300	69 080	160 400
30	315 200		494 400	89 020	61 670	49 580	37 940	118 800	108 500	290 900	67 350	111 500
31	296 000		398 100		60 170		36 170	122 100		288 700		101 400
Average	328 000	405 100	410 100	175 700	80 650	53 380	37 400	92 360	122 300	169 600	187 500	110 500
Lowest	160 200	250 600	275 300	86 110	60 170	42 520	30 540	32 830	57 620	73 700	67 350	42 220
Highest	844 800	1011 000	659 800	339 600	113 400	90 400	50 530	172 900	285 200	388 600	496 000	372 000
Peak flow	992 10	1172 00	826 80	383 90	128 30	155 00	50 83	246 00	349 20	431 40	603 10	657 70
Day of peak	15	7	9	1	25	13	[illegible]	20	20	28	2	24
Monthly total (million cu m)	878 60	980 00	1098 00	455 50	216 00	138 40	100 20	247 40	317 00	454 20	486 00	295 90
Runoff (mm)	192	214	239	99	47	30	22	54	69	99	106	65
Rainfall (mm)	227	275	220	50	46	66	40	165	101	172	56	91

Statistics of monthly data for previous record (Oct 1952 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	238 900	200 400	201 700	146 200	121 300	80 570	68 660	89 050	125 400	191 500	213 600	245 800
	Low	92 900	52 560	69 380	75 210	45 500	42 080	31 390	14 700	40 660	39 690	89 160	112 800
	(year)	1963	1963	1953	1974	1980	1957	1984	1955	1955	1972	1972	1952
	High	515 800	353 700	424 800	231 200	321 100	190 400	129 600	286 100	283 900	390 500	407 700	491 400
	(year)	1974	1962	1967	1960	1986	1966	1988	1985	1985	1982	1984	1954
Runoff	Avg	140	107	118	83	71	46	40	52	71	112	121	144
	Low	54	28	41	43	27	24	18	9	23	23	50	66
	High	301	187	248	131	188	108	76	167	160	228	230	287
Rainfall	Avg	155	99	119	71	98	82	96	108	133	152	146	169
	Low	33	29	39	10	26	23	21	14	11	63	38	64
	High	393	182	224	150	214	181	219	250	266	269	311	304

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	179 700		160 200		112
Lowest yearly mean			107 300	1955	
Highest yearly mean			207 900	1954	
Lowest monthly mean	37 400	Jul	14 700	Aug 1955	
Highest monthly mean	410 100	Mar	515 800	Jan 1974	
Lowest daily mean	30 540	24 Jul	11 460	6 Aug 1955	
Highest daily mean	1011 000	7 Feb	1223 000	27 Nov 1954	
Peak	1172 000	7 Feb	1569 000	30 Jan 1974	
10% exceedance	389 700		312 600		125
50% exceedance	112 700		129 500		87
95% exceedance	34 900		43 410		80
Annual total (million cu m)	5667 00		5056 00		112
Annual runoff (mm)	1235		1102		112
Annual rainfall (mm)	1509		1428		106
[1941 70 rainfall average (mm)			1443]		

Factors affecting flow regime

- Reservoir(s) in catchment
- Regulation for HEP
- Abstraction for public water supplies
- Flow reduced by industrial and/or agricultural abstractions

Station and catchment description

Velocity-area station with cableway. 90m wide The most d/s station on the Tay, records highest mean flow in UK Since end of 1957, 1980 sq km (43%) controlled for HEP; there was some control prior to this 73 sq km controlled for water supply. Catchment is mostly steep, comprising mountains and moorland, exceptions are lower valleys Mainly rough grazing and forestry Geology: mainly metamorphics and granite, but lower 20% (Isla valley) is Old Red Sandstone

019001 Almond at Craigiehall 1989

Measuring authority: FRPB
First year: 1957

Grid reference: 36 (NT) 165 752
Level stn. (m OD): 22.90

Catchment area (sq km): 369.0
Max alt. (m OD): 518

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3.507	3.141	11.820	4.900	1.971	1.809	2.042	1.558	3.311	1.079	4.159	1.398
2	3.214	3.100	7.896	4.113	1.715	1.772	1.532	1.298	2.431	1.066	3.661	1.352
3	3.199	3.827	6.349	3.581	1.592	1.811	1.149	1.308	1.893	1.039	3.396	1.325
4	9.325	26.220	5.539	3.556	1.539	1.591	1.005	1.274	1.543	0.988	3.585	1.335
5	12.660	17.750	5.015	3.479	1.504	1.793	0.906	2.010	1.299	1.057	3.240	1.327
6	11.980	9.360	4.734	3.734	1.495	3.901	0.882	1.990	1.109	1.024	2.534	1.316
7	7.115	6.582	4.780	5.366	1.474	2.907	0.979	1.403	1.015	1.007	2.408	1.302
8	6.344	5.308	4.118	5.396	1.510	2.041	0.869	1.326	1.382	1.006	2.863	1.270
9	18.650	4.485	24.130	4.217	1.489	1.852	0.745	1.587	1.222	0.964	3.410	1.284
10	11.760	4.177	14.280	4.189	1.479	1.709	0.862	1.829	1.064	0.966	6.332	1.280
11	81.260	6.026	8.087	5.367	2.020	1.654	0.753	2.048	1.026	1.023	5.240	1.280
12	28.100	10.810	6.546	6.063	2.354	1.586	0.724	2.350	1.048	1.050	4.069	1.286
13	30.360	17.690	8.071	4.331	1.855	2.620	0.706	11.660	1.741	1.273	4.193	1.309
14	25.550	10.800	11.680	3.914	1.567	1.908	0.724	5.040	1.818	1.341	3.340	1.324
15	13.080	19.610	8.372	3.310	1.634	1.487	0.708	3.953	2.116	1.576	2.766	1.383
16	9.154	8.415	5.518	2.970	1.819	1.248	0.709	2.661	1.613	2.711	2.305	18.030
17	6.761	6.618	4.334	3.064	1.593	1.148	0.770	1.851	1.223	6.043	2.051	56.150
18	5.586	11.090	7.619	2.750	1.722	1.037	0.856	1.507	1.383	9.281	1.933	16.630
19	4.746	11.090	14.560	2.579	1.781	1.159	0.884	2.148	1.503	4.889	1.783	7.314
20	4.602	10.670	11.160	2.433	1.655	1.130	1.087	4.537	1.653	3.964	1.720	5.595
21	4.515	13.920	8.946	2.397	1.631	1.095	1.153	3.834	3.270	5.781	1.640	7.240
22	3.908	11.010	28.290	3.571	1.690	1.058	1.083	2.177	3.743	3.474	1.531	7.525
23	4.161	7.215	51.720	2.918	1.705	0.964	1.072	1.769	4.568	2.654	1.556	7.824
24	4.226	6.078	38.820	2.629	3.017	0.943	1.117	1.855	2.794	4.901	1.580	23.200
25	3.795	8.208	17.130	2.361	2.642	1.201	1.134	1.937	2.070	6.410	1.558	16.090
26	4.304	7.676	10.780	2.247	1.986	1.731	1.065	4.734	1.790	6.962	1.502	7.583
27	5.726	12.390	8.122	2.085	1.697	3.029	1.032	3.671	1.559	11.370	1.463	5.123
28	8.200	24.330	7.472	1.945	1.584	2.275	1.384	2.274	1.346	10.400	1.478	4.092
29	4.736		8.139	1.845	1.598	1.721	1.970	2.063	1.200	6.967	1.470	3.424
30	3.968		10.380	1.801	1.614	2.164	1.160	7.511	1.124	6.934	1.457	3.052
31	3.562		5.956		1.909		1.000	7.051		5.041		2.990
Average	11.230	10.270	11.930	3.437	1.769	1.745	1.034	2.975	1.829	3.684	2.674	6.827
Lowest	3.199	3.100	4.118	1.801	1.474	0.943	0.706	1.274	1.015	0.964	1.457	1.270
Highest	81.260	26.220	51.720	6.063	3.017	3.901	2.042	11.660	4.568	11.370	6.332	56.150
Peak flow	142.60	39.14	90.10	8.73	5.76	6.68	2.65	16.2[illegible]	5.23	17.45	6.74	72.72
Day of peak	11	4	23	11	24	6	29	30	23	27	10	17
Monthly total (million cu m)	30.07	24.85	31.96	8.91	4.74	4.52	2.77	7.97	4.74	9.87	6.93	18.29
Runoff (mm)	82	67	87	24	13	12	8	22	13	27	19	50
Rainfall (mm)	100	100	110	38	35	63	17	125	42	80	23	74

Statistics of monthly data for previous record (Jan 1957 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows:	Avg	9.272	7.384	6.388	4.350	3.169	2.439	2.377	3.222	4.659	6.374	9.244	9.24[illegible]
	Low	3.574	1.782	1.918	1.410	1.091	0.817	0.950	0.869	0.668	0.668	1.862	3.016
	(year)	1963	1963	1973	1974	1961	1961	1960	1983	1959	1977	1972	1975
	High	16.300	15.450	14.300	9.840	11.170	8.572	9.223	8.568	20.360	15.120	21.660	19.860
	(year)	1984	1984	1979	1986	1968	1966	1958	1985	1985	1981	1963	1986
Runoff:	Avg	67	49	46	31	23	17	17	23	33	46	65	67
	Low	26	12	14	10	8	6	7	6	5	5	13	22
	High	118	105	104	69	81	60	67	62	143	110	152	144
Rainfall	Avg	80	54	67	51	61	60	74	84	89	88	92	86
	Low	28	17	22	8	16	15	23	19	14	23	19	2[illegible]
	High	145	107	127	89	123	136	173	142	195	177	190	179

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	4.934		5.669		87
Lowest yearly mean			2.890	1973	
Highest yearly mean			8.199	1986	
Lowest monthly mean	1.034	Jul	0.668	Oct 1972	
Highest monthly mean	11.930	Mar	21.660	Nov 1963	
Lowest daily mean	0.706	13 Jul	0.241	9 Oct 1959	
Highest daily mean	81.260	11 Jan	142.300	21 Sep 1985	
Peak	142.600	11 Jan	199.600	3 Nov 1984	
10% exceedance	10.920		12.920		85
50% exceedance	2.375		2.887		82
95% exceedance	0.981		0.876		112
Annual total (million cu m)	155.60		178.90		87
Annual runoff (mm)	422		485		87
Annual rainfall (mm)	807		886		91
[1941-70 rainfall average (mm)			909]		

Factors affecting flow regime

- Abstraction for public water supplies.
- Flow reduced by industrial and/or agricultural abstractions.
- Augmentation from effluent returns.

Station and catchment description

The recorder is well sited on a straight even reach with steep banks which have contained all recorded floods. Stable rating over the period of record. Weed growth in summer - some adjustment to stage is required. Low flows substantially affected by sewage effluent especially from Mid Calder. Abstraction at Almondell to feed a canal. A number of storage reservoirs are situated in the catchment. Geology - predominantly Carboniferous rocks. Land use - mainly rural. Livingston new town and several small mining towns in catchment.

021009 Tweed at Norham 1989

Measuring authority: TWRP
First year: 1962

Grid reference: 36 (NT) 898 477
Level stn (m OD): 4 30

Catchment area (sq km): 4390 0
Max alt (m OD): 839

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	53 640	52 350	205 300	71 540	31 050	18 970	17 070	12 620	36 980	19 930	47 630	20 140
2	50 770	47 590	157 100	65 350	31 080	19 750	17 260	11 860	29 900	19 160	58 450	18 330
3	47 220	65.710	143 800	58 970	28 910	18 480	16 410	11 170	25 120	18 430	58 430	17 820
4	66 630	167 300	122 300	56.910	30 150	17 720	15 010	10 860	22 960	17 690	52 340	16 390
5	77.350	186 800	128 200	58 730	28 760	17 120	14 010	11 050	21 210	18 470	51 290	17 190
6	110 500	116 900	151 000	63 820	26 500	18 410	14 860	10 800	19 900	18 680	42 860	17 240
7	77.690	101.700	137 900	80 050	24 900	18 540	14 940	11 580	19 280	17 470	39 290	16 980
8	69 260	93 680	107 700	78 690	23 360	18 450	13.040	10 910	19 490	18 870	38.540	16 510
9	114 500	75 180	329 500	65.550	22 870	19 360	12 730	11 110	19 130	18.560	39 210	16 150
10	92 190	66 110	323 700	60 540	22 290	16 780	13.080	11 540	17 930	18 100	52 010	16 250
11	117 600	63 330	148 500	75 970	22 790	16 240	13 130	16 440	17 400	17 980	79 490	16 130
12	269 900	90 450	116 300	162 000	69 800	15 920	12 340	16 3[illegible]0	17 350	16.920	50 230	15 820
13	169 900	116 200	176 200	93 950	65 730	16 880	11 710	15 930	17 170	16 260	44 160	16 030
14	249 600	101 300	136 500	83 490	40 790	26 330	13.750	43.590	17 650	16 820	39 660	16 030
15	145 800	176 500	145 700	73 160	32 620	22 930	11 720	47 [illegible]0	18 480	18 320	36 000	16 100
16	114.900	110 100	104 100	63 800	30 250	20 430	10 940	42 540	17.510	24 160	33 320	41 290
17	96 200	84.170	86 370	59 150	28 570	17 050	10 640	29 490	18 210	31.790	30 920	322 800
18	80 400	120 600	109 800	55 900	27 510	16 090	10 620	22.750	16 440	36 740	29 320	155 800
19	71 000	165 200	118 500	52.670	27 920	15 460	10 610	18 670	33 620	29.350	27 870	82 730
20	65 140	102 100	121 200	49 820	27 950	14 890	10 650	18 370	31 640	33 030	26 600	58.930
21	80 860	87 880	89 510	48 330	26 040	14 260	12 900	74 350	140 900	43 280	25 380	63 380
22	66 010	103 600	211 900	54 680	23 920	14 610	11 000	33 260	71 350	41 940	24 600	64 650
23	61 150	82.120	186 200	54 520	23 350	17 210	10 490	25 060	55 980	37 990	24 950	54 300
24	57 530	73 550	313 400	45 910	23 980	14 160	10 290	22 680	41 650	33 270	24 330	173 700
25	54 420	142 100	189 800	40 920	25 430	13 830	10 380	35 130	33 630	44 340	2[illegible] 950	233 100
26	54 330	109 400	156 300	38 610	25 030	14 250	9 832	27 280	29 870	46 770	20 940	146 500
27	74 530	93.230	126 900	37.190	22 040	17 300	9 488	34 430	27 030	46 590	20 190	100 800
28	128.100	187 700	112 700	33 720	20 990	19 100	12.230	27 930	24 940	59 910	19 820	76 380
29	79 190		94 430	32 770	20 220	20 980	11 190	22.720	22 710	54 200	19 620	63 750
30	63 900		92 400	31.460	19.740	21 060	15.150	23.530	21 040	49.790	20 260	55 140
31	56.150		79 530		19 590		13 010	61.330		46 220		48 030
Average	94 080	106 500	152 300	61 610	28 840	17 750	12 600	24 920	30 220	30 030	36 660	64 340
Lowest	47 220	47 590	79 530	31 460	19 590	13 830	9 488	10 800	16 440	16 260	19 620	15 820
Highest	269 900	187 700	329 500	162 000	69 800	26 330	17 260	74 350	140 900	59 910	79 490	322 800
Peak flow	408 30	298.90	572 30	2[illegible]5.50	99 45	29 44	18 00	121 60	190 00	69 00	108 60	422 70
Day of peak	12	4	10	12	12	14	30	21	21	28	11	17
Monthly total (million cu m)	252 00	257 70	408 00	159 70	77 25	46 01	33 74	66 74	78 32	80 44	95 01	172 30
Runoff (mm)	57	59	93	36	18	10	8	15	18	18	22	39
Rainfall (mm)	74	107	111	48	41	47	23	113	47	69	31	79

Statistics of monthly data for previous record (Oct 1962 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	124 700	100 700	101 700	70 200	56 800	37 750	33 770	45 930	55 840	81 240	111 100	114 900
	Low	50 320	37 180	26 290	25 190	17 950	15 550	11 650	9 881	10 990	10.170	24 710	40 690
	(year)	1973	1963	1973	1974	1980	1974	1984	1976	1972	1972	1973	1975
	High	249 700	173 300	236 400	142 200	153 300	66 200	85 330	146 300	179 900	176.300	271 700	197 900
	(year)	1982	1978	1963	1979	1967	1981	1985	1985	1985	1967	1963	1979
Runoff	Avg	76	56	62	41	35	22	21	28	33	50	66	70
	Low	31	20	16	15	11	9	7	6	6	6	15	25
	High	152	99	144	84	94	39	52	89	106	108	160	121
Rainfall	Avg	96	62	83	60	76	68	78	92	94	93	101	93
	Low	45	15	21	12	22	20	24	21	19	25	16	23
	High	165	125	138	98	181	129	186	188	164	163	224	175

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	54 770		77 820		70
Lowest yearly mean			33 920	1973	
Highest yearly mean			102 400	1963	
Lowest monthly mean	12.600	Jul	9 881	Aug 1976	
Highest monthly mean	152.300	Mar	271.700	Nov 1963	
Lowest daily mean	9 488	27 Jul	7 427	28 Aug 1976	
Highest daily mean	329 500	9 Mar	1138 000	4 Jan 1982	
Peak	572 300	10 Mar	1518 000	4 Jan 1982	
10% exceedance	124 500		165 300		75
50% exceedance	32 440		52.730		62
95% exceedance	11 470		14 380		80
Annual total (million cu m)	1727 00		2456 00		70
Annual runoff (mm)	393		559		70
Annual rainfall (mm)	790		996		79
(1941-70 rainfall average (mm)			1009)		

Factors affecting flow regime

- Reservoir(s) in catchment
- Abstraction for public water supplies.

Station and catchment description

Lowest station on River Tweed. Velocity-area station at very wide natural section Complex control Moderate seasonal weed growth effects on rating Reservoirs in headwaters have only a small impact on the flow regime - monthly naturalised flows available Geology: mixed but principally impervious Palaeozoic formations Moorland and hill pasture predominates; improved grasslands and arable farming below Melrose.

022001 Coquet at Morwick 1989

Measuring authority: NRA-N
First year: 1963

Grid reference: 46 (NU) 234 044
Level stn. (m OD): 5.20

Catchment area (sq km): 569.8
Max alt. (m OD): 776

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	4.700	3.680	29.940	4.200	2.970	1.810	1.490	1.110	1.860	1.110	2.910	1.760
2	4.460	2.790	19.130	4.050	2.910	1.820	1.480	1.080	1.520	1.140	3.030	1.680
3	4.260	3.480	17.420	3.940	2.760	1.840	1.390	1.030	1.410	1.130	2.800	1.600
4	4.570	16.130	15.050	3.960	2.710	1.800	1.290	0.990	1.350	1.120	2.470	1.370
5	5.270	17.720	15.640	5.560	2.670	1.820	1.240	0.990	1.300	1.120	2.740	1.730
6	7.210	8.430	18.650	11.040	2.490	2.190	1.170	1.030	1.260	1.170	2.300	1.680
7	6.440	6.240	13.160	13.140	2.440	1.950	1.200	1.080	1.240	1.190	2.070	1.600
8	5.600	5.480	9.080	11.840	2.350	1.790	1.150	1.010	1.300	1.270	2.140	1.580
9	5.320	5.000	9.740	8.290	2.270	1.780	1.150	1.100	1.260	1.430	3.250	1.500
10	4.900	4.600	10.360	11.440	2.190	1.970	1.240	1.290	1.220	1.310	4.920	1.510
11	4.460	4.180	7.540	19.900	2.230	1.780	1.220	1.380	1.230	1.230	8.820	1.550
12	6.980	4.390	6.720	22.300	3.190	1.790	1.140	1.260	1.270	1.220	4.990	1.500
13	5.800	4.960	8.350	9.990	5.310	2.070	1.050	1.290	1.300	1.180	3.800	1.550
14	13.150	5.030	6.900	7.900	3.440	2.920	1.080	2.700	1.290	1.210	3.160	1.720
15	6.890	5.450	8.420	6.760	2.650	2.110	1.020	2.000	1.210	1.190	2.770	2.710
16	5.530	4.880	6.470	5.810	2.330	1.710	1.000	1.710	1.190	1.270	2.460	13.640
17	5.050	3.990	5.780	5.320	2.190	1.570	1.060	1.430	1.190	1.250	2.290	27.320
18	4.650	4.140	5.310	4.850	2.180	1.450	1.070	1.280	1.170	1.290	2.190	10.850
19	4.390	7.190	5.870	4.550	2.200	1.410	1.080	1.180	1.120	1.350	2.110	6.590
20	4.160	5.440	5.610	4.470	2.200	1.340	1.050	1.140	1.100	1.460	2.060	5.180
21	4.050	5.520	5.800	4.620	2.070	1.280	1.030	1.250	1.100	2.420	1.930	7.100
22	3.840	5.900	10.460	5.260	1.960	1.290	1.030	1.230	1.220	2.440	1.880	6.820
23	3.990	5.290	9.430	4.980	1.950	1.320	1.000	1.120	1.570	1.850	1.980	5.170
24	4.750	14.680	16.990	4.150	2.070	1.270	1.000	1.190	1.530	1.630	2.010	5.170
25	3.840	64.690	7.820	3.910	1.970	1.270	1.060	1.350	1.360	1.530	1.950	11.490
26	3.620	17.730	7.110	3.710	1.880	1.410	1.000	2.040	1.260	1.510	1.780	7.290
27	3.600	12.260	6.340	3.500	1.730	1.740	0.990	3.210	1.210	1.700	1.760	5.450
28	8.230	17.410	5.760	3.320	1.690	1.630	1.010	2.170	1.190	3.670	1.790	4.630
29	5.510		5.170	3.130	1.630	1.710	1.090	1.740	1.140	3.590	1.750	4.150
30	4.240		4.770	3.030	1.580	1.490	1.240	1.610	1.110	3.320	1.730	3.790
31	3.890		4.450		1.640		1.180	1.870		3.050		3.490
Average	5.269	9.524	9.975	6.964	2.382	1.709	1.135	1.447	1.283	1.656	2.728	4.941
Lowest	3.600	2.790	4.450	3.030	1.580	1.270	0.990	0.990	1.100	1.110	1.730	1.370
Highest	13.150	64.690	29.940	22.300	5.310	2.920	1.490	3.210	1.860	3.670	8.820	27.320
Peak flow	23.28	121.80	36.82	37.12	6.97	3.62	1.66	4.11	2.17	4.54	12.82	36.58
Day of peak	14	25	1	12	13	14	5	27	1	28	11	17
Monthly total (million cu m)	14.11	23.04	26.72	18.05	6.38	4.43	3.04	3.88	3.32	4.44	7.07	13.23
Runoff (mm)	25	40	47	32	11	8	5	7	6	8	12	23
Rainfall (mm)	29	85	57	52	28	47	13	82	20	60	34	67

Statistics of monthly data for previous record (Nov 1963 to Dec 1988—incomplete or missing months total 0.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean	Avg	15.280	12.970	12.780	8.963	5.753	3.789	3.501	4.566	4.754	7.989	12.360	13.130
flows	Low	5.420	2.672	1.729	2.929	2.039	1.140	1.168	1.232	1.418	1.084	1.926	4.563
	(year)	1973	1973	1973	1974	1984	1970	1984	1983	1972	1972	1973	1971
	High	32.310	26.350	31.390	20.980	15.410	6.441	8.138	12.950	14.240	26.860	31.370	33.340
	(year)	1982	1978	1979	1987	1983	1987	1988	1986	1965	1976	1965	1978
Runoff	Avg	72	56	60	41	27	17	16	21	22	38	56	62
	Low	25	11	8	13	10	5	5	6	6	5	9	21
	High	152	112	148	95	72	29	38	61	65	126	143	157
Rainfall	Avg	91	58	80	56	67	57	70	76	78	77	87	83
(1966-	Low	38	15	18	8	18	8	19	18	15	19	19	31
1988)	High	140	120	144	118	127	129	169	161	215	176	214	251

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	4.050		8.803		46
Lowest yearly mean			3.716	1973	
Highest yearly mean			11.380	1969	
Lowest monthly mean	1.135	Jul	1.084	Oct 1972	
Highest monthly mean	9.975	Mar	33.340	Dec 1978	
Lowest daily mean	0.990	27 Jul	0.721	20 Jun 1970	
Highest daily mean	64.690	25 Feb	203.200	3 Jan 1982	
Peak	121.800	25 Feb	289.700	4 Jan 1982	
10% exceedance	8.315		19.170		43
50% exceedance	2.178		5.059		43
95% exceedance	1.066		1.400		76
Annual total (million cu m)	127.70		277.80		46
Annual runoff (mm)	224		488		46
Annual rainfall (mm)	574		880		65
(1941-70 rainfall average (mm)			884)		

Factors affecting flow regime

- Natural to within 10% at 95 percentile flow.

Station and catchment description

Velocity-area station with 34m wide concrete Flat V weir made with pre-cast segments (installed 1969). Cableway. Fairly straight section with high banks. Replaced earlier station at Guyzance. Natural catchment.

023004 South Tyne at Haydon Bridge 1989

Measuring authority NRA-N
First year 1962

Grid reference 35 (NY) 856 647
Level stn (m OD) 58 50

Catchment area (sq km) 751 1
Max alt (m OD) 893

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	9 017	4 670	33 380	7 390	3 590	2 390	2 800	1 710	4 990	1 790	19 720	2 930
2	8 044	4 480	22 070	6 240	3 460	2 470	2 750	1 660	3 670	1 740	16 620	2 940
3	17 155	35 400	20 040	5 720	3 370	2 500	2 320	1 530	3 080	1 720	19 010	2 570
4	23 060	167 600	28 450	6 030	3 350	2 420	2 030	1 520	2 720	1 670	39 130	2 330
5	26 930	32 720	32 800	12 920	3 220	2 300	1 870	1 510	2 480	1 670	17 840	2 930
6	21 690	17 290	39 460	31 570	3 070	2 300	1 760	1 520	2 310	1 800	11 180	2 870
7	13 850	19 900	18 850	32 670	2 950	2 330	1 750	1 510	2 180	5 990	9 160	2 830
8	13 160	23 140	11 570	54 020	2 850	2 230	1 750	1 500	2 180	6 640	13 680	2 700
9	20 950	13 150	38 160	20 230	2 800	2 150	1 750	1 540	2 150	3 340	17 800	2 610
10	12 760	10 080	29 080	18 870	2 710	2 150	1 750	2 340	2 030	2 720	66 870	2 560
11	10 700	21 440	14 990	65 510	2 700	2 030	1 740	4 730	2 060	4 040	32 560	2 560
12	18 880	18 030	13 350	44 190	7 630	1 980	1 620	3 150	2 290	8 960	16 500	2 570
13	78 880	49 060	29 020	32 850	7 010	2 000	1 550	16 420	2 220	12 920	11 960	2 660
14	40 050	19 910	23 400	19 260	3 680	2 130	1 550	11 650	2 170	9 200	9 370	2 980
15	15 690	39 450	19 160	13 450	3 020	2 000	1 540	12 420	2 140	13 270	7 680	3 940
16	11 720	15 400	11 710	10 140	2 910	1 920	1 520	8 720	2 420	20 420	6 320	73 160
17	11 860	11 090	9 370	8 640	2 820	1 830	1 510	3 980	2 320	9 780	5 350	132 000
18	9 546	20 710	23 970	7 500	2 670	1 770	1 510	3 040	2 040	5 840	4 800	28 570
19	8 264	23 360	28 640	6 680	4 390	1 760	1 510	2 500	1 920	4 030	4 360	14 350
20	7 514	25 040	25 670	6 620	4 570	1 680	1 510	2 290	1 810	26 660	3 920	36 390
21	8 486	23 080	23 700	7 680	2 990	1 660	1 510	2 620	1 870	26 070	3 670	73 280
22	8 056	32 810	75 840	11 340	2 600	1 660	1 510	2 330	2 830	27 830	3 620	31 410
23	10 450	15 290	107 800	10 490	2 670	1 660	1 510	2 110	3 200	16 160	3 600	19 770
24	9 200	19 900	42 080	7 490	3 120	1 660	1 530	4 670	2 460	15 410	3 450	70 470
25	7 230	21 490	19 370	6 450	2 780	1 660	1 400	10 570	2 280	25 030	3 300	113 300
26	7 672	17 250	16 970	6 400	2 570	1 990	1 370	9 220	2 630	17 270	3 130	28 340
27	7 140	24 760	12 370	4 940	2 420	6 440	1 380	10 930	3 000	22 280	3 050	17 670
28	15 090	45 940	11 000	4 130	2 300	7 840	1 520	4 750	2 270	17 300	3 030	13 840
29	7 820		9 110	3 790	2 230	5 010	1 940	3 320	2 010	41 160	3 020	11 420
30	6 042		9 350	3 660	2 160	2 900	1 990	14 610	1 870	48 190	2 940	9 480
31	5 169		8 170		2 170		1 740	11 570		20 320		8 080
Average	14 910	27 590	26 090	15 900	3 251	2 494	1 725	5 224	2 453	13 590	12 220	23 340
Lowest	5 169	4 480	8 170	3 660	2 160	1 660	1 370	1 500	1 810	1 670	2 940	2 330
Highest	78 880	167 600	107 800	65 510	7 630	7 840	2 800	16 420	4 990	48 190	66 870	132 000
Peak flow	274 10	404 30	293 60	160 90	19 77	16 26	3 09	41 35	6 59	192 80	210 00	204 50
Day of peak	13	4	23	11	12	27	1	13	1	29	10	16
Monthly total (million cu m)	39 92	66 74	69 89	41 20	8 71	6 46	4 62	13 99	6 36	36 39	31 68	62 51
Runoff (mm)	53	89	93	55	12	9	6	19	8	48	42	83
Rainfall (mm)	66	143	117	70	39	52	27	112	29	124	54	107

Statistics of monthly data for previous record (Oct 1962 to Dec 1988—incomplete or missing months total 0 3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	27 330	20 490	23 500	15 950	10 440	8 138	8 493	11 760	15 800	19 600	26 940	27 200
	Low	10 090	6 899	18 358	2 943	2 205	2 482	1 778	1 510	4 420	1 770	9 392	9 136
	(year)	1963	1986	1975	1974	1980	1978	1984	1976	1983	1972	1983	1971
	High	47 710	36 570	50 720	25 440	25 360	20 910	28 170	27 960	38 550	61 260	54 720	44 970
	(year)	1982	1967	1979	1966	1983	1980	1988	1985	1985	1967	1963	1974
Runoff	Avg	97	67	84	55	37	28	30	42	55	70	93	97
	Low	36	22	30	10	8	9	6	5	15	6	32	33
	High	170	118	181	88	90	72	100	100	133	218	189	160
Rainfall	Avg	115	73	104	70	77	79	90	105	110	108	125	115
	Low	58	22	40	9	35	33	37	20	32	23	49	41
	High	181	150	187	110	141	184	226	193	207	274	247	211

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	12 320		17 960		69
Lowest yearly mean			11 670	1973	
Highest yearly mean			23 740	1967	
Lowest monthly mean	1 725	Jul	1 510	Aug 1976	
Highest monthly mean	27 590	Feb	61 260	Oct 1967	
Lowest daily mean	1 370	26 Jul	0 920	9 Sep 1969	
Highest daily mean	167 600	4 Feb	308 600	23 Mar 1968	
Peak	404 300	4 Feb	598 800	28 Jul 1988	
10% exceedance	28 790		42 460		68
50% exceedance	5 018		9 981		50
95% exceedance	1 557		2 210		70
Annual total (million cu m)	388 50		566 80		69
Annual runoff (mm)	517		755		69
Annual rainfall (mm)	940		1171		80
[1941 70 rainfall average (mm)			1234]		

Factors affecting flow regime

- Natural to within 10% at 95 percentile flow

Station and catchment description

Velocity-area station with informal Flat V weir as low flow control installed in 1972 Cableway. Natural catchment

025001 Tees at Broken Scar 1989

Measuring authority: NRA-N
First year: 1956
Grid reference 45 (NZ) 259 137
Level stn. (m OD): 37.20
Catchment area (sq km): 818.4
Max alt. (m OD): 893

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	19.930	4 660	47.790	7 590	3.880	4 000	4.680	4 090	2.850	3.220	10 980	3 190
2	18.770	4 620	32 020	6.620	3 800	3 410	4 640	4 220	2.730	3.170	10 190	2 940
3	17 240	10 740	34 210	6 480	3 550	3 120	3.450	3.980	3 680	3 160	11.340	3 050
4	20.400	90 270	47 460	7.190	3 570	3.180	2.980	3 750	3 840	3 520	17 700	3 910
5	32.540	33.530	54.330	19.950	3 310	3 330	2.880	3 260	4 380	3.160	10 660	4 210
6	29 410	21.000	57.420	49 070	2 810	3 430	2.760	3.270	3 320	3.630	5 910	4 010
7	18.180	17.030	31 840	34 330	2.910	3 490	3 460	3 700	3 880	5 420	4.150	3.820
8	13.680	27 690	20 190	44 110	2 940	4.150	3 570	3 790	3 930	6.500	4.280	3.390
9	14 820	15.250	49 740	23.230	3 140	3.730	3 770	4 380	3 970	4.460	10 560	3.880
10	11.300	10 070	42 470	27.620	3.030	3 470	3 660	6 980	4 140	4 200	55.910	4 100
11	8 590	12 440	22 450	79 240	4.260	3.240	2 950	6 200	3 750	4.490	31 930	4 350
12	12 760	17 960	25 150	66 210	6 890	3.390	2 940	4 600	3.420	4 400	14 270	3 230
13	42 470	35 950	48 000	70.740	8 100	4 220	2.660	5 300	3 150	6 380	8 220	3 700
14	48 670	22 130	51.770	39.730	4 180	4 280	2.980	12 210	2 970	6 640	5 910	5 100
15	21 210	45.710	36 890	20 510	3 980	3 350	7 600	6 300	2 870	2 920	5 170	5 700
16	16 850	19 850	20 270	14 500	3 160	4 340	2 850	5 380	3 630	8 800	4 270	29 780
17	15.530	13 950	15.370	11.910	2 750	4 400	3 210	4 410	3.460	6 860	4.180	142 000
18	9 670	60 290	19.420	9 800	2 380	4 300	3 110	4 230	3 480	5 360	4 200	29 800
19	8 430	62.910	30 870	8 470	2 990	4 340	3 400	3 330	3 040	4 350	3 740	12 670
20	7.220	36 090	32 960	8 900	3 900	3 890	3 280	3 540	3 080	31.510	3 780	27 050
21	6 910	22.500	26 650	8 770	3 590	3 870	3 110	5 420	3 050	27.250	3 250	53 210
22	6 440	29 060	83 980	9 930	3 780	3 380	3 180	3 830	3 200	17.310	3 380	29 870
23	9 260	19.030	97 190	13.540	3.740	2.640	3 150	2 770	3 680	14 100	3 320	16 440
24	11 960	22 900	76.660	11 480	3 910	2 530	3 460	2 980	2 900	6 580	3 900	30 730
25	7 860	30 030	30 260	9 950	3 160	2.760	3 080	11 340	3 000	11.210	3 410	38 390
26	10 570	19 370	26 110	9 880	3 300	4 280	3 190	5 020	3 750	10 290	2.690	19 480
27	10 970	26 490	20 750	6 530	2 970	6 440	3 870	7 680	3 630	12 290	3 440	12 150
28	15 840	51 060	17 430	4 900	3 000	7 500	3.860	4 690	3 940	13 170	3 010	9 310
29	9 700		13 610	4 230	2 850	7 030	4 120	4 270	3 480	19 790	2 950	7 470
30	6 400		11 090	3 910	2 970	4 370	4 420	5 280	2 780	32 010	2 940	5 930
31	5 110		10 440		3 250		4 340	8 860		9 470		4 800
Average	15 760	27 770	36 610	21 310	3 615	3 995	3 407	5 131	3.431	9 536	8 655	17 020
Lowest	5 110	4 620	10 440	3 910	2 380	2 530	2 600	2 770	2 730	2 920	2 690	2 940
Highest	48 670	90 270	97 190	79 240	8 100	7 500	4 680	12 210	4 380	32 010	55 910	142 000
Peak flow	172 20	265 00	300 10	142 10	15 93	10 75	5 69	33 21	5 36	84 46	156 60	222 50
Day of peak	13	4	23	11	12	29	1	13	7	20	10	17
Monthly total (million cu m)	42 22	67 18	98 05	55 24	9 68	10 36	9 12	13 74	8 89	25 54	22 43	45 59
Runoff (mm)	52	82	120	67	12	13	11	17	11	31	27	56
Rainfall (mm)	58	137	119	92	23	58	20	80	19	113	46	109

Statistics of monthly data for previous record (Oct 1956 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	29 840	23 470	23 370	18 530	10 420	6 601	6 889	10 250	11 330	18 370	23 040	28 460
	Low	2 907	2 803	5 480	2.538	2 009	0 502	1 794	0 458	0 636	2 709	4 061	5 780
	(year)	1963	1963	1975	1957	1959	1957	1969	1959	1959	1969	1958	1971
	High	57 570	52 670	68 660	60 870	27 020	15 270	25 090	28 520	25 800	53 940	51 580	50 040
	(year)	1988	1988	1979	1977	1967	1972	1988	1985	1985	1967	1963	1979
Runoff	Avg	98	70	76	59	34	21	23	34	36	60	73	93
	Low	10	8	18	8	7	2	6	2	2	9	13	19
	High	188	161	225	193	88	48	82	93	82	177	163	164
Rainfall	Avg	121	83	97	75	80	74	85	102	98	105	114	123
	Low	51	16	29	10	18	22	28	73	19	27	25	43
	High	186	175	224	150	167	182	206	190	222	226	221	268

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre 1989
Mean flow (m^3s^{-1})	12.940		17 530		74
Lowest yearly mean			9 382	1973	
Highest yearly mean			25 160	1988	
Lowest monthly mean	3 407	Jul	0 458	Aug 1959	
Highest monthly mean	36 610	Mar	68 660	Mar 1979	
Lowest daily mean	2 380	18 May	0 023	16 Oct 1959	
Highest daily mean	142 000	17 Dec	391 500	3 Jan 1982	
Peak	300 100	23 Mar	709 800	26 Aug 1986	
10% exceedance	32 400		43 450		75
50% exceedance	4 752		8 485		56
95% exceedance	2 899		1 437		202
Annual total (million cu m)	408 10		553 20		74
Annual runoff (mm)	499		676		74
Annual rainfall (mm)	874		1157		76
[1941-70 rainfall average (mm)			1248]		

Factors affecting flow regime

- Reservoir(s) in catchment.
- Abstraction for public water supplies.
- Augmentation from surface water and/or groundwater.

Station and catchment description

Compound Crump profile weir with total crest length of 63 9m Two low-flow crests total 9 1m Theoretical rating. A mainly impervious catchment developed on Millstone Grit and Carboniferous Limestone. Headwaters drain the Pennines Moorland and rough pasture give way to more intensive agriculture in the lower reaches

027002 Wharfe at Flint Mill Weir 1989

Measuring authority: NRA-Y
First year: 1936

Grid reference: 44 (SE) 422 473
Level stn (m OD): 13.70

Catchment area (sq km): 758.9
Max alt (m OD): 704

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	9.539	5.994	49.010	11.690	6.796	2.805	36.350	3.100	5.760	1.863	14.660	2.159
2	8.867	6.004	33.480	9.657	6.196	2.641	10.720	2.687	4.459	1.801	19.850	2.178
3	8.417	6.594	29.850	9.186	5.756	2.478	6.097	2.561	4.059	1.758	16.440	2.045
4	7.711	21.150	28.450	8.739	5.424	2.463	4.996	2.290	3.174	1.639	22.650	1.957
5	12.680	31.110	21.620	20.240	5.261	2.418	3.819	2.193	2.897	1.688	23.720	1.981
6	33.750	19.470	18.020	41.560	4.960	2.554	3.389	2.131	2.632	1.807	13.690	2.064
7	14.690	12.020	24.470	42.830	8.624	2.446	3.363	2.268	2.471	2.204	10.230	2.041
8	11.180	21.490	14.960	39.150	5.941	2.678	4.059	2.028	2.327	2.388	11.700	1.999
9	15.000	14.200	21.320	24.130	4.451	2.393	6.953	2.063	2.180	2.421	14.980	1.993
10	14.530	10.360	37.130	30.840	4.158	2.290	4.663	8.962	2.116	2.200	39.150	1.811
11	10.450	8.879	18.110	45.490	4.446	2.210	3.450	10.120	2.057	2.045	47.500	1.784
12	10.240	24.830	12.980	81.940	5.501	2.222	3.058	9.453	2.027	2.008	21.910	1.960
13	12.730	25.890	25.030	72.470	5.177	2.748	3.042	6.195	2.086	3.147	13.810	3.326
14	54.910	20.700	31.380	46.850	4.542	3.174	2.756	5.708	1.938	4.200	9.981	13.310
15	21.260	33.480	40.240	26.190	4.331	2.355	2.520	8.732	1.919	4.226	8.084	10.940
16	14.180	20.300	19.460	18.740	4.519	2.100	2.432	6.521	2.988	35.290	6.746	48.720
17	16.470	12.500	13.980	14.230	4.236	2.003	2.321	5.882	4.161	19.550	5.901	89.500
18	12.730	37.500	11.560	11.820	3.628	1.906	2.352	5.234	2.801	7.929	4.957	52.690
19	10.510	52.690	29.920	10.460	3.479	1.867	2.347	3.897	2.428	5.773	4.368	25.010
20	8.838	41.850	35.610	9.496	3.365	1.886	2.184	3.376	2.499	46.230	3.967	38.620
21	10.640	24.260	23.940	8.829	3.228	1.770	2.173	2.793	2.350	53.200	4.079	68.530
22	9.473	18.000	98.720	8.971	3.142	1.648	2.174	2.620	2.353	22.050	3.668	35.650
23	8.602	14.040	60.150	11.310	3.128	1.731	2.117	2.416	2.348	13.480	3.330	22.050
24	9.988	29.150	112.900	11.270	3.344	1.720	2.062	2.473	2.626	8.373	3.126	33.080
25	8.552	30.710	37.850	11.060	3.146	1.610	2.127	2.479	2.523	19.350	2.828	32.810
26	11.420	18.540	24.730	9.511	2.959	1.883	2.162	2.843	2.343	17.330	2.234	19.980
27	13.740	16.140	18.910	8.867	2.856	14.470	1.977	3.187	2.243	15.800	2.084	14.130
28	8.849	36.480	15.070	7.188	2.739	11.700	1.948	3.410	2.121	14.450	2.206	10.910
29	7.318		12.450	7.224	2.680	12.820	2.531	2.848	2.016	39.050	2.231	9.173
30	6.872		14.440	6.963	2.552	9.109	5.094	3.430	1.914	55.690	2.276	7.545
31	6.666		16.440		2.538		5.386	11.190		20.360		6.614
Average	13.250	21.940	30.720	22.230	4.294	3.537	4.536	4.358	2.661	13.850	11.410	18.280
Lowest	6.666	5.994	11.560	6.963	2.538	1.610	1.948	2.028	1.914	1.639	2.084	1.784
Highest	54.910	52.690	112.900	81.940	8.624	14.470	36.350	11.190	5.760	55.690	47.500	89.500
Peak flow	101.40	97.77	173.30	110.60	11.22	37.86	65.82	21.31	6.98	103.20	91.37	129.70
Day of peak	14	18	24	12	7	30	1	11	1	30	10	17
Monthly total (million cu m)	35.49	53.08	82.27	57.62	11.50	9.17	12.15	11.67	6.90	37.09	29.58	48.95
Runoff (mm)	47	70	108	76	15	12	16	15	9	49	39	65
Rainfall (mm)	55	127	138	106	22	97	53	67	27	137	59	121

Statistics of monthly data for previous record (Oct 1955 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	27.790	22.920	21.290	15.890	11.130	7.454	7.676	11.850	13.700	18.310	23.500	27.550
	Low	4.472	2.974	6.741	4.390	2.312	1.545	1.674	0.991	1.419	3.026	6.876	10.230
	(year)	1963	1963	1961	1982	1980	1957	1976	1976	1959	1972	1958	1963
	High	42.880	54.590	53.940	35.240	26.750	18.520	16.440	41.340	33.520	54.000	51.090	62.090
	(year)	1984	1966	1981	1970	1967	1972	1963	1956	1968	1967	1963	1965
Runoff	Avg	98	74	75	54	39	25	27	42	47	65	80	97
	Low	16	9	24	15	8	5	6	4	5	11	23	36
	High	151	174	190	120	94	63	58	146	115	191	174	219
Rainfall	Avg	115	81	91	75	77	75	86	102	104	109	112	124
	Low	41	14	28	8	13	18	20	18	8	32	33	41
	High	217	194	222	147	181	183	185	226	241	225	211	233

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	12.540		17.410		72
Lowest yearly mean			11.420	1975	
Highest yearly mean			23.300	1966	
Lowest monthly mean	2.661	Sep	0.991	Aug 1976	
Highest monthly mean	30.720	Mar	62.090	Dec 1965	
Lowest daily mean	1.610	25 Jun	0.425	23 Jun 1957	
Highest daily mean	112.900	24 Mar	233.600	4 Dec 1960	
Peak	173.300	24 Mar	380.000	3 Jan 1982	
10% exceedance	33.540		41.500		81
50% exceedance	6.358		9.741		65
95% exceedance	1.924		2.234		86
Annual total (million cu m)	395.50		549.40		72
Annual runoff (mm)	521		724		72
Annual rainfall (mm)	1009		1151		88
[1941-70 rainfall average (mm)			1168]		

Factors affecting flow regime

- Reservoir(s) in catchment
- Abstraction for public water supplies
- Flow reduced by industrial and/or agricultural abstractions.
- Augmentation from surface water and/or groundwater

Station and catchment description

The control is a broad-crested masonry weir 47m wide with a current meter cableway 1.5km upstream. Insensitive at low flows. Level data only from June 1936 to October 1955. Pre-October 1965 rating may be less reliable. Headwaters contain numerous reservoirs which exert a substantial influence on flows. Mixed geology comprising mainly Carboniferous Limestone, grits and Coal Measures with some Permian sand and Magnesian Limestone and marls in the lower catchment. Predominantly rural catchment with moorland headwaters.

027035 Aire at Kildwick Bridge 1989

Measuring authority: NRA-Y
First year: 1968

Grid reference: 44 (SE) 013 457
Level stn. (m OD): 87.30

Catchment area (sq km): 282.3
Max alt. (m OD): 594

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	4.936	2.480	14.420	4.066	1.860	0.938	7.739	0.552	0.844	0.392	8.541	0.944
2	4.402	2.189	13.930	3.921	1.728	0.791	2.635	0.503	0.716	0.379	8.067	0.878
3	3.977	2.122	10.280	3.870	1.653	0.780	1.627	0.461	0.639	0.368	9.389	0.855
4	4.289	8.004	8.221	3.848	1.612	0.748	1.191	0.418	0.606	0.351	19.030	0.836
5	8.688	6.854	7.859	8.233	1.542	0.750	0.970	0.416	0.549	0.353	13.970	0.843
6	8.471	5.002	7.110	10.530	1.452	0.762	0.847	0.410	0.504	0.413	7.415	0.826
7	5.991	4.859	6.599	14.190	1.359	0.891	0.841	0.404	0.496	0.426	5.754	0.803
8	5.544	6.050	5.487	11.920	1.339	0.797	2.471	0.397	0.493	0.435	6.883	0.795
9	5.220	4.567	9.110	7.290	1.303	0.759	1.653	0.516	0.455	0.412	8.786	0.787
10	4.494	3.649	9.720	12.360	1.253	0.811	1.114	0.864	0.426	0.386	20.110	0.768
11	4.034	4.687	6.566	24.030	1.473	0.719	0.872	1.244	0.425	0.384	17.920	0.756
12	4.326	5.890	5.963	25.850	1.971	0.731	0.732	0.903	0.419	0.393	9.768	0.926
13	11.020	10.730	7.795	19.470	1.665	1.141	0.662	0.787	0.413	0.519	6.683	1.438
14	17.670	7.028	13.160	11.230	1.337	0.842	0.630	1.559	0.397	1.279	5.196	4.886
15	8.121	12.280	11.550	8.075	1.216	0.668	0.610	1.637	0.499	0.865	4.095	3.181
16	6.679	7.111	7.058	6.249	1.150	0.605	0.596	1.302	0.554	3.737	3.352	15.460
17	6.291	6.084	5.354	5.137	1.098	0.582	0.563	1.236	0.512	2.335	2.919	23.870
18	5.161	23.640	8.721	4.429	1.067	0.535	0.538	0.806	0.497	1.377	2.755	16.610
19	4.526	21.550	16.620	3.945	1.044	0.500	0.514	0.656	0.432	1.880	2.467	9.311
20	4.209	16.090	11.790	3.399	0.992	0.474	0.489	0.594	0.415	13.060	7.183	22.730
21	4.589	9.818	13.860	3.063	0.942	0.443	0.482	0.572	0.425	10.180	1.938	25.920
22	4.060	7.641	39.620	3.714	0.913	0.397	0.480	0.532	0.534	6.342	1.719	15.100
23	4.077	6.660	38.460	4.064	0.926	0.396	0.443	0.488	0.503	4.080	1.566	11.910
24	3.901	17.390	40.770	3.532	0.889	0.400	0.423	0.480	0.482	2.936	1.474	19.620
25	3.467	15.940	19.040	3.046	0.860	0.379	0.425	0.541	0.453	5.055	1.365	13.740
26	5.666	9.215	11.610	2.686	0.833	2.669	0.536	0.647	0.473	4.860	1.287	8.879
27	4.586	9.471	8.395	2.464	0.821	7.415	0.457	0.713	0.495	6.465	1.205	6.670
28	3.752	16.200	6.598	2.166	0.804	3.612	0.476	0.573	0.458	6.868	1.121	5.306
29	3.312		5.374	2.146	0.793	1.909	0.678	0.551	0.417	14.140	1.070	4.424
30	3.018		5.089	1.974	0.802	8.157	1.537	0.704	0.394	14.730	1.010	3.760
31	2.799		4.731		0.965		0.733	1.198		8.301		3.293
Average	5.525	9.043	12.290	7.363	1.215	1.353	1.096	0.731	0.497	3.668	5.968	7.294
Lowest	2.799	2.122	4.731	1.974	0.793	0.379	0.423	0.397	0.394	0.351	1.010	0.756
Highest	17.670	23.640	40.770	25.850	1.971	8.157	7.739	1.637	0.844	14.730	20.110	25.920
Peak flow	36.34	30.41	59.41	35.01	2.27	27.83	18.02	2.51	0.95	25.12	30.58	35.40
Day of peak	13	19	23	11	12	30	1	15	1	30	10	17
Monthly total (million cu m)	14.80	21.88	32.91	19.09	3.25	3.51	2.93	1.96	1.29	9.82	15.47	19.54
Runoff (mm)	52	77	117	68	12	12	10	7	5	35	55	69
Rainfall (mm)	55	116	131	85	23	100	49	68	26	132	67	101

Statistics of monthly data for previous record (Dec 1968 to Dec 1988—incomplete or missing months total 0.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	11.140	8.101	7.574	4.929	2.946	2.355	1.900	3.433	3.986	7.352	10.250	10.910
	Low	4.463	3.529	2.391	0.923	0.611	0.604	0.298	0.289	1.147	0.789	3.583	3.175
	(year)	1973	1986	1985	1974	1974	1970	1984	1976	1971	1972	1975	1971
	High	18.800	14.990	22.520	11.400	8.174	6.416	5.927	11.410	10.360	17.570	16.540	20.820
	(year)	1988	1988	1981	1986	1983	1982	1973	1985	1974	1981	1984	1979
Runoff	Avg	106	70	72	45	28	22	18	33	37	70	94	104
	Low	42	30	23	8	6	6	3	3	11	7	33	30
	High	178	133	214	105	78	59	56	108	95	167	152	198
Rainfall	Avg	123	73	104	68	74	76	79	96	110	115	127	124
	Low	45	13	44	3	10	23	17	17	22	37	55	42
	High	222	139	233	135	142	155	179	171	250	213	187	238

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre 1989
Mean flow (m^3s^{-1})	4.643		6.235		74
Lowest yearly mean			3.655	1971	
Highest yearly mean			8.161	1988	
Lowest monthly mean	0.497	Sep	0.289	Aug 1976	
Highest monthly mean	12.290	Mar	22.520	Mar 1981	
Lowest daily mean	0.351	4 Oct	0.180	23 Aug 1976	
Highest daily mean	40.770	24 Mar	79.900	27 Oct 1980	
Peak	59.410	23 Mar	98.130	5 Dec 1972	
10% exceedance	12.350		15.860		78
50% exceedance	1.881		3.190		59
95% exceedance	0.410		0.544		75
Annual total (million cu m)	146.40		196.80		74
Annual runoff (mm)	519		697		74
Annual rainfall (mm)	953		1169		82
[1941-70 rainfall average (mm)			1134]		

Factors affecting flow regime

- Reservoir(s) in catchment.

Station and catchment description

Velocity-area station rated by current meter cableway 150m downstream. Low flow control is the sills of the bridge. Washland storage and headwater reservoirs influence the flow pattern. Geology is mainly Carboniferous Limestone with some Millstone Grit series. Rural catchment draining part of the eastern Pennines.

027041 Derwent at Buttercrambe 1989

Measuring authority: NRA-Y
First year: 1973

Grid reference. 44 (SE) 731 587
Level stn. (m OD). 9.50

Catchment area (sq km): 1586.0
Max alt. (m OD). 454

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	9 722	7 944	13 030	10 760	10 310	5 878	8 677	3 992	3.731	3 236	5 418	4.320
2	9 581	7 904	14 320	10 390	10 010	6 097	8.246	3 939	3.589	3.270	5 017	4 313
3	9 472	8 020	18 120	10 010	9 573	6 037	6 160	3 779	3 509	3.200	4 949	4 263
4	9 505	8 205	14 070	10.690	9 383	5 904	5 360	3 650	3 535	3 176	4 723	4.234
5	9 948	8 874	12 670	17 120	9 372	5 705	4 934	3 573	3 507	3 207	4 430	4 233
6	13 440	8 426	12 830	24 770	9.169	5 742	4 670	3 520	3 439	3 357	4.262	4 295
7	11 910	8 066	16.180	22 250	9 047	6.092	4 814	3 519	3.398	3.552	4 161	4.357
8	10 940	7 849	13 730	20 460	8.907	6 358	4 819	3 497	3 384	3 514	5.058	4 300
9	10.520	7 816	12.770	16 710	8 723	6.113	4 820	3 697	3.487	3.471	9 460	4 386
10	9.883	7 719	12.580	20 460	8.538	5 847	4 869	4 186	3 515	3 451	9 000	4 647
11	9.599	7 646	11 510	25 780	8.585	5 668	4 720	4 517	3.498	3 425	11 680	4.705
12	9 562	7 809	11.180	31.250	8.933	5 457	4 440	4 276	3 744	3.459	8 820	4 615
13	9 425	7.952	12 510	20 080	9 066	5.354	4 236	4 257	3 925	3 554	6 844	5.146
14	11.670	8 134	12.550	17 170	8 376	5 336	4 124	4 412	3 803	3 416	5 919	9.153
15	11.130	8 018	22 250	15 770	8 029	5 223	4 055	4 347	3.587	3 289	5 486	17.640
16	10 140	7 521	15.790	14 360	7 823	5 087	3 978	4 223	3 577	3 330	5 179	16 130
17	9 671	7 396	14 080	13 430	7 559	4 959	3 963	4 027	3 634	3 375	4 973	25 930
18	9 286	8 091	14 050	12 720	7 440	4 804	3 935	3 862	3.543	3 383	4.840	23 500
19	9 163	9 935	13.800	12 290	7 353	4 649	3 898	3 732	3 413	3 503	4 694	18 890
20	9 148	9.393	14 760	13 060	7.145	4 439	3 854	3 656	3.257	4.554	4 593	18.390
21	9 438	8 814	14.200	13 030	6.992	4 283	3 794	3 584	3.229	7.874	4 466	25.470
22	9 148	8.522	13.530	13.260	6 615	4 305	3 773	3.511	3 271	6 453	4 384	18 280
23	8 982	8 233	12.750	13 120	6.542	4.215	5 959	3 332	3.455	5.284	4 379	13.350
24	8 906	13 410	16 960	13.990	6 824	4 131	6 629	3 294	3 360	4 629	4 443	11 520
25	8 736	43.950	14.300	13.120	7 047	4 096	4 466	3 308	3 293	4 090	4 531	12 900
26	8 676	31.260	12 370	11.930	6.674	4.282	3 968	3 478	3 305	3 933	4.661	10.950
27	8 612	16.970	11.750	11 280	6.349	5.956	3 651	3 665	3.320	4.095	4.586	9.549
28	8 414	14 110	12 530	10 780	6 147	7 963	3 552	3 794	3 271	5 093	4 474	8 895
29	8.172		12.700	10 430	6.011	6.067	3.599	3 631	3.256	5.847	4 395	8 323
30	8.103		11 410	10 370	5.831	6 000	4 157	3 712	3 244	6 759	4 344	7 876
31	7 954		10.910		5.741		4 190	3 701		6.538		7 516
Average	9.640	11.000	13 750	15 360	7 875	5 402	4 720	3 796	3 469	4 172	5 472	10 390
Lowest	7 954	7.396	10.910	10 010	5 741	4 096	3 552	3 294	3.229	3.176	4 161	4 233
Highest	13.440	43 950	22 250	31 250	10 310	7 963	8 677	4 517	3 925	7 874	11 680	25.930
Peak flow	14.36	49 60	25 32	35 80	10 42	8.86	9.70	4 75	4.00	8 86	12 48	28 89
Day of peak	6	25	15	12	1	28	23	13	13	21	11	18
Monthly total (million cu m)	25.82	26 61	36 82	39 82	21 09	14 00	12.64	10 17	8.99	11.17	14 18	27.83
Runoff (mm)	16	17	23	25	13	9	8	6	6	7	9	18
Rainfall (mm)	20	48	59	56	17	61	33	44	18	67	42	74

Statistics of monthly data for previous record (Oct 1973 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows.	Avg	30 060	27.780	27 670	20.980	15 520	10 710	8 136	8 536	8 364	14 170	15 850	24 990
	Low	16 780	15 260	8 799	6.928	7 849	5.342	3.882	3 214	4.729	5 555	7 401	13 460
	(year)	1983	1982	1976	1976	1982	1974	1976	1976	1975	1975	1978	1984
	High	48 190	49 280	56.110	37 540	29 840	21 260	12 620	15 430	14 710	36 820	25 220	42.740
	(year)	1977	1978	1979	1986	1979	1979	1988	1980	1976	1976	1980	1978
Runoff:	Avg	51	43	47	34	26	17	14	14	14	24	26	42
	Low	28	23	15	11	13	9	7	5	8	9	12	23
	High	81	75	95	61	50	35	21	26	24	62	41	72
Rainfall.	Avg	78	49	74	52	62	55	64	69	71	78	67	80
	Low	34	5	6	11	22	11	18	10	21	21	28	24
	High	132	101	143	113	142	149	138	126	192	158	111	180

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	7.900		17 700		45
Lowest yearly mean			11 720	1975	
Highest yearly mean			25 320	1979	
Lowest monthly mean	3 469	Sep	3 214	Aug 1976	
Highest monthly mean	15 360	Apr	56 110	Mar 1979	
Lowest daily mean	3.176	4 Oct	2 697	23 Aug 1976	
Highest daily mean	43.950	25 Feb	121 400	29 Dec 1978	
Peak	49 600	25 Feb	124 800	5 Jan 1982	
10% exceedance	13.990		35 310		40
50% exceedance	6.102		13 330		46
95% exceedance	3 347		5 090		66
Annual total (million cu m)	249 10		558.60		45
Annual runoff (mm)	157		352		45
Annual rainfall (mm)	539		799		67
[1941-70 rainfall average (mm)			784]		

Factors affecting flow regime

- Abstraction for public water supplies.
- Augmentation from surface water and/or groundwater.

Station and catchment description

Compound Crump profile weir, 20m wide, with current meter rating for high flows. Supersedes 27015. Peak flows from the headwaters upstream of Forge Valley (8% catchment) are diverted down the Sea Cut (27033). Mixed geology of clays, shales and limestone. Rural catchment draining the North York Moors

027053 Nidd at Birstwith 1989

Measuring authority: NRA-Y
First year: 1975

Grid reference: 44 (SE) 230 603
Level stn. (m OD): 67.40

Catchment area (sq km): 217.6
Max alt. (m OD): 705

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2.817	2.243	8.927	3.328	2.313	1.087	2.404	0.879	0.756	0.642	2.304	1.126
2	2.735	2.210	14.100	3.195	2.181	1.069	1.350	0.853	0.756	0.624	2.270	1.112
3	2.640	2.191	9.405	2.557	2.125	1.058	1.120	0.837	0.747	0.638	2.021	1.098
4	2.829	4.169	5.415	2.606	2.085	1.049	1.070	0.825	0.739	0.631	3.140	1.090
5	3.352	3.768	6.879	7.718	2.026	1.033	0.982	0.818	0.727	0.624	2.310	1.091
6	3.112	2.962	6.657	15.140	1.978	1.067	0.963	0.813	0.719	0.584	1.824	1.099
7	2.774	2.875	6.278	11.790	1.938	1.040	0.980	0.801	0.733	0.519	1.739	1.083
8	2.725	2.999	5.961	8.013	1.892	1.028	2.631	0.793	0.845	0.503	2.728	1.063
9	2.732	2.680	6.578	5.728	1.837	1.012	2.370	0.812	0.907	0.460	3.595	1.052
10	2.612	2.541	6.383	7.817	1.823	1.011	1.474	0.833	0.896	0.466	6.677	1.049
11	2.532	2.587	5.827	17.090	1.869	0.999	1.142	0.946	0.901	0.489	4.606	1.040
12	2.619	2.995	6.117	20.580	1.872	0.987	1.054	0.838	0.912	0.492	4.544	1.066
13	4.852	4.803	6.290	35.250	1.795	1.185	0.985	0.836	0.905	0.527	4.525	1.928
14	4.586	6.048	11.360	15.130	1.738	1.013	0.968	0.877	0.880	0.521	2.870	5.392
15	5.965	7.544	13.990	8.024	1.713	0.951	0.943	0.915	0.943	0.522	2.572	3.527
16	7.021	5.961	10.800	6.054	1.682	0.946	0.930	0.890	1.018	1.031	2.471	16.920
17	3.570	3.401	6.215	5.339	1.644	0.935	0.911	0.887	0.926	0.702	2.395	22.530
18	2.784	6.950	4.568	5.023	1.633	0.919	0.906	0.832	0.896	0.581	2.346	16.010
19	2.678	11.580	5.501	4.834	1.591	0.882	0.899	0.816	0.835	1.084	2.301	13.110
20	2.677	13.030	6.642	3.505	1.580	0.879	0.893	0.795	0.832	3.392	2.271	20.670
21	2.796	11.240	10.160	2.763	1.565	0.868	0.891	0.772	0.835	2.500	2.212	16.450
22	2.600	10.560	49.530	3.310	1.524	0.876	0.886	0.765	0.781	1.937	2.147	12.990
23	2.585	6.139	59.060	3.552	1.569	0.855	0.878	0.756	0.660	1.485	2.112	11.980
24	2.545	10.980	48.610	3.147	1.526	0.842	0.881	0.772	0.657	1.290	1.440	12.030
25	2.439	10.390	14.320	3.078	1.503	0.850	0.880	0.790	0.659	1.700	1.220	10.630
26	2.824	5.616	12.400	3.334	1.284	1.322	0.851	0.819	0.660	1.626	1.202	6.490
27	2.565	4.766	7.202	2.721	1.123	2.860	0.853	0.797	0.653	2.733	1.174	3.411
28	2.407	8.594	4.423	2.535	1.110	1.573	0.887	0.762	0.664	2.785	1.173	2.858
29	2.339		3.739	2.473	1.089	1.195	0.900	0.779	0.639	4.253	1.158	2.688
30	2.273		3.711	2.391	1.078	3.689	1.003	0.814	0.641	3.256	1.131	2.537
31	2.260		3.536		1.083		0.915	0.805		2.053		2.428
Average	3.072	5.779	11.950	7.267	1.670	1.169	1.121	0.823	0.791	1.311	2.483	6.373
Lowest	2.260	2.191	3.536	2.391	1.078	0.842	0.851	0.756	0.639	0.460	1.131	1.040
Highest	7.021	13.030	59.060	35.250	2.313	3.689	2.631	0.946	1.018	4.253	6.677	22.530
Peak flow	13.10	22.94	194.00	52.61	2.40	11.39	4.88	1.07	1.13	8.08	11.39	40.75
Day of peak	13	19	23	13	1	30	8	15	16	29	10	16
Monthly total (million cu m)	8.23	13.98	32.02	18.84	4.47	3.03	3.00	2.21	2.05	3.51	6.43	17.07
Runoff (mm)	38	64	147	87	21	14	14	10	9	16	30	78
Rainfall (mm)	52	140	161	123	16	98	50	61	27	135	65	140

Statistics of monthly data for previous record (Apr 1975 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	10.110	7.888	7.834	4.361	2.920	1.849	1.286	2.048	2.312	5.238	7.067	9.837
	Low	4.432	3.068	1.915	1.681	1.064	1.015	0.814	0.655	1.263	1.508	1.893	3.612
	(year)	1985	1986	1985	1984	1984	1976	1984	1984	1977	1978	1975	1975
	High	16.110	16.010	21.140	12.770	7.061	3.131	2.164	5.690	3.955	15.120	12.830	20.280
	(year)	1988	1984	1979	1986	1983	1982	1988	1985	1985	1976	1984	1979
Runoff:	Avg.	124	89	96	52	36	22	16	25	28	64	84	121
	Low	55	34	24	20	13	12	10	8	15	19	23	44
	High	198	184	260	152	87	37	27	70	47	186	153	250
Rainfall (1976-1988)	Avg	146	88	131	73	85	78	65	109	116	136	133	158
	Low	57	16	75	11	27	16	18	22	22	36	62	80
	High	250	182	243	165	149	185	191	192	253	223	208	258

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre 1989
Mean flow (m^3s^{-1})	3.642		5.224		70
Lowest yearly mean			3.775	1987	
Highest yearly mean			7.148	1979	
Lowest monthly mean	0.791	Sep	0.655	Aug 1984	
Highest monthly mean	11.950	Mar	21.140	Mar 1979	
Lowest daily mean	0.460	9 Oct	0.392	21 Aug 1984	
Highest daily mean	59.060	23 Mar	109.400	28 Dec 1978	
Peak	194.000	23 Mar	204.400	13 Jan 1984	
10% exceedance	8.104		12.550		65
50% exceedance	1.875		2.637		71
95% exceedance	0.648		1.016		64
Annual total (million cu m)	114.90		164.90		70
Annual runoff (mm)	528		758		70
Annual rainfall (mm)	1068		1318		81
(1941-70 rainfall average (mm)			1209)		

Factors affecting flow regime

- Reservoir(s) in catchment.
- Abstraction for public water supplies
- Augmentation from surface water and/or groundwater

Station and catchment description

Velocity-area station approximately 17m wide, rated by current metering from bridge at the section. Heavily reservoired catchment with substantial effect on flows. Geology is mostly Millstone Grit. Rural catchment.

028009 Trent at Colwick 1989

Measuring authority: NRA-ST
First year 1958

Grid reference 43 (SK) 620 399
Level stn (m OD) 16 00

Catchment area (sq km) 7486 0
Max alt (m OD) 636

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	50 790	54 620	176 700	65 670	71 690	35 070	69 040	30 840	25 500	22 210	40 270	28 640
2	50 180	52 370	188 500	143 100	66 450	36 900	59 130	29 650	24 610	22 070	37 170	27 600
3	49 450	49 960	190 800	230 800	63 660	37 280	39 060	25 650	23 260	22 400	38 280	27 030
4	48 670	48 230	141 300	150 200	60 850	34 650	35 570	23 770	23 030	23 120	34 280	25 960
5	50 320	59 550	114 800	213 100	57 160	35 710	31 580	24 670	23 240	22 780	33 960	26 790
6	59 420	55 710	104 100	315 700	54 510	54 670	30 760	24 990	24 120	24 370	36 300	27 430
7	53 180	50 790	106 700	363 500	51 300	87 880	63 280	24 330	23 680	25 300	33 660	26 920
8	50 050	47 160	91 710	342 200	51 980	64 980	75 190	24 520	23 450	26 510	75 930	26 010
9	51 530	45 580	87 450	222 500	50 620	49 260	48 820	24 870	24 140	25 340	177 200	26 580
10	51 170	45 640	84 960	268 300	49 290	41 940	39 870	36 970	23 130	23 730	131 500	26 200
11	47 540	42 980	83 330	312 800	51 470	36 640	34 390	42 920	23 920	22 990	102 200	26 820
12	55 730	43 670	75 600	275 400	57 740	37 670	30 530	33 710	23 650	22 530	95 950	29 100
13	62 880	45 300	89 030	250 400	62 160	37 850	29 510	27 800	24 360	22 930	64 210	45 930
14	71 980	50 640	113 200	189 700	50 980	39 530	28 180	30 560	25 660	24 900	51 830	195 700
15	74 740	51 120	214 000	139 800	46 750	39 250	27 590	32 910	27 550	22 800	45 210	299 300
16	64 470	58 050	150 300	117 800	45 980	31 240	26 670	33 720	30 810	22 580	40 890	333 900
17	59 460	53 900	115 000	106 500	46 410	29 950	26 700	28 710	56 880	22 450	38 760	356 100
18	56 730	69 820	94 010	95 950	45 740	29 590	26 000	26 510	50 430	22 820	37 130	334 100
19	51 710	90 090	96 280	87 140	44 180	26 580	26 320	25 560	32 480	23 240	37 750	338 400
20	51 580	73 650	104 700	82 150	44 380	27 380	26 050	22 850	27 450	44 880	34 350	359 000
21	65 020	62 800	131 400	77 550	42 790	26 920	25 220	23 170	25 780	86 560	33 050	384 700
22	81 740	60 300	123 400	74 130	35 290	26 450	25 540	22 830	25 080	86 840	31 600	358 500
23	69 930	59 050	109 400	84 460	37 940	26 620	27 070	22 920	24 550	78 850	31 330	251 400
24	63 530	108 100	185 700	99 490	65 230	26 210	24 890	22 860	24 220	46 230	30 420	190 100
25	57 980	299 700	150 600	126 400	68 110	26 200	23 630	24 330	23 420	34 500	28 810	247 800
26	55 590	250 000	106 900	119 300	50 100	26 840	22 820	33 660	23 440	31 520	28 380	214 200
27	52 810	158 600	91 010	106 900	42 950	35 050	22 320	31 410	23 880	31 390	27 540	152 100
28	62 380	158 300	85 260	98 440	39 340	40 030	23 270	25 980	22 540	35 490	28 730	119 200
29	79 150		85 710	84 020	37 440	43 120	22 800	24 230	22 790	46 630	28 150	99 610
30	66 820		74 610	78 610	36 530	43 530	31 050	23 830	22 360	73 130	28 490	86 700
31	59 220		69 340		35 550		41 530	26 180		52 070		78 760
Average	58 900	80 200	117 300	164 100	50 470	37 830	34 330	27 640	26 650	35 260	49 440	153 900
Lowest	47 540	42 980	69 340	65 670	35 290	26 200	22 320	22 830	22 360	22 070	27 540	25 960
Highest	81 740	299 700	214 000	363 500	71 690	87 880	75 190	42 920	56 880	86 840	177 200	384 700
Peak flow	91 97	307 80	234 70	369 60	87 47	98 05	103 80	64 64	74 16	102 50	193 60	397 70
Day of peak	29	25	15	7	24	7	24	10	18	22	9	21
Monthly total (million cu m)	157 70	194 00	314 10	425 30	135 20	98 06	91 96	74 04	69 07	94 45	128 20	412 20
Runoff (mm)	21	26	42	57	18	13	12	10	9	13	17	55
Rainfall (mm)	35	64	66	102	27	63	40	41	33	82	48	125

Statistics of monthly data for previous record (Oct 1958 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	143 300	133 000	113 400	93 020	72 310	56 070	45 510	47 690	49 960	67 380	89 900	123 300
	Low	52 910	49 990	47 190	35 220	32 260	24 690	19 460	18 440	23 070	25 260	34 170	46 240
	(year)	1963	1976	1976	1976	1976	1976	1976	1976	1959	1959	1975	1975
	High	216 400	384 000	227 600	179 500	175 100	103 100	104 100	76 480	121 100	187 000	231 700	351 600
	(year)	1988	1977	1981	1966	1969	1987	1968	1966	1965	1960	1960	1965
Runoff	Avg	51	43	41	32	26	19	16	17	17	24	31	44
	Low	19	17	17	12	12	9	7	7	8	9	12	17
	High	77	124	81	62	63	36	37	27	42	67	80	126
Rainfall	Avg	73	52	62	57	61	61	58	72	65	66	73	77
	Low	23	8	13	9	18	14	18	21	3	12	38	15
	High	138	175	116	116	144	148	125	120	149	141	145	173

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	69 580		86 040		81
Lowest yearly mean			47 030	1976	
Highest yearly mean			124 000	1966	
Lowest monthly mean	26 650	Sep	18 440	Aug 1976	
Highest monthly mean	164 100	Apr	384 000	Feb 1977	
Lowest daily mean	22 070	2 Oct	14 700	23 Aug 1976	
Highest daily mean	384 700	21 Dec	854 900	26 Feb 1977	
Peak	397 700	21 Dec	956 700	25 Feb 1977	
10% exceedance	151 300		171 800		88
50% exceedance	45 180		61 250		74
95% exceedance	22 960		28 890		79
Annual total (million cu m)	2194 00		2715 00		81
Annual runoff (mm)	293		363		81
Annual rainfall (mm)	726		777		93
[1941-70 rainfall average (mm)			771]		

Factors affecting flow regime

- Reservoir(s) in catchment
- Flow influenced by groundwater abstraction and/or recharge.
- Abstraction for public water supplies
- Flow reduced by industrial and/or agricultural abstractions
- Augmentation from surface water and/or groundwater
- Augmentation from effluent returns

Station and catchment description

Velocity-area station in the navigable Trent. Main channel approx 62m, cableway span 99m Holme sluices 750m u/s affect water levels up to medium flows. Bypassed at high flows on rb when gravel workings inundated Very substantial flow modifications owing to imports, WRW's, cooling water and industrial usage. Very large catchment with the gamut of land usage. Predominantly impervious - glacial clay and Triassic Marl, but some sandstone and limestone. Extensive terrace gravels and alluvium maintain baseflow

028085 Derwent at St. Marys Bridge 1989

Measuring authority: NRA-ST
First year: 1936

Grid reference: 43 (SK) 355 368
Level stn. (m OD): 44.00

Catchment area (sq km): 1054.0
Max alt. (m OD): 636

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	10.950	8 460	54.360	16.550	14 110	6 778	14 970	4 819	4.126	3.954	6.761	4 881
2	11 400	8 561	60 560	40.730	13 110	6 461	7.488	4 230	3 853	3.997	6 255	4.943
3	11 070	8.247	42.910	29.950	12 850	5.744	6 313	4.067	4.049	4 018	6 074	4 921
4	10.910	7 600	34.250	27.860	12 560	5.591	5.622	4 052	4.260	4.108	6.350	4 901
5	10 530	9 025	29.550	59.210	11 890	5.995	5.266	4 016	4 038	4 034	7.846	4 924
6	11.850	8.789	25.420	69 090	11 430	7.798	5 296	3 992	3 823	4 012	7.408	5 094
7	10 480	8 278	22.500	70 120	11.190	7.335	7.196	3 874	3 858	3.867	6.552	4 516
8	10.520	7.979	18.460	63 480	11 020	6.783	5 127	3.837	4.259	3.808	13.430	4 656
9	10.280	7.900	19.570	46 490	10 490	6 530	6 893	3 908	4.193	3.640	15.700	4 895
10	9.718	7.110	17.690	77.530	10 310	5 431	5.289	4.180	4 075	3.429	12.950	4 973
11	9.671	6.960	17 430	63 510	10.400	5 889	4 550	4 801	4 124	3 473	14 320	4 889
12	10 980	7 054	17.330	54 570	10 520	6 482	4 492	4 415	4 546	3.486	12.670	4 887
13	10.370	8 866	24 270	57.620	9 658	6 691	3 991	4.302	4 443	3.567	10.580	8 274
14	12.940	8.789	42 270	40 180	9.188	6.195	4 212	4 690	4 421	3.687	9 222	40.950
15	11.100	9 461	43 220	31 760	9 055	5 531	4 170	5.594	4 303	3 756	8 317	27 010
16	11.080	9.298	31 180	27 960	8 627	4 857	4 079	4 486	4 682	3.602	7.659	49 680
17	10 510	9.198	25 410	25 640	8 592	4 648	4 045	4 022	6.142	3 422	7.855	43 460
18	9 964	19.010	21.420	22 650	8 240	4.390	3 926	4 047	4 665	3 515	6 893	36 090
19	9 935	17.600	26 730	20.660	8 132	4 200	3.949	3 892	4.171	4.376	7.100	34 800
20	10 400	13.240	28 780	19 180	7 771	4 151	3 986	3.860	3.958	6 808	7 027	49 290
21	13 010	12.610	26.360	17 770	7 656	3 995	3.959	3.876	3.898	8 029	6 081	75 650
22	10.700	12.600	36.380	17 070	7.527	3 902	4 005	3 912	4 214	9 156	5.781	49 300
23	10 820	12.940	33.580	21 750	7 413	4 384	4 035	4 225	3.933	6 879	5 601	35 000
24	10 290	50 430	96 210	23 530	9.979	4 516	3.962	4 158	3.979	4.775	5 352	41.580
25	9.885	41.370	46.110	19.480	9 417	4 601	3 861	4 434	4 014	4 876	5.323	37 900
26	9 761	23 280	34 130	16 840	7 637	4 567	4 362	4 966	3 991	3 796	5 135	27 820
27	9.509	28 990	28 230	19.150	7 259	5 703	4 200	4.398	3 962	4 788	5 550	23 480
28	9 316	33.800	25.750	16 370	7 072	6 700	4 185	4 165	3 838	5 095	5 496	20 350
29	9 198		21 930	15 860	6 761	6 114	4 246	4 365	3 975	11 610	5 084	17.580
30	9 374		19 430	14.870	6 630	8 442	4 897	4.521	3 968	11 170	4 938	16 080
31	8 660		18 050		6.568		4.793	4 404		7 675		15.030
Average	10.490	14.550	31.920	34.910	9 454	5 680	5 076	4 274	4 192	5 045	7 844	22 830
Lowest	8 660	6 960	17 330	14 870	6.568	3 902	3 861	3 837	3 823	3 422	4 938	4 516
Highest	13 010	50 430	96 210	77 530	14 110	8 442	14 970	5 594	6 142	11 610	15 700	75 650
Peak flow	15 46	98 90	129 60	88 51	14.89	16 63	20 81	6 91	7 33	22 79	18 60	93 82
Day of peak	14	24	24	10	1	30	1	15	17	29	8	21
Monthly total (million cu m)	28 10	35.20	85 49	90 50	25.32	14 72	13 60	11 45	10 87	13 51	20 33	61 15
Runoff (mm)	27	33	81	86	24	14	13	11	10	13	19	58
Rainfall (mm)	40	104	111	128	33	83	35	45	28	114	62	147

Statistics of monthly data for previous record (Jan 1936 to Dec 1988—incomplete or missing months total 0.9 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	30 320	28 710	22 950	17 990	'2 870	10 330	8 836	9 204	10 510	'3 910	21 690	26 200
	Low	9 749	8 084	9 110	7 678	6 284	4 805	4 211	3 647	3 955	4 155	4 304	8 480
	(year)	1963	1963	1976	1976	1976	1976	1976	1976	1959	1959	1975	1975
	High	67 000	76.780	69 530	39 590	26 410	20 220	28 660	33 840	32 940	35 130	54.320	88 690
	(year)	1939	1977	1947	1966	1967	1987	1958	1956	1946	1960	1940	1965
Runoff:	Avg.	77	67	58	44	33	25	22	23	26	35	53	67
	Low	25	19	23	19	16	12	11	9	10	11	11	22
	High	170	176	177	97	67	50	73	86	81	89	134	225
Rainfall:	Avg	105	78	77	65	70	70	77	84	82	89	105	100
	Low	33	8	16	8	15	15	16	10	3	17	16	20
	High	215	236	185	132	163	188	158	185	199	178	232	246

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	13 010		17 740		73
Lowest yearly mean			9 625	1976	
Highest yearly mean			25 200	1966	
Lowest monthly mean	4.192	Sep	3 647	Aug 1976	
Highest monthly mean	34 910	Apr	88 690	Dec 1965	
Lowest daily mean	3 422	17 Oct	1 663	28 Aug 1984	
Highest daily mean	96 210	24 Mar	334.200	10 Dec 1965	
Peak	129 600	24 Mar			
10% exceedance	32 300		36 490		89
50% exceedance	7 400		12 080		61
95% exceedance	3 866		5 081		76
Annual total (million cu m)	410.30		559 90		73
Annual runoff (mm)	389		531		73
Annual rainfall (mm)	930		1002		93
[1941-70 rainfall average (mm)			1016].		

Factors affecting flow regime

- Reservoir(s) in catchment
- Flow influenced by groundwater abstraction and/or recharge.
- Abstraction for public water supplies.
- Flow reduced by industrial and/or agricultural abstractions.
- Augmentation from surface water and/or groundwater.
- Augmentation from effluent returns.

Station and catchment description

Ten channel, interleaved cross path US gauge in the centre of Derby, 1.75km ds of Longbridge Weir (28010). Record continuous with 28010 At high flows Derby may flood but bypassing small. Substantial flow modification owing to Derwent reservoirs, milling and PWS abstractions Large, predominantly upland catchment draining Millstone Grit and Carb Lst. Lower reaches drain Coal Measures on the lb and Triassic sandstones and marls on the rb Peat moorland headwaters; forestry, pasture and some arable

030001 Witham at Claypole Mill 1989

Measuring authority: NRA-A
First year: 1959
Grid reference: 43 (SK) 842 480
Level stn (m OD): 16.90
Catchment area (sq km): 297.9
Max alt (m OD): 158

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.633	0.626	1.095	0.937	2.416	1.115	1.453	0.699	0.395	0.388	0.495	0.594
2	0.656	0.617	1.366	1.750	2.342	1.118	1.036	0.593	0.410	0.382	0.565	0.596
3	0.656	0.830	1.887	2.468	2.049	1.119	0.880	0.512	0.374	0.396	0.549	0.581
4	0.682	0.819	1.515	2.010	2.147	1.042	0.831	0.487	0.378	0.385	0.491	0.568
5	0.674	0.839	1.390	7.755	2.037	1.045	0.773	0.476	0.366	0.371	0.438	0.582
6	0.684	0.861	1.122	8.611	1.985	1.186	0.756	0.480	0.373	0.507	0.538	0.519
7	0.697	0.828	1.182	8.744	1.878	1.989	0.822	0.465	0.292	0.612	0.481	0.448
8	0.648	0.809	0.984	4.617	1.845	1.264	0.915	0.433	0.439	0.586	1.861	0.567
9	0.679	0.787	1.191	3.343	1.823	1.074	0.850	0.491	0.379	0.489	2.204	0.494
10	0.686	0.852	1.008	3.504	1.629	0.972	0.798	0.819	0.364	0.455	1.471	0.540
11	0.666	0.810	0.950	3.873	1.794	1.012	0.636	0.893	0.393	0.446	0.976	0.610
12	0.857	0.748	1.010	3.642	1.978	0.868	0.609	0.576	0.461	0.434	0.759	0.700
13	0.758	0.795	0.952	4.435	1.726	0.794	0.562	0.547	0.405	0.424	0.647	0.904
14	1.338	0.783	1.205	3.474	1.557	0.786	0.559	0.557	0.383	0.397	0.620	4.455
15	1.126	0.785	1.624	2.900	1.528	0.823	0.533	0.537	0.424	0.399	0.582	5.081
16	0.901	0.754	1.399	2.641	1.389	0.699	0.521	0.506	0.449	0.391	0.597	4.572
17	0.862	0.784	1.538	2.414	1.398	0.660	0.545	0.579	1.185	0.407	0.593	4.117
18	0.799	0.818	1.310	2.405	1.401	0.692	0.519	0.463	0.606	0.420	0.573	4.790
19	0.796	0.810	1.168	2.297	1.277	0.690	0.473	0.456	0.537	0.426	0.552	7.278
20	0.801	0.759	1.284	2.173	1.226	0.693	0.529	0.444	0.484	0.640	0.569	5.590
21	1.134	0.740	1.344	2.142	1.273	0.696	0.505	0.359	0.531	1.454	0.593	4.335
22	1.233	0.791	1.194	2.135	1.181	0.704	0.546	0.335	0.515	1.096	0.543	3.138
23	1.162	0.716	1.248	2.548	1.383	0.710	0.670	0.312	0.440	0.644	0.557	2.485
24	0.982	1.225	1.648	3.343	1.422	0.653	0.569	0.427	0.405	0.592	0.568	2.327
25	0.676	2.375	1.613	6.325	1.378	0.662	0.534	0.452	0.397	0.554	0.562	2.267
26	0.675	1.631	3.946	4.357	1.251	0.655	0.464	0.518	0.407	0.506	0.548	1.999
27	0.779	1.254	1.559	3.960	1.221	1.022	0.432	0.489	0.422	0.506	0.635	1.839
28	1.012	1.066	1.090	3.373	1.205	1.166	0.456	0.421	0.419	0.493	0.590	1.747
29	0.820		0.965	2.841	1.009	1.077	0.454	0.390	0.410	0.572	0.542	1.633
30	0.847		0.918	2.636	1.045	0.963	1.480	0.435	0.379	0.536	0.527	1.585
31	0.818		0.932		1.057		0.756	0.337		0.546		1.582
Average	0.830	0.911	1.343	3.588	1.576	0.932	0.692	0.498	0.446	0.531	0.707	2.211
Lowest	0.633	0.617	0.918	0.937	1.009	0.653	0.432	0.312	0.292	0.371	0.438	0.448
Highest	1.338	2.375	3.946	8.744	2.416	1.989	1.480	0.893	1.185	1.454	2.204	7.278
Peak flow	1.92	2.71	5.25	11.03	2.55	3.27	2.28	1.26	2.32	2.21	3.11	8.74
Day of peak	14	25	26	7	1	6	30	11	17	21	8	19
Monthly total (million cu m)	2.22	2.20	3.60	9.30	4.22	2.41	1.85	1.33	1.15	1.42	1.83	5.92
Runoff (mm)	7	7	12	31	14	8	6	4	4	5	6	20
Rainfall (mm)	27	33	45	98	23	64	35	30	34	52	41	91

Statistics of monthly data for previous record (May 1959 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	2.933	3.304	2.977	2.414	1.799	1.150	0.799	0.797	0.730	0.970	1.414	2.113
	Low	0.673	0.492	0.453	0.365	0.311	0.184	0.063	0.136	0.232	0.218	0.278	0.312
	(year)	1965	1976	1976	1976	1976	1976	1976	1976	1959	1959	1959	1964
	High	5.857	10.690	6.995	5.748	4.695	3.141	2.118	2.376	2.885	3.906	6.525	7.879
	(year)	1988	1977	1979	1979	1983	1985	1968	1980	1968	1960	1960	1965
Runoff	Avg	26	27	27	21	16	10	7	7	6	9	12	19
	Low	6	4	4	3	3	2	1	1	2	2	2	3
	High	53	87	63	50	42	27	19	21	25	35	57	71
Rainfall	Avg	54	39	50	50	53	53	52	63	50	49	56	55
	Low	20	3	8	10	11	3	9	5	3	5	24	13
	High	117	140	92	103	130	148	132	127	127	137	115	142

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	1.188		1.776		67
Lowest yearly mean			0.594	1976	
Highest yearly mean			2.807	1979	
Lowest monthly mean	0.446	Sep	0.063	Jul 1976	
Highest monthly mean	3.588	Apr	10.690	Feb 1977	
Lowest daily mean	0.292	7 Sep	0.021	24 Jul 1976	
Highest daily mean	8.744	7 Apr	31.600	11 Feb 1977	
Peak	11.030	7 Apr	37.540	11 Feb 1977	
10% exceedance	2.358		3.833		61
50% exceedance	0.783		1.075		73
95% exceedance	0.391		0.347		112
Annual total (million cu m)	37.46		56.05		67
Annual runoff (mm)	126		188		67
Annual rainfall (mm)	573		624		92
[1941-70 rainfall average (mm)			631]		

Factors affecting flow regime

- Abstraction for public water supplies.
- Augmentation from surface water and/or groundwater
- Augmentation from effluent returns.

Station and catchment description

An old weir at three levels with a total width of 24.99m converted into a standard Lea designed broad-crested weir. It is rated theoretically and there is no bypassing or drowning. Low flows in summer are moderately influenced by transfer of water from Rutland Water (since 1985) and abstractions for public supply at Saltersford. The catchment is clay (50%) with limestone (40%) and gravel, and is largely rural.

032004 Ise Brook at Harrowden Old Mill 1989

Measuring authority: NRA-A
First year: 1943

Grid reference: 42 (SP) 898 715
Level stn. (m OD): 45.30

Catchment area (sq km): 194.0
Max alt. (m OD): 197

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.539	0.890	1.158	0.799	2.041	0.702	0.447	0.332	0.267	0.317	0.355	0.394
2	0.532	0.830	1.251	3.150	1.732	0.596	0.392	0.298	0.256	0.309	0.700	0.391
3	0.521	0.800	1.507	2.548	1.664	0.577	0.369	0.314	0.264	0.307	0.550	0.393
4	0.532	0.834	1.511	1.777	1.494	0.567	0.339	0.296	0.262	0.307	0.592	0.394
5	0.626	0.803	1.405	4.392	1.314	0.560	0.390	0.297	0.267	0.309	0.477	0.396
6	0.605	0.749	1.416	7.245	1.161	0.910	0.327	0.289	0.255	0.622	0.443	0.386
7	0.627	0.719	0.848	6.073	1.038	0.796	2.140	0.287	0.305	0.403	0.459	0.381
8	0.607	0.690	1.211	3.092	1.021	0.797	1.002	0.284	0.244	0.342	4.101	0.377
9	0.628	0.687	0.855	2.819	0.988	0.670	0.530	0.435	0.249	0.325	5.882	0.373
10	0.579	0.718	0.566	1.703	0.983	0.599	0.491	0.894	0.266	1.027	2.243	0.371
11	0.551	0.658	0.850	3.530	1.070	0.543	0.425	0.584	0.280	0.328	1.504	0.362
12	1.817	0.644	0.980	3.856	1.057	0.510	0.419	0.382	0.279	0.322	1.123	0.429
13	1.918	0.734	1.191	6.185	0.936	0.482	0.366	0.375	0.281	0.326	0.891	2.460
14	2.521	0.686	1.529	2.930	0.852	0.459	0.367	0.475	0.306	0.302	0.776	9.780
15	1.795	0.734	3.493	2.311	0.811	0.442	0.342	0.441	0.291	0.293	0.730	9.032
16	1.253	0.718	2.874	2.183	0.780	0.425	0.341	0.364	1.264	0.294	0.650	9.208
17	0.997	0.940	4.285	2.295	0.752	0.416	0.333	0.333	2.414	0.300	0.616	7.751
18	0.876	1.433	1.696	1.940	0.755	0.400	0.313	0.303	1.614	0.305	0.757	7.702
19	0.783	1.380	1.429	1.566	0.714	0.389	0.324	0.294	0.537	0.370	0.786	10.770
20	0.758	1.251	1.475	1.541	0.711	0.373	0.302	0.284	0.462	0.484	0.607	8.938
21	1.044	1.029	1.513	1.400	0.691	0.357	0.295	0.275	0.401	0.503	0.586	6.740
22	1.256	0.932	1.451	1.353	0.662	0.354	0.286	0.265	0.372	0.688	0.542	4.023
23	1.068	0.900	1.311	1.867	0.697	0.351	0.318	0.265	0.355	0.429	0.525	3.100
24	0.954	0.864	1.396	2.644	2.582	0.343	0.250	0.265	0.344	0.372	0.523	2.861
25	0.870	2.093	1.301	6.440	1.731	0.335	0.270	0.385	0.330	0.337	0.476	2.678
26	0.796	1.964	1.100	3.922	0.765	0.403	0.256	0.487	0.330	0.349	0.421	2.296
27	0.729	1.576	0.950	4.626	0.817	0.509	0.260	0.313	0.323	0.335	0.416	2.045
28	0.925	1.428	0.926	3.469	0.743	0.564	0.261	0.294	0.308	0.435	0.419	1.846
29	1.163		0.853	2.442	0.707	0.710	0.286	0.294	0.299	0.411	0.404	1.718
30	1.054		0.819	2.163	0.654	0.465	0.570	0.284	0.306	0.380	0.398	1.598
31	0.943		0.791		0.634		0.410	0.268		0.395		1.510
Average	0.963	0.989	1.417	3.075	1.050	0.520	0.433	0.353	0.457	0.394	0.965	3.248
Lowest	0.521	0.644	0.566	0.799	0.634	0.335	0.250	0.265	0.244	0.293	0.355	0.362
Highest	2.521	2.093	4.285	7.245	2.582	0.910	2.140	0.894	2.414	1.027	5.882	10.770
Peak flow	3.64	3.18	6.74	7.77	6.24	1.39	4.49	1.90	4.13	2.07	7.49	11.41
Day of peak	12	25	17	6	24	6	7	10	17	10	9	19
Monthly total (million cu m)	2.58	2.39	3.80	7.97	2.81	1.35	1.16	0.95	1.19	1.06	2.50	8.70
Runoff (mm)	13	12	20	41	14	7	6	5	6	5	13	45
Rainfall (mm)	33	34	47	109	40	52	51	50	58	45	51	100

Statistics of monthly data for previous record (Dec 1943 to Dec 1988—incomplete or missing months total 0.8 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows:	Avg	2.528	2.635	2.293	1.551	1.125	0.758	0.567	0.542	0.507	0.752	1.389	1.923
	Low	0.459	0.324	0.219	0.330	0.143	0.128	0.166	0.110	0.128	0.185	0.176	0.218
	(year)	1944	1944	1944	1948	1944	1944	1945	1944	1949	1947	1947	1947
	High	6.441	6.948	7.984	3.835	3.606	2.421	3.018	2.656	2.315	4.384	5.330	5.827
	(year)	1959	1977	1947	1979	1967	1981	1958	1980	1968	1960	1960	1965
Runoff:	Avg	35	33	32	21	16	10	8	7	7	10	19	27
	Low	6	4	3	4	2	2	2	2	2	3	2	3
	High	89	87	110	51	50	32	42	37	31	61	71	80
Rainfall:	Avg	55	42	50	45	54	55	51	65	53	53	59	58
	Low	15	3	5	8	10	5	5	3	3	5	10	13
	High	112	115	127	91	130	141	109	139	127	137	132	123

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	1.156		1.375		84
Lowest yearly mean			0.422	1944	
Highest yearly mean			2.337	1960	
Lowest monthly mean	0.353	Aug	0.110	Aug 1944	
Highest monthly mean	3.248	Dec	7.984	Mar 1947	
Lowest daily mean	0.244	8 Sep	0.048	18 Aug 1944	
Highest daily mean	10.770	19 Dec	21.360	15 Aug 1980	
Peak	11.410	19 Dec	28.390	17 Mar 1947	
10% exceedance	2.428		3.029		80
50% exceedance	0.642		0.753		85
95% exceedance	0.272		0.202		135
Annual total (million cu m)	36.46		43.39		84
Annual runoff (mm)	188		224		84
Annual rainfall (mm)	670		640		105
[1941-70 rainfall average (mm)			631]		

Factors affecting flow regime

- Reservoir(s) in catchment
- Flow reduced by industrial and/or agricultural abstractions

Station and catchment description

Flume with low flow notch and side weir to 1965, compound Crump profile weir to April 1976, and theoretically-rated Flat V weir with 5.94m crest since. Crump weir modular to 15.6 cumecs, but bypassed at 14.2m Flat V also bypassed. Two small storage reservoirs with minor influence on low flows. Underlain by clay (59%) and sandstone (24%), mostly rural but includes Kettering.

033002 Bedford Ouse at Bedford 1989

Measuring authority NRA-A
First year 1933

Grid reference 52 (TL) 055 495
Level stn (m OD) 24 70

Catchment area (sq km) 1460 0
Max alt (m OD) 247

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	5 100	10.000	55 000	8 100	14 300	4 900	4 300	2 600	2 100	2 200	3 600	3 000
2	5 000	8 700	27 200	18 000	12 700	5 200	3 700	2 500	1 900	2 200	3 600	3 000
3	4 900	8 200	29 700	32 000	11 400	5 100	3 500	2 400	1 900	2 300	5 600	3 100
4	4 900	8 100	33 500	22 000	10 100	4 800	3 400	2 200	1 900	2 200	5 300	3 200
5	4 900	8 000	24 400	22 900	10 000	4 600	3 300	2 100	1 800	2 200	4 500	3 400
6	5 800	7 200	18 600	48 900	8 000	5 300	3 500	2 200	1 600	2 200	3 900	3 400
7	6 000	6 800	15 600	60 800	7 800	7 200	6 600	2 200	1 600	2 500	3 700	3 300
8	5 700	6 400	13 600	56 700	7 800	6 400	13 000	2 200	1 700	2 400	4 800	3 200
9	5 700	6 000	12 700	30 500	6 700	5 300	9 300	2 200	1 800	2 900	10 300	3 100
10	5 600	6 200	11 900	22 900	7 100	4 800	5 100	2 200	1 900	2 800	11 200	3 200
11	5 300	6 200	11 400	21 300	7 600	4 800	4 400	2 200	1 800	2 500	7 300	3 300
12	7 600	5 900	11 000	30 300	8 100	4 400	4 100	2 500	2 300	2 400	6 000	3 400
13	13 900	6 000	11 100	34 500	7 700	4 300	3 800	2 400	2 700	2 300	5 200	5 900
14	12 200	6 500	11 100	29 500	6 900	4 200	3 400	2 500	3 900	2 200	4 600	24 100
15	11 500	6 400	23 100	18 200	6 300	3 700	3 300	2 500	3 000	2 200	3 900	46 200
16	10 100	6 300	34 100	15 100	6 000	3 400	3 000	3 000	3 200	2 200	4 100	49 200
17	8 400	6 400	43 900	18 800	5 800	3 500	3 000	3 000	4 500	2 200	4 000	51 500
18	8 000	10.100	36 400	19 700	5 600	3 400	2 900	2 800	5 400	1 700	3 700	52 300
19	6 900	13 100	18 200	15 800	5 800	3 300	2 800	2 400	4 400	2 500	3 700	50 600
20	6 800	11 700	20 500	12 500	5 600	3 300	2 800	2 100	3 400	3 500	3 400	65 400
21	9 500	13 100	26 700	11 600	5 100	3 200	2 500	2 200	2 900	3 400	3 300	71 400
22	21 400	10 200	26 700	10 500	4 900	3 000	2 700	2 100	2 200	3 200	3 400	75 400
23	16 600	9 500	20 800	10 100	4 300	3 000	3 300	2 200	2 200	3 000	3 300	71 800
24	12 600	8 700	17 400	14 500	5 000	3 000	3 700	2 200	2 200	3 000	3 100	36 600
25	11 000	13 900	16 200	38 800	11 800	3 100	2 700	2 100	2 200	3 000	3 300	43 800
26	9 500	45 000	13 200	51 300	7 900	3 200	2 500	2 100	2 300	3 100	3 300	58 700
27	8 400	62 600	12 000	35 100	5 800	3 100	2 500	2 700	2 300	3 100	3 300	64 500
28	9 100	69 200	10 000	30 500	5 300	4 000	2 400	2 800	2 200	3 200	3 000	31 600
29	15 700		9 100	22 900	4 900	4 400	2 400	2 600	2 200	3 800	3 100	21 800
30	14 100		7 800	17 500	4 900	5 800	2 400	2 300	2 200	4 600	3 300	17 600
31	11 200		7 700		4 900		2 500	2 100		3 900		15 000
Average	9 142	13 800	20 340	26 040	7 294	4 257	3 832	2 374	2 523	2 739	4 493	28 770
Lowest	4 900	5 900	7 700	8 100	4 300	3 000	2 400	2 100	1 600	1 700	3 000	3 000
Highest	21 400	69 200	55 000	60 800	14 300	7 200	13 000	3 000	5 400	4 600	11 200	75 400
Peak flow	24 70	69 90	69 90	62 40	15 00	7 80	13 90	3 40	5 80	4 90	13 20	80 70
Day of peak	22	28	1	8	1	7	8	17	18	30	10	23
Monthly total (million cu m)	24 49	33 38	54 48	67 50	19 53	11 03	10 26	6 36	6 54	7 33	11 65	77 07
Runoff (mm)	17	23	37	46	13	8	7	4	4	5	8	53
Rainfall (mm)	34	55	57	92	25	41	47	29	39	51	40	134

Statistics of monthly data for previous record (Jan 1933 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	19 820	20 080	17 250	11 230	7 230	4 653	3 250	2 827	2 835	5 546	11 280	15 270
	Low	2 608	2 232	2 410	1 996	1 411	0 483	0 100	0 040	0 268	0 454	1 152	1 531
	(year)	1934	1965	1944	1976	1934	1934	1934	1934	1934	1934	1934	1964
	High	55 190	53 300	62 020	31 470	28 280	14 280	19 080	14 400	18 000	30 420	43 800	40 400
	(year)	1939	1977	1947	1951	1983	1985	1968	1980	1968	1987	1960	1960
Runoff	Avg	36	34	32	20	13	8	6	5	5	10	20	28
	Low	5	4	4	4	3	1	0	0	0	1	2	3
	High	101	88	114	56	52	75	35	26	32	56	78	74
Rainfall (1934-1988)	Avg	58	41	49	44	56	53	53	62	53	60	64	59
	Low	14	3	5	3	10	8	5	3	3	4	10	13
	High	124	111	140	96	113	119	120	138	110	147	178	128

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre 1989
Mean flow (m^3s^{-1})	10 450		10 060		104
Lowest yearly mean			2 401	1934	
Highest yearly mean			18 890	1937	
Lowest monthly mean	2 374	Aug	0 040	Aug 1934	
Highest monthly mean	28 770	Dec	62 020	Mar 1947	
Lowest daily mean	1 600	6 Sep	0 008	31 Aug 1934	
Highest daily mean	75 400	22 Dec	278 100	15 Mar 1947	
Peak	80 700	23 Dec			
10% exceedance	26 710		26 410		101
50% exceedance	4 963		4 648		107
95% exceedance	2 185		0 909		240
Annual total (million cu m)	329 60		317 50		104
Annual runoff (mm)	226		217		104
Annual rainfall (mm)	644		652		99
(1941-70 rainfall average (mm))			648		

Factors affecting flow regime

- Reservoir(s) in catchment
- Flow influenced by groundwater abstraction and/or recharge.
- Abstraction for public water supplies.
- Flow reduced by industrial and/or agricultural abstractions
- Augmentation from effluent returns

Station and catchment description

3 broad-crested weirs, 30m, 20m and 12m wide supplemented by 3 vertical sluice gates which are either fully open or shut. High flow rating confirmed by current meter measurements. Records before 1959 based on daily gauge board readings and gate openings. In 1972, station built at Roxton (d/s) - to achieve a better record. Significant surface water and groundwater abstractions in catchment for PWS. Geology - predominantly clay. Land use - agricultural with substantial urban development over last 15 years (inc Milton Keynes)

034006 Waveney at Needham Mill 1989

Measuring authority: NRA-A
First year: 1963

Grid reference: 62 (TM) 229 811
Level stn. (m OD): 16.50

Catchment area (sq km): 370.0
Max alt. (m OD): 65

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.835	1.550	4.315	1.053	1.344	0.451	0.789	0.312	0.318	0.272	0.349	0.338
2	0.820	1.392	6.530	1.035	1.189	0.464	0.677	0.307	0.304	0.279	0.387	0.338
3	0.829	1.294	7.755	1.025	1.061	0.471	0.494	0.286	0.274	0.292	0.484	0.330
4	0.847	1.249	4.934	1.033	0.990	0.470	0.433	0.282	0.266	0.286	0.439	0.338
5	1.188	1.254	3.718	1.270	0.901	0.496	0.393	0.272	0.274	0.295	0.375	0.342
6	4.201	1.115	3.150	1.349	0.825	0.622	0.371	0.263	0.276	0.318	0.369	0.364
7	2.826	1.068	2.342	1.797	0.791	0.646	0.455	0.258	0.284	0.323	0.366	0.357
8	2.174	1.048	1.987	1.593	0.799	0.782	0.583	0.266	0.270	0.306	0.432	0.403
9	1.914	1.025	1.925	1.308	0.796	0.711	0.887	0.268	0.282	0.308	0.504	0.357
10	1.629	1.002	1.841	1.545	0.763	0.589	0.565	0.289	0.280	0.317	0.488	0.342
11	1.206	0.862	1.692	2.054	0.738	0.522	0.475	0.325	0.306	0.322	0.438	0.349
12	1.564	0.828	1.625	2.795	0.726	0.491	0.434	0.331	0.310	0.327	0.392	0.405
13	1.814	0.957	1.681	2.008	0.723	0.468	0.400	0.289	0.341	0.340	0.375	0.542
14	3.077	1.046	1.673	1.587	0.615	0.449	0.361	0.270	0.330	0.313	0.403	1.500
15	3.262	1.000	3.744	1.276	0.594	0.422	0.345	0.298	0.341	0.288	0.382	1.713
16	2.505	0.951	7.145	1.216	0.594	0.388	0.315	0.311	0.342	0.291	0.363	1.597
17	2.092	1.264	14.320	1.288	0.588	0.372	0.309	0.292	0.325	0.298	0.373	1.380
18	1.679	1.993	9.239	1.094	0.589	0.347	0.316	0.275	0.309	0.337	0.369	1.073
19	1.503	1.943	4.904	1.042	0.556	0.347	0.309	0.271	0.328	0.342	0.352	1.404
20	1.402	1.632	4.048	1.313	0.540	0.354	0.301	0.246	0.353	0.384	0.358	2.990
21	2.196	1.349	5.623	1.363	0.511	0.385	0.295	0.233	0.373	0.372	0.369	5.302
22	2.712	1.479	4.333	1.241	0.503	0.412	0.288	0.239	0.376	0.338	0.367	2.654
23	2.287	1.591	3.040	3.188	0.503	0.396	0.279	0.242	0.378	0.338	0.368	1.567
24	1.965	1.583	2.740	6.896	0.489	0.362	0.262	0.242	0.363	0.345	0.371	1.077
25	1.755	2.180	1.947	6.740	0.478	0.328	0.256	0.245	0.274	0.345	0.359	1.018
26	1.577	7.136	1.537	4.083	0.461	0.319	0.254	0.362	0.272	0.345	0.343	0.896
27	1.368	7.166	1.613	2.769	0.447	0.438	0.249	0.487	0.266	0.368	0.352	0.810
28	1.449	4.668	1.453	1.916	0.433	0.453	0.230	0.412	0.263	0.380	0.360	0.728
29	1.729		1.223	1.353	0.436	0.547	0.232	0.354	0.273	0.388	0.349	0.685
30	1.759		1.170	1.334	0.426	0.566	0.254	0.358	0.280	0.392	0.342	0.642
31	1.594		1.123		0.440		0.301	0.337		0.388		0.616
Average	1.863	1.844	3.689	1.985	0.672	0.469	0.391	0.297	0.308	0.330	0.386	1.047
Lowest	0.820	0.828	1.123	1.025	0.426	0.319	0.230	0.233	0.263	0.272	0.342	0.330
Highest	4.201	7.166	14.320	6.896	1.344	0.782	0.887	0.487	0.378	0.392	0.504	5.302
Peak flow	5.56	8.37	15.25	7.62	1.39	0.79	1.12	0.52	0.39	0.42	0.52	6.58
Day of peak	6	26	17	24	1	8	9	27	23	29	9	21
Monthly total (million cu m)	4.99	4.46	9.88	5.15	1.80	1.21	1.05	0.80	0.80	0.88	1.00	2.80
Runoff (mm)	13	12	27	14	5	3	3	2	2	2	3	8
Rainfall (mm)	35	40	55	63	5	65	35	35	11	31	29	90

Statistics of monthly data for previous record (Dec 1963 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows:	Avg	4.309	3.440	2.714	2.076	1.170	0.799	0.548	0.759	0.886	1.231	1.872	2.872
	Low	0.609	0.722	0.591	0.487	0.369	0.285	0.285	0.281	0.261	0.352	0.397	0.492
	(year)	1973	1965	1973	1974	1974	1974	1974	1973	1964	1964	1964	1964
	High	14.260	10.670	7.665	5.646	3.254	4.302	1.197	6.958	9.753	10.260	8.852	8.379
	(year)	1988	1979	1981	1983	1969	1985	1987	1987	1968	1987	1974	1965
Runoff:	Avg	31	23	20	15	8	6	4	5	6	9	13	21
	Low	4	5	4	3	3	2	2	2	2	3	3	4
	High	103	70	55	40	24	30	9	50	68	74	62	61
Rainfall:	Avg	54	37	45	44	48	51	49	51	53	54	62	54
	Low	16	10	10	9	10	10	11	7	2	4	25	18
	High	122	72	96	86	97	132	93	110	161	118	150	100

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre 1989
Mean flow (m^3s^{-1})	1.104		1.883		59
Lowest yearly mean			0.537	1973	
Highest yearly mean			3.366	1987	
Lowest monthly mean	0.297	Aug	0.261	Sep 1964	
Highest monthly mean	3.689	Mar	14.260	Jan 1988	
Lowest daily mean	0.230	28 Jul	0.189	23 Aug 1973	
Highest daily mean	14.320	17 Mar	89.760	16 Sep 1968	
Peak	15.250	17 Mar	113.300	16 Sep 1968	
10% exceedance	2.237		4.270		52
50% exceedance	0.483		0.817		59
95% exceedance	0.267		0.330		81
Annual total (million cu m)	34.82		59.43		59
Annual runoff (mm)	94		161		59
Annual rainfall (mm)	494		602		82
[1941-70 rainfall average (mm)			603]		

Factors affecting flow regime

- Flow reduced by industrial and/or agricultural abstractions.
- Augmentation from surface water and/or groundwater.

Station and catchment description

A compound Crump weir 8.5 m wide in the main channel with a single crested Crump in the mill bypass. Sluice action at a mill 2.4 km upstream is infrequent but is evident in flow records. Surface water abstractions, and the use of river gravels as an aquifer, influence flows but the overall impact is minimal. Was affected by the Waveney Groundwater Scheme between 1975 and 1979. Predominantly a Boulder Clay catchment with largely rural land use.

036006 Stour at Langham 1989

Measuring authority: NRA-A
First year: 1962
Grid reference: 62 (TM) 020 344
Level stn. (m OD): 6.40
Catchment area (sq km): 578.0
Max alt. (m OD): 128

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.648	2.875	4.527	2.539	2.600	0.960	2.107	1.194	0.802	0.747	1.262	2.379
2	1.631	2.695	4.501	3.693	2.376	1.134	2.002	0.989	0.827	0.760	1.426	2.501
3	1.484	2.508	3.875	9.310	2.274	1.094	1.801	1.036	0.854	0.758	1.563	2.295
4	1.480	2.388	4.665	4.699	2.182	1.180	1.839	1.058	0.913	0.781	1.386	2.392
5	1.811	2.265	4.068	5.320	2.081	0.972	1.798	0.953	0.757	0.729	1.451	2.598
6	5.728	2.207	3.725	9.018	1.988	1.385	1.699	0.905	0.688	0.889	1.148	2.628
7	3.788	1.861	3.263	16.410	1.839	1.686	2.555	0.854	0.736	0.934	1.398	2.685
8	2.667	1.978	2.614	9.832	1.725	1.370	2.462	0.757	0.754	0.938	1.798	2.581
9	2.648	2.471	3.365	5.503	1.721	1.420	2.330	0.805	0.803	0.817	1.751	2.465
10	2.412	3.557	4.987	4.753	1.603	1.220	1.995	1.093	0.801	0.974	1.925	2.205
11	1.909	4.307	5.152	6.685	1.660	1.268	1.425	1.052	0.787	0.781	1.950	1.735
12	2.124	4.601	5.004	9.550	1.707	1.073	1.435	0.854	0.806	0.766	2.025	2.244
13	3.503	4.283	5.163	5.561	1.721	1.161	1.419	0.972	0.856	0.729	1.816	2.934
14	3.288	4.452	5.414	3.823	1.525	1.175	1.572	0.884	0.943	0.667	2.262	4.944
15	3.449	4.285	6.694	3.227	1.355	1.163	1.892	1.003	0.882	0.714	2.127	4.824
16	3.401	4.217	10.980	3.689	1.355	1.167	1.840	1.080	0.883	0.707	2.104	4.290
17	2.124	4.856	21.400	2.850	1.385	1.120	1.921	1.039	0.875	0.684	2.153	4.606
18	2.375	6.764	23.830	2.962	1.535	1.082	1.990	0.856	0.886	0.851	2.141	3.063
19	2.461	6.213	9.596	2.915	1.539	1.014	1.989	0.892	0.814	0.956	2.224	3.470
20	1.954	5.054	7.077	2.796	1.512	1.410	1.801	0.759	0.753	1.129	2.226	6.272
21	3.947	4.894	9.275	2.989	1.517	1.330	1.728	0.817	0.716	1.328	2.306	14.910
22	11.600	4.669	7.962	2.834	1.522	1.614	1.711	0.845	0.778	1.083	2.157	10.860
23	6.070	4.792	5.519	2.642	1.348	1.775	1.720	0.832	0.663	1.002	2.263	4.241
24	3.313	4.854	4.719	3.013	1.351	1.752	1.779	0.821	0.905	1.026	2.309	3.895
25	2.595	6.551	3.399	5.576	1.461	1.691	1.821	1.038	0.627	1.020	2.305	3.172
26	2.985	14.790	3.147	5.147	1.414	1.655	1.636	1.295	0.693	1.052	2.355	2.784
27	2.509	14.570	3.097	4.112	1.291	1.924	1.660	1.232	0.718	1.092	2.366	1.680
28	2.595	9.348	2.871	3.046	1.284	2.026	1.545	0.941	0.729	1.117	2.226	2.451
29	5.642		2.559	2.418	1.268	2.246	1.197	0.932	0.764	1.223	2.325	2.013
30	4.148		2.335	2.601	1.068	2.093	1.177	0.817	0.703	1.237	2.374	1.552
31	2.952		2.591		0.858		1.285	0.812		1.216		1.648
Average	3.234	4.939	6.044	4.984	1.615	1.405	1.778	0.949	0.790	0.926	1.971	3.623
Lowest	1.480	1.861	2.335	2.418	0.858	0.960	1.177	0.757	0.627	0.667	1.148	1.552
Highest	11.600	14.790	23.830	16.410	2.600	2.246	2.555	1.295	0.943	1.328	2.374	14.910
Peak flow	13.67	16.89	28.05	17.86	2.96	2.56	3.13	1.55	1.12	1.91	2.58	16.41
Day of peak	22	26	18	7	1	21	7	26	24	8	14	22
Monthly total (million cu m)	8.66	11.95	16.19	12.92	4.33	3.64	4.76	2.54	2.05	2.48	5.11	9.70
Runoff (mm)	15	21	28	22	7	6	8	4	4	4	9	17
Rainfall (mm)	37	39	54	66	7	49	45	30	11	42	27	103

Statistics of monthly data for previous record (Oct 1962 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg.	5.708	4.983	4.774	3.643	2.416	1.653	1.101	1.178	1.176	1.996	2.898	4.061
	Low	1.398	0.883	1.597	1.217	0.758	0.454	0.191	0.210	0.395	0.510	0.578	0.692
	(year)	1965	1965	1976	1974	1974	1965	1976	1976	1964	1970	1964	1964
	High	16.080	12.980	9.775	9.334	7.253	5.999	2.957	6.236	4.945	13.170	11.340	10.550
	(year)	1988	1979	1981	1983	1983	1987	1987	1987	1968	1987	1974	1965
Runoff	Avg	26	21	22	16	11	7	5	5	5	9	13	19
	Low	6	4	7	5	4	2	1	1	2	2	3	3
	High	75	54	45	42	34	27	14	29	22	61	51	49
Rainfall	Avg	50	33	48	44	49	53	47	52	51	52	59	51
	Low	14	13	12	11	12	10	8	11	1	3	20	13
	High	125	63	93	99	100	132	93	105	118	128	155	107

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	2.674		2.957		90
Lowest yearly mean			1.428	1973	
Highest yearly mean			5.119	1987	
Lowest monthly mean	0.790	Sep	0.191	Jul 1976	
Highest monthly mean	6.044	Mar	16.080	Jan 1988	
Lowest daily mean	0.627	25 Sep	0.094	9 Jul 1976	
Highest daily mean	23.830	18 Mar	50.280	12 Oct 1987	
Peak	28.050	18 Mar	91.000	17 Sep 1968	
10% exceedance	5.075		6.450		79
50% exceedance	1.846		1.694		109
95% exceedance	0.757		0.523		145
Annual total (million cu m)	84.33		93.32		90
Annual runoff (mm)	146		161		90
Annual rainfall (mm)	510		589		87
[1941-70 rainfall average (mm)			598]		

Factors affecting flow regime

- Abstraction for public water supplies.
- Flow reduced by industrial and/or agricultural abstractions.
- Augmentation from surface water and/or groundwater

Station and catchment description

Twin-trapezoidal flume, throat tapping. Spillway channel with weir constructed in 12/85 takes some flow above 1.45m. Bypassing also occurs over opposite bank above 1.85m. More bypassing possible from 0.5km u/s during extreme events. Naturalised flows to 9/76. Occasional high peaks due to gate action. Flow augmented by intermittent pumping from Ely/Ouse Transfer Scheme and occasional SAGS borehole pumping. Mainly rural catchment. Chalk outcrops in N, London Clay in S, all covered by semi-pervious Boulder Clay.

038003 Mimram at Panshanger Park 1989

Measuring authority: NRA-T
First year: 1952

Grid reference: 52 (TL) 282 133
Level stn. (m OD): 47.10

Catchment area (sq km): 133.9
Max alt. (m OD): 193

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.440	0.421	0.469	0.622	0.674	0.507	0.522	0.359	0.307	0.283	0.286	0.272
2	0.441	0.427	0.520	0.760	0.660	0.503	0.417	0.370	0.302	0.274	0.453	0.271
3	0.440	0.421	0.461	0.577	0.652	0.502	0.403	0.348	0.298	0.274	0.320	0.271
4	0.434	0.423	0.455	0.628	0.629	0.495	0.390	0.349	0.292	0.273	0.342	0.270
5	0.504	0.424	0.446	0.776	0.603	0.489	0.596	0.343	0.290	0.290	0.324	0.273
6	0.446	0.409	0.447	0.680	0.582	0.568	0.608	0.340	0.287	0.274	0.295	0.275
7	0.434	0.415	0.441	0.603	0.568	0.507	0.723	0.341	0.287	0.291	0.306	0.276
8	0.429	0.402	0.437	0.588	0.555	0.493	0.663	0.339	0.282	0.274	0.400	0.271
9	0.438	0.419	0.445	0.597	0.537	0.486	0.481	0.329	0.282	0.275	0.356	0.270
10	0.428	0.401	0.477	0.692	0.531	0.479	0.451	0.451	0.285	0.270	0.330	0.269
11	0.430	0.400	0.446	0.826	0.536	0.475	0.431	0.377	0.287	0.268	0.306	0.318
12	0.548	0.397	0.451	0.644	0.528	0.465	0.416	0.336	0.378	0.268	0.299	0.311
13	0.461	0.409	0.437	0.644	0.524	0.454	0.409	0.444	0.304	0.269	0.280	0.703
14	0.453	0.391	0.633	0.623	0.521	0.450	0.406	0.452	0.320	0.260	0.278	0.689
15	0.427	0.415	0.493	0.620	0.523	0.445	0.402	0.391	0.300	0.258	0.274	0.520
16	0.423	0.393	0.978	0.634	0.518	0.439	0.399	0.468	0.322	0.258	0.271	0.727
17	0.443	0.531	0.567	0.633	0.519	0.420	0.392	0.357	0.332	0.260	0.273	0.487
18	0.420	0.455	0.525	0.627	0.521	0.419	0.389	0.338	0.300	0.265	0.272	0.650
19	0.419	0.422	0.544	0.627	0.516	0.415	0.383	0.337	0.292	0.378	0.275	0.576
20	0.425	0.404	0.644	0.659	0.512	0.409	0.377	0.319	0.289	0.450	0.270	1.260
21	0.573	0.398	0.559	0.634	0.504	0.402	0.379	0.316	0.298	0.329	0.278	0.774
22	0.449	0.428	0.528	0.616	0.510	0.406	0.367	0.308	0.290	0.308	0.277	0.539
23	0.437	0.401	0.530	0.615	0.502	0.409	0.356	0.304	0.285	0.293	0.276	0.617
24	0.426	0.429	0.526	0.841	0.498	0.397	0.349	0.303	0.283	0.280	0.276	0.573
25	0.421	0.704	0.517	0.727	0.496	0.392	0.344	0.360	0.280	0.280	0.268	0.579
26	0.427	0.671	0.516	0.740	0.497	0.421	0.340	0.367	0.284	0.306	0.267	0.497
27	0.420	0.512	0.516	0.875	0.489	0.468	0.342	0.316	0.290	0.286	0.269	0.486
28	0.522	0.477	0.524	0.696	0.482	0.438	0.346	0.310	0.283	0.372	0.268	0.474
29	0.429		0.526	0.676	0.479	0.529	0.349	0.310	0.279	0.330	0.267	0.469
30	0.425		0.527	0.673	0.476	0.438	0.417	0.311	0.280	0.312	0.272	0.465
31	0.418		0.532		0.499		0.372	0.311		0.296		0.462
Average	0.446	0.443	0.520	0.672	0.537	0.457	0.426	0.352	0.296	0.294	0.298	0.480
Lowest	0.418	0.391	0.437	0.577	0.476	0.392	0.340	0.303	0.279	0.258	0.267	0.269
Highest	0.573	0.704	0.978	0.875	0.674	0.568	0.723	0.468	0.378	0.450	0.453	1.260
Peak flow	0.90	1.04	1.53	1.39	0.69	0.84	1.46	0.84	0.63	0.76	0.77	2.34
Day of peak	21	26	16	11	1	29	5	16	12	19	2	20
Monthly total (million cu m)	1.19	1.07	1.39	1.74	1.44	1.18	1.14	0.94	0.77	0.79	0.77	1.29
Runoff (mm)	9	8	10	13	11	9	9	7	6	6	6	10
Rainfall (mm)	35	49	55	95	8	32	54	33	19	50	31	141

Statistics of monthly data for previous record (Dec 1952 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	0.586	0.647	0.673	0.660	0.623	0.565	0.491	0.452	0.423	0.420	0.456	0.509
	Low	0.244	0.289	0.259	0.261	0.216	0.187	0.163	0.145	0.195	0.175	0.176	0.189
	(year)	1974	1973	1973	1973	1976	1976	1976	1976	1973	1973	1973	1973
	High	1.102	1.167	1.119	1.050	1.084	0.971	0.803	0.764	0.632	0.638	0.739	1.005
	(year)	1961	1961	1961	1979	1979	1979	1979	1979	1968	1968	1960	1960
Runoff	Avg	12	12	13	13	12	11	10	9	8	8	9	10
	Low	5	5	5	5	4	4	3	3	4	4	3	4
	High	22	21	22	20	22	19	16	15	12	13	14	20
Rainfall	Avg	56	41	49	45	52	59	54	58	56	62	62	61
	Low	11	3	3	5	15	5	5	7	5	5	20	13
	High	121	96	116	105	115	122	123	127	121	171	151	119

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	0.435		0.541		80
Lowest yearly mean			0.231	1973	
Highest yearly mean			0.767	1961	
Lowest monthly mean	0.294	Oct	0.145	Aug 1976	
Highest monthly mean	0.672	Apr	1.167	Feb 1961	
Lowest daily mean	0.258	15 Oct	0.135	21 Aug 1976	
Highest daily mean	1.260	20 Dec	2.050	29 Jan 1988	
Peak	2.340	20 Dec	3.541	30 May 1979	
10% exceedance	0.626		0.798		78
50% exceedance	0.422		0.512		82
95% exceedance	0.271		0.246		110
Annual total (million cu m)	13.72		17.09		80
Annual runoff (mm)	102		128		80
Annual rainfall (mm)	602		655		92
[1941-70 rainfall average (mm)			641]		

Factors affecting flow regime

- Flow influenced by groundwater abstraction and/or recharge
- Flow reduced by industrial and/or agricultural abstractions.

Station and catchment description

Critical-depth flume; 5m overall width. Theoretical calibration confirmed by gaugings. All flows contained. Net export of water, considerable groundwater abstraction in headwaters. Very high baseflow component. A predominantly permeable catchment (Upper Chalk - overlain by glacial deposits near headwaters), mainly rural but some urbanisation in the lower valley.

039001 Thames at Kingston 1989

Measuring authority NRA-T
First year 1883

Grid reference 51 (TQ) 177 698
Level stn (m OD) 4 70

Catchment area (sq km) 9948 0
Max alt (m OD) 330

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	23 100	16 200	164 000	55 600	56 000	12 400	8 820	7 720	4 330	3 650	4 730	7 240
2	23 400	21 100	115 000	63 800	45 100	18 500	10 100	6 460	4 230	3 800	6 740	6 400
3	23 100	13 900	155 000	64 500	43 000	18 300	9 950	7 230	4 000	3 430	14 100	7 500
4	22 100	14 400	151 000	66 700	42 600	11 600	9 200	5 920	4 570	5 070	5 940	6 290
5	23 600	19 200	119 000	94 000	41 900	13 500	9 010	7 660	5 630	5 030	4 920	7 550
6	24 000	16 300	88 300	177 000	39 800	26 400	13 700	6 430	6 150	4 530	5 480	5 070
7	20 400	10 100	84 900	169 000	38 100	23 600	39 300	6 980	4 730	4 280	6 590	7 760
8	18 600	8 830	73 400	137 000	31 100	22 500	44 100	7 040	3 780	4 310	6 470	6 950
9	17 400	8 510	67 500	105 000	33 800	18 900	34 800	5 640	3 990	3 830	11 900	5 780
10	15 900	10 700	56 400	99 300	32 500	16 800	24 200	23 100	4 060	5 510	35 300	7 430
11	16 700	12 800	61 700	114 000	29 200	14 600	9 160	6 320	4 820	7 140	25 700	6 390
12	22 400	10 600	63 800	172 000	31 800	15 000	9 320	7 410	5 170	7 250	8 390	10 400
13	37 900	10 300	61 800	131 000	30 800	11 900	12 900	7 150	6 700	3 770	12 300	18 500
14	38 700	12 200	63 400	104 000	30 900	21 700	8 980	6 120	5 050	3 190	9 310	88 700
15	41 900	10 900	134 000	94 900	30 200	18 800	10 900	8 160	3 600	3 730	7 610	109 000
16	36 500	11 700	185 000	79 900	28 900	13 400	9 600	5 840	4 170	3 050	4 120	148 000
17	34 800	33 000	216 000	77 300	25 700	10 400	10 300	5 670	4 320	5 040	5 020	187 000
18	26 300	70 500	152 000	74 300	23 300	11 300	8 850	6 520	5 800	5 610	4 770	175 000
19	20 900	101 000	119 000	72 900	19 600	11 200	10 600	5 230	4 010	4 890	7 220	164 000
20	25 700	110 000	127 000	66 700	23 700	14 500	9 530	5 570	4 530	10 200	8 410	226 000
21	31 500	75 700	196 000	58 700	21 100	9 610	9 440	4 850	5 280	13 400	3 940	304 000
22	46 000	35 500	159 000	57 800	21 500	9 240	9 040	4 640	4 040	6 700	6 420	292 000
23	42 500	29 700	106 000	52 000	18 400	9 710	10 600	5 260	4 600	8 710	7 390	245 000
24	27 700	79 500	99 100	59 600	31 100	12 300	7 410	4 230	4 230	5 530	8 330	238 000
25	18 900	154 000	87 200	71 100	58 800	11 900	7 060	4 950	5 640	4 160	5 800	224 000
26	20 300	235 000	72 000	68 000	26 400	9 930	6 410	14 000	4 880	5 160	5 950	235 000
27	15 200	225 000	75 300	89 200	19 200	11 500	7 420	13 000	3 030	4 370	7 880	205 000
28	20 600	184 000	70 900	70 600	20 000	9 080	7 540	7 590	3 760	4 180	6 670	181 000
29	24 400		56 000	63 900	19 700	10 800	6 570	5 160	3 560	8 420	8 330	146 000
30	32 500		62 500	48 800	11 000	10 400	7 610	4 730	3 810	5 660	8 650	118 000
31	27 000		57 600		11 200		6 950	3 950		6 400		95 700
Average	26 450	55 020	106 400	88 620	30 210	14 310	12 560	7 114	4 549	5 484	8 813	112 400
Lowest	15 200	8 510	56 000	48 800	11 000	9 080	6 410	3 950	3 030	3 050	3 940	5 070
Highest	46 000	235 000	216 000	177 000	58 800	26 400	44 100	23 100	6 700	13 400	35 300	304 000
Peak flow	57 70	282 00	242 00	226 00	83 50	48 60	60 60	41 80	48 40	29 10	51 10	320 00
Day of peak	13	27	17	6	25	6	7	10	16	18	10	21
Monthly total (million cu m)	70 85	133 10	285 10	229 70	80 90	37 09	33 64	19 05	11 79	14 69	22 84	301 10
Runoff (mm)	7	13	29	23	8	4	3	2	1	1	2	30
Rainfall (mm)	35	67	67	76	18	39	34	44	30	[illegible]	41	145

Statistics of monthly data for previous record (Jan 1883 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	127 700	123 800	104 900	75 500	53 970	37 470	23 700	22 090	23 560	38 990	72 820	101 400
	Low	18 570	12 290	9 426	8 975	4 391	3 302	2 079	1 912	0 688	3 144	7 472	10 210
	(year)	1976	1976	1976	1976	1976	1976	1921	1976	1976	1934	1921	1933
	High	325 300	342 000	359 500	188 800	171 700	171 600	72 290	79 330	123 900	179 800	334 000	333 900
	(year)	1915	1904	1947	1916	1932	1903	1968	1931	1927	1903	1894	1929
Runoff	Avg	34	30	28	20	15	10	6	6	6	10	19	27
	Low	5	3	3	2	1	1	1	1	0	1	2	3
	High	88	86	97	49	46	45	19	21	32	48	87	90
Rainfall	Avg	65	49	53	48	55	52	59	64	58	73	72	72
	Low	14	3	3	3	8	3	8	3	3	5	8	13
	High	137	127	142	104	137	137	130	147	157	188	188	185

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	39 310		66 890		59
Lowest yearly mean			20 410	1934	
Highest yearly mean			120 000	1951	
Lowest monthly mean	4 549	Sep	0 688	Sep 1976	
Highest monthly mean	112 400	Dec	359 500	Mar 1947	
Lowest daily mean	3 030	27 Sep	0 010	11 Oct 1976	
Highest daily mean	304 000	21 Dec	1059 000	18 Nov 1894	
Peak	320 000	21 Dec			
10% exceedance	115 300		161 700		71
50% exceedance	13 370		42 370		32
95% exceedance	4 010		9 239		43
Annual total (million cu m)	1240 00		2111 00		59
Annual runoff (mm)	125		212		59
Annual rainfall (mm)	667		720		93
[1941-70 rainfall average (mm)			724]		

Factors affecting flow regime

- Reservoir(s) in catchment
- Flow influenced by groundwater abstraction and/or recharge.
- Abstraction for public water supplies
- Flow reduced by industrial and/or agricultural abstractions
- Augmentation from surface water and/or groundwater
- Augmentation from effluent returns

Station and catchment description

Ultrasonic station commissioned in 1974; multi-path operation from 1986 Full range No peak flows pre-1974 when dmfs derived from Teddington weir complex (70m wide); significant structural improvements since 1883 Some underestimation of pre-1951 low flows. Baseflow sustained mainly from the Chalk and the Oolites Runoff decreased by major PWS abstractions - naturalised flows available. Diverse topography, geology and land use which - together with the pattern of water utilisation - has undergone important historical changes

039007 Blackwater at Swallowfield 1989

Measuring authority: NRA-T
First year: 1952

Grid reference: 41 (SU) 731 648
Level stn. (m OD): 42.30

Catchment area (sq km): 354.8
Max alt. (m OD): 225

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.840	2.190	4.240	2.730	2.640	2.800	1.540	1.310	1.170	1.270	1.800	1.500
2	1.870	2.150	6.560	3.650	2.630	2.690	1.440	1.260	1.170	1.300	4.240	1.540
3	1.940	2.120	9.390	2.770	2.540	2.000	1.390	1.200	1.160	1.280	2.740	1.530
4	1.980	2.150	5.580	2.820	2.370	1.860	1.340	1.170	1.170	1.280	2.330	1.520
5	2.260	2.110	4.650	7.890	2.290	1.810	1.290	1.120	1.180	1.340	1.980	1.550
6	2.190	2.110	4.070	7.890	2.190	4.120	1.610	1.090	1.170	1.470	1.890	1.590
7	2.020	2.040	3.610	5.240	2.180	3.860	2.440	1.160	1.160	1.360	1.900	1.590
8	2.020	2.030	3.340	4.170	2.140	7.430	2.300	1.180	1.140	1.360	2.910	1.560
9	2.020	2.010	3.280	3.760	2.120	2.150	2.860	1.170	1.190	1.330	2.860	1.510
10	2.070	2.020	3.290	4.200	2.070	1.960	1.810	3.960	1.220	1.330	3.270	1.520
11	1.910	1.980	3.170	11.200	2.060	1.830	1.600	2.300	1.240	1.330	2.380	1.640
12	2.660	1.970	3.100	6.810	2.060	1.760	1.470	1.500	1.580	1.300	2.030	2.500
13	2.260	2.180	2.890	4.880	1.990	1.630	1.400	1.380	1.580	1.310	1.930	4.110
14	3.300	2.080	6.050	3.990	1.990	1.600	1.380	1.980	1.510	1.320	1.860	10.800
15	2.560	2.650	6.350	3.530	1.910	1.540	1.340	1.650	1.850	1.280	1.760	4.980
16	2.400	2.350	13.800	3.480	1.910	1.520	1.300	1.450	1.640	1.290	1.710	12.700
17	2.510	5.030	8.700	3.320	1.770	1.490	1.300	1.330	1.440	1.280	1.680	10.600
18	2.270	6.800	5.560	3.100	1.780	1.450	1.270	1.440	1.380	1.280	1.660	7.800
19	2.180	4.440	5.230	2.860	1.780	1.420	1.270	1.370	1.320	1.770	1.650	7.280
20	2.200	3.730	9.700	2.770	1.770	1.400	1.240	1.260	1.260	4.380	1.720	17.100
21	3.000	3.180	10.700	2.700	1.730	1.380	1.210	1.230	1.260	5.050	1.760	19.100
22	2.590	3.380	6.050	2.650	1.740	1.400	1.210	1.200	1.240	2.460	1.680	8.220
23	2.400	3.270	4.610	2.600	1.700	1.360	1.270	1.170	1.230	2.220	1.630	8.560
24	2.290	9.380	4.170	3.390	5.130	1.340	1.230	1.170	1.240	2.000	1.640	7.690
25	2.250	11.200	3.580	3.380	5.630	1.330	1.220	1.210	1.230	1.890	1.590	9.430
26	2.190	12.700	3.310	3.050	2.670	1.370	1.220	1.410	1.230	2.550	1.600	6.580
27	2.130	8.200	3.340	3.850	2.250	2.050	1.200	1.480	1.260	2.060	1.590	4.930
28	2.690	5.290	3.130	2.990	2.000	1.750	1.150	1.280	1.300	3.690	1.620	4.260
29	2.480		2.960	2.950	1.880	1.720	1.200	1.200	1.160	2.650	1.640	3.720
30	2.320		2.830	2.710	1.830	1.660	1.380	1.220	1.250	2.150	1.630	3.230
31	2.250		2.770		1.720		1.510	1.200		2.690		3.090
Average	2.292	3.955	5.162	4.044	2.273	1.889	1.464	1.421	1.298	1.910	2.023	5.604
Lowest	1.840	1.970	2.770	2.600	1.700	1.330	1.150	1.090	1.140	1.270	1.590	1.500
Highest	3.300	12.700	13.800	11.200	5.630	4.120	2.860	3.960	1.850	5.050	4.240	19.100
Peak flow	4.02	16.80	18.40	17.50	8.14	6.10	3.71	5.31	2.24	7.38	5.63	23.50
Day of peak	14	25	20	11	24	6	8	10	12	21	2	21
Monthly total (million cu m)	6.14	9.57	13.82	10.48	6.09	4.90	3.92	3.81	3.36	5.12	5.24	15.01
Runoff (mm)	17	27	39	30	17	14	11	11	9	14	15	42
Rainfall (mm)	30	69	75	69	32	47	31	43	21	71	34	155

Statistics of monthly data for previous record (Oct 1952 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	4.767	4.130	3.879	3.146	2.587	2.037	1.518	1.525	1.827	2.611	3.390	3.997
	Low	1.757	1.686	1.323	1.520	1.081	0.767	0.712	0.723	0.638	0.907	1.262	1.298
	(year)	1954	1965	1953	1976	1956	1953	1953	1953	1959	1959	1964	1953
	High	8.000	7.292	6.897	5.600	5.946	6.472	2.830	2.621	6.609	7.612	8.019	7.022
	(year)	1975	1966	1979	1966	1978	1971	1988	1977	1968	1960	1960	1960
Runoff	Avg	36	28	29	23	20	15	11	12	13	20	25	30
	Low	13	12	10	11	8	6	5	5	5	7	9	10
	High	60	50	52	41	45	47	21	20	48	57	59	53
Rainfall	Avg	68	43	55	45	56	52	55	59	65	72	72	72
	Low	14	5	3	3	8	5	18	17	3	6	18	15
	High	124	108	125	106	128	144	104	117	167	208	179	167

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	2.773		2.946		94
Lowest yearly mean			1.466	1953	
Highest yearly mean			3.777	1982	
Lowest monthly mean	1.298	Sep	0.638	Sep 1959	
Highest monthly mean	5.604	Dec	8.019	Nov 1960	
Lowest daily mean	1.090	6 Aug	0.464	18 Aug 1953	
Highest daily mean	19.100	21 Dec	39.200	16 Sep 1968	
Peak	23.500	21 Dec	41.000	16 Sep 1968	
10% exceedance	5.134		5.550		93
50% exceedance	1.993		2.184		91
95% exceedance	1.184		0.886		134
Annual total (million cu m)	87.45		92.97		94
Annual runoff (mm)	246		262		94
Annual rainfall (mm)	677		714		95
[1941-70 rainfall average (mm)			710]		

Factors affecting flow regime

- Flow influenced by groundwater abstraction and/or recharge
- Augmentation from effluent returns.

Station and catchment description

Two Crump weirs (main 4.6m, side 2.7m wide) superseded original flume, plus side-spilling weir, in 1970. Minor bypassing of the side weir in flood conditions, overflows more frequent pre-1970. Some net import of water - sewage effluent augments flows. Exact delineation of the hydrological catchment is difficult. Chalk in the headwaters, clay, sands and alluvium in the valley. Substantial and expanding urban development in the catchment but large rural tracts remain; significant areas of heath and woodland.

039020 Coln at Bibury 1989

Measuring authority: NRA-T
First year: 1963

Grid reference: 42 (SP) 122 062
Level stn (m OD): 100.60

Catchment area (sq km): 106.7
Max alt (m OD): 330

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.645	0.625	1.680	1.740	1.570	0.898	0.672	0.520	0.451	0.401	0.397	0.696
2	0.637	0.624	1.880	1.780	1.520	0.889	0.661	0.521	0.457	0.398	0.415	0.686
3	0.635	0.625	1.990	1.690	1.470	0.870	0.660	0.517	0.455	0.393	0.420	0.677
4	0.627	0.626	1.900	1.650	1.440	0.849	0.620	0.513	0.443	0.391	0.423	0.670
5	0.630	0.634	1.880	1.750	1.410	0.838	0.617	0.515	0.440	0.393	0.419	0.664
6	0.630	0.640	1.890	1.870	1.400	0.839	0.624	0.510	0.440	0.396	0.421	0.661
7	0.622	0.642	2.040	1.810	1.370	0.823	0.645	0.504	0.442	0.397	0.436	0.657
8	0.613	0.639	1.920	1.690	1.340	0.810	0.647	0.508	0.430	0.395	0.519	0.653
9	0.610	0.642	1.910	1.690	1.290	0.793	0.633	0.509	0.425	0.396	0.538	0.648
10	0.606	0.646	1.890	1.710	1.270	0.777	0.620	0.503	0.422	0.389	0.555	0.649
11	0.562	0.644	1.820	1.810	1.260	0.753	0.611	0.519	0.427	0.387	0.602	0.644
12	0.629	0.646	1.820	1.810	1.240	0.737	0.604	0.495	0.419	0.380	0.640	0.655
13	0.630	0.637	1.750	1.890	1.210	0.716	0.595	0.495	0.423	0.371	0.682	0.746
14	0.625	0.642	1.850	1.850	1.180	0.701	0.590	0.506	0.423	0.372	0.717	0.876
15	0.635	0.641	1.920	1.890	1.170	0.704	0.587	0.522	0.428	0.368	0.741	0.899
16	0.638	0.642	1.960	1.950	1.140	0.698	0.587	0.514	0.423	0.360	0.759	1.050
17	0.623	0.666	1.990	1.970	1.130	0.703	0.577	0.510	0.457	0.351	0.765	1.150
18	0.585	0.826	1.930	1.970	1.090	0.700	0.573	0.517	0.453	0.354	0.768	1.400
19	0.581	0.918	1.970	1.960	1.080	0.676	0.568	0.509	0.431	0.371	0.774	1.580
20	0.589	0.844	2.020	1.960	1.060	0.668	0.567	0.498	0.417	0.365	0.747	1.900
21	0.614	0.832	2.090	1.920	1.030	0.665	0.558	0.501	0.414	0.407	0.732	2.140
22	0.630	0.868	2.050	1.900	1.010	0.669	0.553	0.510	0.408	0.437	0.726	2.450
23	0.608	0.894	2.020	1.860	1.030	0.660	0.549	0.508	0.413	0.420	0.739	2.730
24	0.602	1.060	2.010	1.840	1.080	0.661	0.552	0.514	0.412	0.395	0.724	2.900
25	0.598	1.430	1.970	1.780	1.030	0.658	0.541	0.562	0.417	0.386	0.713	2.870
26	0.592	1.560	1.930	1.740	0.976	0.680	0.528	0.482	0.418	0.383	0.703	2.890
27	0.592	1.580	1.920	1.710	0.957	0.699	0.538	0.472	0.405	0.389	0.702	2.930
28	0.588	1.660	1.870	1.660	0.937	0.683	0.537	0.463	0.404	0.422	0.701	2.930
29	0.630		1.840	1.640	0.931	0.689	0.543	0.465	0.401	0.446	0.698	2.890
30	0.643		1.810	1.600	0.906	0.690	0.549	0.459	0.398	0.405	0.687	2.830
31	0.630		1.780		0.893		0.541	0.453		0.400		2.740
Average	0.615	0.833	1.913	1.803	1.175	0.740	0.589	0.503	0.426	0.391	0.629	1.544
Lowest	0.562	0.624	1.680	1.600	0.893	0.658	0.528	0.453	0.398	0.351	0.397	0.644
Highest	0.645	1.660	2.090	1.970	1.570	0.898	0.672	0.562	0.457	0.446	0.774	2.930
Peak flow	0.70	1.79	2.31	2.03	1.63	0.94	0.71	0.66	0.53	0.57	0.78	3.06
Day of peak	7	25	3	20	1	2	6	25	9	31	19	24
Monthly total (million cu m)	1.65	2.02	5.12	4.67	3.15	1.92	1.58	1.35	1.11	1.05	1.63	4.13
Runoff (mm)	15	19	48	44	29	18	15	13	10	10	15	39
Rainfall (mm)	41	90	73	83	30	41	34	52	50	112	59	148

Statistics of monthly data for previous record (Oct 1963 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	2.089	2.370	2.148	1.793	1.342	1.127	0.856	0.684	0.596	0.658	1.024	1.583
	Low	0.374	0.380	0.383	0.371	0.334	0.290	0.242	0.207	0.202	0.259	0.344	0.375
	(year)	1976	1976	1976	1976	1976	1976	1976	1976	1976	1976	1973	1975
	High	3.196	3.695	3.385	3.415	2.599	2.290	1.397	1.085	0.908	1.299	2.714	3.015
	(year)	1982	1988	1977	1979	1983	1979	1985	1985	1968	1968	1967	1965
Runoff	Avg	52	54	54	44	34	27	22	17	14	17	25	40
	Low	9	9	10	9	8	7	6	5	5	7	8	9
	High	80	87	85	83	65	56	35	27	22	33	66	76
Rainfall	Avg	75	57	69	50	71	61	59	69	68	65	75	84
	Low	13	8	19	5	23	9	15	23	17	8	30	24
	High	142	159	143	109	161	158	120	149	149	171	163	159

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	0.931		1.351		69
Lowest yearly mean			0.399	1976	
Highest yearly mean			1.771	1966	
Lowest monthly mean	0.391	Oct	0.202	Sep 1976	
Highest monthly mean	1.913	Mar	3.695	Feb 1988	
Lowest daily mean	0.351	17 Oct	0.190	23 Aug 1976	
Highest daily mean	2.930	27 Dec	4.870	22 Dec 1965	
Peak	3.060	24 Dec	5.000	22 Dec 1965	
10% exceedance	1.891		2.613		72
50% exceedance	0.654		1.102		59
95% exceedance	0.394		0.396		99
Annual total (million cu m)	29.37		42.64		69
Annual runoff (mm)	275		400		69
Annual rainfall (mm)	813		803		101
[1941-70 rainfall average (mm)			819]		

Factors affecting flow regime

- Flow influenced by groundwater abstraction and/or recharge.
- Augmentation from effluent returns

Station and catchment description

Crump weir (9.1m broad). Modular throughout the range. Some overspill onto floodplain before design capacity reached. Limited impact of artificial influences on river flows - net import (sewage effluent). Baseflow dominated flow regime. Pervious (Oolitic Limestone) catchment on the dip-slope of the Cotswolds; predominantly rural.

040003 Medway at Teston 1989

Measuring authority: NRA-S
First year: 1956

Grid reference: 51 (TQ) 708 530
Level stn. (m OD): 7.00

Catchment area (sq km): 1256.1
Max alt. (m OD): 267

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2.522	3 076	5.566	4.584	7 441	2.951	2.231	1 472	1.533	1.609	1.906	1 618
2	2.519	3 046	10.380	6.732	7 051	4 115	2 022	1.549	1.538	1.597	3 599	1.622
3	2.658	3.181	22.790	5.307	5 959	3.569	2.028	1.502	1.638	1.853	3 887	1.987
4	2.755	2.929	12.810	5.673	5 414	2.844	2 029	1.489	1 606	1.784	3 401	1.947
5	4.242	2.938	9.823	76.380	4.648	2.958	1.988	1.585	1 436	1.648	2 843	2.258
6	5 410	2.901	5 206	89.520	4 335	5.938	1.949	1.561	1 411	1.550	2 387	2.179
7	3.727	2.797	5.278	29.640	4 343	5.949	2.577	1.399	1 444	1.770	1 910	2.153
8	3.127	2.736	5 286	16 670	4 110	4.926	2 889	1 484	1 490	1.873	3 069	2 159
9	3.259	2.716	4 777	11.730	3 731	2.210	2 874	1 461	1 554	1 755	4.382	2.066
10	3 851	2.713	5 205	10 190	3 540	2.700	2.101	1.518	2.103	1.716	5 812	2.145
11	3.529	2.587	3.894	77.150	3 311	2.459	1.669	1.553	2 319	1.667	4 280	2 105
12	3.438	2.569	4 393	74 800	3 182	2 869	1 426	1 759	3 080	1 657	2 571	2 454
13	3 178	2.625	4 317	26 180	3.251	1 560	1.359	1 678	2 083	1 599	1 910	4 800
14	3.258	2.804	6.535	14 740	3 138	1.754	1.584	1 739	1.954	1 569	1 702	20 560
15	2.859	2.570	17 650	10.320	2 816	2 430	1 925	1 611	2 281	1 534	1 631	11 050
16	3 762	2.746	43.190	9 254	2 848	1.980	1.955	1 639	2.227	1 471	1 802	24 770
17	3.073	3 874	74 670	8.518	2 900	2.342	1 861	2 087	2.035	1.616	2 060	20 930
18	2 843	12.870	22 020	6 702	2 860	2 227	1 717	1 839	1.839	1 507	2 318	17.320
19	2 706	7 554	13.600	6 579	2 671	2.102	1 675	1 577	1 724	2 573	1 821	18 140
20	2.783	5 169	19.370	6.385	2 591	2 092	1 662	1.563	1.593	2 220	2.259	93 480
21	3 858	3 988	24.380	6 462	2 676	2 039	1.611	1.505	1.584	2 621	2 041	66 470
22	5.064	5 089	14 640	6.090	2 286	1 979	1.717	1 477	1.876	2 366	1.999	23 010
23	3 918	6.269	6.737	5.796	2 032	2 061	1 573	1 426	1 857	1 525	1.949	13.130
24	3 378	12.330	5.581	6 222	2 413	1.912	1 532	1.501	2.285	1 384	1 966	13 020
25	3.724	45 060	6.233	7.745	2 236	1 929	1.497	1 492	1.599	1 758	1.910	12.450
26	2 982	58.440	6 193	6 838	1 931	1 793	1 479	1.796	1 756	2 096	1.881	13 340
27	3.071	29 020	5 883	20 510	2 013	2 107	1 362	1.817	1.381	1.575	2 456	8 147
28	3 130	12.860	5.307	20 980	1 982	1 939	1 336	1 704	1 515	3 346	1.500	6 274
29	3 064		4.728	10 510	1 916	2 068	1 423	1.540	1.792	2 444	1 781	5 296
30	2.856		4 670	8 233	1 993	2 328	1.539	1 602	1.605	3 241	1 751	4 855
31	2 821		4 438		2 493		1 479	1 524		4 191		4 494
Average	3.334	8 838	12.440	19 880	3 358	2 671	1.809	1.595	1.805	1.971	2.493	13 100
Lowest	2 519	2.569	3.894	4 584	1.916	1 560	1 336	1 399	1.381	1 384	1.500	1 618
Highest	5 410	58.440	74.670	89 520	7 441	5 949	2 889	2 087	3 080	4 191	5 812	93 480
Peak flow												
Day of peak												
Monthly total (million cu m)	8.93	21 38	33 31	51 53	8 99	6 92	4 84	4 27	4.68	5.28	6 46	35 10
Runoff (mm)	7	17	27	41	7	6	4	3	4	4	5	28
Rainfall (mm)	27	56	70	99	3	46	23	30	32	68	42	127

Statistics of monthly data for previous record (Oct 1956 to Dec 1988—incomplete or missing months total 1.5 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows.	Avg.	23 460	19 140	14 920	10.730	6.963	4 817	3 035	3 400	4 888	8 732	15 630	18 940
	Low	4 911	5 296	3 383	2 328	1.751	1.141	1 118	0 578	1 068	1 401	2.339	3 670
	(year)	1973	1981	1976	1976	1976	1976	1976	1976	1959	1972	1978	1988
	High	48.240	49 160	31 600	23 470	20 820	21 690	7 553	9 875	30 090	53 220	66.830	37 330
	(year)	1988	1957	1975	1983	1978	1964	1980	1985	1968	1987	1960	1965
Runoff.	Avg.	50	37	32	22	15	10	6	7	10	19	32	40
	Low	10	10	7	5	4	2	2	1	2	3	5	8
	High	103	95	67	48	44	45	16	21	62	113	138	80
Rainfall:	Avg.	75	49	58	48	54	53	54	59	69	77	81	80
	Low	13	3	3	7	21	8	20	10	5	5	14	15
	High	187	123	113	108	112	127	103	122	183	198	169	168

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	6 079		11.190		54
Lowest yearly mean			7 584	1962	
Highest yearly mean			19 330	1960	
Lowest monthly mean	1.595	Aug	0 578	Aug 1976	
Highest monthly mean	19 880	Apr	66 830	Nov 1960	
Lowest daily mean	1 336	28 Jul	0 383	22 Aug 1976	
Highest daily mean	93.480	20 Dec	269 300	4 Nov 1960	
Peak			294 500	4 Nov 1960	
10% exceedance	12.550		25 070		50
50% exceedance	2.563		5 182		49
95% exceedance	1 481		1 481		100
Annual total (million cu m)	191 70		353 20		54
Annual runoff (mm)	153		281		54
Annual rainfall (mm)	623		757		82
[1941-70 rainfall average (mm)			755]		

Factors affecting flow regime

- Reservoir(s) in catchment.
- Flow influenced by groundwater abstraction and/or recharge.
- Abstraction for public water supplies.
- Augmentation from surface water and/or groundwater.

Station and catchment description

Crump profile weir plus sharp-crested weir superseded insensitive broad-crested weir. Flows greater than 27 cumecs measured at well calibrated river section 2km d/s (East Farleigh), updating of primary record incomplete. Responsive regime. Significant artificial disturbance, low flow augmentation from Bewl Water (via River Teise), some naturalised flows available. Mixed geology; impervious formations constitute up to 50% of the catchment. Diverse land use with significant areas of woodland and orchard.

041016 Cuckmere at Cowbeech 1989

Measuring authority NRA-S
First year 1939

Grid reference 51 (TQ) 611 150
Level stn (m OD) 29.80

Catchment area (sq km) 18.7
Max alt (m OD) 183

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.067	0.081	0.203	0.138	0.121	0.040	0.028	0.015	0.013	0.014	0.042	0.020
2	0.066	0.078	0.556	0.148	0.121	0.040	0.026	0.014	0.012	0.014	0.098	0.022
3	0.065	0.078	0.502	0.143	0.105	0.041	0.023	0.014	0.012	0.014	0.094	0.020
4	0.065	0.079	0.389	0.142	0.102	0.043	0.018	0.014	0.012	0.014	0.083	0.020
5	0.342	0.072	0.337	1.216	0.090	0.040	0.014	0.014	0.012	0.014	0.058	0.019
6	0.259	0.064	0.262	0.552	0.089	0.037	0.024	0.014	0.008	0.016	0.045	0.014
7	0.140	0.065	0.224	0.295	0.087	0.041	0.046	0.014	0.008	0.016	0.038	0.013
8	0.119	0.071	0.189	0.209	0.085	0.051	0.075	0.014	0.014	0.015	0.077	0.013
9	0.133	0.070	0.182	0.193	0.080	0.042	0.037	0.013	0.022	0.015	0.071	0.012
10	0.141	0.068	0.166	0.190	0.066	0.039	0.027	0.014	0.045	0.014	0.112	0.010
11	0.118	0.064	0.165	1.273	0.065	0.036	0.026	0.013	0.016	0.014	0.081	0.009
12	0.113	0.070	0.164	0.422	0.090	0.025	0.023	0.015	0.017	0.014	0.055	0.007
13	0.101	0.076	0.149	0.262	0.068	0.027	0.016	0.016	0.021	0.014	0.046	0.141
14	0.103	0.070	0.380	0.199	0.067	0.029	0.012	0.016	0.032	0.014	0.044	0.613
15	0.102	0.071	0.399	0.182	0.063	0.027	0.016	0.015	0.031	0.014	0.030	0.385
16	0.098	0.068	1.147	0.163	0.052	0.025	0.018	0.015	0.025	0.014	0.025	1.258
17	0.099	0.123	0.533	0.161	0.048	0.024	0.018	0.029	0.019	0.014	0.026	0.390
18	0.084	0.301	0.318	0.144	0.054	0.024	0.017	0.015	0.017	0.014	0.025	0.918
19	0.091	0.185	0.478	0.142	0.054	0.024	0.017	0.014	0.015	0.023	0.025	0.851
20	0.091	0.153	0.483	0.138	0.052	0.024	0.016	0.013	0.014	0.039	0.026	2.273
21	0.190	0.119	0.452	0.134	0.051	0.024	0.017	0.013	0.014	0.033	0.028	0.847
22	0.138	0.214	0.338	0.125	0.049	0.024	0.017	0.013	0.024	0.040	0.027	0.375
23	0.120	0.218	0.273	0.123	0.048	0.025	0.018	0.013	0.017	0.056	0.027	0.247
24	0.105	0.604	0.309	0.142	0.038	0.025	0.016	0.012	0.017	0.023	0.026	0.214
25	0.106	1.269	0.235	0.130	0.039	0.025	0.015	0.013	0.016	0.017	0.024	0.211
26	0.094	0.880	0.210	0.119	0.041	0.025	0.015	0.016	0.015	0.018	0.024	0.186
27	0.089	0.455	0.199	0.290	0.040	0.026	0.015	0.015	0.015	0.017	0.023	0.158
28	0.087	0.278	0.178	0.202	0.040	0.023	0.014	0.013	0.014	0.048	0.025	0.130
29	0.082		0.164	0.160	0.041	0.062	0.015	0.012	0.014	0.055	0.022	0.127
30	0.081		0.160	0.133	0.041	0.036	0.017	0.013	0.014	0.058	0.021	0.116
31	0.082		0.155		0.040		0.017	0.014		0.099		0.112
Average	0.115	0.212	0.319	0.262	0.065	0.032	0.022	0.014	0.017	0.025	0.045	0.314
Lowest	0.065	0.064	0.149	0.119	0.038	0.023	0.012	0.012	0.008	0.014	0.021	0.007
Highest	0.342	1.269	1.147	1.273	0.121	0.062	0.075	0.029	0.045	0.099	0.112	2.273
Peak flow	0.88	2.18	1.73	3.40	0.13	0.16	0.17	0.04	0.11	0.17	0.21	3.47
Day of peak	5	25	16	11	1	29	8	17	10	31	2	20
Monthly total (million cu m)	0.31	0.51	0.86	0.68	0.18	0.08	0.06	0.04	0.05	0.07	0.12	0.84
Runoff (mm)	17	27	46	36	9	5	3	2	2	4	6	45
Rainfall (mm)	36	69	73	87	8	51	30	27	48	92	150	136

Statistics of monthly data for previous record (Jan 1968 to Dec 1988—incomplete or missing months total 0.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	0.485	0.343	0.284	0.176	0.109	0.073	0.049	0.044	0.064	0.189	0.286	0.331
	Low	0.088	0.068	0.053	0.027	0.018	0.009	0.013	0.009	0.013	0.014	0.013	0.031
	(year)	1973	1981	1973	1976	1976	1976	1976	1976	1978	1978	1973	1971
	High	1.139	0.755	0.574	0.363	0.286	0.393	0.372	0.230	0.394	1.110	0.854	0.695
	(year)	1988	1974	1981	1983	1983	1971	1980	1985	1974	1987	1974	1984
Runoff	Avg	69	45	41	24	16	10	7	6	9	27	40	47
	Low	13	9	8	4	3	1	2	1	2	2	2	4
	High	163	98	82	50	41	54	46	133	55	159	118	100
Rainfall	Avg	97	58	72	49	58	62	57	65	80	93	100	89
	Low	25	23	22	3	21	12	16	7	9	5	19	21
	High	208	155	137	109	114	155	119	144	222	244	199	184

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	0.120		0.202		59
Lowest yearly mean			0.050	1973	
Highest yearly mean			0.282	1987	
Lowest monthly mean	0.014	Aug	0.009	Jun 1976	
Highest monthly mean	0.319	Mar	1.139	Jan 1988	
Lowest daily mean	0.007	12 Dec	0.003	21 Jun 1976	
Highest daily mean	2.273	20 Dec	6.658	14 Jan 1968	
Peak	3.466	20 Dec	18.790	7 Oct 1987	
10% exceedance	0.272		0.461		59
50% exceedance	0.045		0.086		52
95% exceedance	0.013		0.012		106
Annual total (million cu m)	3.78		6.38		59
Annual runoff (mm)	202		341		59
Annual rainfall (mm)	707		880		80
(1941-70 rainfall average (mm))			836		

Factors affecting flow regime

- Flow influenced by groundwater abstraction and/or recharge.
- Abstraction for public water supplies.

Station and catchment description

Asymmetrical compound Crump profile weir (crests 2.13m and 2.97m broad) with crest tapping - not currently used. Very limited head during droughts. Structure capacity exceeded in large floods. Early data (1939-67) is of poorer quality and relates to low flows only. Responsive to rainfall on impervious fraction of catchment. Flows diminished by surface and groundwater abstractions. A rural catchment developed on mixed geology (Hastings Beds predominate).

042010 Itchen at Highbridge+Allbrook 1989

Measuring authority: NRA S
First year: 1958

Grid reference: 41 (SU) 467 213
Level stn. (m OD): 17.10

Catchment area (sq km): 360.0
Max alt. (m OD): 208

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3.440	3.378	4.493	5.483	5.379	4.646	3.533	2.586	2.735	2.557	2.992	2.608
2	3.428	3.385	5.043	5.546	5.323	4.423	3.423	2.627	2.691	2.544	3.541	2.613
3	3.438	3.392	5.180	5.422	5.297	4.388	3.188	2.618	2.642	2.522	3.642	2.587
4	3.473	3.384	4.752	5.427	5.275	4.314	3.009	2.530	2.659	2.596	3.293	2.646
5	3.482	3.388	4.673	5.725	5.228	4.173	3.043	2.476	2.620	2.476	3.180	2.636
6	3.559	3.423	4.677	6.057	5.108	4.649	3.297	2.476	2.601	2.562	3.156	2.532
7	3.507	3.406	4.582	5.693	5.076	4.763	3.328	2.518	2.569	2.554	3.147	2.510
8	3.467	3.394	4.499	5.565	4.719	4.550	3.288	2.587	2.642	2.526	3.232	2.482
9	3.471	3.390	4.660	5.521	4.745	4.395	3.253	2.544	2.685	2.593	3.237	2.449
10	3.380	3.396	4.704	5.510	4.943	4.341	3.457	2.944	2.713	2.518	3.553	2.580
11	3.351	3.327	4.627	6.373	4.939	4.731	3.285	2.844	2.656	2.554	3.299	2.653
12	3.495	3.335	4.650	6.121	4.994	4.022	3.186	2.866	2.775	2.530	3.213	2.930
13	3.538	3.440	4.525	5.704	5.085	3.948	3.143	2.912	3.108	2.497	3.191	3.369
14	3.594	3.362	5.505	5.441	5.040	3.957	3.020	3.135	3.077	2.534	3.084	4.449
15	3.515	3.353	5.859	5.363	4.931	3.860	2.934	3.090	3.146	2.534	2.988	3.319
16	3.457	3.377	5.643	5.385	4.899	3.718	2.841	3.005	2.983	2.578	3.021	3.983
17	3.449	4.057	5.394	5.370	4.993	3.649	2.854	2.919	2.848	2.654	2.811	4.259
18	3.422	4.476	5.189	5.352	4.929	3.531	2.706	2.976	2.828	2.498	2.790	3.933
19	3.412	4.069	5.238	5.488	4.814	3.523	2.731	2.942	2.753	2.693	2.928	3.797
20	3.429	3.881	6.099	5.513	4.731	3.379	2.709	2.931	2.662	3.227	2.954	5.776
21	3.640	3.708	6.272	5.544	4.595	3.221	2.633	2.935	2.629	4.260	2.868	5.387
22	3.587	3.727	5.696	5.512	4.527	3.103	2.758	2.853	2.646	3.746	2.757	5.481
23	3.737	3.794	5.485	5.565	4.449	2.887	2.659	2.783	2.600	3.088	2.721	5.333
24	3.658	5.329	5.489	5.701	4.520	2.894	2.631	2.722	2.595	3.001	2.891	5.762
25	3.626	5.556	5.399	5.583	4.429	2.796	2.516	2.797	2.634	3.028	2.761	6.159
26	3.618	5.206	5.432	5.600	4.308	2.892	2.484	2.867	2.667	2.879	2.873	5.901
27	3.611	4.934	5.477	5.756	4.304	3.184	2.499	2.927	2.612	2.936	2.782	4.935
28	3.734	4.593	5.437	5.463	4.221	3.287	2.542	2.814	2.568	3.394	2.727	4.770
29	3.741		5.455	5.435	4.138	3.441	2.553	2.965	2.576	3.197	2.699	4.801
30	3.676		5.460	5.387	4.147	3.495	2.666	2.883	2.542	3.114	2.649	4.693
31	3.413		5.469		4.307		2.6[illegible]5	2.737		3.146		4.740
Average	3.527	3.838	5.195	5.587	4.787	3.789	2.929	2.800	2.715	2.824	3.033	3.938
Lowest	3.351	3.327	4.493	5.352	4.138	2.796	2.484	2.476	2.542	2.476	2.649	2.449
Highest	3.741	5.556	6.272	6.373	5.379	4.763	3.533	3.135	3.146	4.260	3.642	6.159
Peak flow												
Day of peak												
Monthly total (million cu m)	9.45	9.28	13.92	14.48	12.87	9.82	7.84	7.50	7.04	7.56	7.86	10.55
Runoff (mm)	26	26	39	40	36	27	22	21	20	2[illegible]	22	29
Rainfall (mm)	34	95	96	70	10	43	31	36	35	93	48	174

Statistics of monthly data for previous record (Oct 1958 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	6.628	7.260	7.037	6.553	5.764	4.876	4.161	3.849	3.707	4.135	4.846	5.703
	Low	4.208	4.163	3.644	3.203	3.093	2.581	2.474	2.331	2.670	2.702	2.840	3.136
	(year)	1976	1964	1976	1976	1976	1976	1976	1976	1973	1959	1973	1973
	High	10.520	10.850	9.923	8.521	7.311	6.549	5.219	5.244	5.127	7.867	9.858	10.860
	(year)	1969	1969	1977	1969	1966	1979	1979	1979	1968	1960	1960	1960
Runoff	Avg	49	49	52	47	43	35	31	29	27	31	35	42
	Low	31	29	27	23	23	19	18	17	19	20	20	23
	High	78	73	74	61	54	47	39	39	37	59	71	81
Rainfall (1959-1988)	Avg	91	55	73	54	61	56	56	65	75	85	90	94
	Low	12	5	3	2	18	10	17	13	5	6	27	19
	High	159	146	172	113	145	128	109	120	201	234	218	229

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre 1989
Mean flow (m^3s^{-1})	3.746		5.367		70
Lowest yearly mean			3.708	1973	
Highest yearly mean			6.594	1960	
Lowest monthly mean	2.715	Sep	2.331	Aug 1976	
Highest monthly mean	5.587	Apr	10.860	Dec 1960	
Lowest daily mean	2.449	9 Dec	2.167	24 Aug 1976	
Highest daily mean	6.373	11 Apr	12.800	29 Jan 1969	
Peak					
10% exceedance	5.458		7.755		70
50% exceedance	3.402		4.964		69
95% exceedance	2.533		3.115		81
Annual total (million cu m)	118.10		169.40		70
Annual runoff (mm)	328		470		70
Annual rainfall (mm)	765		855		89
[1941-70 rainfall average (mm)			873]		

Factors affecting flow regime

- Flow influenced by groundwater abstraction and/or recharge
- Abstraction for public water supplies
- Augmentation from surface water and/or groundwater.

Station and catchment description

Crump profile weir 7.75m broad, installed in 1971 (superseded rated section with weedgrowth problems) plus thin-plate weir (Allbrook). All flows contained (rare bypassing resulted from wrong sluice settings). Flow augmentation from GW during droughts. GW catchment larger than topographical catchment. Artificial influences have minor, but increasing, impact on baseflow dominated regime, small net export of water. Very permeable catchment (90% Chalk). Land use is mainly arable with scattered urban settlements.

043005 Avon at Amesbury 1989

Measuring authority: NRA-W
First year: 1965

Grid reference: 41 (SU) 151 413
Level stn (m OD) 67.10

Catchment area (sq km) 323.7
Max alt. (m OD): 294

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2 396	2 580	4 076	4 750	4 201	2 794	1 643	1 082	0 965	0 862	1 308	1 192
2	2 415	2 547	4 275	4 821	4 173	2 767	1 617	1 111	0 962	0 824	1 569	1 202
3	2 419	2 534	4 448	4 698	4 099	2 735	1 533	1 110	0 962	0 867	1 661	1 209
4	2 426	2 526	4 112	4 672	4 047	2 710	1 496	1 106	0 953	0 860	1 579	1 252
5	2 434	2 496	3 988	4 846	4 023	2 540	1 395	1 047	0 913	0 858	1 434	1.237
6	2 473	2 457	3 818	5 399	3 892	2 523	1 424	1 075	0 909	0 865	1 326	1 185
7	2 465	2 422	3 825	5 220	3 826	2 525	1 531	1 025	0 882	0 875	1 310	1 211
8	2 436	2 393	3 679	4 982	3 785	2 518	1 728	1 035	0 878	0 870	1 454	1 203
9	2 419	2 383	3 901	4 866	3 754	2 362	1 703	1 064	0 889	0 845	1 553	1.178
10	2 419	2 413	3 876	5 304	3 743	2 274	1 580	1 116	0 895	0 848	1 572	1 200
11	2 416	2 380	3 948	6 032	3 697	2 229	1 488	1 111	0 887	0 857	1 553	1 217
12	2 561	2 374	4 015	6 193	3 654	2 190	1 466	1 091	0 877	0 866	1 535	1 284
13	2 787	2 385	3 927	5 684	3 588	2 142	1 412	1 118	0 891	0 861	1 458	1 601
14	2 808	2 378	4 411	5 168	3 513	2 097	1 388	1 133	0 966	0 858	1 445	2 532
15	2 847	2 360	5 760	5 033	3 490	2 054	1 328	1 106	1 101	0 867	1 386	2 765
16	2 719	2 346	5 192	4 963	3 468	1 919	1 267	1 129	1 085	0 845	1 366	3 024
17	2 633	2 578	5 049	4 894	3 404	1 913	1 243	1 153	1 060	0 871	1 335	3 520
18	2 567	2.968	4 779	4 803	3 344	1 872	1 207	1 085	0 998	0 885	1 336	3 142
19	2 425	2 909	4 681	4 658	3 303	1 844	1 150	1 043	0 968	0 983	1 328	3 724
20	2 492	2 818	4 885	4 605	3 206	1 743	1 131	1 007	0 950	1 075	1 311	4 371
21	2 654	2 686	5 491	4 571	3 176	1 731	1 139	0 968	0 899	1 188	1 297	8 369
22	2 782	2 685	4 997	4 556	3 021	1 691	1 115	0 987	0 901	1 191	1 169	5 806
23	2 677	2 667	4 844	4 488	3 055	1 674	1 105	0 970	0 892	1 143	1 168	4 660
24	2 600	3 515	4 963	4 493	3 620	1 644	1 067	0 977	0 885	1 075	1 192	4 762
25	2 567	4 737	4 925	4 493	3 465	1 605	1 063	0 970	0 861	1 028	1 192	6 078
26	2 544	5 732	4 858	4 435	3 146	1 653	1 045	0 981	0 882	1 059	1 190	5 331
27	2 520	5 582	4 852	4.442	3 022	1 613	1 073	0 992	0 874	1 045	1 192	4 574
28	2 595	4.515	4 766	4 305	2 928	1 668	1 125	0 967	0 868	1 166	1 222	4 161
29	2 801		4 683	4 237	2 884	1 652	1 096	0 971	0 858	1 211	1 185	3 883
30	2 698		4 676	4 220	2 837	1 657	1 044	0 986	0 865	1 222	1 190	3 733
31	2 618		4 686		2 785		1 070	0 975		1 278		3 587
Average	2 568	2 942	4.529	4 861	3 489	2 078	1 312	1 048	0 926	0 972	1.361	3 038
Lowest	2 396	2 346	3 679	4 220	2 785	1 605	1 044	0 967	0 858	0 824	1 168	1 178
Highest	2 847	5 732	5 760	6 193	4 201	2 794	1 778	1 153	1 101	1 278	1 661	8 369
Peak flow	3 18	6.72	6 45	6 49	4 29	2 84	1 78	1 18	1 21	1 32	1 69	9 32
Day of peak	15	26	15	11	1	1	8	17	15	30	3	21
Monthly total (million cu m)	6 88	7 12	12 13	12 60	9 34	5 39	3 51	2 81	2 40	2 60	3 53	8 14
Runoff (mm)	21	22	37	39	29	17	11	9	7	8	11	25
Rainfall (mm)	39	77	72	66	31	27	32	41	30	78	49	158

Statistics of monthly data for previous record (Feb 1965 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg.	5 382	6 061	5 542	4 592	3 541	2 723	2 021	1 704	1 598	1 912	2 595	3 930
	Low	1 199	1 188	1 158	1 038	0 834	0 626	0 474	0 372	0 645	1 149	1 090	1 385
	(year)	1976	1976	1976	1976	1976	1976	1976	1976	1976	1970	1973	1975
	High	8 556	9 686	8 352	7 586	5 146	4 259	3 022	2 362	2 528	3 521	6 440	7 259
	(year)	1982	1977	1972	1979	1979	1979	1971	1979	1974	1966	1974	1982
Runoff	Avg	45	46	46	37	29	22	17	14	13	16	21	33
	Low	10	9	10	8	7	5	4	3	5	10	9	11
	High	71	73	69	61	43	34	25	20	20	29	52	60
Rainfall	Avg.	79	52	68	45	62	58	50	63	67	70	75	84
	Low	14	6	14	1	24	3	15	22	11	4	31	17
	High	134	134	150	100	121	143	113	152	179	161	185	160

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	2 424		3 454		70
Lowest yearly mean			1 430	1976	
Highest yearly mean			4 476	1977	
Lowest monthly mean	0 926	Sep	0 372	Aug 1976	
Highest monthly mean	4 861	Apr	9 686	Feb 1977	
Lowest daily mean	0 824	2 Oct	0 175	22 Aug 1976	
Highest daily mean	8 369	21 Dec	15 540	25 Feb 1977	
Peak	9 325	21 Dec	17 330	16 Mar 1982	
10% exceedance	4 734		6 579		72
50% exceedance	2 087		2 870		73
95% exceedance	0.874		1 171		75
Annual total (million cu m)	76 44		109 00		70
Annual runoff (mm)	236		337		70
Annual rainfall (mm)	700		773		91
[1941-70 rainfall average (mm)			768]		

Factors affecting flow regime

- Flow influenced by groundwater abstraction and/or recharge

Station and catchment description

Crump profile weir (crest 9.14m broad) flanked by broad-crested weirs. Small bypass channel approx. 2m u/s of weir - included in rating. Full range station. Bankfull is 1.37m. During summer flows are naturally augmented from groundwater draining from northern half of River Bourne catchment. Some groundwater pumping also takes place within the catchment. Predominantly permeable (Chalk) catchment with a small inlier of Upper Greensand and Gault. Land use - rural. Topographical and groundwater catchments do not coincide.

045001 Exe at Thorverton 1989

Measuring authority: NRA-SW
First year: 1956

Grid reference: 21 (SS) 936 016
Level stn. (m OD): 25.90

Catchment area (sq km): 600.9
Max alt. (m OD): 519

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	5.717	7.541	47.380	12 810	8.106	2.977	2 480	1.540	1 400	2 713	31.680	4 228
2	5.596	7.105	65 530	12.260	6 999	3.042	2 468	1.593	1 338	2.641	31 820	4 032
3	5.520	6 742	47.090	10 180	6 573	3 047	2 160	1.512	1 341	2.578	28.760	3 896
4	5.993	6 602	38 840	9 402	6.263	2.965	1.945	1.516	1 322	2.536	34.280	3 800
5	17.740	6 911	32.180	9 367	5 891	2.900	1 852	1.346	1.328	2.658	39.930	3 674
6	15.270	6 115	27.090	9 845	5.673	2.917	2 502	1.344	1.296	2 793	32.580	3 568
7	11.810	5 733	21 930	9 925	5.397	2 961	7.791	1 336	1.275	2.983	28.050	3 479
8	11.500	5 578	21.690	8.286	5 225	2 823	6 095	1.346	1 214	2.619	59 120	3 404
9	11.500	5 569	29.570	8 313	5 130	2.739	3 874	1.708	1 279	2 614	49 220	3 287
10	10 890	6 239	24 150	9 495	4.820	2 699	3 045	2 304	1 328	2 455	45 420	3 199
11	10 180	5 428	21 410	13 600	4 865	2.596	2 601	1 871	1.506	2 440	37 980	3 300
12	19 830	6 558	22 690	10 980	5 164	2 592	2 438	1 697	1 951	2 746	31 590	5.502
13	14 540	9.569	20 280	10 220	4 559	2 512	2 274	1 661	1 747	2.608	25 320	16 300
14	24 270	7 371	58 930	9 496	4 335	2.450	2 134	2 077	5 261	2.752	20 480	39.740
15	18 790	9 255	45 000	10.550	4 084	2 247	2 031	2 406	8 960	2 660	17 070	35.130
16	17 900	8 497	46 940	17 480	3 937	2 175	1 965	2 062	11 330	2 557	14 490	58 200
17	17 450	17.170	36 010	21 290	3 914	1 985	1.918	1 961	10 900	2 496	12 740	53 260
18	14 880	67.640	36 670	17 860	3 862	1 933	1 892	1 819	7 487	2 488	11 480	75.840
19	13 480	51 270	38 040	16 860	3 617	1 832	1 791	1 685	6 192	2 922	10 000	64.860
20	12 740	39 710	40 370	15.350	3 465	1 850	1 753	1 605	4 946	9 725	8.970	81 390
21	19 480	31.770	34 980	13 650	3 318	1 816	1 712	1.551	4 713	18.730	8 254	61 360
22	14 080	32 040	30 060	12 290	3 742	1 799	1 669	1.516	3 977	22 740	7.374	43 700
23	13 350	29 830	29 540	11.240	3.092	1 822	1 631	1 512	4 165	17 590	6 733	37 790
24	12 910	52 980	48 570	10 730	3 196	1.758	1 628	1 385	3 607	13.810	6.284	47 330
25	12 080	73 630	34 550	9 567	3 146	1 765	1 549	1 503	3 314	11 480	5.808	45 410
26	11 270	70 920	30 000	9 164	3 131	1 851	1 583	1 574	3 718	10 900	5 378	37 940
27	10 390	72 010	24 760	10 080	3 178	2 382	1 523	1 556	3 125	9 875	5.100	31 370
28	9.992	63 300	20 800	8 162	3 041	2 303	1 478	1 479	2 909	24 410	4 921	25 220
29	9 046		17 360	8 266	3 001	2 585	1 727	1 577	2 817	55 750	4 663	20 610
30	8.523		15 020	7 799	2 998	2 565	1 658	1 465	2 767	58 440	4 410	17 300
31	8 016		13 210		2 907		1 660	1 414		41 950		14 930
Average	12 730	25 470	32.920	11 480	4 391	2 396	2 349	1 643	3 600	11.150	21 000	27 520
Lowest	5 520	5 428	13 210	7 799	2 907	1 758	1 478	1 336	1 214	2 440	4 410	3 199
Highest	24 270	73 630	65 530	21 290	8 106	3 047	7 791	2 406	11 330	58 440	59 120	81 390
Peak flow	50 81	109 40	126 20	32 75	8 81	3 33	15 76	2 71	13 98	98 06	73 41	105 70
Day of peak	6	18	15	17	1	6	7	15	15	30	8	30
Monthly total (million cu m)	34 10	61 61	88 18	29 77	11 76	6 21	6 29	4 40	9 33	29 86	54 42	73 70
Runoff (mm)	57	103	147	50	20	10	10	7	16	50	91	123
Rainfall (mm)	71	161	137	89	12	45	63	62	103	166	96	183

Statistics of monthly data for previous record (May 1956 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	29 610	25 450	18 760	13 360	8 763	5 675	4 711	6 565	9 280	17 150	22 210	29 990
	Low	5.438	6 450	6 376	4 341	2.595	1 988	1 154	0 695	1 699	1 560	5 297	12 460
	(year)	1963	1965	1962	1974	1976	1975	1976	1976	1972	1978	1978	1963
	High	57 190	47 220	49.630	28 800	29 380	15 870	19 770	20 550	35 830	59 830	46 170	68 440
	(year)	1984	1957	1981	1966	1983	1958	1968	1985	1974	1960	1986	1965
Runoff	Avg	132	103	84	58	39	24	21	29	40	76	96	134
	Low	24	26	28	19	12	9	5	3	7	7	23	56
	High	255	190	221	124	131	68	88	92	155	267	199	305
Rainfall	Avg	145	100	104	74	80	73	81	98	110	127	130	152
	Low	30	7	18	7	25	9	19	31	13	13	48	51
	High	297	196	222	163	175	160	174	181	254	300	239	321

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre 1989
Mean flow (m^3s^{-1})	12 990		15 930		82
Lowest yearly mean			9 698	1964	
Highest yearly mean			22 600	1960	
Lowest monthly mean	1 643	Aug	0 695	Aug 1976	
Highest monthly mean	32 920	Mar	68 440	Dec 1965	
Lowest daily mean	1 214	8 Sep	0 440	28 Aug 1976	
Highest daily mean	81 390	20 Dec	282 200	4 Dec 1960	
Peak	126 200	15 Mar	492 600	4 Dec 1960	
10% exceedance	37.780		37 910		100
50% exceedance	5 736		9 567		60
95% exceedance	1 483		1 928		77
Annual total (million cu m)	409 70		502 70		81
Annual runoff (mm)	682		837		81
Annual rainfall (mm)	1188		1274		93
[1941-70 rainfall average (mm)			1303]		

Factors affecting flow regime

- Reservoir(s) in catchment.
- Flow influenced by groundwater abstraction and/or recharge
- Abstraction for public water supplies.
- Flow reduced by industrial and/or agricultural abstractions.
- Augmentation from surface water and/or groundwater
- Augmentation from effluent returns

Station and catchment description

Velocity-area station with cableway. Flat V Crump profile weir constructed in 1973 due to unstable bed condition. Minor culvert flow through mill u/s of station included in rating. Wimbleball Reservoir has significant effect upon low flows Control point for Wimbleball Reservoir operational releases Headwaters drain Exmoor Geology predominantly Devonian sandstones and Carboniferous Culm Measures, with subordinate Permian sandstones in the east Moorland, forestry and a range of agriculture

047001 Tamar at Gunnislake 1989

Measuring authority: NRA-SW | Grid reference: 20 (SX) 426 725 | Catchment area (sq km): 916 9
First year: 1956 | Level stn (m OD): 8.20 | Max alt. (m OD): 586

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	8 769	10 100	48 170	14 540	13 010	3 594	2 108	1 335	1 083	2 917	34 940	7 252
2	8 523	9.585	98 210	14 700	10 600	3 539	2 122	1 183	1 044	2 850	42 430	6 930
3	8 379	9 327	54 580	12 520	9 803	3 477	1 977	1 161	0 997	2 763	66 990	6 787
4	8 640	9 154	41 660	11 560	9 161	3 678	1 690	1 063	0 975	2 649	69 610	6 611
5	14 850	9 095	36 360	11 590	8 558	3 336	1 699	0 992	0 983	2 613	76 250	6 417
6	35 100	8 526	30 560	11 770	8 051	3 766	1 732	0 930	0 963	2 815	53 980	6 276
7	16 680	8 106	25 580	15 060	7 661	3 456	2 580	0 894	0 929	3 106	41 850	6 125
8	15 310	7 832	24 710	11 790	7 411	3 162	3 735	0 881	0 912	2 802	153 400	5 956
9	15 220	12 620	35 580	10 740	7 211	3 324	2 816	1 302	0 937	2 591	89 290	5 765
10	15 630	14 650	29 480	12 060	6 982	3 330	2 250	6 800	1 014	2 566	82 110	5 603
11	13 980	9 757	25 610	29 540	6 852	3 159	2 028	2 620	1 167	2 605	61 250	5 770
12	33 000	10 250	27 800	26 600	6 913	3 172	1 895	1 882	2 035	2 709	45 220	8 115
13	21 030	11 450	27 450	18 660	6 462	3 163	1 767	1 659	2 361	2 791	35 300	28 850
14	36 620	11 250	104 400	14 560	6 003	2 958	1 747	2 176	6 546	2 852	28 910	75 340
15	22 420	10 360	59 650	14 260	5 718	2 730	1 769	3 049	17 510	2 654	24 430	48 460
16	20 260	11 140	79 700	19 700	5 636	2 577	1 694	2 264	26 250	2 480	21 190	97 920
17	19 180	38 260	44 970	17 300	5 632	2 429	1 373	1 935	26 520	2 324	19 900	97 900
18	16 890	97 830	43 400	14 400	5 432	2 294	1 314	2 208	12 530	2 206	20 860	129 000
19	15 670	62 130	52 900	13 380	5 149	2 093	1 135	1 737	8 589	3 026	16 960	91 100
20	14 930	46 170	76 470	12 550	4 877	2 000	1 064	1 487	6 023	20 160	15 730	111 200
21	23 950	34 730	50 110	11 740	5 282	2 045	1 111	1 387	4 875	46 310	14 810	77 810
22	16 830	41 390	36 200	11 150	4 748	2 077	1 106	1 326	4 736	69 150	13 090	53 240
23	15 090	49 730	31 640	10 650	5 205	2 044	1 086	1 247	6 035	35 840	11 770	47 400
24	14 330	161 700	30 300	10 520	5 152	1 778	1 097	1 193	5 717	23 570	11 120	126 500
25	13 500	156 600	25 420	9 774	4 271	1 731	1 247	1 221	4 589	18.690	10 250	94 560
26	12 890	99 400	22 460	9 725	4 005	1 779	1 075	1 280	4 092	19 550	9 492	58 650
27	12 240	75 850	20 350	18 500	3 790	2 856	1 052	1 264	3 753	19 530	8 983	44 430
28	13 080	78 560	20 190	11 800	3 645	2 651	1 040	1 190	3 435	39 760	8 580	35 800
29	11 660		17 250	12 220	3 550	2 274	1 024	1 112	3 163	57 880	8 226	28 980
30	10 910		15 780	11 050	3 467	2 413	1 082	1 071	3 020	68 340	7 727	24 490
31	10 520		14 660		3 384		1 314	1 103		49 080		21 700
Average	16 650	39 480	40 370	14 150	6 246	2 763	1 636	1 644	5 426	16 750	36 820	44 220
Lowest	8 379	7 832	14 660	9 725	3 384	1 731	1 024	0 881	0 912	2 206	7 727	5 603
Highest	36 620	161 700	104 400	29 540	13 010	3 766	3 735	6 800	26 520	69 150	153 400	129 000
Peak flow	57 32	240 80	191 00	60 23	14 58	4 07	4 17	10 39	38 71	122 10	186 50	201 50
Day of peak	14	24	15	11	1	7	8	10	17	30	8	25
Monthly total (million cu m)	44 59	95 52	108 10	36 67	16 73	7 16	4 38	4 40	14 06	44 86	95 44	118 40
Runoff (mm)	49	104	118	40	18	8	5	5	15	49	104	129
Rainfall (mm)	68	157	127	85	18	48	34	78	126	164	117	177

Statistics of monthly data for previous record (Jul 1956 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	45 950	35 960	25 790	16 820	11 560	6 903	6 154	8 757	12 100	23 010	34 540	45 000
	Low	8 475	9 162	11 250	6 422	3 487	1 994	1 182	0 758	1 117	1 540	4 212	18 340
	(year)	1964	1965	1961	1974	1976	1976	1976	1976	1959	1978	1978	1963
	High	89 410	84 270	65 520	35 200	32 370	20 630	28 720	42 100	59 840	65 080	78 760	91 690
	(year)	1974	1974	1981	1985	1983	1972	1968	1958	1974	1981	1959	1959
Runoff	Avg	134	96	75	48	34	20	18	26	34	67	98	131
	Low	25	24	33	18	10	6	3	2	3	5	12	54
	High	261	222	191	100	95	58	84	123	169	190	223	268
Rainfall	Avg	145	95	100	67	75	71	83	95	103	124	136	145
	Low	23	3	14	7	25	11	13	18	10	12	57	41
	High	301	206	219	151	149	167	160	179	251	258	274	266

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre 1989
Mean flow (m^3s^{-1})	18 720		22 670		83
Lowest yearly mean			12 520	1964	
Highest yearly mean			34 890	1974	
Lowest monthly mean	1 636	Jul	0 758	Aug 1976	
Highest monthly mean	44 220	Dec	91 690	Dec 1959	
Lowest daily mean	0 881	8 Aug	0 580	23 Aug 1976	
Highest daily mean	161 700	24 Feb	482 300	27 Dec 1979	
Peak	240 800	24 Feb	714 600	28 Dec 1979	
10% exceedance	51 850		55 420		94
50% exceedance	8 631		12 330		70
95% exceedance	1 067		1 904		56
Annual total (million cu m)	590 40		715 50		83
Annual runoff (mm)	644		780		83
Annual rainfall (mm)	1199		1239		97
[1941-70 rainfall average (mm)			1240]		

Factors affecting flow regime

- Reservoir(s) in catchment.
- Abstraction for public water supplies.
- Flow reduced by industrial and/or agricultural abstractions.
- Augmentation from surface water and/or groundwater.
- Augmentation from effluent returns.

Station and catchment description

Velocity-area station, wide, shallow channel. Cableway span 46 9m. Low flows measured at another, narrower, site. High flow gauging difficult owing to standing waves. Roadford Reservoir from 1989 may have significant affect at low flows. Rural catchment of moderate relief, draining very disturbed lower Carboniferous slates, shales, grits and volcanics. Significant alluvial flats in middle reaches, Devonian slates low down. Fairly responsive. A range of agriculture, grazing and forestry as land use.

050001 Taw at Umberleigh 1989

Measuring authority: NRA SW
First year: 1958

Grid reference: 21 (SS) 608 237
Level stn (m OD): 14.10

Catchment area (sq km): 826.2
Max alt. (m OD): 604

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	7.081	7.954	42.940	11.800	13.350	2.296	1.749	0.796	0.723	2.099	38.570	3.967
2	6.816	7.403	66.140	11.640	8.667	2.195	1.548	0.729	0.694	2.026	37.570	3.769
3	6.577	7.022	51.850	9.567	7.902	2.179	1.330	0.713	0.680	1.962	37.780	3.664
4	6.904	6.898	38.770	8.645	7.245	2.350	1.182	0.696	0.681	1.833	46.690	3.541
5	18.050	6.976	31.620	8.727	6.698	2.124	1.095	0.650	0.706	1.801	73.530	3.435
6	23.050	6.235	26.020	10.290	6.200	2.426	1.103	0.683	0.674	2.224	52.630	3.344
7	15.180	5.790	21.230	10.810	5.882	2.195	5.486	0.670	0.644	2.259	39.450	3.723
8	14.870	5.511	19.160	8.657	5.657	2.071	4.805	0.687	0.625	2.087	117.700	3.113
9	14.580	8.435	22.680	7.954	5.469	2.076	2.364	0.758	0.606	1.802	78.130	2.995
10	13.750	10.030	19.410	10.310	5.243	1.919	1.797	1.686	0.592	1.776	65.640	2.887
11	12.810	6.834	16.920	14.690	5.420	1.801	1.539	1.193	0.716	1.841	48.570	3.007
12	31.670	7.316	18.490	13.870	5.841	1.748	1.387	0.952	1.462	2.004	36.760	6.364
13	22.360	9.538	17.760	11.520	4.904	1.655	1.273	0.899	1.268	1.931	28.280	25.200
14	38.040	8.222	60.490	10.050	4.539	1.561	1.204	1.245	4.401	1.891	22.580	78.090
15	25.810	9.662	45.340	10.800	4.145	1.430	1.134	1.210	11.250	1.808	18.590	54.650
16	22.660	9.546	58.440	27.760	3.993	1.364	1.086	1.373	16.210	1.754	15.660	101.900
17	20.510	30.270	36.440	18.430	4.023	1.320	1.042	1.186	14.620	1.688	13.560	83.320
18	16.970	99.050	36.020	14.370	3.907	1.274	0.979	1.088	8.704	1.663	12.150	108.700
19	15.050	70.330	39.090	13.210	3.614	1.193	0.920	0.945	6.501	2.308	10.530	78.920
20	14.490	50.640	55.970	12.140	3.372	1.154	0.915	0.883	4.834	11.300	9.445	111.600
21	31.790	37.020	43.670	11.010	3.270	1.114	0.842	0.871	4.014	28.370	8.614	81.840
22	20.340	37.300	34.250	10.140	3.013	1.083	0.842	0.826	3.683	40.720	7.534	51.640
23	17.940	38.310	31.890	9.383	3.514	1.070	0.835	0.779	4.138	29.940	6.727	47.720
24	16.310	69.120	44.960	9.140	3.097	1.064	0.814	0.755	3.339	21.540	6.329	85.920
25	14.610	118.500	31.390	8.284	2.696	1.051	0.799	0.811	2.971	16.450	5.815	70.630
26	13.140	102.500	26.940	8.107	2.500	1.155	0.742	0.912	2.763	14.600	5.307	47.660
27	11.750	73.730	22.800	12.530	2.467	1.778	0.736	0.871	2.550	13.710	5.033	36.240
28	11.160	61.790	19.540	8.468	2.374	1.419	0.730	0.794	2.288	37.220	4.824	27.770
29	9.805		16.270	8.775	2.313	2.080	0.715	0.772	2.282	73.750	4.513	22.160
30	9.103		14.250	8.632	2.110	1.652	0.803	0.718	2.162	77.650	4.230	18.170
31	8.520		12.640		2.142		0.829	0.786		56.420		15.520
Average	16.510	32.570	33.010	11.320	4.696	1.660	1.375	0.899	3.559	14.790	28.760	38.420
Lowest	6.577	5.511	12.640	7.954	2.110	1.051	0.715	0.650	0.592	1.663	4.230	2.887
Highest	38.040	118.500	66.140	27.760	13.350	2.426	5.486	1.686	16.210	77.650	117.700	111.600
Peak flow	58.40	167.00	120.40	40.40	18.48	2.64	12.93	2.07	21.23	125.90	154.90	146.60
Day of peak	14	25	15	16	1	29	8	10	16	30	8	18
Monthly total (million cu m)	44.21	78.79	88.42	29.35	12.58	4.30	3.68	2.41	9.23	39.61	74.54	102.90
Runoff (mm)	54	95	107	36	15	5	4	3	11	48	90	125
Rainfall (mm)	69	146	114	83	17	47	42	61	113	157	91	170

Statistics of monthly data for previous record (Oct 1958 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	36.240	28.200	20.870	14.440	9.430	5.268	4.830	6.025	7.973	19.650	28.610	36.330
	Low	6.657	3.245	7.449	3.888	2.073	1.329	0.793	0.423	0.859	1.043	3.654	13.200
	(year)	1963	1959	1984	1974	1976	1984	1984	1976	1959	1978	1978	1963
	High	62.100	54.760	52.140	32.800	37.000	16.630	23.390	19.130	47.670	77.360	58.500	73.670
	(year)	1984	1970	1981	1966	1983	1972	1968	1985	1974	1960	1963	1965
Runoff	Avg	117	83	68	45	31	17	16	20	25	64	90	118
	Low	22	10	24	12	7	4	3	1	3	3	11	43
	High	201	160	169	103	120	52	76	62	150	251	184	239
Rainfall	Avg	132	85	93	70	73	68	73	89	92	117	128	137
	Low	28	3	18	8	28	10	23	24	14	14	53	41
	High	242	173	183	145	146	164	156	160	247	278	239	271

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	15.540		18.120		86
Lowest yearly mean			11.310	1964	
Highest yearly mean			27.590	1960	
Lowest monthly mean	0.899	Aug	0.423	Aug 1976	
Highest monthly mean	38.420	Dec	77.360	Oct 1960	
Lowest daily mean	0.592	10 Sep	0.200	28 Aug 1976	
Highest daily mean	118.500	25 Feb	363.800	4 Dec 1960	
Peak	167.000	25 Feb	644.900	4 Dec 1960	
10% exceedance	45.590		47.240		97
50% exceedance	6.306		9.306		68
95% exceedance	0.724		1.240		58
Annual total (million cu m)	490.10		571.80		86
Annual runoff (mm)	593		692		86
Annual rainfall (mm)	1110		1157		96
(1941-70 rainfall average (mm)			1193)		

Factors affecting flow regime

- Abstraction for public water supplies.

Station and catchment description

Velocity-area station, main channel 34m wide, cableway span 54.9m. Rock step downstream forms control. Bypassing begins at about 3.7m on right bank, but a good rating accommodates this. Significant modification to flows owing to PWS abstraction. Some naturalised flow data available. Large rural catchment - drains Dartmoor (granite) in south and Devonian shales and sandstones of Exmoor in north. Central area underlain mainly by Culm shales and sandstones (Carboniferous). Agriculture conditioned by grade 3 and 4 soils.

052005 Tone at Bishops Hull 1989

Measuring authority: NRA W
First year: 1961

Grid reference 31 (ST) 206 250
Level stn (m OD) 16.20

Catchment area (sq km): 202.0
Max alt (m OD) 409

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.255	1.565	5.979	3.572	2.330	1.087	0.754	0.438	0.501	0.546	1.362	0.944
2	1.252	1.547	10.030	3.369	2.107	1.019	0.692	0.514	0.436	0.558	2.127	0.930
3	1.220	1.494	6.670	2.631	2.030	1.017	0.644	0.486	0.473	0.531	1.834	0.926
4	1.357	1.500	5.649	2.454	1.975	1.017	0.592	0.481	0.468	0.526	2.313	0.909
5	1.966	1.484	5.005	2.492	1.878	0.995	0.646	0.458	0.514	0.557	2.542	0.902
6	2.010	1.412	4.638	2.527	1.794	1.173	1.163	0.471	0.477	0.512	1.800	0.894
7	1.553	1.383	3.981	2.420	1.730	1.044	2.988	0.500	0.440	0.496	1.665	0.881
8	1.499	1.359	3.767	2.212	1.614	1.025	1.337	0.457	0.444	0.462	8.232	0.884
9	1.546	1.418	4.510	2.605	1.556	0.979	0.956	0.563	0.431	0.454	5.211	0.893
10	1.513	1.412	4.089	3.323	1.497	0.991	0.875	0.646	0.436	0.459	5.730	0.886
11	1.526	1.339	3.789	5.195	1.499	0.970	0.820	0.493	0.646	0.479	4.300	0.933
12	3.564	1.349	3.981	3.901	1.534	0.920	0.782	0.466	0.677	0.528	3.322	1.306
13	2.271	1.613	3.786	3.196	1.401	0.895	0.739	0.472	0.707	0.520	2.824	4.130
14	2.907	1.435	18.720	2.744	1.355	0.848	0.725	0.825	1.651	0.529	2.509	12.040
15	2.289	1.478	7.987	3.559	1.355	0.836	0.704	0.771	1.085	0.521	2.259	5.704
16	2.075	1.419	9.860	6.286	1.309	0.818	0.671	0.541	1.254	0.514	2.021	11.900
17	2.010	3.108	7.159	5.690	1.328	0.772	0.652	0.501	1.027	0.494	1.863	11.720
18	1.919	5.874	6.395	3.852	1.319	0.757	0.636	0.484	0.711	0.495	1.784	28.180
19	1.882	4.435	6.043	3.506	1.263	0.716	0.615	0.486	0.676	0.612	1.612	11.180
20	1.903	3.749	9.045	3.257	1.222	0.710	0.595	0.477	0.576	1.523	1.509	34.660
21	2.833	3.275	6.541	3.077	1.185	0.685	0.604	0.466	0.570	1.713	1.432	11.780
22	2.265	3.750	5.442	2.900	1.259	0.692	0.599	0.480	0.549	2.067	1.344	7.530
23	2.130	3.480	5.312	2.756	1.195	0.680	0.572	0.456	0.588	0.943	1.309	7.210
24	1.991	15.800	5.937	2.734	1.246	0.683	0.565	0.454	0.562	0.713	1.224	18.790
25	1.923	32.840	4.815	2.522	1.126	0.650	0.546	0.496	0.569	0.621	1.187	9.045
26	1.954	11.040	4.598	2.469	1.112	0.734	0.549	0.530	0.559	0.803	1.141	6.537
27	1.805	7.966	4.499	2.431	1.069	0.765	0.511	0.498	0.551	0.828	1.123	5.434
28	1.770	7.780	4.144	2.228	1.047	0.766	0.531	0.482	0.538	2.445	1.040	4.598
29	1.665		3.666	2.285	1.017	0.773	0.568	0.506	0.534	3.376	1.005	4.008
30	1.646		3.730	2.267	0.974	0.729	0.587	0.489	0.535	2.623	0.973	3.563
31	1.585		2.993		0.994		0.548	0.466		1.810		3.264
Average	1.906	4.511	5.895	3.149	1.430	0.858	0.767	0.511	0.639	0.944	2.287	6.857
Lowest	1.220	1.339	2.993	2.212	0.974	0.650	0.511	0.438	0.431	0.454	0.973	0.881
Highest	3.564	32.840	18.720	6.286	2.330	1.173	2.988	0.825	1.651	3.376	8.232	34.660
Peak flow	5.38	66.13	43.45	9.11	8.16	1.36	4.15	1.82	2.76	6.50	15.03	67.42
Day of peak	12	25	14	11	22	6	7	14	14	29	8	20
Monthly total (million cu m)	5.10	10.91	15.79	8.16	3.83	2.22	2.05	1.37	1.66	2.53	5.93	18.37
Runoff (mm)	25	54	78	40	19	11	10	7	8	13	29	91
Rainfall (mm)	48	126	102	84	14	27	54	48	73	131	76	172

Statistics of monthly data for previous record (Feb 1961 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	6.154	6.037	4.355	3.059	2.136	1.410	1.196	0.964	1.232	2.086	3.334	5.053
	Low	1.246	1.746	1.552	1.176	0.734	0.456	0.326	0.266	0.501	0.580	0.651	1.821
	(year)	1976	1965	1962	1976	1976	1976	1976	1976	1964	1978	1978	1975
	High	14.560	14.000	9.259	6.655	6.562	2.770	5.628	1.685	4.892	9.873	7.611	11.280
	(year)	1984	1978	1981	1966	1983	1972	1968	1965	1974	1976	1982	1965
Runoff	Avg	82	73	58	39	28	18	16	13	16	28	43	67
	Low	17	21	21	15	10	6	4	4	6	8	8	24
	High	193	168	123	85	87	36	75	22	63	131	98	150
Rainfall	Avg	114	80	85	61	68	59	59	70	81	92	97	111
	Low	25	6	5	6	25	8	16	19	8	8	31	34
	High	250	170	170	150	137	147	144	126	202	249	192	205

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	2.471		3.072		80
Lowest yearly mean			1.600	1964	
Highest yearly mean			4.084	1974	
Lowest monthly mean	0.511	Aug	0.266	Aug 1976	
Highest monthly mean	6.857	Dec	14.560	Jan 1984	
Lowest daily mean	0.431	9 Sep	0.179	22 Aug 1976	
Highest daily mean	34.660	20 Dec	84.200	23 Feb 1978	
Peak	67.420	20 Dec	112.700	11 Jul 1968	
10% exceedance	5.499		6.636		83
50% exceedance	1.333		1.813		74
95% exceedance	0.473		0.651		73
Annual total (million cu m)	77.93		96.94		80
Annual runoff (mm)	386		480		80
Annual rainfall (mm)	955		977		98
[1941-70 rainfall average (mm)			995]		

Factors affecting flow regime

- Reservoir(s) in catchment
- Abstraction for public water supplies.

Station and catchment description

Crump profile weir (breadth 12.2m) with crest tapping (not operational). Full range station. Pre-March 1968: velocity-area station; flows inaccurate below 1.42 cumecs. Clatworthy and smaller Luxhay Reservoir in headwaters. Compensation flow maintains low flows. Reservoirs not large enough to influence fairly rapid response to rainfall. Minor surface water abstractions for PWS. Catchment geology - predominantly sandstones and marls. Land use - rural.

053018 Avon at Bathford 1989

Measuring authority: NRA-W
First year: 1969

Grid reference: 31 (ST) 786 671
Level stn. (m OD): 18.00

Catchment area (sq km): 1552.0
Max alt. (m OD): 305

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	6.941	12.910	34.760	15.920	11.550	6 100	4 400	2.900	2 700	2 418	10 180	7 038
2	6 994	11 870	38.130	16.630	11.280	5.600	4.200	2.800	2.600	2 339	14 370	6 895
3	6.709	11 580	35.650	15.180	10 830	5 500	4 000	2 800	2 700	2 438	16.710	6 791
4	6.713	11 310	28 390	14.570	10 650	5 300	3.900	2.800	2.700	2 254	14 240	6 801
5	7.804	10.910	25 260	21 420	10 230	5.400	3.900	2 800	2.600	2 914	13.420	6 552
6	9.786	10 350	24 100	44 230	9 923	5.900	4.500	2 800	2.600	3 057	11.080	6 616
7	8.160	9 821	24 220	26 130	9.551	6.100	9 000	2 900	2.600	2 782	10.140	6 452
8	7.632	9 272	21 910	20 050	9 344	5 600	6 400	2 800	2.600	2 754	24 910	6 176
9	7.486	8 990	47 370	18 780	9.175	5.300	4.700	2 800	2.600	2 694	27.640	6 138
10	7.273	9.363	31 450	36 930	8 966	5.300	4 300	3 200	2.600	2 647	26.960	6 024
11	7 223	8 507	27 240	45 510	8 853	5.100	4 100	3 300	2 600	2 773	23.580	6 232
12	19 510	8.148	24 070	38 940	9 045	5 000	3 900	3 300	2.900	2 963	18.190	8 825
13	15.850	10 330	22 370	36 940	8 371	4 900	3 800	3.300	3 300	2 971	15.780	12 290
14	23.670	9 278	61 920	25 400	7.762	4 700	3 700	4 300	3.900	3 013	14 260	47 540
15	17 490	9 188	68 890	22 190	7 433	4.700	3 700	4 800	4 000	3 290	13.130	40 160
16	14.170	8 538	54 800	22 760	7 008	4 500	3 400	3 400	5 412	3 056	12 240	72 060
17	12 620	14 330	38 870	23 620	6 805	4 300	3 300	3 200	5 454	3 001	11 710	65 060
18	11 320	45 330	29 720	19 800	6 440	4 200	3 300	2.900	5 034	3 171	11 100	85 350
19	10.720	45 540	28 480	17 610	6 064	4 200	3 300	2 800	3 889	3 552	10 580	108 500
20	10 540	37.100	39 540	16 520	5 963	4 100	3 200	2 800	3 503	6 224	9 875	131 800
21	20 710	25.310	41 580	15 260	5 779	4 000	2 900	2.800	3 159	8 604	9 304	206 400
22	17 630	26.040	29 300	14 610	6 633	4 000	2 900	2 700	2 985	8 575	9 025	91 320
23	14 340	23 090	26 610	14 090	11 420	4 000	2 900	2 700	2 927	7 190	8 690	57 490
24	13 220	49.870	50.780	14 030	8 501	4 000	2 900	2.800	2 825	5.539	8 564	74 980
25	11 810	77.840	31 470	13 560	7 242	3 900	2 800	2 800	2 751	4 835	8 191	109 400
26	11 270	110.000	25 800	13 240	6 221	4 000	2 800	2 900	3 028	4 944	7 979	62 150
27	10 510	82 590	23 270	13 860	5 652	4 400	2 800	2 800	2 926	5 085	7 974	41 290
28	22 230	45 790	21 000	12 660	5 322	4 200	2 800	2 700	2 646	8 465	7 676	33 820
29	21 850		19 280	12 410	5 111	4 800	2 800	2 700	2 655	13 940	7 308	29 030
30	15 940		17 830	12 010	5 090	4 400	2 900	2 700	2 535	14 320	7 064	25 600
31	14 030		16 860		4 781		2 900	2 700		12 630		23 010
Average	12 650	26 540	32 610	21 160	7 968	4 783	3 755	3 000	3 158	4 982	13 060	45 090
Lowest	6 709	8 148	16.860	12 010	4 781	3 900	2 800	2 700	2 535	2 254	7 064	6 024
Highest	23 670	110 000	68 890	45 510	11 550	6 100	9 000	4 800	5 454	14 320	27 640	206 400
Peak flow	34 19	130 60	124 40	55 67	14 01	6 70	12 42	5.93	5 70	15 60	32 70	233 90
Day of peak	28	26	14	11	23	1	7	15	16	29	8	21
Monthly total (million cu m)	33 88	64 21	87 34	54 85	21 34	12 40	10 06	8 03	8 18	13 34	33 86	120 80
Runoff (mm)	22	41	56	35	14	8	6	5	5	9	22	78
Rainfall (mm)	49	90	88	75	28	37	37	40	49	98	56	155

Statistics of monthly data for previous record (Dec 1969 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean	Avg	33 090	31 390	25 680	16 950	12 450	9 675	5 879	5 799	6 719	11 440	19 370	28 360
flows	Low	9 227	11 370	10 080	7 719	5 048	3 897	2 410	1 715	3 320	3 115	4 406	12 110
	(year)	1976	1976	1973	1976	1976	1976	1976	1976	1987	1978	1978	1975
	High	51 270	64 730	54 230	26 520	31 020	30 110	9 956	13 830	25 450	28 180	39 810	48 270
	(year)	1984	1977	1981	1987	1983	1971	1973	1985	1974	1976	1986	1976
Runoff	Avg	57	49	44	28	21	16	10	10	11	20	32	49
	Low	16	18	17	13	9	7	4	3	6	5	7	21
	High	88	101	94	44	54	50	17	24	43	49	66	83
Rainfall	Avg	88	58	78	48	62	66	55	67	76	74	81	88
(1970-	Low	18	7	17	2	29	5	25	18	15	6	35	20
1988)	High	148	143	163	110	142	151	115	140	178	149	178	144

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	14 850		17 170		86
Lowest yearly mean			10 360	1973	
Highest yearly mean			22 160	1977	
Lowest monthly mean	3.000	Aug	1 715	Aug 1976	
Highest monthly mean	45 090	Dec	64 730	Feb 1977	
Lowest daily mean	2 254	4 Oct	1 093	29 Aug 1976	
Highest daily mean	206 400	21 Dec	253 600	28 Dec 1979	
Peak	233 900	21 Dec	300 500	28 Dec 1979	
10% exceedance	36 030		36 500		99
50% exceedance	7 704		11 270		68
95% exceedance	2 669		3 354		80
Annual total (million cu m)	468 30		541 80		86
Annual runoff (mm)	302		349		86
Annual rainfall (mm)	802		841		95
[1941-70 rainfall average (mm)			840]		

Factors affecting flow regime

- Flow influenced by groundwater abstraction and/or recharge
- Abstraction for public water supplies.
- Augmentation from surface water and/or groundwater.
- Augmentation from effluent returns.

Station and catchment description
Velocity-area station with cableway. (Replacement station for Bath St James) Upstream of the city of Bath Situated immediately downstream of confluence with Bybrook. Section by railway bridge; area widely inundated in flood conditions, but all flows contained through bridge Flows below 5 cumecs are inaccurate Flows augmented by groundwater scheme in catchment Mixed geology - predominantly clays and limestone with eastern tributaries rising from Chalk. Land use - mainly rural, some urbanisation.

054001 Severn at Bewdley 1989

Measuring authority: NRA-ST
First year: 1921
Grid reference: 32 (SO) 782 762
Level stn (m OD): 17.00
Catchment area (sq km): 4325.0
Max alt (m OD): 827

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	39 010	32 010	159 500	48 440	27 240	12 140	19 530	12 380	13 350	8 751	59 570	16 460
2	35 630	30 480	195 500	77 270	24 740	11 630	18 290	12 010	13 040	8 394	41 550	14 780
3	33 670	28 760	191 800	107 200	24 710	14 180	17 620	11 220	10 330	8 692	37 280	14 090
4	30 610	26 680	174 200	74 570	24 990	13 230	12 350	10 480	9 901	8 358	42 910	14 410
5	31 830	49 800	141 100	90 180	24 040	13 120	10 180	10 100	9 492	8 558	53 280	13 790
6	50 600	84 420	116 000	163 800	21 300	12 500	8 534	9 622	9 262	8 396	71 130	13 520
7	73 690	49 860	101 400	193 100	21 020	13 850	18 050	9 776	10 240	8 547	62 830	13 600
8	48 310	43 180	85 680	169 500	22 700	13 630	29 520	9 573	10 200	8 394	58 370	13 570
9	41 770	39 100	78 150	138 800	21 270	13 800	24 650	10 760	10 220	9 007	102 900	13 010
10	38 760	34 320	145 400	118 700	19 610	12 980	18 480	11 020	9 766	8 861	121 200	12 830
11	37 440	32 290	133 100	102 700	19 100	12 330	14 200	11 960	8 960	8 984	135 800	12 980
12	35 190	33 250	101 300	115 400	19 380	12 570	12 140	11 820	10 210	8 886	163 500	13 250
13	50.630	41 980	90 110	123 400	19 620	10 620	9 789	11 640	10 180	9 088	120 900	21 170
14	52 160	48 440	130 100	134 900	25 980	10 200	8 642	10 980	10 140	8 490	80 090	93 680
15	93 630	49 900	187 700	98 020	23 690	9 584	10 320	12 500	9 801	9 074	59 910	203 300
16	67 620	60 390	209 900	75 020	20 910	9 499	9 221	13 110	9 793	8 428	49 110	253 700
17	56 730	57 610	155 200	64 240	19 630	8 966	9 877	13 730	13 880	8 658	42 360	269 800
18	56 210	52 680	109 600	55 960	18 520	10 210	10 590	10 950	15 810	8 669	37 000	292 200
19	48 450	183 500	85 730	49 850	18 230	10 420	10 600	10 820	15 390	9 392	33 620	335 200
20	43 360	223 900	96 220	45 450	15 140	9 938	10 110	10 400	11 210	13 240	30 560	307 100
21	40 750	180 700	108 400	42 390	13 590	9 823	9 896	9 509	10 090	16 110	27 640	287 700
22	56 860	120 200	120 000	37 490	15 090	10 030	9 145	8 173	8 751	48 210	25 650	298 900
23	58 490	94 390	126 800	38 000	15 660	8 853	8 932	10 170	10 220	36 990	23 490	326 800
24	47 160	117 900	131 600	37 970	20 230	8 686	10 490	10 860	10 190	33 400	22 290	305 100
25	50 090	197 900	204 700	35 880	16 600	9 398	10 650	11 390	10 110	23 780	20 240	288 200
26	42 910	168 100	189 700	33 930	14 000	10 430	10 710	10 840	10 100	23 000	19 690	284 200
27	41 890	143 600	135 200	33 460	13 330	11 880	9 584	12 200	9 562	34 720	17 690	250 000
28	42 090	163 600	106 000	33 700	12 200	13 110	9 747	11 700	9 539	32 190	17 150	179 100
29	39 550		82 420	30 510	14 690	14 440	11 290	12 090	9 769	39 230	16 240	134 500
30	37 430		63 120	28 540	12 150	16 240	13 140	11 160	8 866	117 900	16 330	100 300
31	34 260		54 520		12 000		13 150	11 440		101 500		77 940
Average	46 990	85 320	129 400	79 950	19 080	11 610	12 880	11 110	10 610	22 130	53 680	144 400
Lowest	30 610	26 680	54 520	28 540	12 000	8 686	8 534	8 173	8 751	8 358	16 240	12 830
Highest	93 630	223 900	209 900	193 100	27 240	16 240	29 520	13 730	15 810	117 900	163 500	335 200
Peak flow	103 50	229 70	220 00	199 10	29 42	21 40	32 31	15 35	17 21	130 80	169 50	342 30
Day of peak	15	20	16	7	1	30	8	17	19	30	12	19
Monthly total (million cu m)	125 90	206 40	346 50	207 20	51 09	30 09	34 51	29 75	27 51	59 26	139 10	386 70
Runoff (mm)	29	48	80	48	12	7	8	7	6	14	32	89
Rainfall (mm)	46	102	94	86	26	47	46	48	37	99	72	165

Statistics of monthly data for previous record (Apr 1921 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	115 300	101 600	73 870	52 870	38 870	29 720	23 040	28 330	36 860	54 830	90 130	100 500
	Low	22 100	21 200	23 200	15 880	10 230	9 804	9 587	7 461	7 668	10 490	21 730	17 850
	(year)	1963	1934	1943	1938	1938	1976	1976	1976	1949	1947	1942	1933
	High	250 600	232 300	261 900	112 400	131 600	117 400	91 240	92 360	126 700	140 700	238 300	297 400
	(year)	1939	1946	1947	1947	1969	1931	1968	1927	1946	1967	1940	1965
Runoff	Avg	71	57	46	32	24	18	14	18	22	34	54	62
	Low	14	12	14	10	6	6	6	5	5	7	13	11
	High	155	130	162	67	81	70	57	57	76	87	143	184
Rainfall	Avg	93	67	64	60	70	61	72	78	78	85	97	94
	Low	23	8	3	5	18	5	10	13	5	13	13	10
	High	226	170	175	128	186	136	193	160	209	174	244	294

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	52 130		61 970		84
Lowest yearly mean			36 460	1964	
Highest yearly mean			94 740	1960	
Lowest monthly mean	10 610	Sep	7 461	Aug 1976	
Highest monthly mean	144 400	Dec	297 400	Dec 1965	
Lowest daily mean	8 173	22 Aug	5 990	4 Sep 1976	
Highest daily mean	335 200	19 Dec	637 100	21 Mar 1947	
Peak	342 300	19 Dec			
10% exceedance	138 700		147 400		94
50% exceedance	21 980		37 740		58
95% exceedance	8 886		11 370		78
Annual total (million cu m)	1644 00		1956 00		84
Annual runoff (mm)	380		452		84
Annual rainfall (mm)	868		919		94
[1941-70 rainfall average (mm)			936]		

Factors affecting flow regime

- Reservoir(s) in catchment.
- Flow influenced by groundwater abstraction and/or recharge.
- Abstraction for public water supplies.
- Flow reduced by industrial and/or agricultural abstractions
- Augmentation from surface water and/or groundwater
- Augmentation from effluent returns

Station and catchment description

Velocity-area station with rock control. Stage monitoring site relocated in 1950 and 1970; lowest flows not reliable in earlier record. US gauge since 1988. Sig. exports for PWS and CEGB, minimum flow maintained by Clywedog releases. Naturalised flow series accommodates major usages. Diverse catchment; wet western 50% from impermeable Palaeozoic rocks and river gravels; drier northern 50% from Drift covered Carboniferous to Liassic sandstones and marls. Moorland, forestry, mixed farming

054002 Avon at Evesham 1989

Measuring authority: NRA-ST
First year: 1936

Grid reference. 42 (SP) 040 438
Level stn (m OD): 19.50

Catchment area (sq km): 2210.0
Max alt. (m OD): 320

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	7.160	10.630	18.120	9.706	14.210	6.217	7.129	5.801	5.032	5.059	6.072	5.836
2	6.903	9.548	20.980	37.350	12.770	6.691	6.022	5.457	4.833	5.154	6.998	5.823
3	6.811	8.778	25.940	46.660	11.490	6.341	5.761	5.135	4.762	5.121	7.985	5.615
4	7.176	8.673	20.370	25.800	10.770	6.065	5.674	4.937	4.748	5.111	7.328	5.604
5	7.067	10.180	16.530	51.950	10.210	6.129	5.471	4.760	4.799	5.500	6.522	5.745
6	7.780	9.413	17.010	104.000	9.490	10.440	5.465	4.780	4.798	5.923	6.320	5.733
7	7.482	8.697	22.270	102.500	9.260	19.230	17.260	4.714	4.845	5.301	6.229	5.790
8	7.106	8.308	15.730	69.070	9.201	13.630	22.670	4.721	4.927	5.616	32.030	5.920
9	7.261	7.829	14.910	34.770	9.116	10.870	13.230	5.499	5.102	5.595	43.670	5.902
10	7.164	7.831	13.650	43.850	8.763	8.060	8.430	18.700	4.896	5.372	36.040	5.764
11	7.102	7.807	11.700	43.830	9.471	7.024	7.012	12.740	5.742	5.328	19.570	5.936
12	10.910	7.514	11.340	49.750	10.820	6.581	6.372	8.025	5.345	5.342	12.670	7.714
13	15.920	7.538	12.320	41.190	10.300	6.296	5.983	6.300	5.404	5.408	10.280	35.430
14	21.700	7.507	17.590	31.360	8.690	6.201	5.732	8.167	5.089	5.293	8.604	105.700
15	24.100	7.695	37.100	22.430	8.216	5.916	5.655	9.517	5.165	5.027	7.822	111.500
16	16.370	7.860	41.010	18.850	7.980	5.849	5.481	7.029	7.629	5.035	7.425	119.200
17	13.920	9.259	52.180	20.140	7.752	5.757	5.366	5.978	23.850	4.991	7.147	116.300
18	11.320	14.440	34.030	18.480	7.499	5.657	5.221	5.431	16.460	5.130	7.317	103.000
19	9.805	15.720	22.860	15.990	7.485	5.607	5.112	5.099	9.789	5.481	6.780	126.700
20	9.282	13.780	23.260	14.430	6.924	5.673	5.338	4.997	6.437	8.233	6.491	107.900
21	11.070	12.200	26.160	13.310	6.589	5.411	4.916	4.954	5.575	14.450	6.574	80.230
22	12.890	11.600	20.910	12.320	6.467	5.258	4.955	4.927	5.159	15.700	6.303	53.220
23	12.510	10.920	16.840	12.440	6.887	5.321	4.581	4.841	5.124	12.240	6.082	35.570
24	11.100	32.290	20.550	13.870	10.610	5.205	4.495	4.774	4.997	7.493	6.080	41.980
25	10.100	67.950	17.120	17.080	11.180	5.054	4.567	5.367	5.015	6.106	5.962	57.710
26	8.822	51.660	13.880	23.980	7.351	5.587	4.637	6.402	5.095	6.237	5.866	38.130
27	8.193	37.380	12.580	24.200	6.652	9.437	4.636	5.870	5.107	5.902	5.874	28.010
28	14.120	24.730	11.730	21.640	6.270	9.315	4.621	5.501	5.074	6.799	5.875	22.280
29	20.310		10.550	18.750	6.179	9.799	4.931	5.330	4.922	7.756	5.626	18.890
30	15.010		10.240	16.310	6.097	8.199	6.021	5.419	4.837	7.727	5.850	16.500
31	12.100		9.741		5.987		6.500	5.400		6.714		14.770
Average	11.240	15.630	19.970	32.530	8.732	7.427	6.750	6.341	6.350	6.650	10.440	42.080
Lowest	6.811	7.507	9.741	9.706	5.987	5.054	4.495	4.714	4.748	4.991	5.626	5.604
Highest	24.100	67.950	52.180	104.000	14.210	19.230	22.670	18.700	23.850	15.700	43.670	126.700
Peak flow	26.45	74.57	57.46	115.60	15.57	22.30	27.83	24.10	29.40	17.91	56.01	134.60
Day of peak	15	25	17	7	1	7	7	10	17	22	8	19
Monthly total (million cu m)	30.12	37.82	53.50	84.32	23.39	19.25	18.08	16.98	16.46	17.81	27.07	112.70
Runoff (mm)	14	17	24	38	11	9	8	8	7	8	12	51
Rainfall (mm)	36	46	53	88	19	58	43	57	50	58	46	112

Statistics of monthly data for previous record (Dec 1936 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	28.580	27.700	22.750	15.060	11.570	8.772	6.597	6.790	6.744	9.449	17.570	22.460
	Low	5.143	4.868	2.261	3.237	2.220	1.935	2.256	2.042	1.968	2.485	2.681	3.549
	(year)	1950	1944	1944	1938	1944	1944	1976	1943	1959	1959	1943	1943
	High	73.520	77.930	75.600	36.100	37.690	27.380	42.220	16.100	24.200	45.420	55.910	65.160
	(year)	1939	1977	1947	1987	1983	1977	1968	1969	1960	1960	1960	1965
Runoff	Avg	35	31	28	18	14	10	8	8	8	11	21	27
	Low	6	6	3	4	3	2	3	2	2	3	3	4
	High	89	85	92	42	46	37	51	20	28	55	66	79
Rainfall (1937 1988)	Avg	60	43	49	43	56	54	57	71	54	58	64	60
	Low	13	3	5	5	15	10	8	5	3	6	8	15
	High	127	122	140	94	130	121	122	130	127	150	163	121

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	14.510		15.280		95
Lowest yearly mean			6.895	1944	
Highest yearly mean			25.020	1960	
Lowest monthly mean	6.341	Aug	1.935	Jun 1944	
Highest monthly mean	42.080	Dec	77.930	Feb 1977	
Lowest daily mean	4.495	24 Jul	1.274	9 Oct 1959	
Highest daily mean	126.700	19 Dec	277.100	11 Jul 1968	
Peak	134.600	19 Dec	371.000	11 Jul 1968	
10% exceedance	31.370		34.230		92
50% exceedance	7.626		8.294		92
95% exceedance	4.879		2.792		175
Annual total (million cu m)	457.60		482.20		95
Annual runoff (mm)	207		218		95
Annual rainfall (mm)	666		669		100
[1941-70 rainfall average (mm)			672]		

Factors affecting flow regime

- Reservoir(s) in catchment.
- Flow influenced by groundwater abstraction and/or recharge.
- Abstraction for public water supplies.
- Flow reduced by industrial and/or agricultural abstractions.
- Augmentation from effluent returns.

Station and catchment description

Velocity-area station. Recording site, control and gauging site are widely separated, recording at a site where all flows contained. Gauge site can measure out-of-bank flows. Extensive modification to flow regime from abstractions and returns. Large catchment of low relief, draining argillaceous rocks almost exclusively. Contains many large towns, but chief land use is agriculture.

055026 Wye at Ddol Farm 1989

Measuring authority: NRA-WEL
First year 1937

Grid reference 22 (SN) 976 676
Level stn (m OD) 192 80

Catchment area (sq km) 174 0
Max alt (m OD) 752

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3 501	2 780	39 480	3 771	1 853	0 532	3 419	0 433	2 280	1 173	10 100	1 124
2	3 111	2 588	35 380	5 032	1 594	0 523	1 882	0 351	1 714	1 046	9 757	1 054
3	2 900	2 418	19 020	3 213	1 450	0 507	1 314	0 325	1 374	0 944	12 990	0 982
4	3 416	15 160	13 910	2 852	1 339	0 469	0 958	0 298	1 142	0 872	24 230	0 928
5	16 720	8 461	10 190	4 783	1 237	0 471	0 741	0 266	0 985	0 919	25 400	0 884
6	8 032	5 370	10 270	7 922	1 114	0 561	0 985	0 248	0 818	7 839	13 500	0 750
7	5.912	4 273	6 906	14 430	1 022	0 508	1 743	0 225	0 715	4 468	9 727	0 700
8	5 120	3 731	7 609	10 170	0 956	0 733	1 413	0 214	0 648	3.164	39 030	0 657
9	5.266	3 888	16 820	7 574	0 923	0 818	1 074	0 231	0 625	2 412	26 040	0 625
10	4 797	3 833	12 570	7 069	0 861	0 599	0 837	0 643	0 663	2 083	36 020	0 591
11	4 933	5 702	8 097	13 670	0 943	0 523	0 676	0 661	0 659	2 472	38 210	0 594
12	8 815	5 213	11 980	10 470	3 017	0 495	0 593	0 628	0 609	2 603	17 360	0 998
13	13 960	11 230	11 810	9 547	2 159	0 458	0 538	0 692	0 687	6 040	10 730	7 038
14	14 010	6 250	35 860	7 112	1 544	0 409	0 476	1 366	1 793	4 055	7 622	26 900
15	9 276	13 130	18 570	5 739	1 336	0 367	0 428	1 856	4 043	3 185	5 864	14 780
16	8 661	7 013	10 670	4 717	1 343	0 347	0 383	1 333	6 601	2 759	4 677	59 000
17	8 312	15 390	7 489	4 047	1 195	0 314	0 354	1 193	6 198	2 288	3 994	56 770
18	5 981	45 860	11 960	3 550	1 235	0 298	0 332	0 895	4 074	2 033	3 484	20 370
19	5 055	19 950	13 530	3 068	1 089	0 271	0 310	0 701	3 346	3 267	3 082	14 160
20	4 750	10 860	11 830	2 759	0 968	0 273	0 286	0 607	2 510	17 190	2 807	48 850
21	7 084	7 915	15 560	2 483	0 881	0 248	0 275	0 930	2 222	13 390	2 534	86 250
22	4 955	6 871	12 640	2 187	0 837	0 242	0 260	0 718	3 063	12 860	2 296	23 650
23	6 052	6 947	28 870	2 014	0 802	0 235	0 238	0 630	4 556	8 190	2 106	20 720
24	5 285	12 540	39.510	1 841	0 849	0 223	0 230	0 549	3 322	6 339	1 955	65 670
25	4 462	8.741	14 550	1 684	0 845	0 217	0 221	0 838	2 577	15 750	1 756	31 670
26	4 753	8.743	9 180	1 868	0 745	0 266	0 228	1 550	2 196	11 710	1 589	15 420
27	4 025	17 050	6 806	1.938	0 657	0 541	0 232	1 534	1 921	9 238	1 527	9 846
28	4 577	22 670	5 457	1 606	0 620	2 509	0 231	1 055	1 582	199 400	1 444	6 985
29	3 667		4 472	2 521	0 582	3 495	0 266	4 719	1 402	153 600	1 310	5 397
30	3 284		3 898	1 806	0 552	2 137	0 588	6 250	1 227	30.830	1 192	4 372
31	3 016		3 357		0 532		0 541	3 558		14 430		3 780
Average	6 248	10 160	14 780	5 048	1 132	0 653	0 711	1 145	2 185	17 630	10 740	17 150
Lowest	2 900	2 418	3 357	1 606	0 532	0 217	0 721	0 214	0 609	0 872	1 192	0 591
Highest	16 720	45 860	39 510	14 430	3 017	3 495	3 419	6 250	6 601	199 400	39 030	86 250
Peak flow	46 20	81 84	82.97	18 06	4 27	7 43	5 82	8 65	9 28	767 20	73 34	157 40
Day of peak	5	18	24	11	12	28	1	17	17	28	10	24
Monthly total (million cu m)	16 73	24 59	39 59	13 08	3 03	1 69	1 90	3 07	5 66	47 22	27 85	45 92
Runoff (mm)	96	141	228	75	17	10	11	18	33	271	160	264
Rainfall (mm)	115	224	211	108	36	76	46	92	80	261	134	244

Statistics of monthly data for previous record (Oct 1937 to Dec 1988—incomplete or missing months total 0.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	10 650	8 611	6 626	4 894	3 227	2 717	2 739	3 798	5 308	7 215	10 190	10 890
	Low	1 972	1 476	1 373	1 014	0 485	0 497	0 316	0 177	0 291	0 683	2 011	1 947
	(year)	1940	1947	1943	1974	1980	1975	1984	1976	1959	1972	1945	1963
	High	20 990	18 000	19 610	12 460	8 773	8 867	8 455	10 370	16 830	18 840	22 030	23 930
	(year)	1948	1946	1981	1972	1979	1985	1939	1957	1946	1981	1939	1965
Runoff	Avg	164	121	102	73	50	40	42	58	79	111	152	168
	Low	30	21	21	15	7	7	5	3	4	11	30	30
	High	323	250	302	186	135	132	130	160	251	290	328	368
Rainfall	Avg	182	131	122	96	100	92	105	124	142	153	184	192
	Low	41	10	25	11	25	21	14	13	13	28	28	28
	High	386	310	310	206	204	202	267	251	325	329	356	452

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	7 304		6 396		114
Lowest yearly mean			4 304	1976	
Highest yearly mean			8 529	1954	
Lowest monthly mean	0 653	Jun	0 177	Aug 1976	
Highest monthly mean	17 630	Oct	23 930	Dec 1965	
Lowest daily mean	0 214	8 Aug	0 083	15 Aug 1983	
Highest daily mean	199 400	28 Oct	147 200	3 Dec 1960	
Peak	767 200	28 Oct	252 200	5 Aug 1973	
10% exceedance	15 430		15 480		100
50% exceedance	2 582		3.534		73
95% exceedance	0 269		0 540		50
Annual total (million cu m)	230 30		201 80		114
Annual runoff (mm)	1324		1160		114
Annual rainfall (mm)	1627		1623		100
[1941 70 rainfall average (mm)			1618]		

Factors affecting flow regime

- Abstraction for public water supplies

Station and catchment description

Initially, gauged nearby at Rhayader (55005, 1937-69); resited as velocity-area station with a rock bar as control Informal Flat V installed 1972 Bankfull width - 30m. Cableway span 54m All but exceptional floods contained. Lowest g/s on Wye unaffected by large water supply res (flows from the Elan valley complex enter just d/s) Wet, upland catchment draining impermeable, metamorphosed Silurian sediments. High relief, headwaters reach over 600m, and feature steep sided and high gradient streams. Moorland and forestry

056001 Usk at Chain Bridge 1989

Measuring authority: NRA-WEL
First year: 1957
Grid reference: 32 (SO) 345 056
Level stn. (m OD): 22.60
Catchment area (sq km): 911.7
Max alt. (m OD): 886

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	13 420	17.320	118.700	24 450	13 630	5 749	6 412	3.015	3.126	4 074	37.930	9.781
2	12.740	16.120	139.100	34.740	12.890	5.836	6.539	2.892	2 985	4 060	51.070	9.383
3	12.320	15 400	93 640	24.820	12.350	5.683	5.908	2.837	2 941	4.142	40 990	9.058
4	13.980	20 300	70 200	22 480	11.800	5.547	5.572	2.803	2.946	4 022	44 000	8.754
5	22.520	29.090	58.380	27.640	11.220	5.391	5.391	2.795	2.931	3 952	39.950	8.536
6	27.130	19 010	56.400	38 220	10.820	5 432	5.733	2.795	2.920	3 929	32.640	8 252
7	18 120	16.830	46.240	47.550	10.580	5.386	9 313	2.775	2.920	4 550	28.330	7.983
8	16 670	15 630	44 020	39 250	10.270	5.546	10 820	2 762	2 900	4.603	86.230	7 810
9	16 610	14 910	118 000	34 010	10.100	5.865	8.392	2.812	2.899	4 258	88.440	7 585
10	16 960	18.370	82 330	35 330	10 140	5.516	6 873	6 076	3 000	4 026	102.500	7.360
11	15 200	14 580	53 820	62.970	9 926	5.224	6.237	4.659	3.154	4 022	117.500	7 394
12	37 030	19 900	55.220	52.600	9.929	5 057	5 812	3.702	3.208	4 059	68.210	8 714
13	27 840	20 450	55 990	51.770	9 470	4 992	5 564	3.382	3 550	4 002	48 650	46 970
14	59 670	18.160	147 600	38 960	8 891	4.694	5.383	3 468	3 939	4 022	39 490	122.900
15	31 920	24 350	84 610	35.190	8 588	4 892	5 241	4.924	4 543	4 004	32.670	66 730
16	27 040	20 780	61 540	35.000	8 314	5 307	5.113	7 272	6 487	3 957	28 400	144.200
17	29 470	25.960	48.550	29.140	8 106	5 200	5 035	5.103	17.070	3 886	25 340	239.700
18	23.060	200.500	46 490	26.150	7.992	5 129	4 606	4 159	10 440	3.818	23.040	116.500
19	20 950	106.100	54.010	73 820	8 019	5 009	4 000	3.719	8.970	4.946	20.710	95 690
20	19 950	60.580	55.390	22.030	7 601	4 939	3 807	3 415	7.253	49 180	18.980	206 400
21	28 350	45 980	50 180	20 440	7.319	4 887	3.673	3.255	6 260	89.930	17.520	227 100
22	22 390	58.880	49.150	19.200	7 163	5.164	3.565	3 403	5.745	57 450	16 240	108 300
23	37 320	51.580	45.350	18 220	7 323	5.535	3 430	3 124	5 686	36 170	14 820	93.630
24	39 100	167 200	116 000	17 340	7 491	5 511	3 031	2.973	5 469	24.750	14.040	251 100
25	27 660	86 010	56 630	16 240	7 801	5 491	2.888	2 964	5 055	21.270	13.190	147 900
26	23 920	74 430	45 210	16.000	6 901	5 685	2 823	3 025	4 793	25.890	12 340	93.450
27	21 550	95.600	38 990	19 110	6 471	6 354	2 799	3 025	4 650	22 930	11.800	70 850
28	30 350	79.760	38 350	15 290	6 270	6 340	2.795	2.995	4 482	105 400	11.350	57.190
29	22.450		32.420	15 020	6 052	7 174	3 006	2 922	4 316	116.600	10.710	47.670
30	20 430		28 430	14 220	5 861	6 868	3 390	2.915	4 246	68 940	10.190	41.540
31	18 740		25 020		5 715		3 017	2.968		47 680		37 410
Average	24 350	48 350	65 030	29 240	8 871	5 513	5 038	3 514	4 963	24.020	36 840	74.700
Lowest	12 320	14 580	25 020	14 220	5.715	4 694	2.795	2.762	2 899	3 818	10.190	7 360
Highest	59.670	200.500	147.600	62.970	13 630	7 174	10 820	7 272	17 070	116 600	117.500	251.100
Peak flow	102 90	234.30	308 90	92.92	13 91	8 06	11 40	9 86	25 26	193 90	181 40	461 40
Day of peak	14	18	14	11	1	29	7	10	17	28	11	24
Monthly total (million cu m)	65 22	117 00	174.20	75.79	23.76	14 29	13 49	9 41	12 86	64 33	95 49	200 10
Runoff (mm)	72	128	191	83	26	16	15	10	14	71	105	219
Rainfall (mm)	91	198	165	98	16	55	57	74	64	206	103	264

Statistics of monthly data for previous record (Mar 1957 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	51.700	41 030	34 330	23.920	17 590	11 340	8 341	10 780	16.520	29 220	39 640	49 880
	Low	10.850	12 680	10 010	8.120	6 125	4 273	3 390	2 698	2.939	4.303	13.760	17.770
	(year)	1964	1963	1962	1974	1984	1957	1976	1976	1959	1978	1988	1988
	High	88 650	95 720	100 700	49 330	46 590	26 740	27 490	38 540	45 680	86 350	99 840	112 700
	(year)	1974	1958	1981	1985	1983	1972	1968	1985	1974	1967	1960	1959
Runoff	Avg.	152	110	101	68	52	32	25	32	47	86	113	147
	Low	32	34	29	23	18	12	10	8	8	13	39	52
	High	260	254	296	140	137	76	81	113	130	254	284	331
Rainfall	Avg	158	108	116	84	93	76	78	99	124	137	149	167
	Low	28	10	15	8	31	17	21	25	8	19	55	46
	High	331	223	303	175	22'	144	177	210	259	325	323	351

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	27 460		27 810		99
Lowest yearly mean			14 880	1973	
Highest yearly mean			44 050	1960	
Lowest monthly mean	3 514	Aug	2 698	Aug 1976	
Highest monthly mean	74 700	Dec	112.700	Dec 1959	
Lowest daily mean	2 762	8 Aug	1 607	27 Aug 1976	
Highest daily mean	251 100	24 Dec	585 400	27 Dec 1979	
Peak	461 400	24 Dec	945 000	27 Dec 1979	
10% exceedance	68 170		63.650		107
50% exceedance	11 850		16 760		71
95% exceedance	2.932		4.367		67
Annual total (million cu m)	866 00		877 60		99
Annual runoff (mm)	950		963		99
Annual rainfall (mm)	1391		1389		100
(1941-70 rainfall average (mm)			1378)		

Factors affecting flow regime

- Reservoir(s) in catchment.

Station and catchment description

Velocity-area station; permanent cableway. Low flows measured at complementary station downstream (56010 - Trostrey weir). There is a partial impact on flows resulting from three large existing public water supply reservoirs in upper catchment. Intake to canal upstream of gauge. Some naturalised flows available. Geology - mainly Old Red Sandstone. Hill farming in upper areas, with dairy or livestock farming below; forest 3%. Peaty soils in uplands, seasonally wet.

062001 Teifi at Glan Teifi 1989

Measuring authority NRA-WEL
First year: 1959

Grid reference. 22 (SN) 244 416
Level stn (m OD): 5.20

Catchment area (sq km): 893.6
Max alt (m OD). 595

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	19 210	21 750	71.390	21 670	13 680	4 268	4.159	1.501	3 581	3 242	55 870	8 462
2	17 910	20.360	91 010	31 210	12 230	4 268	3 580	1 501	3 193	2 953	63.540	8.382
3	16.570	19 130	72 850	24 840	11 560	4 401	3.477	1 501	2 813	2 707	53 090	8.145
4	17 870	19 500	58 320	19 780	11 060	4 325	3 177	1 501	2 617	2 529	56 240	7 732
5	25 310	23.100	48 050	18 890	10 520	4 100	2 648	1.501	2 330	2 529	57 420	7 182
6	41 230	20 130	82.180	34 210	9 994	3 971	2 344	1 501	2 112	2 529	57 180	7 034
7	30 830	16.870	55 710	40 080	9 393	4 249	2.655	1.501	2.086	4.901	46.820	6.865
8	26 440	15 610	59 880	35 920	9 059	4 268	3.699	1 501	2 086	8 205	89 010	6 841
9	26 160	15 770	129 600	30 820	8 596	4 268	3 744	1 582	2.086	7 938	103 000	6 603
10	29 660	21 470	110 600	26 490	8 382	4 268	3 225	2 060	2 086	7 281	129 600	6 186
11	29 510	19 690	75 690	58 690	8 066	4 268	2 891	2 086	2 086	6 509	180 700	5.983
12	42 260	23 280	65.740	47 730	8 040	4 100	2.559	2 086	2 086	7 515	143 100	8 332
13	42 330	25.110	52 720	44 360	8 040	3 881	2.330	2 086	2 008	6 748	85 710	21 270
14	60 480	23 600	115.300	36 290	8 040	3 685	2.206	2 113	2 034	7 463	56 810	57 620
15	49 120	28 160	104 500	30 830	7 757	3 563	2 '66	3 066	2 248	5 964	42 800	40.330
16	42 590	27 790	79.820	27 170	7.279	3 443	2 086	3 444	2 835	5 162	34 800	56.510
17	41.980	25.620	56 360	23 590	6 889	3.325	2 086	3 161	5 470	4 596	29 870	93 320
18	36 410	51 610	51 740	20 820	6 463	3 176	1 982	3 016	6 010	4 194	25 810	82.860
19	30 900	55 750	53.130	18 850	6 118	3 032	1 770	2 906	5 984	4 139	22 010	75 810
20	29 380	50 430	65 800	16 650	5 523	2 752	1 880	2 662	5 342	20 450	19 460	106 600
21	33 230	40 860	62 560	15 680	5 099	2 588	1 918	2 486	4 518	40.880	17 560	157 400
22	29 930	49 230	56 650	14 570	5 058	2.529	1 987	2 344	4 421	32.320	15 190	143.000
23	29 560	40 820	51 620	13 780	5 058	2 529	1 868	2 139	5 175	30 820	13 580	101 100
24	29 650	126 500	69 440	13 010	5 290	2 457	1 569	1 956	5 994	21 760	13.040	152.200
25	26 440	108 000	57 020	12 100	5 '41	2 316	1 592	1 880	4 675	18 810	12 060	172 900
26	26 490	107 800	46 410	12.720	4 996	2 372	1.592	1 905	4 083	21 170	11 470	120 300
27	24 950	111.800	36 990	15 140	4 814	2 769	1 512	2 099	3 738	22.010	10 490	75 230
28	36 410	87 710	32.530	13 850	4.734	3 226	1 501	2 288	3 512	71.410	9.792	53 580
29	29 500		27.890	16 020	4 576	3 380	1.501	2.415	3 291	144 700	9 088	41 070
30	25 690		24 090	15 870	4 401	4 754	1 501	2 529	3 275	142 600	8 570	33 400
31	23 190		21 790		4 268		1.501	3.091		87 640		28 380
Average	31 330	42.770	64 110	25.050	7 423	3 551	2.345	2.174	3.459	24 250	49.120	54 860
Lowest	16 570	15.610	21.790	12 100	4 268	2 316	1 501	1 501	2 008	2 529	8 570	5.983
Highest	60 480	126 500	129 600	58 690	13 680	4 754	4.159	3.444	6 010	144 700	180 700	172.900
Peak flow	67 86	'52 40	162 60	70 13	14 93	4 89	4 58	3 55	6 84	153 10	185 10	198 70
Day of peak	14	24	14	11	1	30	1	16	17	29	11	24
Monthly total (million cu m)	83 91	103 50	171 70	64 94	19 88	9 70	6 28	5 82	8 97	64 94	127 30	146 90
Runoff (mm)	94	116	192	73	22	10	7	7	10	73	142	164
Rainfall (mm)	102	150	168	103	22	61	35	93	70	185	117	185

Statistics of monthly data for previous record (Jul 1959 to Dec 1988—incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg.	47 820	37 610	30.900	22 470	18 020	11 390	8 579	12 640	17 290	36 090	45 710	53 300
	Low	7 086	11 140	8 280	7 481	4 228	2 975	1 819	1 127	1 073	3 886	16 060	17 820
	(year)	1963	1965	1962	1974	1984	1984	1984	1976	1959	1972	1983	1963
	High	106 000	81 100	96 730	41 810	36 780	41 700	24 930	39 210	48 680	102 000	85 130	93.960
	(year)	1974	1974	1981	1985	1979	1972	1968	1985	1974	1981	1986	1965
Runoff	Avg.	143	103	93	65	54	33	26	38	50	108	133	160
	Low	21	30	25	22	13	9	5	3	3	12	47	53
	High	318	220	290	121	110	121	75	118	141	306	247	282
Rainfall	Avg	146	91	105	84	81	80	81	101	118	151	154	160
	Low	28	2	25	10	29	17	25	16	10	40	75	28
	High	326	213	312	163	168	148	166	180	242	293	279	315

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	25 790		28 460		91
Lowest yearly mean			18 860	1964	
Highest yearly mean			38 230	1974	
Lowest monthly mean	2 174	Aug	1 073	Sep 1959	
Highest monthly mean	64 110	Mar	106 000	Jan 1974	
Lowest daily mean	1 501	28 Jul	0 731	29 Aug 1976	
Highest daily mean	180 700	11 Nov	373 600	18 Oct 1987	
Peak	198 700	24 Dec	448 800	18 Oct 1987	
10% exceedance	70 220		63 600		110
50% exceedance	10 390		19 020		55
95% exceedance	1 837		3.217		57
Annual total (million cu m)	813 30		898 20		91
Annual runoff (mm)	910		1005		91
Annual rainfall (mm)	1291		1352		95
[1941-70 rainfall average (mm)			1364]		

Factors affecting flow regime

- Reservoir(s) in catchment.
- Abstraction for public water supplies.

Station and catchment description

Velocity-area station. Straight reach (width: 35m), natural control. Flood flows spill over right bank. Public water supply impounding reservoirs in upland area where there is mostly hill farming. Tregaron bog (10 sq. km.) has partial effect on flows; sensibly natural regime. Geology - mainly Ordovician and Silurian deposits. Dairy farming predominates in southern area. Forest: 5%. Peaty soils on hills, seasonally wet. Apart from Tregaron bog, most of the lower areas have soils with permeable substrate.

065001 Glaslyn at Beddgelert 1989

Measuring authority: NRA-WEL
First year: 1961

Grid reference: 23 (SH) 592 478
Level stn. (m OD). 32.90

Catchment area (sq km). 68.6
Max alt. (m OD): 1085

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2.245	2.032	8 641	3.684	4 605	0 462	7.603	0.312	3 573	0.986	23 020	0 551
2	1 888	1.754	10 880	4.842	2.987	0 427	3 893	0 307	2 484	0.818	17 400	0 514
3	1.794	2.531	7 888	3.394	2 230	0 409	2 541	0.353	1 824	0 832	17.620	0 492
4	1.927	8 867	8 931	2.630	1 718	0 388	1 737	0 376	1.765	1.080	21.840	0 483
5	19 110	6 137	8.747	2.684	1 387	0 400	1.270	0 286	1 576	1.563	16.510	0 469
6	9 459	3 936	14 370	3.972	1 154	0 543	1 570	0 259	1 232	13.640	8 434	0.534
7	5 087	11 210	6 857	7 425	0 987	0 549	1.829	0 253	1 103	6.008	7.947	0.570
8	5 217	12 690	29.130	7.349	0 862	0 594	.1 925	0.402	1.192	4 903	21.760	0.595
9	13 630	5 572	86 290	4 427	0 759	0 639	1 549	15 160	1 031	4.014	18 790	0 600
10	5 645	3 847	24.920	3 943	0 696	0 658	1 391	10 610	0 789	5.164	45.870	0.578
11	4.932	14 510	9.181	17.250	0 880	0 582	1 383	9 869	0.760	4.555	20.760	0 522
12	5 905	7 879	12.580	8.620	3 249	0 620	1 304	3.653	1 048	4 864	8.828	0 628
13	15 320	22 880	12 300	7 114	2 496	1 129	1 228	2.889	1 371 .	5 299	5 828	1.933
14	11 960	7 430	35 860	4 475	1.797	0 984	1 141	5 310	1 455	3.513	4 446	5.182
15	5 537	16 390	16.110	3.300	1.784	0 778	0 880	5 012	2.318	2 804	4 066	3.521
16	7 648	6 386	7 486	2 535	1.966	0 617	0 648	3 755	2 251	3.779	3.043	11 090
17	6 740	7 264	5 130	2 013	1 852	0 517	0 594	2 961	1 909	3 594	2.528	15.370
18	4 234	22 900	25 030	1 649	2 750	0 437	0 734	2 271	3.563	3 115	2 023	4.646
19	3 196	10 060	25 040	1 405	2 070	0 378	0.743	1 740	3 155	4 390	1 431	3 451
20	3 278	5.127	12 450	1 194	1.521	0 335	0 590	10 290	2 257	11 580	1 171	24 130
21	4 268	4 485	14 070	1 067	1 189	0 310	0 609	5 296	1.678	11 000	1 039	26 020
22	3 622	4.512	12 380	0 972	0 964	0 300	0 607	3 357	2 307	10 430	1 053	9 389
23	5 365	5 397	11 690	0 899	0 826	0 300	0 486	2 646	2 448	10 650	1 063	9 295
24	3.947	10.670	12 230	0 810	0 827	0 298	0 395	2 776	1 728	7 580	0 993	27.920
25	3 152	5 684	6 651	0 727	0 757	0 284	0 363	5 067	1 668	21 950	0 849	23 850
26	3 981	5 297	4 881	1 759	0 653	2 249	0 324	7 318	1 734	8 613	0 734	11 400
27	4 085	7 785	3 858	1 943	0 581	3 648	0 290	4 761	2 112	5 323	0 666	5 243
28	6 457	7 251	3 419	2 381	0 525	13 210	0 275	2 916	1 926	24 830	0 611	3 473
29	4 092		3 049	3 559	0 485	6 072	0 274	4 136	1 680	30 520	0 610	2 545
30	3 090		8 613	4 112	0 443	13 320	0 302	18 740	1 271	13 540	0 600	2 124
31	2 459		6 617		0 451		0 310	6 585		8 158		1 614
Average	5 783	8 230	14 690	3.738	1 466	1 715	1 251	4 504	1 840	7 713	8 718	6 411
Lowest	1 794	1 754	3 049	0 727	0 443	0 284	0 274	0 253	0 760	0 818	0 600	0 469
Highest	19 110	22 900	86 290	17 250	4 605	13 320	7 603	18 740	3 573	30 520	45 870	27 920
Peak flow	42 24	44 11	99 50	27 52	5 78	24 70	11 58	36 34	4 42	57 17	72 30	45 73
Day of peak	5	13	9	11	1	30	1	30	•	28	10	24
Monthly total (million cu m)	15 49	19 91	39 34	9 69	3 93	4 44	3 35	12 06	4 77	20 66	22 60	17 17
Runoff (mm)	226	290	573	141	57	65	49	176	70	301	329	250
Rainfall (mm)	243	346	513	184	72	176	60	309	83	407	259	308

Statistics of monthly data for previous record (Dec 1961 to Dec 1988—incomplete or missing months total 1.8 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	7 853	5 492	6 004	3 812	3 390	3 321	3 608	5 072	6 077	7 421	8 464	9 087
	Low	1 535	1 139	1 734	0 814	0 325	0 625	0 495	0 305	1 889	3 526	3 399	1 793
	(year)	1963	1986	1984	1974	1980	1988	1984	1976	1986	1978	1983	1963
	High	13 630	13 040	15 600	8 228	7 064	7 429	7 132	12 860	11 830	13 370	14 460	16 400
	(year)	1983	1977	1981	1975	1986	1971	1978	1985	1974	1980	1980	1965
Runoff	Avg	307	195	234	144	132	125	141	198	230	290	320	355
	Low	60	40	68	31	13	24	19	12	71	138	128	70
	High	532	460	609	311	276	281	278	502	447	522	546	640
Rainfall	Avg	313	195	250	180	179	196	209	266	282	320	359	355
	Low	28	20	69	20	39	41	66	16	35	136	130	74
	High	563	475	638	482	334	358	380	563	508	726	564	700

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	5 499		5 807		95
Lowest yearly mean			4 185	1968	
Highest yearly mean			6 942	1980	
Lowest monthly mean	1.251	Jul	0 305	Aug 1976	
Highest monthly mean	14 690	Mar	16 400	Dec 1965	
Lowest daily mean	0 253	7 Aug	0 039	9 Jul 1973	
Highest daily mean	86 290	9 Mar	85 850	27 Oct 1980	
Peak	99 500	9 Mar	220 700	26 Mar 1987	
10% exceedance	13 650		13 200		103
50% exceedance	2 936		3 232		91
95% exceedance	0 349		0 543		64
Annual total (million cu m)	173 40		183 30		95
Annual runoff (mm)	2528		2671		95
Annual rainfall (mm)	2960		3104		95
[1941-70 rainfall average (mm)			3030]		

Factors affecting flow regime

- Reservoir(s) in catchment
- Regulation for HEP

Station and catchment description

A 20m wide river section rated by current meter and, in the past, by dilution gauging. Rating tends to be insensitive at low flows due to subtle movements in the natural bed control downstream High flow gauging restricted to peaks and troughs because of rapid water level changes Station bypassed at high flows Lakes (Dinas and Gwynant) and HEP discharge from the higher Llyn Llydaw marginally affect records. Catchment drains the southern flanks of Snowdonia with much bare rock exposure (impermeable Ordovician volcanics).

067015 Dee at Manley Hall 1989

Measuring authority: NRA-WEL
First year: 1937

Grid reference: 33 (SJ) 348 415
Level stn (m OD): 25.40

Catchment area (sq km): 1019.3
Max alt (m OD): 884

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	27 130	17 650	80 370	23 330	10 910	10 770	12 480	10 400	9 560	9 886	46 550	8 512
2	23 720	15 610	97 330	39 670	10 120	10 920	12 610	10 230	9 879	9 394	39 930	8 333
3	22 050	14 460	91 620	29 350	9 549	10 770	11 380	10 230	9 995	8 240	39 820	8 146
4	24 110	27 840	75 630	26 440	8 983	10 530	10 380	10 120	10 140	8 100	44 180	8 422
5	26 760	39 130	60 800	35 380	9 468	10 600	10 600	10 370	10 770	8 277	57 270	8 511
6	37 980	31 080	62 110	47 060	9 174	10 990	13 020	11 960	10 740	8 215	54 100	8 898
7	31 090	25 920	55 450	55 170	9 175	10 540	15 220	14 130	11 410	8 793	43 610	9 007
8	26 420	22 510	49 790	57 050	10 010	11 050	13 700	11 110	10 740	9 017	58 540	8 596
9	24 690	19 880	71 820	50 480	9 790	11 010	10 280	10 640	10 890	8 746	64 350	8 721
10	24 500	18 800	78 600	47 270	10 520	10 700	10 550	10 710	11 420	8 918	100 600	8 727
11	23 580	17 870	74 600	88 020	11 520	10 410	10 630	10 760	11 500	9 811	115 800	8 717
12	34 170	22 060	64 590	95 660	18 140	10 210	10 340	10 650	11 500	10 650	100 100	9 233
13	32 860	25 930	75 030	107 200	13 130	10 430	10 050	11 000	11 300	10 920	70 850	12 220
14	51 760	26 090	105 900	83 980	11 630	10 530	10 110	11 540	10 680	10 490	50 700	24 130
15	39 530	33 360	102 800	61 680	10 930	10 390	10 540	12 320	10 330	10 130	38 670	25 810
16	34 090	33 420	85 160	48 140	11 260	10 210	10 530	11 360	10 660	10 990	31 160	131 600
17	36 500	29 940	63 290	38 720	11 070	10 430	10 470	11 430	11 040	10 130	26 030	216 600
18	32 460	77 900	52 990	29 530	11 270	10 350	10 050	10 540	9 860	9 305	22 980	141 400
19	30 390	83 290	53 830	24 840	10 650	10 310	10 340	10 690	10 400	9 708	19 780	97 260
20	28 000	71 340	54 550	22 420	9 916	10 400	11 420	10 560	9 784	19 230	17 610	100 300
21	28 190	52 160	63 680	20 340	10 550	10 460	11 490	10 460	10 310	51 080	15 790	131 700
22	24 860	48 150	67 870	17 970	10 550	10 560	11 510	10 560	9 337	49 990	13 980	119 100
23	23 760	40 740	73 390	17 080	11 310	10 710	11 450	10 510	8 932	42 940	12 720	106 900
24	24 060	58 930	109 700	15 110	11 070	10 660	11 340	10 800	8 758	30 370	12 010	163 200
25	22 870	46 890	94 700	13 810	11 280	10 650	11 460	11 180	8 670	29 880	11 070	138 900
26	23 280	40 630	67 860	13 100	10 710	10 950	11 510	11 230	8 589	39 590	10 050	103 600
27	23 190	49 640	57 770	13 720	10 550	11 980	11 510	10 790	10 080	40 650	9 750	71 180
28	22 930	55 320	46 540	12 380	10 750	11 580	11 570	10 650	9 995	44 290	9 425	52 940
29	20 340		37 420	11 850	10 760	12 240	11 570	10 630	9 794	58 000	9 167	42 090
30	19 160		31 480	11 350	10 670	10 100	11 500	10 720	9 906	61 660	9 068	34 540
31	18 800		26 170		10 560		11 190	10 250		62 910		29 620
Average	27 850	37 380	68 640	38 600	10 840	10 710	11 300	10 920	10 230	22 910	38 520	59 580
Lowest	18 800	14 460	26 170	11 350	8 983	10 100	10 050	10 120	8 589	8 100	9 068	8 146
Highest	51 760	83 290	109 700	107 200	18 140	12 240	15 220	14 130	11 500	62 910	115 800	216 600
Peak flow	62 89	114 30	141 90	128 90	20 34	13 57	16 40	14 63	13 95	69 20	124 30	242 90
Day of peak	14	18	14	11	12	29	6	7	7	30	10	17
Monthly total (million cu m)	74 58	90 42	183 80	100 10	29 03	27 77	30 26	29 24	26 52	61 37	99 85	159 60
Runoff (mm)	73	89	180	98	28	27	30	29	26	60	98	157
Rainfall (mm)	83	175	178	117	32	72	44	76	50	174	113	207

Statistics of monthly data for previous record (Oct 1937 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	52 310	44 700	37 920	24 410	17 580	13 870	13 090	17 450	23 830	33 910	47 070	52 010
	Low	13 460	7 858	8 128	7 841	4 273	3 742	3 113	3 288	3 052	4 216	11 580	18 610
	(year)	1964	1963	1943	1938	1938	1961	1949	1955	1949	1947	1937	1963
	High	109 300	106 700	103 700	61 030	41 940	31 240	40 270	59 400	69 470	92 470	103 000	105 200
	(year)	1948	1946	1947	1970	1969	1972	1957	1957	1950	1967	1960	1965
Runoff	Avg	137	107	87	62	46	35	34	46	61	89	120	137
	Low	35	19	21	20	11	10	8	9	8	11	29	49
	High	287	253	273	155	110	79	106	156	177	243	262	277
Rainfall	Avg	152	107	104	83	93	87	95	110	122	139	159	156
	Low	41	14	33	10	30	13	20	9	13	25	15	36
	High	338	241	251	182	197	168	244	211	306	317	300	314

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	28 930		31 030		93
Lowest yearly mean			20 460	1964	
Highest yearly mean			44 600	1954	
Lowest monthly mean	10 230	Sep	3 052	Sep 1949	
Highest monthly mean	68 640	Mar	109 300	Jan 1948	
Lowest daily mean	8 100	4 Oct	1 926	30 Jul 1949	
Highest daily mean	216 600	17 Dec	521 000	14 Dec 1964	
Peak	242 900	17 Dec	665 400	14 Dec 1964	
10% exceedance	70 210		70 650		99
50% exceedance	12 030		19 620		61
95% exceedance	8 855		5 040		176
Annual total (million cu m)	912 30		979 20		93
Annual runoff (mm)	895		961		93
Annual rainfall (mm)	1321		1402		94
[1941-70 rainfall average (mm)			1395]		

Factors affecting flow regime

- Reservoir(s) in catchment.
- Abstraction for public water supplies.
- Flow reduced by industrial and/or agricultural abstractions.
- Augmentation from surface water and/or groundwater.

Station and catchment description

Asymmetrical compound Crump profile weir, checked by current meter. Drowns at flows above 200 cumecs. Low flows maintained by releases from major river regulating res. (Celyn and Brenig). Data prior to February 1970 is poorer quality - based on d/s Erbistock (67002, area: 1040.0 sq. km.) flow record. D/s flood attenuation is notable. Geology is 75% shales, slates, mudstones and palaeozoic grits; 25% extrusive igneous and Carboniferous rocks. 80% grazed open moorland, 12% forestry, remainder arable, urban negligible.

068001 Weaver at Ashbrook 1989

Measuring authority: NRA-NW
First year: 1937

Grid reference: 33 (SJ) 670 633
Level stn. (m OD): 16.30

Catchment area (sq km): 622.0
Max alt. (m OD): 222

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	4.241	3.537	20.360	3.132	3.012	1.731	5.235	1.584	1.325	1.015	2.066	1.909
2	3.877	3.293	18.690	11.480	2.825	1.766	2.611	1.336	1.257	1.032	2.274	1.755
3	3.628	3.302	15.730	8.779	2.797	1.655	2.073	1.329	1.225	1.035	2.231	1.721
4	3.689	3.388	10.080	5.113	2.740	1.582	1.801	1.259	1.183	1.036	2.205	1.727
5	4.900	3.339	8.238	18.070	2.699	1.980	1.630	1.137	1.159	1.253	2.997	1.875
6	5.409	3.024	6.909	29.440	2.619	2.786	1.547	1.069	1.102	1.215	2.777	1.775
7	4.547	2.809	5.779	33.030	2.495	1.998	3.791	1.075	1.006	1.622	2.545	1.616
8	4.356	2.706	4.860	19.440	2.488	2.279	3.453	1.001	1.084	1.537	11.370	1.620
9	4.416	2.667	4.642	11.310	2.411	2.084	2.556	1.166	1.079	1.414	12.140	1.595
10	4.243	2.650	5.292	20.850	2.403	1.826	2.132	1.359	1.042	1.307	9.083	1.586
11	3.828	2.824	4.465	17.620	2.615	1.677	1.947	1.869	1.052	1.255	15.960	1.635
12	3.938	2.950	4.208	12.570	3.620	1.650	1.806	1.289	1.253	1.265	9.628	1.988
13	4.322	2.916	5.900	10.910	3.078	1.676	1.775	1.236	1.661	1.628	5.279	8.289
14	6.638	2.866	6.181	8.053	2.608	1.571	1.706	1.656	1.377	1.486	4.056	37.760
15	4.863	3.368	9.752	6.193	7.438	1.457	1.644	1.711	1.465	1.310	3.613	34.220
16	4.300	3.350	6.087	5.147	2.471	1.403	1.602	1.497	1.579	1.225	3.067	24.060
17	4.061	3.023	4.510	4.485	2.324	1.338	1.610	1.238	2.345	1.199	2.741	21.120
18	3.684	5.291	4.059	4.256	2.459	1.330	1.508	1.106	1.718	1.150	2.635	19.430
19	3.469	4.218	5.071	3.916	2.356	1.315	1.450	1.047	1.351	1.789	2.519	25.730
20	3.395	3.449	7.495	3.625	2.199	1.245	1.380	1.017	1.238	3.666	2.328	22.120
21	4.277	3.078	8.420	3.350	2.133	1.287	1.325	0.984	1.145	2.797	2.238	42.170
22	5.168	3.089	6.245	3.213	2.098	1.265	1.797	1.113	1.509	3.788	2.309	33.110
23	4.459	2.900	4.545	6.184	5.172	1.277	1.265	1.028	1.188	2.699	2.189	18.030
24	4.241	23.310	4.642	4.596	3.179	1.297	1.229	1.088	1.054	1.938	1.983	22.840
25	3.862	37.780	3.941	3.709	2.529	1.313	1.318	1.688	1.075	1.775	1.927	27.060
26	3.628	20.820	3.588	3.622	2.179	1.512	1.395	2.034	1.100	1.909	1.898	16.770
27	3.478	21.820	3.362	4.115	2.015	2.512	1.271	1.563	1.125	2.171	1.924	11.440
28	6.012	14.980	4.302	3.578	1.938	2.190	1.253	1.262	1.074	2.154	2.061	9.069
29	5.071		3.980	3.503	1.872	2.291	1.190	1.161	1.025	5.051	1.892	7.363
30	4.230		3.563	3.184	1.794	3.948	1.797	1.863	1.009	5.078	1.867	6.105
31	3.784		3.258		1.677		1.716	1.755		2.814		5.655
Average	4.323	6.882	6.715	9.214	2.556	1.775	1.881	1.339	1.260	1.955	4.060	13.330
Lowest	3.395	2.650	3.258	3.132	1.677	1.245	1.190	0.984	1.006	1.015	1.867	1.586
Highest	6.638	37.780	20.360	33.030	5.172	3.948	5.235	2.034	2.345	5.078	15.960	42.170
Peak flow	8.43	41.79	24.09	34.39	7.98	7.64	7.81	3.61	2.76	6.33	18.04	45.70
Day of peak	18	25	1	7	23	30	1	30	17	30	10	14
Monthly total (million cu m)	11.58	16.65	17.98	23.88	6.85	4.60	5.04	3.59	3.27	5.24	10.52	35.70
Runoff (mm)	19	27	29	38	11	7	8	6	5	8	17	57
Rainfall (mm)	28	62	45	81	33	56	32	46	30	80	63	105

Statistics of monthly data for previous record (Oct 1937 to Dec 1988—incomplete or missing months total 1.8 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows.	Avg	10.470	9.149	6.775	4.932	3.807	2.815	2.785	3.057	3.285	4.534	7.732	9.349
	Low	1.966	2.376	2.183	1.491	0.904	1.125	0.737	0.641	0.918	1.184	1.302	2.430
	(year)	1964	1965	1938	1938	1946	1962	1976	1976	1964	1947	1942	1947
	High	21.950	19.860	18.580	11.760	22.720	6.996	12.750	8.405	16.990	15.970	22.540	22.250
	(year)	1939	1980	1947	1986	1969	1954	1968	1971	1957	1954	1954	1965
Runoff:	Avg	45	36	29	21	16	12	12	13	14	20	32	40
	Low	8	9	9	6	4	5	3	3	4	5	5	10
	High	95	80	80	49	98	29	55	36	71	69	94	96
Rainfall.	Avg.	68	49	52	48	60	59	69	72	66	68	77	69
	Low	18	2	18	2	18	13	16	6	5	15	13	10
	High	145	145	127	98	194	142	168	175	169	137	170	140

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	4.594		5.709		80
Lowest yearly mean			2.752	1964	
Highest yearly mean			9.209	1954	
Lowest monthly mean	1.260	Sep	0.641	Aug 1976	
Highest monthly mean	13.330	Dec	22.720	May 1969	
Lowest daily mean	0.984	21 Aug	0.394	17 Aug 1976	
Highest daily mean	42.170	21 Dec	84.950	9 Feb 1946	
Peak	45.700	14 Dec	212.400	8 Feb 1946	
10% exceedance	9.935		12.550		79
50% exceedance	2.496		3.269		76
95% exceedance	1.074		1.138		94
Annual total (million cu m)	144.90		180.20		80
Annual runoff (mm)	233		290		80
Annual rainfall (mm)	661		757		87
[1941-70 rainfall average (mm)			765]		

Factors affecting flow regime

- Flow influenced by groundwater abstraction and/or recharge.
- Abstraction for public water supplies.
- Augmentation from effluent returns.

Station and catchment description

Natural river section. Accuracy of early ratings not known and gaugings lost. However, calibration came under suspicion in 1972 and previous records, particularly low flows, deemed to be of little value. Low flow rating then changed several times before station moved 400m downstream and shallow V bed control constructed in August 1978. High flow rating (above 40 cumecs) has yet to be defined. Flat catchment includes western half of Crewe. Post glacial deposits over (mostly) Keuper Marl.

072004 Lune at Caton 1989

Measuring authority NRA-NW
First year 1959

Grid reference 34 (SD) 529 653
Level stn (m OD). 10.70

Catchment area (sq km): 983 0
Max alt (m OD): 736

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	21.900	12 110	77 810	21 530	8 480	4 249	24 650	2 574	13 280	2 723	78 440	6 144
2	19 020	11 390	62 980	18 990	8 289	4 023	9.536	2 336	10 540	2 618	66 730	5 975
3	16.750	76 830	51 040	16 940	7.554	3 867	6 375	2 262	8.174	2.544	76 010	5 549
4	22 970	127.000	46 660	14 970	7.201	3 590	4.799	2 088	7 009	2 465	108 800	5.130
5	75.710	60 050	35 810	14 960	6 762	3 476	3 604	1 966	6 281	2 476	66.120	5 590
6	47.250	35 520	57 660	19 800	6 240	3 378	3 262	1 997	5 552	4 547	35 730	5 591
7	27 480	111.200	39 300	37.640	5 917	3 307	2 905	2 164	4 972	6 275	32 990	5 400
8	25.130	66 540	35 470	33 350	5 692	3 250	3 597	1 839	4 579	7.138	46 160	5.150
9	61 500	36 230	262 100	19 620	5 503	3 215	3 321	16.150	4.102	5 000	49 130	4 900
10	29 220	26 180	129 200	25 330	5.279	3 163	3 117	16 690	3 606	3 759	238 100	4 751
11	22 530	84 450	51 460	156 900	5 633	3 098	2 933	20 850	3 431	3 4'1	126 '00	4 697
12	34 960	60 510	49 900	183 300	7 216	3 137	2 633	12 040	3.346	3 462	61 860	4 863
13	88 460	112 200	70 490	91 070	7 441	3.188	2 264	28 620	3 413	8 913	38 570	4 997
14	131 400	49 470	126 300	48 480	6.066	3 219	2 078	34 960	3.277	15 830	28 950	5 289
15	41 980	111 900	67 610	32 200	5 477	3 108	1 985	30 420	3 438	43 220	23 310	5 488
16	35 090	46 380	37 570	24 240	5 449	2 887	2 039	20 100	10 250	121 400	19 120	25 930
17	35 440	33.470	27 500	19 770	5 250	2 751	2 '44	13 290	6 04'	40 110	16 470	91 490
18	24 510	177 900	82 620	17 050	5.257	2 586	2 '06	10 320	'4 727	20 300	14.940	43 170
19	20 420	139.800	91 840	15 120	5 589	2 270	1 944	7 569	6 572	28 600	13 570	19.650
20	18.150	83 970	80 080	13 520	5.689	2.191	2 012	6 912	5.926	155 000	12 110	88 430
21	30 510	48 030	74 400	12 500	4 634	2 117	1 986	12 750	4 536	96 200	10 960	127.000
22	21.260	42 460	156 800	12 680	4 076	2 064	1 948	7 943	3 742	68 180	9 953	53 040
23	46 720	33 480	147 400	14 280	10 460	2 063	1 9'8	6 698	4 341	50 090	9 223	52 020
24	26 740	61 150	142 800	12 560	32.930	2 046	1 903	5 637	3.988	76 640	8 741	105 500
25	19 730	61.360	50 680	10 890	14 460	2 012	1 870	6 450	3 595	98.620	8.203	79 020
26	38 890	40 800	38 290	10 360	7.603	5 300	1 568	7 669	3 503	58 330	7 639	49 180
27	23 080	44 570	28 680	10.980	5 883	13 930	1 508	7 946	3 541	58 190	7 481	30 580
28	18.990	104 800	24 140	8 995	5 081	26 270	1 689	5 884	3 313	60 440	7 012	23 360
29	16 330		19 960	8.666	4 517	13 120	1 962	7 904	3 027	120 600	6 720	19 420
30	14 580		36 700	8 218	4 110	26 850	4 292	40 840	2 828	102 100	6.370	16 480
31	13.240		31 420		3 971		3 453	28 550		53.940		14.380
Average	34.510	67 850	72 090	31 160	7.216	5.324	3 594	12 050	5 164	42 680	41 180	29 620
Lowest	13 240	11.390	19 960	8 218	3 971	2 012	1 508	1 839	2 828	2 465	6 370	4.697
Highest	131 400	177 900	262 100	183 300	32 930	26 850	24 650	40 840	13 280	155 000	238 100	127 000
Peak flow	385 30	289 90	435 40	387 20	78 46	83 23	46 13	95 92	16 42	278 80	444 90	241 60
Day of peak	13	18	9	11	24	30	1	30	1	29	10	21
Monthly total (million cu m)	92 44	164 10	193 10	80 78	19 33	13 80	9 62	32 26	13 39	114 30	106 70	79 33
Runoff (mm)	94	167	196	82	20	14	10	33	14	116	109	81
Rainfall (mm)	96	210	204	95	48	75	31	136	32	205	97	108

Statistics of monthly data for previous record (Jan 1959 to Dec 1988—incomplete or missing months total 4.0 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	53.560	36 130	35 370	28 140	18 860	15 730	19 550	26 400	34 390	44 850	51 340	56.740
	Low	6.622	3 842	11 820	4 203	2 565	3 385	1 882	2.167	2 790	4 314	24 640	18.730
	(year)	1963	1963	1975	1974	1974	1975	1984	1976	1959	1972	1985	1971
	High	86 420	76 630	113 800	67 970	40 700	49.190	42 800	71 330	67 010	134 400	97 220	108.900
	(year)	1983	1966	1981	1970	1986	1972	1988	1985	1985	1967	1963	1986
Runoff	Avg	146	90	96	74	51	41	53	72	91	122	135	155
	Low	18	9	32	11	7	9	5	6	7	12	65	51
	High	235	189	310	179	11'	130	117	194	177	366	256	297
Rainfall	Avg	150	86	107	93	92	92	118	130	144	155	151	165
	Low	20	9	48	5	21	22	29	24	26	54	72	55
	High	263	217	246	193	178	169	245	270	262	402	277	333

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	29.150		35 110		83
Lowest yearly mean			24 700	1976	
Highest yearly mean			46.500	1967	
Lowest monthly mean	3 594	Jul	1 882	Jul 1984	
Highest monthly mean	72 090	Mar	134 400	Oct 1967	
Lowest daily mean	1 508	27 Jul	1 166	25 Aug 1984	
Highest daily mean	262 100	9 Mar	718 300	23 Mar 1968	
Peak	444 900	10 Nov	854 000	2 Jan 1982	
10% exceedance	79 350		84 350		94
50% exceedance	12 580		17 560		72
95% exceedance	2.052		3 166		65
Annual total (million cu m)	919 30		1108 00		83
Annual runoff (mm)	935		1127		83
Annual rainfall (mm)	1337		1483		90
[1941-70 rainfall average (mm)			1525]		

Factors affecting flow regime

- Reservoir(s) in catchment.
- Abstraction for public water supplies.
- Augmentation from surface water and/or groundwater

Station and catchment description

Bazin type compound broad-crested weir operated after 10/6/77 as full-range station. Previously used for low/medium flows; high flows from Halton 3km downstream. High flows inundate wide floodplain. Transfers to river Wyre under Lancs Conjunctive Use Scheme. Major abstractions for PWS. Headwaters rise from Shap Fell and the Pennines. Mixed geology. Carboniferous Limestone, Silurian shales, Millstone Grit and Coal Measures, substantial Drift cover. Agriculture in valleys; grassland rising to peat moss in highest areas.

073010 Leven at Newby Bridge 1989

Measuring authority: NRA NW
First year: 1939

Grid reference: 34 (SD) 367 863
Level stn. (m OD): 37.30

Catchment area (sq km): 247.0
Max alt. (m OD): 873

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	20.790	9.150	23.590	15.170	4.068	0.990	4.091	0.611	15.910	2.110	29.050	1.861
2	17.250	8.095	23.630	14.260	4.100	0.813	3.716	0.597	13.670	1.618	29.630	1.553
3	14.140	17.180	22.250	13.160	4.264	1.431	3.201	0.598	11.220	1.317	32.640	1.461
4	13.330	31.720	20.570	11.910	4.034	1.218	2.873	0.595	9.098	1.225	37.360	1.483
5	17.540	40.020	20.330	10.300	3.839	1.091	2.689	0.596	7.764	1.309	36.220	1.500
6	24.030	35.300	25.330	9.264	3.303	1.291	2.463	0.591	5.719	2.270	32.130	1.579
7	22.520	34.320	27.300	9.340	2.890	0.925	2.183	0.588	4.823	3.546	26.530	1.603
8	20.050	34.390	26.710	10.160	2.633	0.795	1.559	0.580	4.017	3.777	23.400	1.528
9	21.670	28.760	61.800	10.390	2.506	0.841	1.255	1.995	3.733	3.363	21.600	1.510
10	20.990	24.880	85.840	10.300	2.174	0.751	1.035	3.580	3.205	2.606	28.780	1.456
11	18.840	23.070	69.480	11.990	2.185	0.713	0.853	9.446	2.793	2.087	40.390	1.543
12	19.090	25.480	55.860	25.140	2.858	0.828	1.341	9.405	2.453	1.740	37.320	1.554
13	19.990	31.410	50.910	27.780	3.025	1.448	1.225	10.560	2.183	2.039	31.900	1.791
14	25.680	33.150	47.840	26.540	2.663	1.853	0.897	15.090	2.145	2.909	25.000	1.708
15	24.700	37.600	45.220	23.750	2.760	1.857	0.844	18.960	2.634	4.816	20.630	1.324
16	21.980	36.400	38.870	20.370	2.984	1.712	0.720	17.190	3.607	16.090	17.120	2.677
17	20.070	30.730	30.560	17.070	2.865	1.612	0.699	14.240	3.602	20.290	14.200	9.325
18	17.390	29.620	32.200	14.450	3.051	1.535	0.672	11.690	3.213	19.200	12.160	13.270
19	15.000	32.640	37.990	12.380	3.252	1.316	0.642	9.113	3.128	16.720	10.360	12.250
20	13.110	31.930	37.820	10.370	3.156	1.161	0.647	8.848	3.078	19.170	9.037	13.040
21	13.470	28.360	34.560	8.799	2.995	1.098	0.628	10.550	3.914	25.620	7.582	20.280
22	13.340	26.890	38.160	7.780	2.536	0.707	0.618	9.609	3.939	28.570	6.041	21.430
23	17.410	25.060	38.210	6.958	2.569	0.656	0.616	7.927	3.697	35.310	4.933	20.660
24	18.370	25.070	44.070	6.091	2.541	0.574	0.613	6.789	3.310	33.730	4.269	26.200
25	17.110	24.550	39.680	5.289	2.318	0.550	0.606	6.287	2.966	35.190	3.492	35.880
26	16.380	22.820	34.050	4.733	1.830	0.705	0.586	5.817	3.012	32.280	2.918	35.050
27	14.880	20.570	28.980	4.691	1.492	0.987	0.578	4.606	3.061	27.060	2.638	29.610
28	14.270	21.160	22.130	4.017	1.419	1.499	0.573	3.466	2.786	24.300	2.436	22.930
29	12.610		18.100	3.888	1.368	2.716	0.584	3.529	2.579	25.090	2.263	18.650
30	11.730		18.010	3.737	1.161	3.264	0.611	10.120	2.394	30.450	2.052	15.160
31	10.390		17.280		0.973		0.611	17.230		30.340		12.260
Average	17.680	27.510	36.040	12.000	2.704	1.231	1.298	7.123	4.638	14.710	18.470	10.710
Lowest	10.390	8.095	17.280	3.737	0.973	0.550	0.573	0.580	2.145	1.225	2.052	1.324
Highest	25.680	40.020	85.840	27.780	4.264	3.264	4.091	18.960	15.910	35.310	40.390	35.880
Peak flow	26.42	42.62	90.70	28.18	4.50	3.98	4.58	19.75	16.78	37.19	41.28	37.03
Day of peak	14	5	10	13	2	30	1	15	1	22	11	25
Monthly total (million cu m)	47.35	66.56	96.54	31.11	7.24	3.19	3.47	19.08	12.02	39.41	47.87	28.69
Runoff (mm)	192	269	391	126	29	13	14	77	49	160	194	116
Rainfall (mm)	180	339	398	138	43	89	32	246	50	288	147	167

Statistics of monthly data for previous record (Jan 1939 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	19.930	16.390	13.290	11.200	7.656	6.455	7.496	10.670	14.600	17.520	20.290	21.300
	Low	1.935	0.974	3.699	1.796	0.641	0.545	0.774	0.652	0.560	1.438	6.873	8.207
	(year)	1963	1963	1962	1974	1980	1978	1941	1984	1959	1972	1983	1963
	High	38.020	31.030	29.970	21.640	18.680	18.730	16.990	31.070	33.930	50.170	36.450	40.110
	(year)	1975	1945	1981	1949	1986	1972	1953	1985	1946	1967	1986	1954
Runoff	Avg	216	162	144	118	83	68	81	116	153	190	213	231
	Low	21	10	40	19	7	6	8	7	6	16	72	89
	High	412	304	325	227	203	197	184	337	356	544	383	435
Rainfall	Avg	230	148	161	118	118	125	151	184	219	224	235	239
	Low	26	7	32	12	22	17	40	7	29	30	17	90
	High	439	295	341	243	241	269	309	428	427	557	428	450

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	12.760		13.890		92
Lowest yearly mean			9.234	1973	
Highest yearly mean			21.840	1954	
Lowest monthly mean	1.231	Jun	0.545	Jun 1978	
Highest monthly mean	36.040	Mar	50.170	Oct 1967	
Lowest daily mean	0.550	25 Jun	0.108	7 Oct 1977	
Highest daily mean	85.840	10 Mar	115.900	2 Dec 1954	
Peak	90.700	10 Mar	135.800	2 Dec 1954	
10% exceedance	32.130		30.710		105
50% exceedance	7.603		10.190		75
95% exceedance	0.621		1.225		51
Annual total (million cu m)	402.40		438.30		92
Annual runoff (mm)	1629		1775		92
Annual rainfall (mm)	2117		2152		98
[1941-70 rainfall average (mm)			2215]		

Factors affecting flow regime

- Reservoir(s) in catchment.
- Abstraction for public water supplies
- Augmentation from effluent returns

Station and catchment description

Level record since 1939 from four different sites at Newby Bridge. All flow records from 1939 to 1974 combined into a single sequence. Since 5/5/71 compound Crump profile weir - increased sensitivity at low flows. Full-range. Just d/s of Lake Windermere - highly regulated, compensation flow. Major abstractions for PWS, sewage effluent from Ambleside. Predominantly impervious, Borrowdale Volcanics in north and Silurian slate in south. Boulder Clay along river valleys. Mainly grassland, very wooded in lower reaches.

076005 Eden at Temple Sowerby 1989

Measuring authority: NRA-NW
First year 1964

Grid reference 35 (NY) 605 283
Level stn (m OD). 92.40

Catchment area (sq km) 616 4
Max alt (m OD) 950

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	9 316	6 068	29 330	8 380	4 067	2 453	7 622	1 244	3 023	1 188	20 350	2 490
2	8 238	5 748	21 290	7 338	3 916	2 389	2 363	1 181	2 433	1 174	20 080	2 403
3	7 544	21 580	19 760	6 674	3 747	2 344	1 966	1 120	2 088	1 152	20 050	2 178
4	14 630	97 200	21 720	6 395	3 649	2 250	1 782	1 067	1 900	1 110	27 270	2 394
5	21 430	32 020	17 920	9 166	3 459	2 238	1 632	1 063	1 763	1 126	13 970	2 255
6	17 710	18 430	22 710	15 690	3 308	2 250	1 542	1 039	1 663	1 171	9 020	2 248
7	12 130	25 960	16 460	16 020	3 240	2 263	1 529	0 988	1 587	2 800	7 267	2 218
8	10 420	21 910	16 430	17 900	3 174	2 212	1 557	0 956	1 522	2 807	8 895	2 122
9	17 940	13 870	121 000	11 040	3 069	2 230	1 560	1 271	1 438	2 013	11 490	2 038
10	11 300	10 500	53 220	13 250	2 993	2 181	1 574	2 181	1 390	1 696	90 970	2 003
11	11 700	24 010	22 720	63 760	3 128	2 098	1 527	2 309	1 372	2 968	52 780	1 991
12	20 060	19 020	22 600	56 440	3 969	2 113	1 433	2 247	1 374	2 644	22 920	1 995
13	65 760	39 420	31 970	51 550	3 929	2 201	1 360	3 097	1 387	2 647	14 010	2 091
14	50 970	19 190	47 590	27 840	3 206	2 260	1 322	7 269	1 358	2 909	10 300	2 313
15	20 600	45 760	28 470	18 420	2 970	2 065	1 313	5 641	1 410	2 671	8 265	3 069
16	16 000	17 620	16 850	13 060	2 953	1 957	1 257	3 399	1 787	13 640	6 920	20 750
17	14 980	13 110	12 710	10 410	2 873	1 881	1 235	2 578	1 802	7 525	6 030	60 360
18	11 440	70 360	16 180	8 884	2 791	1 846	1 209	2 340	1 517	4 417	5 383	22 430
19	9 693	67 440	32 000	7 856	2 811	1 775	1 183	1 926	1 457	3 372	4 814	10 930
20	8 696	33 540	30 810	7 094	2 728	1 713	1 170	2 111	1 394	27 910	4 404	27 140
21	10 290	21 200	23 950	6 638	2 672	1 693	1 133	2 850	1 341	26 630	4 094	52 830
22	8 948	24 450	57 310	6 618	2 559	1 672	1 122	2 139	1 558	21 760	3 813	24 980
23	21 430	19 250	77 370	6 793	3 462	1 653	1 128	1 797	1 632	13 330	3 557	21 020
24	14 070	34 820	56 730	6 030	3 425	1 637	1 116	1 786	1 503	15 110	3 358	66 330
25	10 100	30 770	21 270	5 424	3 194	1 623	1 078	2 944	1 419	20 460	3 134	54 660
26	12 300	21 120	16 440	5 053	2 878	1 833	1 049	2 813	1 456	13 240	2 918	25 860
27	10 190	21 720	13 080	4 753	2 688	2 802	1 017	3 032	1 398	13 760	2 839	16 030
28	10 130	35 970	11 060	4 448	2 563	2 988	1 068	2 260	1 318	12 180	2 730	11 920
29	8 242		9 453	4 302	2 502	3 074	1 150	1 904	1 263	15 910	2 677	9 726
30	7 302		11 820	4 174	2 398	2 383	1 378	3 014	1 223	20 340	2 567	8 252
31	6 591		9 743		2 390		1 338	5 465		11 080		7 233
Average	15 490	29 000	29 350	14 380	3 120	2 136	1 410	2 420	1 593	8 734	13 230	15 300
Lowest	6 591	5 748	9 453	4 174	2 390	1 623	1 017	0 956	1 223	1 110	2 567	1 991
Highest	65 760	97 200	121 000	63 760	4 067	3 074	2 622	7 269	3 023	27 910	90 920	66 330
Peak flow	164 70	180 50	184 00	130 20	4 87	3 69	2 89	14 36	3 60	46 76	192 70	99 39
Day of peak	13	4	23	11	12	29	1	13	1	20	10	24
Monthly total (million cu m)	41 48	70 16	78 62	37 27	8 36	5 54	3 78	6 48	4 13	23 39	34 29	40 98
Runoff (mm)	67	114	128	60	14	9	6	11	7	38	56	66
Rainfall (mm)	80	163	148	72	33	39	14	92	20	129	76	101

Statistics of monthly data for previous record (Nov 1964 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	23 560	17 600	16 450	10 650	7 530	5 531	5 723	8 410	11 970	17 230	21 930	25 640
	Low	10 870	5 577	6 337	2 923	2 195	1 878	1 177	1 612	2 071	1 974	7 765	9 404
	(year)	1985	1986	1975	1974	1984	1975	1984	1976	1972	1972	1983	1971
	High	41 800	32 960	43 570	19 500	17 010	13 780	16 690	22 070	30 440	55 960	38 740	49 530
	(year)	1974	1966	1979	1979	1967	1972	1988	1985	1968	1967	1984	1979
Runoff	Avg	102	70	71	45	33	23	25	37	50	75	92	111
	Low	47	22	28	12	10	8	5	7	9	9	33	41
	High	182	129	189	82	74	58	73	96	128	243	163	215
Rainfall	Avg	123	76	98	61	73	71	82	97	112	116	127	131
	Low	49	9	45	5	24	21	27	20	18	35	50	49
	High	236	164	200	113	152	149	210	190	222	288	211	236

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	11 240		14 350		78
Lowest yearly mean			8 669	1973	
Highest yearly mean			18 910	1979	
Lowest monthly mean	1 410	Jul	1 177	Jul 1984	
Highest monthly mean	29 350	Mar	55 960	Oct 1967	
Lowest daily mean	0 956	8 Aug	0 999	26 Jul 1984	
Highest daily mean	121 000	9 Mar	285 200	23 Mar 1968	
Peak	192 700	10 Nov	346 300	23 Mar 1968	
10% exceedance	26 650		32 250		83
50% exceedance	3 596		7 700		47
95% exceedance	1 159		1 986		58
Annual total (million cu m)	354 50		452 90		78
Annual runoff (mm)	575		735		78
Annual rainfall (mm)	967		1167		83
[1941-70 rainfall average (mm)			1216]		

Factors affecting flow regime

Station and catchment description

Velocity-area station with cableway Very badly affected by weed growth in summer months, hence numerous rating changes Unstable gravel bed Minor floods contained Above 3.3m inundates wide floodplain on left bank Floods cause considerable scour and erosion. Sewage discharge downstream of Appleby. Rural catchment except for Appleby Boulder Clay covered Permo-Triassic sandstone in main valley supports arable farming; headwaters drain Carboniferous Limestone with rough grazing, moorland on highest ground

079006 Nith at Drumlanrig 1989

Measuring authority: SRPB
First year: 1967

Grid reference: 25 (NX) 858 994
Level stn. (m OD): 52.20

Catchment area (sq km): 471.0
Max alt. (m OD): 725

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	8 076	9.734	17.310	12 000	3 786	1 676	2.480	1.436	12.040	4.651	20 310	3 223
2	7 664	9.101	13.780	9 852	3 509	1.595	2 002	1.256	9.491	4 181	62 980	3.154
3	16 340	30 710	11 970	8 246	3.401	1 592	1 622	1 228	7.119	3.871	33.510	3 143
4	36 170	67 730	11.760	7.435	3 231	1 516	1 388	1.151	5 898	3.760	58.510	3.198
5	44 000	43.150	26 840	7 927	3.140	1.487	1 205	1 106	5 129	4 345	37.260	3.159
6	27.570	20 020	28 420	16 390	3 065	1 462	1.095	1.297	4 527	6 575	21 550	3 082
7	17.650	17 170	18 220	17 450	3 050	1 458	1 045	1 159	4.195	6 087	17.470	2 979
8	18 560	13 590	42 190	22 300	2.998	1 331	0 960	1 075	3 922	5 235	13 400	2 877
9	37 160	12.370	92 640	11.710	2 915	1 273	0 937	1.336	3 476	4 267	33 910	2.787
10	19.290	13 710	36.740	11.570	2.847	1.335	1 110	2.109	3 192	3 902	25.480	2 698
11	108.600	37 090	20 510	58.920	3 679	1 484	1 127	9 926	2 923	5.291	17 590	2 491
12	43 880	28 760	37 590	30 750	3 472	1 488	1 036	3 859	2 737	9.509	13 490	2 431
13	105 900	49 450	40 130	53 240	2 992	5 268	0 987	25 780	2 736	33 500	11 800	2.353
14	38 680	32 140	33 030	31.650	2 781	3 310	0.960	38 620	2 803	23 430	10.100	2 177
15	22.570	54 040	21 780	16 790	2 704	2 008	0 928	22 010	3 520	19 420	8 773	2 214
16	17 730	20 760	15 270	11 860	2.646	1 631	0 898	10 600	3 695	18 030	7.804	81 370
17	15 260	58 290	12 060	10 670	2.572	1 482	0 884	6 238	2 922	16 110	6 939	73 120
18	12 070	48 930	31 490	8 859	2 595	1 381	0 856	4 795	13.230	13 000	6 295	23 020
19	10 290	26 420	59 110	7 588	2 877	1.292	0 883	6 730	8 458	28 250	5 865	11 920
20	22 070	20 000	26 100	6.721	2 461	1 177	0 861	33 960	86 490	30.790	5 403	10 230
21	28 330	42 280	46 390	6 089	2 287	1 134	0 838	14 340	32 490	30 400	5.130	12 500
22	17 920	32 110	73 600	6 173	2 142	1 106	0 837	8 140	36 820	19 470	4 641	17 150
23	15 930	16 510	88 810	5 569	2 005	1 034	0 830	6 077	23 630	12 960	4.262	41 530
24	13 980	13 440	77 560	4 874	1 884	1 017	0 783	33 030	13 880	20 120	4 177	155 300
25	13 530	13 270	44 700	4 490	1 825	1 131	0 796	16 800	10 440	28 880	3 874	50 820
26	20 120	11 670	38 480	4 126	1 810	3 147	0 938	12 860	8 733	19 090	3 745	24 700
27	56 760	21 120	22 750	3 908	1 705	9 893	0 980	9 076	7 855	37 130	3 705	16 410
28	42 060	31 870	24 410	3 717	1 593	5.870	1.156	6 659	6 517	33 660	3 598	12 270
29	19.280		26 530	3 709	1 574	7 925	4 787	5 827	5 561	22.130	3 434	10 470
30	14 090		23 740	3 721	1 462	2 290	2 515	34 160	4 929	28.920	3 337	9 661
31	11 450		15 020		1 529		1 728	20 820		27 990		8 506
Average	28 480	28 410	34 800	13 610	2 598	2 160	1 273	11 080	11 310	16 770	15 280	19.390
Lowest	7 664	9 101	11 760	3 709	1 462	1 017	0 783	1 075	2 736	3 760	3 337	2 177
Highest	108 600	67 730	92 640	58 920	3.786	9 893	4 787	38 620	86 490	33 660	62 980	155 300
Peak flow	222 10	167 50	178 10	112 00	4 70	11 85	7 84	106 70	136 50	60 97	98 33	342 60
Day of peak	13	18	24	11	12	28	29	15	20	20	2	24
Monthly total (million cu m)	76 28	68 72	93 22	35 28	6 96	5 60	3 41	29 67	29 32	44 92	39 60	51 92
Runoff (mm)	162	146	198	75	15	12	7	63	62	95	84	110
Rainfall (mm)	197	195	239	86	39	69	44	196	98	150	69	141

Statistics of monthly data for previous record (Jun 1967 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	28 510	19 720	18 370	9 294	8 017	5 331	5 752	8 336	14 490	23 380	26 350	25 570
	Low	9 037	4 288	4 427	2 457	1 390	1 489	0 868	0 841	1 260	2 744	5 268	12 770
	(year)	1985	1986	1969	1974	1980	1984	1984	1984	1977	1972	1983	1971
	High	61 220	38 900	33 190	24 190	27 570	14 660	15 780	38 280	39 000	39 200	49 350	55 190
	(year)	1974	1984	1978	1972	1986	1972	1988	1985	1985	1967	1982	1986
Runoff	Avg	162	103	104	51	46	29	33	47	80	133	145	145
	Low	51	22	25	14	8	8	5	5	7	16	29	73
	High	348	207	189	133	157	81	90	218	215	223	272	314
Rainfall	Avg	181	105	132	71	98	84	99	108	153	181	175	166
	Low	67	10	34	11	19	30	41	23	20	66	35	69
	High	398	170	217	175	230	163	211	302	247	301	285	345

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	15 380		16 090		96
Lowest yearly mean			10 720	1971	
Highest yearly mean			21 700	1982	
Lowest monthly mean	1 273	Jul	0 841	Aug 1984	
Highest monthly mean	34 800	Mar	61 220	Jan 1974	
Lowest daily mean	0 783	24 Jul	0 606	26 Aug 1984	
Highest daily mean	155 300	24 Dec	231 700	19 Dec 1982	
Peak	342 600	24 Dec	538 400	18 Oct 1982	
10% exceedance	37 410		41 490		90
50% exceedance	7 977		8 100		98
95% exceedance	1 026		1 337		77
Annual total (million cu m)	485 00		507 80		96
Annual runoff (mm)	1030		1078		96
Annual rainfall (mm)	1523		1553		98
[1941-70 rainfall average (mm)			1579]		

Factors affecting flow regime

- Reservoir(s) in catchment.
- Abstraction for public water supplies.

Station and catchment description
Velocity-area station on long straight reach at particularly well confined site. Cableway. Gravel and rock bed Natural channel control Sensibly natural flow regime. Afton Reservoir has small influence

084005 Clyde at Blairston 1989

Measuring authority CRPB
First year 1958

Grid reference 26 (NS) 704 579
Level stn (m OD) 17 60

Catchment area (sq km) 1704 2
Max alt (m OD) 732

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	31 690	29 380	66 000	45 950	14 970	9 762	10 700	5 547	28 630	12 530	43 780	11 620
2	28 720	32 270	44 500	36 840	14 350	8 916	8 317	5 170	21 510	11 840	56 540	11 200
3	27 980	76 740	40 120	29 550	13 960	8 948	7 161	4 995	17 180	10 980	52 720	10 690
4	69 500	177 900	36 880	29 210	13 600	8 722	6 625	4 891	14 800	10 620	78 150	10 070
5	109 200	122 200	36 400	28 490	12 430	8 798	6 173	6 245	13 070	11 230	61 660	10 320
6	91 420	68 950	44 000	31 810	11 830	9 309	6 065	7 344	11 690	12 870	40 850	10 550
7	54 430	56 210	48 120	38 430	11 510	8 994	5 939	5 733	10 980	12 760	39 410	10 530
8	56 710	48 550	40 290	36 520	11 220	8 367	5 848	5 428	10 640	11 770	39 050	10 270
9	124 300	41 720	131 200	29 940	10 980	8 323	5 707	5 531	10 020	11 070	40 010	9 936
10	80 900	43 680	133 400	27 090	10 700	8 031	6 221	6 555	9 182	10 160	63 630	9 915
11	241 200	86 760	63 340	50 690	12 650	8 299	5 944	10 610	8 785	10 060	46 870	9 827
12	201 400	133 400	51 130	83 520	18 030	8 744	5 524	12 990	8 748	13 750	37 200	9 889
13	142 100	130 100	81 570	76 740	16 430	11 230	5 299	79 990	9 531	26 760	34 570	9 729
14	179 800	101 000	83 460	73 370	13 210	10 110	5 289	48 890	9 431	34 460	29 720	9 048
15	92 750	140 400	67 210	46 600	12 470	8 032	5 224	47 340	10 490	32 390	26 180	9 386
16	64 190	70 500	47 290	35 090	12 820	7 254	5 134	25 920	10 820	39 170	24 400	95 350
17	52 720	55 120	38 430	30 730	12 220	7 020	4 950	15 620	9 790	46 230	21 850	170 600
18	43 330	108 100	82 990	27 680	12 290	6 577	4 878	11 810	9 950	54 570	20 450	68 390
19	37 810	87 510	140 500	24 600	13 470	6 285	4 901	15 900	14 970	34 820	19 140	35 840
20	37 150	72 480	101 200	23 190	12 920	6 056	4 834	38 670	27 930	37 930	17 950	32 720
21	56 310	73 650	98 860	21 870	11 660	5 950	4 663	41 730	66 340	43 700	16 800	49 900
22	42 400	99 380	202 100	24 520	11 150	6 043	4 565	20 450	50 520	35 850	15 780	54 710
23	43 970	57 570	187 700	22 140	11 160	6 030	4 567	14 890	80 730	28 730	14 970	144 000
24	38 740	46 450	245 400	19 560	12 070	6 135	4 726	28 040	36 930	64 310	14 260	149 700
25	35 510	50 260	145 500	18 030	11 080	8 289	5 130	29 840	25 940	75 970	13 520	69 550
26	37 160	45 210	90 970	17 210	10 400	8 803	4 925	30 900	21 300	68 180	13 010	65 740
27	64 660	60 120	67 780	16 220	10 200	10 530	5 419	27 090	19 630	85 490	12 570	45 600
28	100 600	81 050	65 140	15 180	10 000	11 540	6 791	17 410	16 760	78 480	12 290	34 680
29	52 970		86 280	14 750	9 453	10 180	9 358	14 770	14 660	56 840	12 320	30 030
30	40 010		109 300	14 520	9 118	11 400	8 335	53 720	13 340	55 960	11 970	27 150
31	33 180		57 500		9 927		6 520	58 270		49 010		26 900
Average	74 610	78 450	88 210	33 000	12 200	8 423	5 991	22 650	20 480	35 110	31 050	40 450
Lowest	27 980	29 380	36 400	14 520	9 118	5 950	4 565	4 891	8 748	10 060	11 970	9 048
Highest	241 200	177 900	245 400	83 520	18 030	11 540	10 700	79 990	80 730	85 490	78 150	170 600
Peak flow	323 80	223 90	270 70	117 00	19 03	13 35	12 89	121 80	109 80	103 60	85 27	241 10
Day of peak	12	5	25	12	14	30	[illegible]	14	23	28	5	24
Monthly total (million cu m)	199 80	189 80	236 30	85 54	32 68	21 83	16 05	60 67	53 08	94 05	80 49	108 30
Runoff (mm)	117	111	139	50	19	13	9	36	31	55	47	64
Rainfall (mm)	136	141	161	55	40	59	32	158	64	107	38	86

Statistics of monthly data for previous record (Oct 1958 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	64 920	49 580	45 030	29 740	23 410	17 150	16 040	25 300	37 270	51 530	64 200	65 290
	Low	11 920	8 854	14 810	10 430	7 994	7 491	5 041	4 536	7 630	8 243	15 870	26 080
	(year)	1963	1963	1969	1974	1980	1984	1984	1984	1972	1977	1983	1963
	High	134 300	97 290	88 940	58 700	56 230	41 190	47 620	82 370	128 400	114 600	129 600	133 400
	(year)	1975	1984	1979	1972	1986	1972	1985	1985	1985	1967	1982	1986
Runoff	Avg	102	71	71	45	37	26	25	40	57	81	98	103
	Low	19	13	23	16	13	11	8	7	12	13	24	41
	High	211	143	140	89	88	63	75	129	195	180	197	210
Rainfall	Avg	112	71	91	64	73	72	83	99	117	122	125	118
	Low	25	16	28	9	18	17	32	24	16	33	24	38
	High	237	127	163	125	150	157	166	206	230	231	221	237

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre 1989
Mean flow (m^3s^{-1})	37 370		40 760		92
Lowest yearly mean			27 090	1973	
Highest yearly mean			53 020	1986	
Lowest monthly mean	5 991	Jul	4 536	Aug 1984	
Highest monthly mean	88 210	Mar	134 300	Jan 1975	
Lowest daily mean	4 565	22 Jul	3 366	23 Aug 1984	
Highest daily mean	245 400	24 Mar	581 700	21 Sep 1985	
Peak	323 800	12 Jan	666 400	22 Sep 1985	
10% exceedance	83 340		96 020		87
50% exceedance	21 880		23 700		92
95% exceedance	5 456		7 893		69
Annual total (million cu m)	1178 00		1286 00		92
Annual runoff (mm)	692		755		92
Annual rainfall (mm)	1077		1147		94
[1941-70 rainfall average (mm)			1152]		

Factors affecting flow regime

Station and catchment description

Recorder moved to present position in Nov 1974 from opposite bank Section is natural with steep grass and tree covered banks Velocity profile slightly uneven due to upstream bend Control - piers of redundant rail bridge, 300m d/s Section rated by current meter to 3 4m, just below max recorded stage Some naturalised flows available Very mixed geology with the older formations (Ordovician/Silurian) to the south. Hill pasture and moorland predominates but some mixed farming and urban development is found in the lower valley

093001 Carron at New Kelso 1989

Measuring authority: HRPB
First year: 1979

Grid reference: 18 (NG) 942 429
Level stn. (m OD): 5.60

Catchment area (sq km): 137.8
Max alt. (m OD): 1053

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	10 090	7.230	13 070	7.427	21.890	2.507	9.197	2 686	11 840	2.630	20 900	1 428
2	5.873	33.750	7.345	5.246	15.790	7.189	4 515	2.388	6 464	2 437	13.770	1.370
3	7.778	37 360	6.535	3.765	8.161	1.972	3 054	2 536	4.123	2.115	23.370	1.421
4	17.880	38.540	12 460	3 094	4 566	1.716	2 438	7 341	3 412	1.834	20.760	1.405
5	10 530	187 400	13.780	2.733	3.352	2 031	2 056	4.572	11.650	3 182	14 820	1 358
6	6 881	168.300	14 870	2 434	2.822	2 252	1.781	17 590	13.620	5.934	8 270	1 354
7	13 570	40 640	14.900	2.284	2 522	2 300	1.630	13.130	5 574	9.726	7.951	1 397
8	22 680	13 370	11.830	2.345	2 472	1.948	1 521	22 680	3 954	5 344	7.199	1 334
9	22 660	12 970	34.440	3 066	3 029	1 736	1 391	20 360	3.117	5 675	5.523	1 305
10	13.540	13 300	17 640	5 605	3.117	1.609	1 806	10 530	2 613	18.320	12.790	1.273
11	45 340	11 910	46.150	5.191	7 227	1 491	1 864	12 810	2.280	16 010	11.450	1.223
12	26 170	9 388	41 250	7 223	6 455	1 824	1.855	15 880	2 056	13 260	5.832	1.126
13	27 050	39 330	16 460	4.607	3 747	5 367	1 668	10 990	2.297	21.860	4 048	1 015
14	87 080	120 500	16 070	3.775	2 824	4 975	1 472	9 580	6.249	15 270	3.558	0 950
15	159 000	37.870	10 440	3 281	5 060	2 821	1 351	11 640	8 811	23.340	3 035	0 881
16	31 790	10 270	6 314	2 816	20 400	2 188	1 254	21 430	11 600	53 910	2 667	1 873
17	13 090	9 990	4.927	2 465	19 310	1.850	1 251	25 260	13 200	16 240	2.378	12 350
18	18 050	19.130	24 330	2 295	12.800	1 597	1 197	19 880	8 064	6.641	2 177	10 960
19	15 500	14 140	19 500	2.198	5.701	1 447	1 114	24 680	35.250	4 906	2 086	4 134
20	54 780	8 287	11.100	2 138	3 786	1 329	1 051	51 830	51.320	10 150	1.948	2 751
21	18 670	8 247	8 804	2 038	2 997	1 273	1 086	23 430	12 890	28 190	1.794	11 920
22	14 390	12.300	8.798	2 055	2 543	1 182	1 038	19 620	9.021	20 690	1 660	17 250
23	14 050	7.757	21 860	2 084	2.262	1 130	0 989	59 690	5 498	23 410	1 908	11 430
24	7 397	7 810	31.870	2.881	2 131	4 310	0 944	19.120	4.451	34 230	1.796	26 350
25	7 995	6 822	16 190	3 841	1 935	41 670	0 898	7.470	12 900	19 040	1.547	17 420
26	13 930	5 879	24.880	3.929	1 753	13 470	0 920	5 241	8.084	17 970	1.605	20.200
27	77.760	6 236	19.380	3 672	1 675	11 340	3 226	4 273	6 421	28 850	1.677	7 367
28	31 780	23.910	11 920	3 457	2 009	8 126	14 740	3 374	4.297	23.140	1 597	4.120
29	111.700		29 630	3.874	2 212	7 284	17 730	3 391	3.294	9 283	1.497	3 009
30	61 440		29.500	6 016	2 101	8 955	5.749	12.790	2.738	13 050	1 446	2 535
31	12 810		12 560		3.194		3 510	10 390		34 680		2 186
Average	31 650	32 590	18 030	3.594	5 801	4 796	3.042	15 050	9 236	15 850	6.369	5 635
Lowest	5 873	5 879	4 927 ·	2 038	1.675	1 130	0 898	2 341	2 056	1.834	1 446	0.881
Highest	159 000	187 400	46 150	7 427	21 890	41 670	17 730	59 690	51 320	53 910	23 370	26 350
Peak flow	243 30	337.40	76 81	12 20	34 68	63 77	27.29	88 54	119 90	71 23	34 04	38 93
Day of peak	16	6	12	30	17	26	30	21	20	16	1	25
Monthly total (million cu m)	84 78	78 85	48 28	9 32	15 54	12 43	8 15	40 31	23 94	42 45	16.51	15 09
Runoff (mm)	615	572	350	68	113	90	59	293	174	308	120	110
Rainfall (mm)	623	583	375	72	112	134	89	360	192	403	114	165

Statistics of monthly data for previous record (Jan 1979 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	13 340	8 667	11 970	6 818	4 868	4 087	6 364	7 928	14 450	13 640	16 460	19 140
	Low	6 148	1 361	4 103	2 863	0 698	0 921	2 426	2 703	7 086	6 332	7 750	5 646
	(year)	1985	1986	1980	1980	1980	1982	1984	1984	1986	1979	1988	1981
	High	28 470	14.050	18 250	13 440	14.120	8 623	10 530	15 070	19 100	24 070	31 120	30 710
	(year)	1983	1988	1983	1984	1986	1980	1985	1985	1980	1983	1981	1983
Runoff	Avg	259	154	233	128	95	77	124	154	272	265	310	372
	Low	120	24	80	54	14	17	47	53	133	123	146	110
	High	553	256	355	253	274	162	205	293	359	468	585	597
Rainfall	Avg	284	155	264	123	113	120	162	192	321	315	347	392
	Low	94	6	95	70	36	28	96	85	150	182	133	124
	High	553	325	397	217	295	275	248	332	425	532	629	546

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	12 550		10.660		118
Lowest yearly mean			8 852	1987	
Highest yearly mean			12.770	1983	
Lowest monthly mean	3 042	Jul	0 698	May 1980	
Highest monthly mean	32.590	Feb	31 120	Nov 1981	
Lowest daily mean	0 881	15 Dec	0.425	27 Jun 1982	
Highest daily mean	187.400	5 Feb	201.100	31 Dec 1983	
Peak	337.400	6 Feb	295.500	31 Dec 1983	
10% exceedance	25 910		26 160		99
50% exceedance	6.324		5 413		117
95% exceedance	1 258		0.993		127
Annual total (million cu m)	395 80		336 40		118
Annual runoff (mm)	2872		2442		118
Annual rainfall (mm)	3222		2788		116
[1941 70 rainfall average (mm)			2498]		

Factors affecting flow regime

- Natural to within 10% at 95 percentile flow.

Station and catchment description

40m wide river section with floodbank on right. Any bypassing in extreme floods will be over 30m wide floodplain on left bank. Unstable gravel control requires regular calibration of low flow range. Adequately gauged to bankfull. Computed flows are 100% natural. 70% of catchment drains through Loch Dughaill with little additional surface storage. Typical mix of rough grazing and moorland. One of the wetter Highland catchments currently gauged.

201005 Camowen at Camowen Terrace 1989

Measuring authority: DOEN
First year: 1972

Grid reference: 23 (IH) 460 730
Level stn (m OD): 66 00

Catchment area (sq km): 274.6
Max alt (m OD): 539

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3 982	3 964	17 720	14 910	2 990	1 105	0 838	0 632	1 060	1 071	10 030	2 060
2	3 651	3 858	23 270	29 870	2 821	1 164	0 811	0 586	1 027	1 045	7 634	1 991
3	5 871	6 358	11 520	9 322	2 600	1 218	0 744	0 553	1 089	0 999	8 781	1 923
4	12 920	22 400	8 226	6 641	2 373	1 146	0 586	0 520	1 063	1 096	16 100	1 856
5	13 650	11 700	7 331	10 870	2 236	1 095	0 552	0 616	1 043	1 908	15 950	1 992
6	8 991	6.634	8 419	27 240	2 245	1 053	0 480	0 645	0 938	3 714	9 126	1 909
7	6 244	7 847	7 115	21 890	1 837	1 021	0 450	0 599	0 922	3 401	7 143	1 819
8	5 473	6 096	7 782	11 750	1 753	1 004	0 440	0 628	0 901	2 999	5 783	1 731
9	5 488	13 750	18 440	12 370	1 721	1 072	0 430	0 930	0 758	2.344	5 338	1 639
10	5.151	7 780	8 975	10 950	1 690	1 167	0 413	0 985	0 723	2 270	7 689	1 548
11	8 008	9 594	6 961	29 500	1 850	1 063	0 400	1 391	0 730	2 227	7 403	1 459
12	10 970	14 720	11 530	14 930	2 519	1 034	0 393	4 069	0 777	2 020	6 994	2 521
13	13 180	17 830	13 980	9 362	2 220	1 090	0 372	7 500	0 842	2 707	5 778	2 803
14	9 111	12 020	16 250	7 314	1 935	1 084	0 367	7 719	0 844	2 552	4 524	3 989
15	6 076	13 480	9 611	6 026	2 054	0 985	0 400	6 609	1 113	3 073	4 075	2 869
16	5 293	7 398	6.698	5 034	2 262	0 950	0 412	3 519	1 081	3 969	3 630	25 110
17	5 116	9 485	6 218	4 384	1 736	0 932	0 372	2 255	0 913	5 488	6 408	15 420
18	4 636	9 186	10 960	3 900	1 838	0 905	0 392	1 566	1 009	7 919	12 930	6 528
19	4 198	7 734	13 320	3 640	2 008	0 830	0 400	1 414	1 147	24 340	5 879	4 703
20	4 035	10 930	11 570	3 470	1 615	0 786	0 408	1 974	4 595	13 580	4 450	5 767
21	8 464	11 700	26 670	3 388	1 408	0 745	0 431	1 949	10 420	13 670	4 059	6 631
22	5 768	10 720	23 080	3 245	1 398	0 729	0 491	1 373	6 002	7 892	3 501	6 256
23	5 273	9 098	37 510	2 988	1 741	0 714	0 450	1 249	3 053	5 146	3 102	5 402
24	5 381	8 792	14 140	2 780	1 632	0 685	0 406	1 462	2 079	6 092	3 053	15 240
25	6 603	9 982	13 410	2 848	1 499	0 716	0 874	5 632	1 661	8 279	3 020	8 362
26	6 017	16 050	16 490	3 498	1 288	0 742	0 851	3 941	1 591	6 763	2 941	5 201
27	19 800	11 750	13 650	3 541	1 269	0 698	0 647	2 343	1 471	37 370	2 833	4 282
28	12 520	14 610	12 100	2 878	1 228	0 709	0 701	1 621	1 316	27 520	2 711	3 904
29	6 258		8 584	2 918	1 179	0 729	0 995	1 331	1 225	15 920	2 473	3 300
30	4 959		7 383	3 032	1 062	0 812	0 900	1 376	1 141	14 340	2 217	3 066
31	4 265		6 785		1 131		0 781	1 219		21 230		3 723
Average	7 334	10 550	13 090	9 150	1 843	0 933	0 554	2 200	1 751	8 159	6 185	5 000
Lowest	3 651	3 858	6 218	2 780	1 062	0 685	0 367	0 520	0 723	0 999	2 217	1 459
Highest	19 800	22 400	37 510	29 870	2 990	1 218	0 995	7 719	10 420	37 370	16 100	25 110
Peak flow	41 83	34 34	49 26	43 73	3 07	1 28	1 53	15 56	12 54	48 70	22 31	43 91
Day of peak	27	4	23	1	1	3	25	12	21	27	17	16
Monthly total (million cu m)	19 64	25 53	35 05	23.72	4 94	2 42	1 48	5 89	4 54	21 85	16 03	13 39
Runoff (mm)	72	93	128	86	18	9	5	21	17	80	58	49
Rainfall (mm)	83	124	133	89	32	36	47	130	59	147	49	62

Statistics of monthly data for previous record (May 1972 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	12 820	8 846	8 515	4 570	3 718	2 807	2 241	3 994	5 448	7 542	9 179	11 440
	Low	7 878	2 992	2 210	1 701	1 076	0 911	0 962	0 927	0 680	1 215	3 757	5 062
	(year)	1985	1986	1973	1974	1980	1974	1984	1983	1972	1972	1983	1975
	High	19 140	17 980	13 630	9 765	9 152	5 471	5 542	13 070	14 560	11 520	18 020	17 330
	(year)	1984	1984	1981	1986	1986	1981	1985	1985	1985	1988	1979	1978
Runoff	Avg	125	79	83	43	36	26	22	39	51	74	87	112
	Low	77	26	22	16	11	9	9	9	6	12	35	49
	High	187	164	133	92	89	52	54	127	137	112	170	169
Rainfall	Avg	128	77	107	57	75	69	75	94	106	110	111	121
	Low	55	4	38	20	20	28	20	20	13	55	45	39
	High	194	161	156	118	145	118	146	188	177	171	182	183

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	5 533		6 759		82
Lowest yearly mean			4 102	1975	
Highest yearly mean			8 435	1986	
Lowest monthly mean	0 554	Jul	0 680	Sep 1972	
Highest monthly mean	13 090	Mar	19 140	Jan 1984	
Lowest daily mean	0 367	14 Jul	0 488	23 Aug 1984	
Highest daily mean	37 510	23 Mar	139 600	21 Oct 1987	
Peak	49 260	23 Mar	180 200	21 Oct 1987	
10% exceedance	13 670		15 310		89
50% exceedance	3 111		4 225		74
95% exceedance	0 490		1 064		46
Annual total (million cu m)	174 50		213 30		82
Annual runoff (mm)	635		777		82
Annual rainfall (mm)	991		1130		88
[1941-70 rainfall average (mm)			1183]		

Factors affecting flow regime

Station and catchment description

Velocity-area station with cableway and weir control - informal broad-crested structure (for angling enhancement), dimensions not known. The net effect of abstractions for public water supply and augmentations from effluent returns is minor. Catchment geology: mixed impermeable rocks (granite, schist and gneiss, and sandstone) overlain by substantial deposits of till, sand and gravel. Largely upland given over mainly to grassland or heath.

203010 Blackwater at Maydown Bridge 1989

Measuring authority: DOEN
First year: 1970

Grid reference: 23 (IH) 820 519
Level stn. (m OD): 15.00

Catchment area (sq km): 951.4
Max alt. (m OD): 380

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	17.770	13.720	25.770	30.750	8 323	2 416	1.900	0 972	2.896	2.574	30 660	6 031
2	15 910	12.760	37.030	90 850	7.737	2.198	1.833	0 905	2 489	2.258	22.730	5.846
3	14.770	14 720	30.950	51.030	7.604	2.568	1 474	0 845	2.257	2.149	18 320	5 693
4	20 210	23.280	21 250	34 340	7 255	2 440	1.613	0.779	2.236	2.118	25 250	5 532
5	31 080	28 270	18 880	38 760	6.436	2 233	1 419	0.737	2.431	3 030	37.350	5.361
6	34 090	18.890	18.760	93 440	5 637	2 215	1.328	0.737	1.984	5.440	23 240	5 228
7	22 870	18 580	19.420	94 460	5 325	1 985	1 414	0.719	2.132	6 902	18.090	5.210
8	17 470	18 400	21.630	59.550	5 052	2 274	1 225	0 904	2.156	5.169	15 620	4 914
9	19.550	34.150	59.320	45 350	4 544	2 293	1.163	0 914	2.011	4 161	14.930	4 810
10	22 250	33 330	49.710	41 950	4 498	2 429	1.115	1.647	1.838	3 426	19 130	4.732
11	28.540	23.350	31.120	61 470	4.566	2 260	0 865	2 021	1.625	3.184	23.200	4.732
12	47.380	22 500	36.390	78 550	5 496	7 474	0.856	3 161	1.586	3 438	17 520	8.486
13	40.010	44.740	48.580	43.310	5.241	3 053	0 853	18 850	1 568	4 761	15 710	11 930
14	39.810	36 400	52.160	30 620	5.192	2.764	0 859	12 360	1 713	6.802	13.730	15.580
15	27.700	37 640	39.810	24 520	4.606	2 331	0 845	13.980	1.815	5 499	12.900	12 880
16	22 960	27.130	26 980	20 600	4 646	2 051	0 816	10 080	2 216	9.526	11.710	55.980
17	20 930	27.160	22 060	16 890	4.385	2 144	0 804	6 090	2 054	16 290	11.550	79.660
18	18 720	30 500	28.000	14.510	4 228	1 976	0 794	4 184	1 659	20 230	22.590	30 430
19	16 970	30.200	43 520	13.450	4 444	1 590	0 779	3.287	1 885	28.060	17 520	19 670
20	15 450	27.380	38 640	12 380	4 161	1 564	0 688	4 208	4 292	40 840	13.960	19 030
21	21.020	23 850	39.330	11.210	3 815	1 563	0 653	5 096	15.480	33 970	11 930	22 100
22	20 220	25 500	66 880	10 200	3 342	1 508	0 612	4 149	16.760	22 260	10 410	18 660
23	17 590	19 920	70 320	9 477	5.415	1 454	0 604	3 110	10 530	14 900	9.192	18 400
24	16.980	17 970	68.830	8 753	4 464	1.564	0 581	2.574	6 962	11 880	8 808	47 380
25	17.710	16 580	47 500	8 380	3 387	1 474	0 529	4 060	4 853	14 800	8 760	33 780
26	15.670	18 060	51.960	8 731	2.920	1.678	0 564	8 231	4 335	17 420	8.554	21.530
27	17.760	22 550	53 580	10.690	2 797	1 760	0 745	5 885	4 391	65 450	7.932	16 940
28	39 080	21.760	48 670	9 610	2 743	1 527	0 774	3 879	3.957	91.770	7.494	15.100
29	22 370		32 250	9 870	2.327	1.603	1 355	2 999	3 220	50 600	7 031	13 710
30	17.770		25 800	9.282	2 362	2 031	1 385	2 992	2.775	35.500	6.521	12 380
31	15 370		22 020		2.436		1 125	3 080		47.840		12.090
Average	23.100	24 620	38 620	33.100	4 690	2 047	1 018	4 304	3 870	18.780	15.740	17 540
Lowest	14.770	12 760	18.760	8 380	2 327	1 454	0 529	0 719	1.568	2.118	6.521	4.732
Highest	47 380	44 740	70 320	94 460	8 323	3 053	1 900	18 850	16.760	91.770	37.350	79 660
Peak flow	56 99	54 03	85.67	108.90	9 47	3 28	2 08	24 92	19 04	108 00	42.43	112 80
Day of peak	12	13	23	2	23	13	4	13	22	28	5	17
Monthly total (million cu m)	61 86	59 55	103.40	85.79	12.56	5 31	2 73	11 53	10 03	50 31	40 81	46 98
Runoff (mm)	65	63	109	90	13	6	3	12	11	53	43	49
Rainfall (mm)	74	79	121	99	26	37	40	113	57	135	38	69

Statistics of monthly data for previous record (Jul 1970 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	33 770	25 800	22 020	11.920	8 212	5 895	3 805	8 806	11.260	18 140	26 480	30 290
	Low	18 050	7 186	8 772	3.441	1 306	0 973	0 859	0 596	1 920	2 163	8 857	10 570
	(year)	1971	1986	1973	1974	1984	1975	1984	1975	1972	1972	1983	1971
	High	56.780	52 240	43.250	26 850	19 810	17.540	12.690	32 480	30 110	33 770	51.680	50 390
	(year)	1984	1977	1981	1986	1983	1981	1985	1985	1985	1988	1970	1978
Runoff	Avg	95	66	62	32	23	16	11	25	31	51	72	85
	Low	51	18	25	9	4	3	2	2	5	6	24	30
	High	160	133	122	73	56	48	36	91	82	95	141	142
Rainfall	Avg	111	74	87	53	63	60	66	81	89	94	97	96
	Low	46	4	33	14	19	19	17	15	7	43	38	30
	High	185	158	142	122	124	111	129	160	153	168	146	164

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre 1989
Mean flow (m^3s^{-1})	15.570		17 170		91
Lowest yearly mean			9 712	1975	
Highest yearly mean			23.860	1988	
Lowest monthly mean	1 018	Jul	0 596	Aug 1975	
Highest monthly mean	38.620	Mar	56 780	Jan 1984	
Lowest daily mean	0.529	25 Jul	0 043	6 Sep 1975	
Highest daily mean	94 460	7 Apr	143.800	22 Oct 1987	
Peak	112.800	17 Dec	144 800	22 Oct 1987	
10% exceedance	38.950		44 340		88
50% exceedance	9 061		10.210		89
95% exceedance	0 844		0 981		86
Annual total (million cu m)	491.00		541 90		91
Annual runoff (mm)	516		570		91
Annual rainfall (mm)	886		971		91
[1941-70 rainfall average (mm)			1005]		

Factors affecting flow regime

- Natural to within 10% at 95 percentile flow.

Station and catchment description

Velocity-area station with cableway and natural control. Flows influenced by major arterial drainage scheme - started in 1988. A substantial portion of the catchment is in the Irish Republic where some groundwater may be abstracted but its hydrological significance is uncertain. Geology: Carboniferous Limestone and Millstone Grit with sandstones overlain by substantial amounts of till. A predominantly rural catchment with limited afforestation. Monaghan Town (pop. 5,000) - in the Irish Republic - is the only significant urban centre.

203028 Agivey at White Hill 1989

Measuring authority: DOEN
First year: 1972

Grid reference: 24 (IC) 883 193
Level stn (m OD): 17 00

Catchment area (sq km): 98 9
Max alt (m OD): 461

Daily mean gauged discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1 402	1 314	7 887	11 390	0 875	0 584	0 349	0 504	0 500	0 473	3 215	0 819
2	1 154	1 209	6 564	22 100	0 777	0 615	0 334	0 560	0 486	0 457	3 641	0 748
3	1 544	1 226	3 374	3 393	0 753	0 587	0 321	0 568	0 414	0 429	8 007	0 677
4	5 836	4 956	2 247	2 023	0 712	0 538	0 319	0 415	0 392	0 416	6 175	0 694
5	5 064	2 767	2 415	7 717	0 657	0 531	0 311	0 432	0 383	1 011	6 846	0 684
6	3 985	1 779	4 014	14 910	0 631	0 629	0 288	0 716	0 354	3 371	3 229	0 664
7	2 360	1 615	2 735	8 845	0 636	0 577	0 283	0 465	0 451	4 196	2 200	0 681
8	1 881	1 464	6 158	3 815	0 639	0 434	0 276	0 416	0 527	4 006	1 773	0 657
9	1 765	4 176	10 700	8 997	0 602	0 426	0 272	0 480	0 409	2 977	2 343	0 604
10	1 674	2 339	3 578	4 904	0 585	0 485	0 265	0 850	0 358	2 503	4 180	0 571
11	2 230	1 897	2 340	22 130	0 930	0 551	0 266	1 407	0 328	1 470	2 777	0 596
12	2 076	3 458	8 635	6 153	2 486	0 638	0 248	1 579	0 333	1 997	3 378	1 363
13	6 261	5 555	6 175	2 950	1 342	4 407	0 238	3 398	0 334	1 981	2 388	1 225
14	4 273	3 535	4 711	2 989	1 194	1 073	0 232	5 569	0 329	1 775	1 801	0 974
15	2 126	4 742	4 594	2 398	1 060	0 612	0 229	2 307	0 426	1 334	1 526	0 773
16	1 922	2 534	2 639	1 880	1 194	0 467	0 226	1 183	0 458	1 309	1 337	16 180
17	1 627	6 973	1 921	1 705	0 823	0 366	0 229	0 805	0 365	1 853	1 863	6 983
18	1 482	3 697	3 060	1 479	0 835	0 299	0 205	0 612	0 395	3 448	3 639	2 611
19	1 394	3 455	5 136	1 274	0 789	0 311	0 197	0 970	0 559	12 490	1 818	1 673
20	1 463	3 047	4 728	1 114	0 643	0 327	0 394	1 431	5 051	5 373	1 404	1 829
21	2 506	4 938	16 200	0 996	0 629	0 323	0 258	1 018	4 895	4 972	1 239	1 852
22	2 226	3 533	10 860	0 918	0 541	0 319	0 225	0 780	3 898	2 531	1 065	1 862
23	1 997	2 535	10 760	0 938	4 200	0 316	0 211	0 572	1 696	1 650	0 961	1 825
24	2 123	2 461	4 423	0 965	1 919	0 315	0 187	0 512	1 005	1 302	1 066	0 580
25	2 213	2 416	3 510	0 947	1 293	0 319	3 751	1 502	0 799	1 384	1 269	2 638
26	2 045	8 013	5 441	1 498	0 829	0 320	0 861	1 773	0 773	1 280	1 012	1 693
27	8 022	8 389	5 556	1 165	0 688	0 297	0 499	1 224	0 700	25 400	0 974	1 402
28	3 349	15 270	4 451	1 020	0 633	0 263	0 437	0 710	0 592	21 880	0 885	1 218
29	1 979		2 512	1 050	0 587	0 236	0 581	0 668	0 527	10 520	0 826	1 044
30	1 568		2 055	1 077	0 535	0 563	0 685	0 650	0 487	7 079	0 777	1 008
31	1 327		1 904		0 535		0 528	0 633		8 762		4 821
Average	2 609	3 903	5 203	4 758	0 985	0 589	0 442	1 120	0 941	4 504	2 454	2 289
Lowest	1 154	1 209	1 904	0 918	0 535	0 236	0 187	0 415	0 328	0 416	0 777	0 571
Highest	8 022	15 270	16 200	22 130	4 200	4 407	3 751	5 569	5 051	25 400	8 007	16 180
Peak flow	20 11	31 53	41 43	43 59	17 40	10 29	15 41	15 32	8 50	56 40	14 16	30 59
Day of peak	27	28	21	11	23	13	25	14	20	27	3	16
Monthly total (million cu m)	6 99	9 44	13 93	12 33	2 64	1 53	1 18	3 00	2 44	12 06	6 36	6 13
Runoff (mm)	71	95	141	125	27	15	12	30	25	122	64	62
Rainfall (mm)	90	139	167	125	48	71	53	127	65	186	53	67

Statistics of monthly data for previous record (Dec 1972 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean flows	Avg	5 466	3 839	3 207	1 668	1 549	1 010	0 951	1 600	2 428	3 817	3 778	4 595
	Low	2 957	0 847	1 384	0 870	0 282	0 340	0 190	0 212	0 421	1 841	0 815	2 218
	(year)	1985	1986	1973	1984	1984	1984	1984	1983	1986	1973	1983	1987
	High	7 902	7 416	4 770	2 991	3 909	2 389	1 775	5 077	6 371	6 337	8 405	7 077
	(year)	1974	1977	1982	1986	1981	1982	1973	1985	1985	1981	1982	1978
Runoff	Avg	148	95	87	44	42	26	26	43	64	103	99	124
	Low	80	21	37	23	8	9	5	6	11	50	21	60
	High	214	185	129	78	106	63	48	137	167	172	220	192
Rainfall	Avg	151	89	107	59	77	67	79	93	107	131	121	129
	Low	63	5	36	22	20	37	26	23	15	53	33	58
	High	221	195	154	117	161	137	144	218	213	208	196	206

Summary statistics

	For 1989		For record preceding 1989		1989 As % of pre 1989
Mean flow (m^3s^{-1})	2 475		2 825		88
Lowest yearly mean			2 165	1983	
Highest yearly mean			3 599	1981	
Lowest monthly mean	0 442	Jul	0 190	Jul 1984	
Highest monthly mean	5 203	Mar	8 405	Nov 1982	
Lowest daily mean	0 187	24 Jul	0 080	7 Sep 1976	
Highest daily mean	25 400	27 Oct	76 500	21 Oct 1987	
Peak	56 400	27 Oct	159 300	21 Oct 1987	
10% exceedance	5 755		6 570		88
50% exceedance	1 302		1 588		82
95% exceedance	0 279		0 301		93
Annual total (million cu m)	78 05		89 16		88
Annual runoff (mm)	789		902		88
Annual rainfall (mm)	1191		1210		98
[1941 70 rainfall average (mm)			:		

Factors affecting flow regime

- Natural to within 10% at 95 percentile flow

Station and catchment description

Velocity-area station with cableway. Geology: mainly basalt overlain by till with some peat. Significant proportion of upland, predominantly grassland or heath. No urban areas or major industry.

039001 Thames at Kingston 1989

Measuring authority: NRA-T
First year: 1883

Grid reference: 51 (TQ) 177 698
Level stn. (m OD): 4.70

Catchment area (sq km): 9948.0
Max alt. (m OD): 330

Daily mean naturalised discharges (cubic metres per second)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	38.800	46 400	203 000	75.300	73.500	38.700	31.600	23 600	19 900	20.100	37.000	23 500
2	38.500	51.400	150 000	83.600	62.900	45 000	30 400	22.300	19.400	19.900	32.200	25 400
3	38 400	44.800	189 000	85.100	63 200	44 600	31.900	22 800	19.700	20 800	45 200	24 300
4	37.300	38 200	183 000	86 300	59 900	37 800	26.500	19 900	20 000	22 200	37.100	26 300
5	40 400	44 400	151.000	113.000	59 300	39.800	27.400	21.700	17.500	22 100	35 200	27.800
6	43 400	49 100	121.000	197.000	57 200	52 600	27 400	20 600	20 800	22 600	37 200	26 000
7	41.500	44 100	117 000	188 000	55 400	49.600	48 400	19 400	20 000	22.600	26 200	27.500
8	40.900	40 900	106 000	156 000	50 500	47.600	50 700	21.800	18.800	24 500	32 700	26.400
9	39.800	41.100	99.900	124 000	53 000	45 000	40 600	21 000	19 000	21.100	32.100	25 600
10	39.100	38 500	90.100	117 000	51.800	42 000	40 700	42 200	18 800	24 700	72.100	24 800
11	36 600	41.900	93.300	132 000	50 000	40 000	35 200	33.300	19.500	25.700	66.800	26 000
12	43.700	39 800	95.200	188 000	51.200	35 800	26.200	26 900	21.500	27.400	50 900	30.500
13	58.200	39 700	91.900	146 000	49 700	31.600	30 400	24.900	31.500	22.600	36 300	50.100
14	58 400	41.400	93.300	117 000	49 700	36.000	25 500	23.800	24.600	21.700	35.100	130 000
15	61.500	41 100	164 000	105 000	49 100	33 700	24.600	34 200	25 000	21 000	37.800	153 000
16	56.500	41 800	217 000	91 000	46 500	33.300	25 800	27.200	25.800	20 100	36 300	190 000
17	54 900	59 900	242 000	89.100	44 900	26 600	25 600	24 500	25 900	21.100	32 500	229 000
18	46 400	96 400	177 000	87 000	42 100	28 400	20 800	24 300	33.500	21.700	29 500	217 000
19	41 300	107 000	141 000	87.300	40 300	26 800	22 600	25.500	23 500	22.700	28 100	205 000
20	44 000	113 000	146 000	81.100	44 600	29 700	23 800	23 400	23.900	32.900	32.200	262 000
21	47.800	84 600	215 000	72.900	41.900	26 800	23 300	20.300	22 900	42.500	30.900	337 000
22	64 500	69 000	176 000	72 500	42.300	25 000	22 400	19 200	23 000	36.700	29 600	321 000
23	68 100	67.400	126 000	69 800	40 700	25 500	23 300	21.200	22 000	30 200	26 000	274 000
24	59.700	89 300	118 000	78 800	54.100	23 900	22 200	19 500	19 600	27 600	22.100	270 000
25	46 800	157 000	106 000	89.800	81.400	25 300	23 200	18 900	17 000	29.100	22 600	256 000
26	53.200	243 000	90 900	86 900	48.100	24 800	21 500	23 100	24 000	29 200	26.100	263 000
27	43 900	262 000	93 800	108.000	40 800	29 400	21 000	22 100	21 700	27 800	26 800	229 000
28	46.800	220 000	89 600	89 400	41 600	25 900	21 400	21.400	21 000	25 600	25.500	205 000
29	55.600		76 800	82 700	41.500	32.200	21 200	20 800	20 800	32 200	27.500	177 000
30	64 300		80 400	67.800	35 600	32 600	22 000	20 500	20 300	30 500	26 800	147 000
31	58 700		77 000		37 100		22 900	20.100		37 300		117 000
Average	48 680	80 470	132.900	105.600	50 320	34 530	27 760	23.560	22 030	26 010	34.550	140 200
Lowest	36 600	38 200	76 800	67 800	35 600	23.900	20 800	18.900	17 000	19 900	22 100	23 500
Highest	68.100	262 000	242 000	197 000	81 400	52.600	50 700	42 200	33 500	42 500	72 100	337 000
Monthly total (million cu m)	130 40	194.70	356 00	273 70	134 80	89 51	74 35	63.11	57 10	69 66	89 54	375 50
Nat'ised runoff (mm)	13	20	36	28	14	9	7	6	6	7	9	38
Rainfall (mm)	35	67	67	76	18	39		44	30		--	145

Statistics of monthly data for previous record (Jan 1883 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean nat'ised flows	Avg	138 500	134 800	116 000	86 450	65 270	48.960	35 330	32 720	34 450	50 120	83 740	112 100
	Low	32.210	25 100	27 320	26.510	18 200	13 470	10 760	11.040	11.230	15 120	17 750	22 480
	(year)	1905	1905	1944	1976	1944	1944	1921	1976	1898	1934	1921	1921
	High	332 900	348 100	370 900	199 800	181 300	178.700	88 840	88 780	139 400	185 300	339 600	343 900
	(year)	1915	1904	1947	1951	1932	1903	1968	1931	1968	1903	1894	1929
nat'ised runoff	Avg	37	33	31	23	18	13	10	9	9	13	22	30
	Low	9	6	7	7	5	4	3	3	3	4	5	6
	High	90	88	100	52	49	47	24	24	36	50	88	93
Rainfall	Avg	65	49	53	48	55	52	59	64	58	73	72	72
	Low	14	3	3	3	8	3	8	3	3	5	8	13
	High	137	127	142	104	137	137	130	147	157	188	188	185

Summary statistics
(naturalised flows)

	For 1989		For record preceding 1989		1989 As % of pre-1989
Mean flow (m^3s^{-1})	60 510		77 940		78
Lowest yearly mean			30 940	1934	
Highest yearly mean			131 800	1951	
Lowest monthly mean	22.030	Sep	10 760	Jul 1921	
Highest monthly mean	140 200	Dec	370 900	Mar 1947	
Lowest daily mean	17 000	25 Sep	7 370	9 Jul 1934	
Highest daily mean	337 000	21 Dec	1065 000	18 Nov 1894	
10% exceedance	145 700		172 400		85
50% exceedance	38 700		53 620		72
95% exceedance	20 060		18 420		109
Annual total (million cu m)	1908 00		2460 00		78
Annual runoff (mm)	192		247		78
Annual rainfall (mm)	667		720		93
(1941-70 rainfall average (mm)			724)		

Factors affecting flow regime

- Reservoir(s) in catchment.
- Flow influenced by groundwater abstraction and/or recharge.
- Abstraction for public water supplies.
- Flow reduced by industrial and/or agricultural abstractions.
- Augmentation from surface water and/or groundwater
- Augmentation from effluent returns.

Station and catchment description

Ultrasonic station commissioned in 1974, multi-path operation from 1986. Full range Pre-1974 dmfs derived from Teddington weir complex (70m wide), significant structural improvements since 1883 Some underestimation of pre-1951 low flows Baseflow sustained mainly from the Chalk and the Oolites. Runoff decreased by major PWS abstractions - naturalised flows available Diverse topography, geology and land use which - together with the pattern of water utilisation - has undergone important historical changes.

Part (ii) - The monthly flow data

The introductory information (measuring authority etc.) is as described in Part (i).

Hydrometric statistics for the year

The monthly average, peak flow, runoff and rainfall figures are equivalent to the summary information following the daily mean gauged discharges in Part (i). Because of the rounding of monthly runoff values the runoff for the year may differ slightly from the sum of the individual monthly totals.

A 'comment' - appearing at the end of the station entry - may be used to draw attention to any particular factors influencing the accuracy of the data for the featured year or, more generally, to indicate that the published hydrometric data are subject to review.

Monthly and yearly statistics for previous record

Monthly mean flows (Average, Low and High) and the monthly rainfall and runoff figures are equivalent to those presented in Part (i). An asterisk indicates an incomplete rainfall series; the first and last years of data are given in parentheses. Due to the rounding of monthly runoff values, the average runoff for the year derived from the previous record may differ slightly from the sum of the individual monthly totals. The peak flow is the highest discharge, in cubic metres per second, for each month. For many stations the archived series of monthly instantaneous maximum flows, from which the preceding record peak is abstracted, is incomplete, particularly for the earlier years, and certain of the peak flows are known to be of limited accuracy. Where the peak value - in an incomplete series - is exceeded by the highest daily mean flow on record, the latter is substituted; such substitutions are indicated by a 'd' flag. An examination of the quality of the peak flow figures is underway and significant revision may be expected as this review proceeds. The figures are published primarily to provide a guide to the range of river flows experienced throughout the year at the featured gauging stations.

Factors affecting flow regime

Code letters are used as described in Part (i).

Station type

The station type is coded by the list of abbreviations given below - two abbreviations may be applied to each station relating to the measurement of lower or higher flows.

B	Broad-crested weir
C	Crump (triangular profile) single crest weir
CB	Compound broad-crested weir. The compounding may include a mixture of types such as rectangular profiles, flumes and shallow-Vs and with or without divide walls
CC	Compound Crump weir
EM	Electromagnetic gauging station
EW	Essex weir (simple Crump weir modified with angled, sloping, triangular profile flanking crests) in trapezoidal channel
FL	Flume
FV	Flat-V triangular profile weir
MIS	Miscellaneous method
TP	Rectangular thin-plate weir
US	Ultrasonic gauging station
VA	Velocity-area gauging station
VN	Triangular (V notch) thin-plate weir

003003 Oykel at Easter Turnaig 1989

Measuring authority: HRPB
First year: 1977

Grid reference: 29 (NC) 403 001
Level stn. (m OD): 15.60

Catchment area (sq km): 330.7
Max alt. (m OD): 998

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	30 350	39 930	25 850	5.761	4 255	4 596	4 881	16.400	7 292	27.760	10.050	11.760	**15.638**
(m^3s^{-1})	Peak	239 60	309.60	126 50	76 83	19.13	31 05	58 79	210 30	104 20	279.40	80 46	149.30	**309.60**
Runoff (mm)		246	292	209	45	34	36	40	133	57	225	79	95	**1491**
Rainfall (mm)		311	423	257	65	76	98	85	204	86	292	85	119	**2101**

Monthly and yearly statistics for previous record (Nov 1977 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	25 250	15 560	20.770	9.533	6 388	6 006	7 912	10 530	21 630	23 760	26.980	24 900	**16.616**
flows	Low	13 550	2.376	6.649	5.445	1 067	0 751	2 853	2 332	14 540	7 328	13 530	8 245	**12.973**
(m^3s^{-1})	High	43 980	25 370	40 740	17 710	14 380	14 140	15 690	22.590	31 870	41.100	49 380	38 210	**20.249**
Peak flow (m^3s^{-1})		510.70	466.50	470 80	208 30	129.60	169 90	191 10	288 90	423 40	847.50	407 70	394 20	**847.50**
Runoff (mm)		205	115	168	75	52	47	64	85	170	192	211	202	**1586**
Rainfall (mm)		228	106	191	86	81	94	113	136	223	232	256	232	**1978**

Factors affecting flow regime: N
Station type: VA

1989 runoff is 94% of previous mean
rainfall 106%

004001 Conon at Moy Bridge 1989

Measuring authority: HRPB
First year: 1947

Grid reference: 28 (NH) 482 547
Level stn (m OD): 10 00

Catchment area (sq km): 961 8
Max alt (m OD): 1052

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	114 400	164 600	101 400	51 550	35 010	21 850	20 510	39 610	38 650	75.410	66 030	36 730	**63.195**
(m^3s^{-1})	Peak	486 20	703 90	203 50	108 30	110 70	95 15	102 40	122 00	65 86	204 00	146 90	134 70	**703.90**
Runoff (mm)		319	414	282	139	97	59	57	110	104	210	178	102	**2072**
Rainfall (mm)		343	420	259	49	71	100	53	176	96	258	66	117	**2008**

Monthly and yearly statistics for previous record (Oct 1947 to Dec 1988—incomplete or missing months total 5.7 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	66 820	57 230	55 360	40 650	31 630	21 890	20 450	27 380	40 660	53 600	63 400	72 410	**45 919**
flows	Low	31.690	25 810	18 670	13 940	10 940	8 861	2 959	8 162	12 510	23 090	24 090	27 970	**29.991**
(m^3s^{-1})	High	138 300	121 000	127 900	75 730	53 050	47 560	36 690	45 140	94 870	94 030	121 700	165 100	**59.238**
Peak flow (m^3s^{-1})		409 60	467 20	367 90	203 90	232 20	165 20	747 40	254 90	223 70	324 80	411 80	1076 00	**1076.00**
Runoff (mm)		186	146	154	110	88	59	57	76	110	149	171	202	**1507**
Rainfall (mm)*		189	125	159	103	105	94	108	125	169	212	205	229	**1823**

*(1953-1988)

Factors affecting flow regime: H
Station type: VA

1989 runoff is 138% of previous mean
rainfall 110%

007002 Findhorn at Forres 1989

Measuring authority: HRPB
First year: 1958

Grid reference: 38 (NJ) 018 583
Level stn (m OD): 9 60

Catchment area (sq km): 781 9
Max alt (m OD): 941

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	26 210	33 630	38 200	17 770	16 980	8 674	4 455	7 364	9 890	17 430	9 900	11 560	**16.758**
(m^3s^{-1})	Peak	274 20	253 60	165 70	50 70	150 00	69 91	13 79	28 63	103 40	114 60	49 59	181 70	**274.20**
Runoff (mm)		90	104	131	59	58	29	15	25	33	60	33	40	**676**
Rainfall (mm)		114	194	107	51	67	58	37	85	62	103	30	59	**967**

Monthly and yearly statistics for previous record (Oct 1958 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	24 080	20 030	23 090	21 650	15 920	10 220	9 948	14 120	15 350	20 990	23 310	25 160	**18.656**
flows	Low	9 429	5 259	8 615	5 560	3 836	3 321	2 744	2 478	2 863	3 547	9 300	8 332	**11.994**
(m^3s^{-1})	High	51 190	44 700	54 320	54 170	41 990	41 900	24 650	58 840	37 870	49 540	39 710	61 550	**25 482**
Peak flow (m^3s^{-1})		361 10	537.70	410 00	173 50	294 30	430 20	469 10	2410 00	861 10	512 00	465 20	616 90	**2410.00**
Runoff (mm)		82	63	79	72	55	34	34	48	51	72	77	86	**753**
Rainfall (mm)		104	63	86	64	73	76	86	105	101	111	116	107	**1092**

Factors affecting flow regime: N
Station type: VA

1989 runoff is 90% of previous mean
rainfall 89%

008007 Spey at Invertruim 1989

Measuring authority: NERPB
First year: 1952

Grid reference: 27 (NN) 687 962
Level stn (m OD): 242 50

Catchment area (sq km): 400 4
Max alt (m OD): 951

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	18 920	18 880	11 660	3 374	2 537	2 866	1 262	2 574	3 884	5 662	4 507	3 599	**6 576**
(m^3s^{-1})	Peak	264 50	173 50	50 26	6 04	4 49	18 30	2 27	6 07	42 49	17.62	40 53	46 69	**264.50**
Runoff (mm)		127	114	78	22	17	19	8	17	25	38	29	24	**518**
Rainfall (mm)		328	360	246	46	51	75	40	156	103	210	54	93	**1762**

Monthly and yearly statistics for previous record (Oct 1952 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	8 714	6 334	6 460	4 197	3 628	2 929	2 885	3 398	4 757	6 909	7 605	9 588	**5 620**
flows	Low	3 314	1 953	2.722	2 075	1 413	1 123	1 042	0 852	1 454	1 638	3 235	3.518	**3.935**
(m^3s^{-1})	High	23 280	21 020	20 600	7 126	6 210	6 269	5 021	7 545	14 650	14 830	15 960	24 970	**8 037**
Peak flow (m^3s^{-1})		153 70	198 20	274 50	61 90	43 92	45 93	72 83	75 00	108 00	106 90	170 60	259 50	**274.50**
Runoff (mm)		58	39	43	27	24	19	19	23	31	46	49	64	**443**
Rainfall (mm)		156	99	119	72	89	76	88	103	135	166	163	180	**1446**

Factors affecting flow regime: H
Station type: VA

1989 runoff is 117% of previous mean
rainfall 122%

009001 Deveron at Avochie 1989

Measuring authority: NERPB
First year: 1959

Grid reference: 38 (NJ) 532 464
Level stn (m OD): 81.80

Catchment area (sq km): 441.6
Max alt (m OD): 775

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	4 529	4 630	8 210	5 211	5 994	3 454	2 144	2 110	2 711	3 218	2 623	3 674	**4.043**
(m^3s^{-1})	Peak	6 61	41 75	39 77	13 95	70 09	8 81	2 94	6 40	52 81	14 74	4 78	22 57	**70.09**
Runoff (mm)		27	25	50	31	36	20	13	13	16	20	15	22	**289**
Rainfall (mm)		14	78	52	61	87	54	24	69	56	75	29	43	**642**

Monthly and yearly statistics for previous record (Oct 1959 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	12 780	10 900	11 830	10 480	7 806	5 235	4 750	6 146	5 943	9 081	10 850	11 760	**8 959**
flows	Low	3 688	3 052	3 391	4 314	3 631	2 610	1 766	1 621	2 092	1 934	3 389	3 504	**5.233**
(m^3s^{-1})	High	24 440	19 720	22 230	21 500	21 930	11 130	9 841	19 110	16 040	28 210	29 790	23 590	**12 437**
Peak flow (m^3s^{-1})		120 50	84 90	118 00	76 13	183 70	153 10	146 40	236 50	155 70	221 90	177 70	157 10	**236.50**
Runoff (mm)		78	60	72	62	47	31	29	37	35	55	64	71	**640**
Rainfall (mm)		97	64	78	71	73	66	79	94	85	100	105	92	**1004**

Factors affecting flow regime: N
Station type: VA

1989 runoff is 45% of previous mean
rainfall 64%

010002 Ugie at Inverugie 1989

Measuring authority: NERPB
First year: 1971

Grid reference: 48 (NK) 101 485
Level stn (m OD): 8.50

Catchment area (sq km): 325.0
Max alt (m OD): 234

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	2 808	2 516	3 500	2 899	2 171	1 620	1 070	1 127	1 133	1 602	1 531	2 858	**2.069**
(m^3s^{-1})	Peak	3 54	8 87	10 04	6 53	6 60	2 33	1 56	4 07	1 88	4 17	2 43	19 17	**19 17**
Runoff (mm)		23	19	29	23	18	13	9	9	9	13	12	24	**201**
Rainfall (mm)		7	41	38	60	51	49	17	65	36	72	25	49	**510**

Monthly and yearly statistics for previous record (Feb 1971 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	8 428	6 775	5 813	4 447	3 555	2 354	2 082	2 196	2 557	4 883	6 391	7 533	**4.745**
flows	Low	2 085	2 088	1 791	1 624	1 738	1 200	0 927	0 858	0 912	0 894	2 055	1 360	**2.950**
(m^3s^{-1})	High	11 300	14 620	9 576	7 785	8 103	4 296	4 901	6 225	7 052	9 079	18 230	13 320	**8.505**
Peak flow (m^3s^{-1})		66 40	96 74	66 40	40 26	35 57	13 29	23 66	21 24	36 25	94 52	99 28	87 75	**99.28**
Runoff (mm)		69	51	48	35	29	19	17	18	20	40	51	62	**461**
Rainfall (mm)		85	46	68	52	51	57	61	63	83	84	91	80	**816**

Factors affecting flow regime: N
Station type: VA

1989 runoff is 44% of previous mean
rainfall 63%

011001 Don at Parkhill 1989

Measuring authority: NERPB
First year: 1969

Grid reference: 38 (NJ) 887 141
Level stn (m OD): 32.40

Catchment area (sq km): 1273.0
Max alt (m OD): 872

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	11 180	9 168	17 700	12 340	10 980	7 886	6 270	5 576	5 283	5 615	5 694	8 197	**8.832**
(m^3s^{-1})	Peak	15 58	14 92	57 11	23 34	43 17	12 28	10 14	9 13	18 89	16 49	8 37	31 33	**57.11**
Runoff (mm)		24	17	37	25	23	16	13	12	11	12	12	17	**219**
Rainfall (mm)		13	62	53	55	57	55	18	71	39	70	23	45	**561**

Monthly and yearly statistics for previous record (Dec 1969 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	31 610	28 970	28 760	25 900	17 090	12 300	10 710	12 130	11 490	19 560	22 920	27 700	**20.728**
flows	Low	9 259	6 557	6 274	9 174	9 544	6 424	5 128	4 644	5 019	4 567	6 856	7 738	**10.694**
(m^3s^{-1})	High	48 660	52 240	48 950	44 750	34 770	27 560	27 530	40 150	36 470	51 940	86 230	50 960	**29.185**
Peak flow (m^3s^{-1})		185 90	131 00	143 70	107 50	92 06	101 60	118 10	277 40	107 20	273 10	213 20	154 50	**277.40**
Runoff (mm)		67	56	61	53	36	25	23	26	23	41	47	58	**514**
Rainfall (mm)		100	57	75	64	64	59	73	75	77	86	89	81	**900**

Factors affecting flow regime: N
Station type: VA

1989 runoff is 43% of previous mean
rainfall 62%

013007 North Esk at Logie Mill 1989

Measuring authority: TRPB
First year: 1976

Grid reference: 37 (NO) 699 640
Level stn (m OD): 10.60

Catchment area (sq km): 730.0
Max alt (m OD): 939

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	12 460	12 420	31 930	14 260	9 491	5 171	2 685	3 853	5 184	7 698	10 980	16 240	**11.043**
(m^3s^{-1})	Peak	88 84	44 31	137.20	79 51	81 20	15 46	3 57	17 65	45 54	46 90	44 65	124 40	**137.20**
Runoff (mm)		46	41	117	51	35	18	10	14	18	28	39	60	**477**
Rainfall (mm)		58	93	116	52	54	53	16	106	58	93	42	81	**822**

Monthly and yearly statistics for previous record (Jan 1976 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	25 200	25 610	30 000	23 080	16 120	9 598	7 223	10 720	12 050	29 610	25 600	30 530	**20.438**
flows	Low	13 770	9 795	16 450	9 071	6 179	3 684	2 993	2 548	3 622	4 099	5 281	15 950	**15.314**
(m^3s^{-1})	High	48 590	45 670	42 750	34 750	36 420	24 300	18 060	35 810	30 540	80 410	91 170	59 880	**24.926**
Peak flow (m^3s^{-1})		240 80	104 50	169 10	230 40	180 80	271 90	133 00	199 20	342 80	452 80	462 10	398.10	**462.10**
Runoff (mm)		92	86	110	82	59	34	27	39	43	109	91	112	**884**
Rainfall (mm)		121	78	111	61	81	66	78	85	106	140	112	125	**1164**

Factors affecting flow regime: S P I
Station type: VA

1989 runoff is 54% of previous mean
rainfall 71%

013008 South Esk at Brechin 1989

Measuring authority: TRPB
First year: 1983

Grid reference: 37 (NO) 600 596
Level stn. (m OD): 18.00

Catchment area (sq km): 490.0
Max alt. (m OD): 958

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	10.900	11.510	22.360	9.737	6.265	3.315	1.803	3.434	5.149	6.339	9.110	9.996	**8.317**
(m^3s^{-1})	Peak	42.37	30.77	60.02	32.22	21.39	9.04	2.63	15.80	27.99	24.12	31.02	59.30	**60.02**
Runoff (mm)		60	57	122	52	34	18	10	19	27	35	48	55	**535**
Rainfall (mm)		73	108	131	50	45	43	19	123	68	98	47	83	**888**

Monthly and yearly statistics for previous record (Jan 1983 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	16.420	13.110	16.300	15.060	13.240	7.640	5.505	8.903	9.337	13.810	16.210	17.290	**12.739**
flows	Low	10.600	7.069	9.773	10.870	6.099	3.609	1.685	1.405	2.401	3.494	3.949	10.970	**10.340**
(m^3s^{-1})	High	21.180	19.330	26.610	21.340	28.180	11.120	10.010	25.920	21.860	28.630	49.350	23.650	**14.856**
Peak flow (m^3s^{-1})		76.24	72.40	98.91	90.85	103.70	86.79	33.20	127.90	122.50	170.60	172.00	181.10	**181.10**
Runoff (mm)		90	66	89	80	72	40	30	49	49	75	86	95	**821**
Rainfall (mm)		139	62	106	70	90	73	82	98	97	123	123	123	**1186**

Factors affecting flow regime: I
Station type: VA

1989 runoff is 65% of previous mean
rainfall 75%

014001 Eden at Kemback 1989

Measuring authority: TRPB
First year: 1967

Grid reference: 37 (NO) 415 158
Level stn. (m OD): 6.20

Catchment area (sq km): 307.4
Max alt. (m OD): 522

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	3.861	5.095	6.018	3.019	1.724	1.336	0.861	0.909	0.985	1.262	1.699	2.839	**2.453**
(m^3s^{-1})	Peak	10.38	24.69	14.63	5.52	2.62	3.42	1.44	1.73	1.87	3.64	3.75	20.22	**24.69**
Runoff (mm)		34	40	52	25	15	11	8	8	8	11	14	25	**252**
Rainfall (mm)		50	78	88	33	27	49	15	85	39	69	32	57	**622**

Monthly and yearly statistics for previous record (Oct 1967 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	7.000	6.334	4.944	3.767	3.139	2.253	1.536	1.762	2.096	3.274	4.652	5.829	**3.871**
flows	Low	2.546	2.170	1.408	1.199	1.406	1.077	0.914	0.799	0.749	0.833	0.830	1.731	**1.446**
(m^3s^{-1})	High	10.890	19.460	8.096	7.243	8.335	6.651	3.390	6.038	11.260	6.880	14.440	12.390	**5.593**
Peak flow (m^3s^{-1})		59.05	71.31	54.89	52.69	47.48	41.93	26.20	17.19	53.64	35.97	39.37	47.82	**71.31**
Runoff (mm)		61	50	43	32	27	19	13	15	18	29	39	51	**398**
Rainfall (mm)		85	53	65	47	68	53	62	60	75	76	75	75	**794**

Factors affecting flow regime: S GEI
Station type: VA

1989 runoff is 63% of previous mean
rainfall 78%

015011 Lyon at Comrie Bridge 1989

Measuring authority: TRPB
First year: 1958

Grid reference: 27 (NN) 786 486
Level stn. (m OD): 92.10

Catchment area (sq km): 391.1
Max alt. (m OD): 1215

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	25.000	33.450	29.680	9.108	6.1'1	5.'06	3.371	10.230	9.853	13.630	10.980	12.840	**14.013**
(m^3s^{-1})	Peak	194.70	315.40	149.30	34.86	19.83	65.02	8.55	84.59	140.00	74.55	91.03	195.20	**315.40**
Runoff (mm)		171	207	203	60	42	34	23	70	65	93	73	88	**1130**
Rainfall (mm)		383	443	372	61	61	92	56	237	143	257	74	117	**2296**

Monthly and yearly statistics for previous record (Jan 1958 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	16.990	13.060	13.690	10.010	9.715	6.541	6.295	7.518	10.490	15.040	14.710	15.920	**11.668**
flows	Low	3.596	3.198	4.219	4.007	3.537	3.514	3.062	2.221	2.843	3.662	5.320	6.182	**8.330**
(m^3s^{-1})	High	43.920	28.580	37.440	17.100	24.520	18.870	20.800	28.940	28.120	29.930	30.550	32.780	**19.870**
Peak flow (m^3s^{-1})		271.20	149.10	254.70	89.80	124.90	56.93	154.70	128.70	145.10	191.90	271.30	198.00	**271.30**
Runoff (mm)		116	82	94	66	67	43	43	51	70	103	97	109	**942**
Rainfall (mm)*		252	123	191	80	110	88	108	120	188	214	243	245	**1982**

*(1971-1988)

Factors affecting flow regime: H
Station type: VA

1989 runoff is 120% of previous mean
rainfall 117%

016003 Ruchill Water at Cultybraggan 1989

Measuring authority: TRPB
First year: 1970

Grid reference: 27 (NN) 764 204
Level stn. (m OD): 62.30

Catchment area (sq km): 99.5
Max alt. (m OD): 985

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	12.050	12.020	13.660	2.660	0.977	0.768	0.370	4.157	4.690	5.466	3.666	3.886	**5.336**
(m^3s^{-1})	Peak	105.60	127.30	133.90	34.86	9.03	17.92	2.14	121.70	120.90	38.85	55.95	77.85	**133.90**
Runoff (mm)		324	292	368	69	76	20	10	112	122	147	95	105	**1691**
Rainfall (mm)		348	380	339	67	47	90	47	204	134	200	76	118	**2050**

Monthly and yearly statistics for previous record (Oct 1970 to Dec 1988—incomplete or missing months total 0.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	7.539	5.637	6.243	2.993	2.867	1.887	1.837	2.578	4.944	6.294	7.667	7.752	**4.853**
flows	Low	2.263	1.050	1.802	0.758	0.304	0.402	0.239	0.164	0.345	0.789	2.306	1.630	**3.281**
(m^3s^{-1})	High	15.240	9.995	11.100	5.156	10.120	4.562	5.739	9.246	10.260	12.130	16.550	12.350	**6.586**
Peak flow (m^3s^{-1})		250.40	130.20	165.30	87.32	165.00	221.30	160.00	143.00	227.30	136.60	183.30	174.50	**250.40**
Runoff (mm)		203	139	168	78	77	49	49	69	129	169	200	209	**1640**
Rainfall (mm)		229	145	176	87	122	94	118	134	203	211	240	237	**1996**

Factors affecting flow regime: N
Station type: VA

1989 runoff is 110% of previous mean
rainfall 103%

016004 Earn at Forteviot Bridge 1989

Measuring authority: TRPB
First year: 1972

Grid reference 37 (NO) 043 184
Level stn (m OD) 7 80

Catchment area (sq km): 782 2
Max alt (m OD) 985

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	61 720	66 280	74 340	23 200	8 899	4 488	3 272	10 430	18 620	23 750	23 810	22 790	**28.276**
(m^3s^{-1})	Peak	227.50	186 40	264 60	63 45	15 80	21 54	5 83	85 64	160 60	84 35	97 95	145 20	**264 60**
Runoff (mm)		211	205	255	77	30	15	11	36	62	81	79	78	**1140**
Rainfall (mm)		219	247	224	47	36	68	36	156	104	148	57	102	**1444**

Monthly and yearly statistics for previous record (Oct 1972 to Dec 1988—incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	46 330	35 660	35 620	20 270	15 450	9 897	8 692	12 000	20 630	32 500	42 200	44 950	**26.994**
flows	Low	19 630	16 070	12 310	8 389	4 906	4 095	2 658	2 456	5 302	5 984	15.120	15 060	**15 508**
(m^3s^{-1})	High	85 510	58 640	58 620	33 790	47 200	20 070	24 620	46 660	55 680	61 980	89 750	79 160	**33.908**
Peak flow (m^3s^{-1})		277 50	214 60	194 10	162 20	155 20	114 90	142 30	169 70	271 80	241 20	328 60	238 70	**328 60**
Runoff (mm)		159	112	122	67	53	33	30	41	68	111	140	154	**1089**
Rainfall (mm)		162	96	137	57	87	69	89	103	156	151	169	168	**1444**

Factors affecting flow regime P H
Station type. VA

1989 runoff is 105% of previous mean
rainfall 100%

017001 Carron at Headswood 1989

Measuring authority FRPB
First year. 1969

Grid reference. 26 (NS) 832 820
Level stn (m OD) 17 10

Catchment area (sq km) 122 3
Max alt (m OD). 570

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	6 809	8 958	9 295	1 521	0 759	0 764	0 767	2 199	1 700	2 879	1 687	2 097	**3.260**
(m^3s^{-1})	Peak	46 28	78 40	84 79	5 34	1 81	3 80	1 52	24 37	16 68	21 74	6 32	21 84	**84 79**
Runoff (mm)		149	177	204	32	17	16	17	48	36	63	36	46	**841**
Rainfall (mm)		223	268	272	61	38	85	41	215	98	182	55	105	**1643**

Monthly and yearly statistics for previous record (Aug 1969 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	5 501	3 695	3 551	2 000	1 567	1 219	1 141	1 625	3.130	4 068	5 519	5 390	**3.199**
flows	Low	1 943	1 018	1 232	0 807	0 590	0 580	0 549	0 557	0 467	0 424	1 412	1 084	**2.108**
(m^3s^{-1})	High	10 890	7 576	7 463	3 444	5 724	2 834	4 650	8 092	16 720	10 270	9 759	10 470	**4.575**
Peak flow (m^3s^{-1})		130 30	63 20	92 83	43 62	51 35	33 74	65 38	84 48	124 30	124 80	105 80	147 90	**147.90**
Runoff (mm)		120	74	78	42	34	26	25	36	66	89	117	118	**826**
Rainfall (mm)		167	99	134	73	91	83	91	111	157	162	187	171	**1526**

Factors affecting flow regime S F
Station type: VA

1989 runoff is 102% of previous mean
rainfall 108%

017002 Leven at Leven 1989

Measuring authority: FRPB
First year 1969

Grid reference 37 (NO) 369 006
Level stn (m OD): 4 10

Catchment area (sq km) 424 0
Max alt (m OD) 522

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	8 947	11 590	14 680	5 390	2 240	2 163	1 316	1 970	2 674	3 073	4 306	4 346	**5.190**
(m^3s^{-1})	Peak	17 56	36 81	27 98	11 43	4 60	3 86	2 11	4 66	3 69	8 67	7 15	24 54	**36.81**
Runoff (mm)		57	66	93	33	14	13	8	12	16	19	26	27	**386**
Rainfall (mm)		85	117	122	37	27	57	20	121	50	88	36	63	**823**

Monthly and yearly statistics for previous record (Aug 1969 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	11 420	10 030	7 164	5 135	3 759	3 135	1 911	3 236	3 898	6 081	8 563	10 720	**6.238**
flows	Low	4.786	2 882	1 543	1 413	2 012	1 166	0 902	0 820	0 970	0 795	0 972	3 462	**2.269**
(m^3s^{-1})	High	20 700	22 660	11 240	9 712	12 050	7 044	5 300	11 840	21 040	13 170	26 510	19 200	**9.294**
Peak flow (m^3s^{-1})		53 54	128 00	39 19	44 68	44 54	26 93	28 83	25 69	84 25	40 67	56 76	62 69	**128.00**
Runoff (mm)		72	58	45	31	24	19	12	20	24	38	52	68	**464**
Rainfall (mm)		95	58	76	51	64	63	68	73	91	88	98	95	**920**

Factors affecting flow regime SR EI
Station type. VA

1989 runoff is 83% of previous mean
rainfall 89%

018003 Teith at Bridge of Teith 1989

Measuring authority FRPB
First year 1957

Grid reference 27 (NN) 725 011
Level stn (m OD) 14 70

Catchment area (sq km): 518.0
Max alt (m OD) 1165

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	60 310	70 420	62 510	14 660	7 048	6 497	4 727	20 000	19 130	27 970	20 200	14 740	**27.131**
(m^3s^{-1})	Peak	222 50	271 20	179 30	37 80	12 80	28 39	8 08	96 91	125 00	92 38	52 51	61 38	**271.20**
Runoff (mm)		312	329	323	73	36	33	24	103	96	145	101	76	**1652**
Rainfall (mm)		360	393	340	68	51	98	60	254	160	250	85	133	**2252**

Monthly and yearly statistics for previous record (Jan 1957 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	34 390	26 910	26 210	15 710	15 000	9 484	9.688	13 280	20 310	27 970	31 480	35 070	**22.120**
flows	Low	9 608	5 743	6 589	5 612	4 017	3 953	3 781	3 135	3 635	5 897	9 842	11 790	**15.094**
(m^3s^{-1})	High	72 430	54 340	60 190	30 040	55 000	21 520	26 390	54 210	45 020	66 410	70 650	72 370	**31.131**
Peak flow (m^3s^{-1})		303 90	207 40	217 40	93 10	158 00	161 70	118 30	174 40	184 10	242 60	245.10	241 10	**303.90**
Runoff (mm)		178	127	136	79	78	47	50	69	102	145	158	181	**1348**
Rainfall (mm)*		224	135	171	90	125	103	112	131	203	219	276	222	**1961**

*(1963-1988)

Factors affecting flow regime. S P
Station type VA

1989 runoff is 123% of previous mean
rainfall 115%

018005 Allan Water at Bridge of Allan 1989

Measuring authority: FRPB
First year. 1971

Grid reference: 26 (NS) 786 980
Level stn. (m OD): 11.20

Catchment area (sq km): 210 0
Max alt. (m OD): 633

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	11.970	14 850	15.100	4.294	1.947	1.473	0.945	3.613	3.856	5.756	4.702	5 413	6.117
(m^3s^{-1}):	Peak	55 92	64.78	74 70	17.25	6.02	4 24	2.12	33 68	29.37	22 49	18 02	36.90	74.70
Runoff (mm)		153	171	193	53	25	18	12	46	48	73	58	69	919
Rainfall (mm)		184	208	201	49	36	65	37	172	85	140	47	89	1313

Monthly and yearly statistics for previous record (Jul 1971 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	10.750	8.113	8.553	4.631	3.924	2.634	2.106	3.155	5 157	7.220	9.315	10 210	6.311
flows	Low	4.751	3.631	3 152	1 654	1.189	0 945	0.726	0 648	0.907	0.971	3.642	3.709	4.269
(m^3s^{-1})	High	18.550	16 610	18.170	7.717	15 430	5 423	6 309	12 390	14 600	12 420	17.760	17.140	9.090
Peak flow (m^3s^{-1})		98.20	67.84	83 43	69.62	72.11	58 10	66 37	67.48	105 60	111.00	97 89	112 60	112.60
Runoff (mm)		137	95	109	57	50	33	27	40	64	92	115	130	949
Rainfall (mm)		142	84	117	62	82	69	83	92	131	133	143	146	1284

Factors affecting flow regime: I
Station type: VA

1989 runoff is 97% of previous mean
rainfall 102%

020001 Tyne at East Linton 1989

Measuring authority: FRPB
First year 1961

Grid reference: 36 (NT) 591 768
Level stn (m OD) 16.50

Catchment area (sq km): 307.0
Max alt. (m OD): 528

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1 662	1 551	1 924	1.515	1 045	0 891	0.757	0 627	0 614	0 614	0 556	0 941	1.056
(m^3s^{-1})	Peak	5.19	8.38	6 41	3 24	6 14	1 14	0 95	1 08	1 71	1 06	0 74	8 15	8.38
Runoff (mm)		15	12	17	13	9	8	7	5	5	5	5	8	108
Rainfall (mm)		28	59	47	38	41	42	11	77	37	45	17	55	497

Monthly and yearly statistics for previous record (Jan 1961 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	4.757	3 845	4 021	2.924	2 470	1 502	1 307	1 713	1 834	2 222	3 601	3 693	2.820
flows	Low	1 032	0.783	0 531	0 644	0 926	0 586	0 500	0 468	0 461	0 450	0 523	0 582	0.709
(m^3s^{-1})	High	11.540	8 624	8 789	7.824	11 600	6 142	4.393	9.855	8 490	7 000	11.210	8 405	4.146
Peak flow (m^3s^{-1})		93.02	39.39	66.17	50 88	119.70	59 12	70 18	112.70	90 84	82.71	127 50	52 02	127.50
Runoff (mm)		42	31	35	25	22	13	11	15	15	19	30	32	290
Rainfall (mm)		65	40	59	48	60	53	63	78	68	67	72	60	733

Factors affecting flow regime. EI
Station type: VA

1989 runoff is 37% of previous mean
rainfall 68%

021006 Tweed at Boleside 1989

Measuring authority: TWRP
First year 1961

Grid reference 36 (NT) 498 334
Level stn (m OD): 94.50

Catchment area (sq km): 1500.0
Max alt. (m OD): 839

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	58 250	58 530	78 290	31 550	13 860	9 004	6 409	15 170	16 980	17 770	20 090	33 350	29.818
(m^3s^{-1})	Peak	311.80	151 40	290 20	107 40	42 95	19 18	14.78	100 50	141 90	43 95	52.96	237 80	311.80
Runoff (mm)		104	94	140	55	25	16	11	27	29	32	35	60	627
Rainfall (mm)		133	144	168	54	50	49	29	147	70	97	32	103	1076

Monthly and yearly statistics for previous record (Oct 1961 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	55 400	43.580	43 000	29 720	24 660	16 430	15 320	22.280	30 470	41 120	50 390	52 630	35.394
flows	Low	14.300	10 480	14 930	9.896	7 605	7 413	6 362	5 012	4.572	4 435	11.570	22 450	18.577
(m^3s^{-1})	High	110.700	81 860	101 000	57 330	64.330	32 820	40 970	81 400	95 510	96 720	119 800	100 400	44.323
Peak flow (m^3s^{-1})		678 60	483 90	470 10	248.90	182.80	126 00	342 60	444 30	496 30	1019.00	486 30	571.90	1019.00
Runoff (mm)		99	71	77	51	44	28	27	40	53	73	87	94	745
Rainfall (mm)		122	79	101	69	87	77	89	106	119	123	125	119	1216

Factors affecting flow regime S P
Station type VA

1989 runoff is 84% of previous mean
rainfall 88%

021012 Teviot at Hawick 1989

Measuring authority: TWRP
First year: 1963

Grid reference: 36 (NT) 522 159
Level stn (m OD): 90.10

Catchment area (sq km): 323.0
Max alt. (m OD): 608

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	11 840	17 560	21 640	6 020	1 965	1 208	0 676	4 584	4 838	5 778	6.319	10.280	7 679
(m^3s^{-1})	Peak	110.40	119 00	182 40	45 11	11 69	2 36	2 79	53 73	46 20	20 86	29 50	142 40	182.40
Runoff (mm)		98	132	179	48	16	10	6	38	39	48	51	85	750
Rainfall (mm)		105	158	181	56	43	49	33	159	67	94	46	103	1094

Monthly and yearly statistics for previous record (Oct 1963 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	13 480	10 360	9 652	6.184	5 645	4 060	3.592	4 786	6 335	10 150	12.650	13 430	8.357
flows	Low	6.981	4.234	2 991	2 189	1 296	1 099	0 751	0 734	0 915	0 816	2.555	4 522	4 183
(m^3s^{-1})	High	28.560	18.510	20 250	13 030	17 340	10 500	12.300	19.120	18.960	25 690	29.930	25 460	10.959
Peak flow (m^3s^{-1})		185 90	235.30	150 20	179 00	117 80	89 40	148 30	178 60	185 60	273.40	188 60	210 70	273.40
Runoff (mm)		112	78	80	50	47	33	30	40	51	84	102	111	817
Rainfall (mm)		116	73	101	65	90	78	90	100	108	118	125	122	1188

Factors affecting flow regime: N
Station type: VA

1989 runoff is 92% of previous mean
rainfall 92%

021018 Lyne Water at Lyne Station 1989

Measuring authority: TWRP
First year: 1968

Grid reference: 36 (NT) 209 401
Level stn. (m OD): 168.00

Catchment area (sq km): 175.0
Max alt. (m OD): 592

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	4.589	4.382	4.792	2.355	1.231	0.888	0.675	0.926	0.810	1.253	1.261	2.416	**2.122**
(m^3s^{-1})	Peak	22.55	13.72	19.83	4.83	2.94	1.28	0.99	3.87	1.25	3.46	2.00	13.66	**22.55**
Runoff (mm)		70	61	73	35	19	13	10	14	12	19	19	37	**382**
Rainfall (mm)		90	111	103	37	42	53	25	127	41	87	20	71	**807**

Monthly and yearly statistics for previous record (Oct 1968 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	4.952	4.086	3.561	2.640	1.804	1.436	1.251	1.471	2.074	2.916	4.225	4.382	**2.894**
flows	Low	1.682	2.158	1.357	1.127	0.882	0.787	0.713	0.605	0.591	0.597	0.977	1.618	**1.428**
(m^3s^{-1})	High	8.774	8.698	7.325	5.028	4.104	2.653	3.884	5.364	10.440	5.684	8.611	8.374	**3.704**
Peak flow (m^3s^{-1})		47.50	41.55	27.65	21.46	17.36	16.46	31.72	20.77	58.74	40.49	53.60	37.98	**58.74**
Runoff (mm)		76	57	54	39	28	21	19	23	31	45	63	67	**522**
Rainfall (mm)		91	56	81	53	64	63	73	77	96	95	100	90	**939**

Factors affecting flow regime: S P
Station type: VA

1989 runoff is 73% of previous mean
rainfall 86%

021022 Whiteadder Water at Hutton Castle 1989

Measuring authority: TWRP
First year: 1969

Grid reference: 36 (NT) 881 550
Level stn (m OD): 29.00

Catchment area (sq km): 503.0
Max alt. (m OD): 533

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	3.457	4.313	6.427	4.489	2.561	1.711	1.245	1.289	1.307	1.210	1.375	2.801	**2.674**
(m^3s^{-1})	Peak	6.32	42.98	19.87	12.36	18.78	4.14	2.12	4.09	3.30	2.51	2.30	16.86	**42.98**
Runoff (mm)		18	21	34	23	14	9	7	7	7	6	7	15	**168**
Rainfall (mm)		26	64	54	45	38	58	14	85	39	46	24	49	**542**

Monthly and yearly statistics for previous record (Sep 1969 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	11.700	10.310	9.723	7.606	5.441	3.568	2.470	3.136	3.224	5.133	7.826	8.659	**6.549**
flows	Low	2.143	1.557	1.108	1.325	2.113	1.403	1.315	1.162	0.990	1.001	1.100	1.347	**4.540**
(m^3s^{-1})	High	25.990	27.300	19.220	15.850	24.050	8.835	6.626	8.184	16.360	16.670	27.680	20.660	**8.847**
Peak flow (m^3s^{-1})		265.90	160.90	133.90	103.10	226.20	75.82	84.85	181.10	105.80	190.00	279.80	108.10	**279.80**
Runoff (mm)		62	50	52	39	29	18	13	17	17	27	40	46	**411**
Rainfall (mm)		83	50	75	53	66	58	63	70	69	71	75	70	**803**

Factors affecting flow regime: S P
Station type: CC

1989 runoff is 41% of previous mean
rainfall 67%

022006 Blyth at Hartford Bridge 1989

Measuring authority: NRA-N
First year: 1966

Grid reference: 45 (NZ) 243 800
Level stn (m OD): 24.60

Catchment area (sq km): 269.4
Max alt (m OD): 259

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1.026	2.251	1.236	1.337	0.393	0.335	0.160	0.173	0.141	0.215	0.208	0.799	**0.679**
(m^3s^{-1})	Peak	1.48	29.46	2.89	3.98	0.64	2.06	0.33	0.82	0.21	0.72	0.40	5.98	**29.46**
Runoff (mm)		10	20	12	13	4	3	2	2	1	2	2	8	**79**
Rainfall (mm)		13	61	33	43	19	58	12	65	18	57	20	63	**462**

Monthly and yearly statistics for previous record (Oct 1966 to Dec 1988—incomplete or missing months total 0.4 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	4.736	3.677	3.721	2.333	1.428	0.631	0.471	0.697	0.755	1.736	2.560	3.670	**2.197**
flows	Low	0.587	0.398	0.245	0.359	0.212	0.177	0.096	0.067	0.107	0.111	0.162	0.274	**0.537**
(m^3s^{-1})	High	10.150	7.997	11.090	6.281	4.948	1.895	1.800	2.963	2.695	9.680	5.735	12.500	**3.410**
Peak flow (m^3s^{-1})		146.60	59.52	150.20	80.31	38.86	31.54	21.52	61.09	30.02	56.84	69.20	122.30	**150.20**
Runoff (mm)		47	33	37	22	14	6	5	7	7	17	25	36	**257**
Rainfall (mm)		68	44	63	45	57	52	60	70	64	61	66	63	**713**

Factors affecting flow regime: E
Station type: FV

1989 runoff is 31% of previous mean
rainfall 65%

023001 Tyne at Bywell 1989

Measuring authority: NRA-N
First year: 1956

Grid reference: 45 (NZ) 038 617
Level stn. (m OD): 14.00

Catchment area (sq km): 2175.6
Max alt. (m OD): 893

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	41.710	72.200	70.430	41.850	10.830	16.210	7.201	15.000	12.520	22.310	23.390	40.690	**30.942**
(m^3s^{-1})	Peak	525.30	843.60	541.70	290.80	24.97	24.67	18.76	75.22	25.43	182.50	295.10	295.80	**843.60**
Runoff (mm)		51	80	87	50	13	19	9	18	15	27	28	50	**449**
Rainfall (mm)		59	127	107	60	29	47	27	101	29	97	46	91	**820**

Monthly and yearly statistics for previous record (Oct 1956 to Dec 1988—incomplete or missing months total 0.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	74.310	57.060	55.770	38.620	25.510	18.310	20.140	29.950	35.590	47.410	62.340	68.890	**44.460**
flows	Low	19.220	14.360	20.150	8.461	7.246	4.910	5.199	3.403	4.155	4.727	18.090	23.080	**25.849**
(m^3s^{-1})	High	150.800	98.140	150.900	75.620	60.650	50.010	58.000	77.360	106.600	147.200	147.000	112.000	**63.834**
Peak flow (m^3s^{-1})		1525.00	922.10	1472.00	905.60	476.30	440.30	1105.00	1561.00	1243.00	1586.00	1382.00	1317.00	**1586.00**
Runoff (mm)		91	64	69	46	31	22	25	37	42	58	74	85	**645**
Rainfall (mm)		104	69	86	63	70	69	85	97	92	95	105	104	**1039**

Factors affecting flow regime: S
Station type: VA

1989 runoff is 70% of previous mean
rainfall 79%

024004 Bedburn Beck at Bedburn 1989

Measuring authority: NRA-N
First year: 1959

Grid reference: 45 (NZ) 118 322
Level stn. (m OD): 109.00

Catchment area (sq km): 74.9
Max alt. (m OD): 531

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.773	1.712	1.963	1.954	0.435	0.266	0.159	0.148	0.128	0.201	0.275	1.047	**0.749**
(m^3s^{-1}):	Peak	3.18	12.26	16.18	10.78	0.78	0.80	0.78	0.32	0.16	1.04	1.62	13.68	**16.18**
Runoff (mm)		28	55	70	68	16	9	6	5	4	7	10	37	**315**
Rainfall (mm)		25	95	59	87	15	46	8	49	15	76	35	98	**608**

Monthly and yearly statistics for previous record (Oct 1959 to Dec 1988—incomplete or missing months total 0.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	2.133	1.755	1.820	1.371	0.915	0.559	0.465	0.596	0.616	1.245	1.604	1.831	**1.241**
flows	Low	0.515	0.471	0.436	0.440	0.270	0.196	0.157	0.120	0.157	0.146	0.244	0.444	**0.687**
(m^3s^{-1})	High	4.341	4.011	5.128	2.986	2.231	1.524	1.522	1.465	1.790	4.346	3.722	4.488	**1.842**
Peak flow (m^3s^{-1})		34.67	39.16	38.51	35.09	24.06	21.66	27.72	46.19	32.30	38.06	34.26	42.93	**46.19**
Runoff (mm)		76	57	65	47	33	19	17	21	21	45	56	65	**523**
Rainfall (mm)		91	62	75	59	65	58	66	79	72	81	91	85	**884**

Factors affecting flow regime: N
Station type: CC

1989 runoff is 60% of previous mean
rainfall 69%

024009 Wear at Chester le Street 1989

Measuring authority: NRA-N
First year: 1977

Grid reference: 45 (NZ) 283 512
Level stn. (m OD): 5.50

Catchment area (sq km): 1008.3
Max alt. (m OD): 747

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	8.611	17.990	19.870	17.050	4.994	4.386	3.068	3.449	3.093	4.563	4.811	12.780	**8.681**
(m^3s^{-1}).	Peak	65.87	111.40	176.40	71.64	8.00	10.77	5.37	6.71	4.81	16.99	43.29	121.00	**176.40**
Runoff (mm)		23	43	53	44	13	11	8	9	8	12	12	34	**271**
Rainfall (mm)		24	89	61	73	15	51	11	60	16	74	37	86	**597**

Monthly and yearly statistics for previous record (Sep 1977 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	25.810	20.770	25.150	17.620	11.090	7.769	6.370	7.611	6.584	12.040	18.220	24.010	**15.241**
flows	Low	15.780	10.210	14.090	5.489	4.386	3.945	2.948	3.335	3.777	4.834	5.022	13.230	**12.556**
(m^3s^{-1})	High	40.980	37.620	64.200	36.800	30.170	14.650	14.010	19.300	12.080	27.060	35.820	50.640	**19.785**
Peak flow (m^3s^{-1})		309.80	248.20	349.60	277.60	157.60	200.60	226.50	354.40	105.50	273.40	254.10	353.10	**354.40**
Runoff (mm)		69	51	67	45	29	20	17	20	17	32	47	64	**477**
Rainfall (mm)		91	53	91	56	65	66	61	83	68	83	93	98	**908**

Factors affecting flow regime: G
Station type: FV

1989 runoff is 57% of previous mean
rainfall 66%

025006 Greta at Rutherford Bridge 1989

Measuring authority: NRA-N
First year: 1960

Grid reference: 45 (NZ) 034 122
Level stn. (m OD): 223.00

Catchment area (sq km): 86.1
Max alt. (m OD): 596

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	2.141	3.651	4.037	3.995	0.285	0.232	0.210	0.215	0.110	1.153	1.690	3.497	**1.755**
(m^3s^{-1})	Peak	41.33	41.75	60.41	39.24	0.63	1.68	1.02	1.21	0.24	13.11	30.16	59.91	**60.41**
Runoff (mm)		67	103	126	120	9	7	7	7	3	36	51	109	**643**
Rainfall (mm)		61	135	114	106	16	64	20	74	18	99	56	118	**881**

Monthly and yearly statistics for previous record (Oct 1960 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	3.769	2.663	3.259	2.134	1.336	0.873	0.729	1.369	1.522	2.580	3.366	3.615	**2.268**
flows	Low	0.291	0.280	0.842	0.375	0.148	0.130	0.092	0.098	0.146	0.195	0.951	0.944	**1.447**
(m^3s^{-1})	High	7.155	6.881	8.926	4.682	3.951	2.502	2.784	4.107	4.067	6.665	6.878	6.406	**2.926**
Peak flow (m^3s^{-1})		118.00	88.63	79.00	70.36	56.35	51.74	57.83	210.40	109.00	93.85	68.81	73.77	**210.40**
Runoff (mm)		117	76	101	64	42	26	23	43	46	80	101	112	**832**
Rainfall (mm)		120	81	100	75	78	71	74	98	95	105	115	120	**1132**

Factors affecting flow regime:
Station type: CC

1989 runoff is 77% of previous mean
rainfall 78%

025019 Leven at Easby 1989

Measuring authority: NRA-N
First year: 1971

Grid reference: 45 (NZ) 585 087
Level stn. (m OD): 101.30

Catchment area (sq km): 14.8
Max alt. (m OD): 335

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	0.082	0.094	0.114	0.189	0.075	0.062	0.046	0.041	0.039	0.049	0.058	0.144	**0.083**
(m^3s^{-1}).	Peak	0.14	0.60	0.24	0.43	0.10	0.17	0.12	0.07	0.09	0.14	0.27	0.65	**0.65**
Runoff (mm)		15	15	21	33	14	11	8	7	7	9	10	26	**176**
Rainfall (mm)		17	41	55	67	18	68	34	53	24	71	47	81	**576**

Monthly and yearly statistics for previous record (May 1971 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0.316	0.301	0.308	0.257	0.183	0.132	0.112	0.135	0.124	0.174	0.200	0.267	**0.209**
flows	Low	0.115	0.100	0.076	0.085	0.072	0.075	0.044	0.039	0.059	0.063	0.092	0.132	**0.143**
(m^3s^{-1})	High	0.630	0.729	0.821	0.771	0.544	0.239	0.188	0.427	0.532	0.556	0.507	0.543	**0.305**
Peak flow (m^3s^{-1})		3.14	4.38	5.68	9.36	7.56	1.99	3.14	15.53	12.83	3.50	4.01	7.66	**15.53**
Runoff (mm)		57	50	56	45	33	23	20	24	22	31	35	48	**445**
Rainfall (mm)		81	51	75	58	61	60	65	78	73	77	76	75	**830**

Factors affecting flow regime: N
Station type: FV

1989 runoff is 40% of previous mean
rainfall 69%

025020 Skerne at Preston le Skerne — 1989

Measuring authority: NRA-N | Grid reference: 45 (NZ) 292 238 | Catchment area (sq km): 147.0
First year: 1972 | Level stn. (m OD): 67.50 | Max alt. (m OD): 222

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.337	0.605	0.326	0.444	0.240	0.254	0.146	0.148	0.118	0.143	0.129	0.325	**0.266**
(m^3s^{-1})	Peak	0.60	9.38	0.70	1.85	0.41	3.13	0.54	0.70	0.45	0.75	0.46	2.91	**9.38**
Runoff (mm)		6	10	6	8	4	4	3	3	2	3	2	6	**57**
Rainfall (mm)		10	39	20	50	10	59	16	48	13	58	30	58	**411**

Monthly and yearly statistics for previous record (Dec 1972 to Dec 1988—incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1.655	1.252	1.406	1.020	0.704	0.465	0.417	0.418	0.355	0.836	0.915	1.398	**0.903**
flows	Low	0.486	0.481	0.293	0.247	0.199	0.112	0.121	0.086	0.082	0.099	0.204	0.553	**0.558**
(m^3s^{-1})	High	3.376	2.731	4.824	2.734	2.106	1.004	1.125	0.943	0.745	4.290	1.962	4.658	**1.510**
Peak flow (m^3s^{-1})		20.08	12.93	26.58	19.20	11.93	16.54	15.92	13.69	9.33	21.71	17.40	24.82	**26.58**
Runoff (mm)		30	21	26	18	13	8	8	8	6	15	16	25	**194**
Rainfall (mm)		61	37	58	45	54	54	51	64	60	58	59	58	**659**

Factors affecting flow regime: E
Station type: VA

1989 runoff is 29% of previous mean
rainfall 62%

026003 Foston Beck at Foston Mill — 1989

Measuring authority: NRA-Y | Grid reference: 54 (TA) 093 548 | Catchment area (sq km): 57.2
First year: 1959 | Level stn. (m OD): 6.40 | Max alt. (m OD): 164

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.245	0.225	0.223	0.224	0.234	0.223	0.203	0.169	0.142	0.124	0.117	0.122	**0.188**
(m^3s^{-1})	Peak	0.31	0.34	0.29	0.32	0.34	0.30	0.30	0.20	0.16	0.15	0.16	0.23	**0.34**
Runoff (mm)		11	10	10	10	11	10	10	8	6	6	5	6	**103**
Rainfall (mm)		18	40	60	50	16	46	45	30	21	46	44	78	**494**

Monthly and yearly statistics for previous record (Oct 1959 to Dec 1988—incomplete or missing months total 0.6 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	0.879	1.165	1.103	1.005	0.863	0.669	0.523	0.411	0.341	0.327	0.420	0.586	**0.688**
flows	Low	0.199	0.183	0.174	0.150	0.174	0.110	0.112	0.105	0.101	0.125	0.148	0.195	**0.155**
(m^3s^{-1})	High	2.224	2.332	2.242	2.070	1.708	1.231	0.882	0.675	0.567	0.612	1.845	2.379	**1.282**
Peak flow (m^3s^{-1})		2.89	3.30	2.69	2.70	1.95	2.01	1.47	0.99	0.80	1.22	2.49	2.86	**3.30**
Runoff (mm)		41	50	52	46	40	30	25	19	15	15	19	27	**380**
Rainfall (mm)		72	50	58	52	55	52	55	65	58	67	74	74	**732**

Factors affecting flow regime: N
Station type: TP

1989 runoff is 27% of previous mean
rainfall 67%

026005 Gypsey Race at Boynton — 1989

Measuring authority: NRA-Y | Grid reference: 54 (TA) 137 677 | Catchment area (sq km): 240.0
First year: 1981 | Level stn. (m OD): 16.80 | Max alt. (m OD): 211

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.006	0.005	0.010	0.011	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.006	**0.003**
(m^3s^{-1})	Peak	0.01	0.01	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.03	**0.03**
Runoff (mm)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Rainfall (mm)		18	44	60	52	16	50	33	32	21	52	41	81	**500**

Monthly and yearly statistics for previous record (Feb 1981 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0.248	0.447	0.481	0.627	0.583	0.356	0.201	0.091	0.042	0.019	0.017	0.041	**0.262**
flows	Low	0.071	0.120	0.116	0.118	0.225	0.132	0.104	0.026	0.006	0.004	0.006	0.013	**0.143**
(m^3s^{-1})	High	0.475	0.887	0.872	1.585	1.217	0.623	0.351	0.184	0.098	0.055	0.033	0.082	**0.349**
Peak flow (m^3s^{-1})		0.72	1.00	1.86	1.87	1.58	0.86	0.60	0.28	0.29	0.14	0.08	0.27	**1.87**
Runoff (mm)		3	5	5	7	7	4	2	1	0	0	0	0	**34**
Rainfall (mm)		74	47	83	57	58	44	60	68	64	66	72	58	**751**

Factors affecting flow regime: G I
Station type: FV

1989 runoff is 1% of previous mean
rainfall 67%

027007 Ure at Westwick Lock — 1989

Measuring authority: NRA-Y | Grid reference: 44 (SE) 356 671 | Catchment area (sq km): 914.6
First year: 1958 | Level stn. (m OD): 14.20 | Max alt. (m OD): 713

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	16.500	34.460	45.430	29.030	5.099	4.011	3.407	4.074	2.886	13.760	13.970	27.020	**16.536**
(m^3s^{-1})	Peak	133.80	156.90	242.10	169.10	9.61	23.41	14.37	14.25	7.42	87.26	139.40	174.50	**242.10**
Runoff (mm)		48	91	133	82	15	11	10	12	8	40	40	79	**570**
Rainfall (mm)		52	138	148	102	12	76	39	56	21	117	58	123	**942**

Monthly and yearly statistics for previous record (Oct 1958 to Dec 1988—incomplete or missing months total 0.5 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	33.980	28.580	26.980	20.210	13.050	8.784	8.167	12.120	14.040	22.250	28.920	32.900	**20.803**
flows	Low	4.009	3.886	10.250	5.674	3.831	3.024	2.202	1.287	1.450	5.856	7.078	11.330	**12.946**
(m^3s^{-1})	High	59.590	84.770	60.330	40.980	29.500	21.400	20.130	31.600	33.030	68.480	65.010	57.370	**27.086**
Peak flow (m^3s^{-1})		537.90	307.30	413.10	263.30	170.80	161.50	153.30	271.90	296.20	266.50	288.80	304.10	**537.90**
Runoff (mm)		100	76	79	57	38	25	24	35	40	65	82	96	**718**
Rainfall (mm)		121	80	96	78	75	71	77	93	96	107	121	125	**1140**

Factors affecting flow regime: S P
Station type: B VA

1989 runoff is 79% of previous mean
rainfall 83%

027025 Rother at Woodhouse Mill 1989

Measuring authority: NRA-Y
First year: 1961

Grid reference: 43 (SK) 432 857
Level stn. (m OD): 28.70

Catchment area (sq km): 352.2
Max alt. (m OD): 367

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1.924	3.902	5.993	10.240	2.643	2.024	1.767	1.450	1.325	1.404	1.522	8.200	**3.527**
(m^3s^{-1})	Peak	3.26	46.07	33.96	45.90	9.97	15.76	9.35	3.96	6.25	8.58	12.49	43.42	**46.07**
Runoff (mm)		15	27	46	75	20	15	13	11	10	11	11	62	**316**
Rainfall (mm)		18	64	71	119	23	59	29	31	27	66	39	140	**686**

Monthly and yearly statistics for previous record (Oct 1961 to Dec 1988—incomplete or missing months total 2.5 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	7.062	6.873	6.460	5.184	3.857	3.005	2.003	2.033	2.168	2.927	4.631	6.135	**4.349**
flows	Low	1.287	1.424	1.830	1.400	1.569	1.166	0.934	0.760	0.712	0.693	1.073	2.393	**2.540**
(m^3s^{-1})	High	13.000	22.440	14.330	13.160	10.110	10.840	4.907	3.323	7.786	7.600	8.200	18.140	**6.364**
Peak flow (m^3s^{-1})		60.30	78.80	53.21	78.14	61.40	105.40	45.63	33.55	45.59	41.74	50.55	91.46	**105.40**
Runoff (mm)		54	48	49	38	29	22	15	15	16	22	34	47	**390**
Rainfall (mm)		72	58	68	67	65	65	55	64	63	63	75	73	**783**

Factors affecting flow regime: SRPGEI
Station type: VA

1989 runoff is 81% of previous mean
rainfall 88%

027030 Dearne at Adwick 1989

Measuring authority: NRA-Y
First year: 1963

Grid reference: 44 (SE) 477 020
Level stn. (m OD): 12.70

Catchment area (sq km): 310.8
Max alt. (m OD): 381

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1.678	2.593	3.528	5.469	1.787	1.582	1.956	1.148	1.115	1.384	1.552	5.882	**2.472**
(m^3s^{-1})	Peak	5.82	20.13	25.77	21.31	9.83	8.85	11.43	2.14	2.34	5.34	8.44	36.36	**36.36**
Runoff (mm)		14	20	30	46	15	13	17	10	9	12	13	51	**251**
Rainfall (mm)		15	56	65	100	24	63	60	22	20	59	37	122	**643**

Monthly and yearly statistics for previous record (Nov 1963 to Dec 1988—incomplete or missing months total 0.7 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	5.037	5.398	4.844	4.251	3.095	2.646	1.921	1.929	1.893	2.488	3.549	4.305	**3.436**
flows	Low	1.946	1.648	1.433	1.273	1.303	1.106	0.806	0.765	0.873	0.922	1.029	1.245	**2.104**
(m^3s^{-1})	High	9.214	14.340	10.750	8.866	7.380	7.299	3.699	3.054	5.658	5.171	7.632	10.980	**5.264**
Peak flow (m^3s^{-1})		51.76	56.32	41.85	58.42	43.97	55.58	31.94	27.40	28.97	26.56	51.52	56.65	**58.42**
Runoff (mm)		43	42	42	35	27	22	17	17	16	21	30	37	**349**
Rainfall (mm)		65	53	61	56	59	58	50	65	58	58	71	66	**720**

Factors affecting flow regime: PGEI
Station type: C VA

1989 runoff is 72% of previous mean
rainfall 89%

027042 Dove at Kirkby Mills 1989

Measuring authority: NRA-Y
First year: 1972

Grid reference: 44 (SE) 705 855
Level stn. (m OD): 35.60

Catchment area (sq km): 59.2
Max alt. (m OD): 429

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.589	0.717	1.067	1.150	0.419	0.339	0.341	0.224	0.186	0.334	0.499	1.061	**0.576**
(m^3s^{-1})	Peak	1.39	8.71	3.31	4.99	1.04	2.04	7.55	0.80	0.76	2.16	2.40	6.14	**8.71**
Runoff (mm)		27	29	48	50	19	15	15	10	8	15	22	48	**307**
Rainfall (mm)		22	59	71	68	18	75	48	54	21	86	46	90	**658**

Monthly and yearly statistics for previous record (Feb 1972 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1.747	1.639	1.733	1.249	0.852	0.643	0.537	0.594	0.683	1.052	1.187	1.624	**1.127**
flows	Low	0.698	0.541	0.347	0.376	0.368	0.279	0.211	0.161	0.245	0.251	0.543	0.853	**0.640**
(m^3s^{-1})	High	2.861	3.180	4.701	2.915	1.702	1.099	1.021	1.397	2.743	2.683	2.032	3.237	**1.554**
Peak flow (m^3s^{-1})		37.45	36.68	40.93	27.63	30.01	7.43	19.33	32.36	56.38	24.71	23.85	53.38	**56.38**
Runoff (mm)		79	68	78	55	39	28	24	27	30	48	52	73	**601**
Rainfall (mm)		98	61	91	62	69	63	72	78	85	92	86	94	**951**

Factors affecting flow regime: N
Station type: FV

1989 runoff is 51% of previous mean
rainfall 69%

027043 Wharfe at Addingham 1989

Measuring authority: NRA-Y
First year: 1974

Grid reference: 44 (SE) 092 494
Level stn. (m OD): 79.70

Catchment area (sq km): 427.0
Max alt. (m OD): 704

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	10.840	19.350	27.100	15.940	2.539	3.234	3.014	3.955	2.359	13.440	9.917	15.400	**10.549**
(m^3s^{-1})	Peak	112.80	92.93	222.90	118.10	4.21	70.03	44.88	27.57	6.63	121.20	103.40	147.80	**222.90**
Runoff (mm)		68	110	170	97	16	20	19	25	14	84	60	97	**779**
Rainfall (mm)		76	160	182	114	23	99	52	88	36	173	71	134	**1208**

Monthly and yearly statistics for previous record (Jan 1974 to Dec 1988—incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	25.740	16.660	20.650	10.030	7.342	5.311	4.997	9.375	13.150	18.250	22.060	24.860	**14.878**
flows	Low	11.760	5.157	6.391	2.453	1.623	1.722	1.245	1.143	3.799	6.422	8.263	5.972	**10.487**
(m^3s^{-1})	High	33.340	28.410	52.490	21.970	16.100	10.320	12.730	26.270	23.450	37.310	32.450	44.680	**19.543**
Peak flow (m^3s^{-1})		509.00	342.00	552.60	205.10	100.90	114.70	163.80	273.80	244.90	370.00	400.00	320.30	**552.60**
Runoff (mm)		161	96	129	61	46	32	31	59	80	114	134	156	**1100**
Rainfall (mm)		165	86	134	70	80	81	84	119	134	143	148	173	**1417**

Factors affecting flow regime: S P.
Station type: C VA

1989 runoff is 71% of previous mean
rainfall 85%

027059 Laver at Ripon 1989

Measuring authority: NRA-Y
First year: 1977

Grid reference: 44 (SE) 301 710
Level stn (m OD): 29 60

Catchment area (sq km): 87 5
Max alt (m OD): 406

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 471	1 217	1 616	1 824	0 438	0 241	0 233	0 105	0 072	0 187	0 324	1 331	**0 668**
(m^3s^{-1})	Peak	1 93	9 30	18 48	14 21	0 82	1 71	1 78	0 14	0 10	1 15	2 57	12 82	**18.48**
Runoff (mm)		14	34	49	54	13	7	7	3	2	6	10	41	**241**
Rainfall (mm)		23	89	93	97	6	82	53	32	14	84	48	104	**720**

Monthly and yearly statistics for previous record (Nov 1977 to Dec 1988—incomplete or missing months total 0.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	2 115	1 640	1 806	1 281	0 785	0 532	0 292	0 448	0 349	0 830	1 308	1 956	**1.110**
flows	Low	1 136	0 659	0 721	0 453	0 272	0 233	0 098	0 096	0 224	0 167	0 419	0 848	**0.837**
(m^3s^{-1})	High	3 265	3 090	3 850	3 063	1 881	1 264	0 696	0 952	0 618	1 736	2 400	3 786	**1.211**
Peak flow (m^3s^{-1})		24 06	18 75	22 65	36 95	13 32	16 75	11 26	11 48	10 21	17 08	15 01	39 14	**39.14**
Runoff (mm)		65	46	55	38	24	16	9	14	10	25	39	60	**401**
Rainfall (mm)*		107	60	101	62	64	64	54	89	72	94	97	117	**981**

*(1978-1988)

Factors affecting flow regime: S P
Station type: C

1989 runoff is 60% of previous mean
rainfall 73%

027071 Swale at Crakehill 1989

Measuring authority: NRA-Y
First year: 1980

Grid reference: 44 (SE) 425 734
Level stn (m OD): 12 00

Catchment area (sq km): 1363 0
Max alt. (m OD): 713

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	14 390	24 580	30 110	23 100	6 205	4 323	3 810	3 506	2 816	8 045	10 620	20 300	**12 579**
(m^3s^{-1})	Peak	69 64	108 20	142 20	112 20	9 79	11 00	8 27	7 80	5 79	30 79	91 02	136 00	**142.20**
Runoff (mm)		28	44	59	44	12	8	7	7	5	16	20	40	**291**
Rainfall (mm)		29	82	80	74	10	68	34	48	15	82	41	89	**652**

Monthly and yearly statistics for previous record (Jun 1980 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	37 260	25 330	30 260	23 660	14 630	10 990	8 686	11 170	10 750	21 950	26 990	31 570	**21.106**
flows	Low	25 210	16 050	15 520	7 819	5 557	4 727	2 712	3 684	6 442	9 089	7 541	17 470	**18.599**
(m^3s^{-1})	High	56 800	46 530	60 040	46 690	32 370	17 180	19 160	24 220	16 090	39 340	44 280	41 050	**23.498**
Peak flow (m^3s^{-1})		230 70	187 90	188 30	183 30	94 62	107 60	123 00	199 80	114 50	184 50	161 40	183 70	**230 70**
Runoff (mm)		73	46	59	45	29	21	17	22	20	43	51	62	**489**
Rainfall (mm)*		98	45	75	71	70	51	65	85	65	91	85	89	**890**

*(1983-1988)

Factors affecting flow regime: N
Station type: C

1989 runoff is 60% of previous mean
rainfall 73%

028018 Dove at Marston on Dove 1989

Measuring authority: NRA-ST
First year: 1961

Grid reference: 43 (SK) 235 288
Level stn (m OD): 47 20

Catchment area (sq km): 883 2
Max alt (m OD): 555

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	11 330	15 800	23 440	22 780	8 060	5 670	5 552	3 800	3 406	5 364	9 961	19 020	**11.152**
(m^3s^{-1})	Peak	21 89	98 05	84 26	83 06	15 85	9 81	35 65	4 91	5 37	26 54	57 11	106 90	**106 90**
Runoff (mm)		34	43	71	67	24	17	17	12	10	16	29	58	**398**
Rainfall (mm)		43	95	93	104	34	79	31	42	30	112	62	123	**848**

Monthly and yearly statistics for previous record (Oct 1961 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	22.840	19 840	17 770	14 520	11 970	9 161	7 629	7 881	8 511	11 160	16 560	21 370	**14.078**
flows	Low	7 822	4 615	8 943	6 195	4 831	3 452	2 430	1 913	2 821	3 495	5 684	7 907	**7 723**
(m^3s^{-1})	High	32 880	55 910	36 570	24 550	22 480	16 280	15 530	14 630	29 350	22 830	31 070	56 460	**19.411**
Peak flow (m^3s^{-1})		191 40	194 60	129 70	121 00	121 40	73 02	77 10	113 60	113 90	132 10	130 80	202 80	**202.80**
Runoff (mm)		69	55	54	43	36	27	23	24	25	34	49	65	**503**
Rainfall (mm)		93	66	79	65	75	76	68	83	80	81	95	94	**955**

Factors affecting flow regime: SRPG
Station type: FV

1989 runoff is 79% of previous mean
rainfall 89%

028024 Wreake at Syston Mill 1989

Measuring authority: NRA-ST
First year: 1967

Grid reference: 43 (SK) 615 124
Level stn (m OD): 47 70

Catchment area (sq km): 413 8
Max alt (m OD): 230

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1 627	2 255	2 904	7 659	1 334	0 895	0 807	0 574	0 580	0 616	1 379	7 527	**2.344**
(m^3s^{-1})	Peak	5 92	13 89	8 83	32 29	3 22	5 37	3 06	1 10	2 65	2 05	12 15	34 60	**34 60**
Runoff (mm)		11	13	19	48	9	6	5	4	4	4	9	49	**179**
Rainfall (mm)		28	35	45	105	27	70	49	35	39	50	47	101	**631**

Monthly and yearly statistics for previous record (Aug 1967 to Dec 1988—incomplete or missing months total 1 6 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	5 889	6 113	5 019	3 484	2 256	1 187	0 934	0 860	0 782	1 416	2 463	4 238	**2 872**
flows	Low	0 959	0 619	0 494	0 358	0 286	0 222	0 137	0 122	0 254	0 264	0 418	0 745	**0.923**
(m^3s^{-1})	High	10 150	21 740	12 630	8 772	8 117	2 776	4 547	3 230	5 367	6 897	7 087	11 850	**4.396**
Peak flow (m^3s^{-1})		43 11	73 37	99 82	97 07	51 83	39 17	26 88	30 44	21 61	31 68	50 25	52 95	**99.82**
Runoff (mm)		38	36	32	22	15	7	6	6	5	9	15	27	**219**
Rainfall (mm)*		55	44	55	45	55	60	46	61	52	53	50	55	**631**

*(1971-1988)

Factors affecting flow regime: GE
Station type: C VA

1989 runoff is 82% of previous mean
rainfall 100%

028026 Anker at Polesworth 1989

Measuring authority: NRA ST
First year: 1966

Grid reference: 43 (SK) 263 034
Level stn. (m OD): 60.40

Catchment area (sq km): 368.0
Max alt. (m OD): 177

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	2.170	3.066	3.264	6.177	1.649	1.403	1.171	1.103	0.999	1.300	2.097	9.416	**2.817**
(m^3s^{-1})	Peak	7.17	26.07	10.60	26.10	10.79	6.90	8.54	4.79	5.76	6.39	16.93	56.80	**56.80**
Runoff (mm)		16	20	24	44	12	10	9	8	7	9	15	69	**241**
Rainfall (mm)		35	45	49	96	30	65	52	54	36	65	42	122	**691**

Monthly and yearly statistics for previous record (Oct 1966 to Dec 1988—incomplete or missing months total 2.6 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	5.292	5.416	4.382	2.785	2.411	1.864	1.367	1.412	1.272	1.937	2.589	3.855	**2.871**
flows	Low	1.298	0.953	0.650	0.657	0.686	0.484	0.343	0.405	0.711	0.728	0.855	1.175	**1.213**
(m^3s^{-1})	High	9.572	16.200	9.233	6.629	8.389	4.650	5.580	4.173	3.274	4.611	5.537	9.473	**3.724**
Peak flow (m^3s^{-1})		75.63	73.18	56.09	45.84	59.77	52.68	59.34	45.03	31.34	36.25	45.77	74.01	**75.63**
Runoff (mm)		39	36	32	20	18	13	10	10	9	14	18	28	**246**
Rainfall (mm)*		58	51	58	41	55	63	45	58	60	53	51	58	**651**

*(1971-1988)

Factors affecting flow regime: GE
Station type: C VA

1989 runoff is 98% of previous mean
rainfall 106%

028031 Manifold at Ilam 1989

Measuring authority: NRA-ST
First year: 1968

Grid reference: 43 (SK) 140 507
Level stn. (m OD): 131.00

Catchment area (sq km): 148.5
Max alt. (m OD): 513

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	2.562	3.898	6.602	5.517	1.508	1.103	1.142	0.552	0.458	1.383	3.199	5.136	**2.748**
(m^3s^{-1})	Peak	8.26	48.46	46.36	40.09	6.60	18.04	17.71	0.71	0.66	15.48	25.02	39.70	**48.46**
Runoff (mm)		46	64	119	96	27	19	21	10	8	25	56	93	**583**
Rainfall (mm)		53	112	118	114	43	98	31	48	29	135	75	132	**988**

Monthly and yearly statistics for previous record (May 1968 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	6.407	5.152	5.014	3.736	2.518	1.967	1.578	1.928	1.878	3.103	4.979	5.327	**3.626**
flows	Low	3.657	2.489	2.528	1.277	0.812	0.745	0.493	0.386	0.535	0.716	1.555	2.135	**2.241**
(m^3s^{-1})	High	8.522	12.710	9.455	6.200	5.713	5.150	3.505	4.560	4.147	6.697	8.198	9.995	**4.806**
Peak flow (m^3s^{-1})		80.13	74.53	66.72	47.36	52.40	39.58	37.29	137.00	45.69	75.78	91.61	66.25	**137.00**
Runoff (mm)		116	85	90	65	45	34	28	35	33	56	87	96	**771**
Rainfall (mm)*		124	81	100	72	76	80	74	82	86	95	119	111	**1100**

*(1969-1988)

Factors affecting flow regime: P E
Station type: C

1989 runoff is 76% of previous mean
rainfall 90%

028039 Rea at Calthorpe Park 1989

Measuring authority: NRA-ST
First year: 1967

Grid reference: 42 (SP) 071 847
Level stn. (m OD): 104.20

Catchment area (sq km): 74.0
Max alt. (m OD): 286

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.483	0.857	0.728	1.285	0.414	0.418	0.453	0.381	0.346	0.712	0.597	1.831	**0.708**
(m^3s^{-1})	Peak	4.76	22.55	12.81	12.81	5.91	3.13	27.42	10.84	8.47	24.68	14.99	23.49	**27.42**
Runoff (mm)		17	28	26	45	15	15	16	14	12	26	21	66	**302**
Rainfall (mm)		33	57	59	96	26	44	53	41	37	98	48	143	**735**

Monthly and yearly statistics for previous record (May 1967 to Dec 1988—incomplete or missing months total 1.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1.212	1.048	1.063	0.796	0.764	0.681	0.532	0.665	0.634	0.675	0.872	1.075	**0.834**
flows	Low	0.601	0.549	0.483	0.316	0.355	0.287	0.257	0.367	0.295	0.320	0.493	0.490	**0.602**
(m^3s^{-1})	High	1.985	2.610	2.101	1.489	1.780	1.324	1.018	1.366	1.423	1.408	1.753	1.934	**1.058**
Peak flow (m^3s^{-1})		36.71	27.44	28.64	25.15	30.37	37.44	46.86	46.38	40.85	23.28	24.97	54.02	**54.02**
Runoff (mm)		44	35	38	28	28	24	19	24	22	24	31	39	**356**
Rainfall (mm)*		78	59	69	56	69	65	56	75	69	61	72	76	**805**

*(1968-1988)

Factors affecting flow regime: E
Station type: C

1989 runoff is 85% of previous mean
rainfall 91%

028067 Derwent at Church Wilne 1989

Measuring authority: NRA-ST
First year: 1973

Grid reference: 43 (SK) 438 316
Level stn. (m OD): 31.00

Catchment area (sq km): 1177.5
Max alt. (m OD): 636

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	13.270	17.780	35.910	40.240	12.540	7.829	7.030	5.464	4.950	5.950	8.958	25.690	**15.448**
(m^3s^{-1})	Peak	19.10	104.20	130.80	92.57	20.04	18.21	23.94	13.44	11.64	23.00	20.04	92.02	**130.80**
Runoff (mm)		30	37	82	89	29	17	16	12	11	14	20	58	**414**
Rainfall (mm)		40	100	106	126	32	81	35	44	29	110	59	144	**906**

Monthly and yearly statistics for previous record (May 1973 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	35.860	33.140	29.810	21.960	15.000	12.090	9.210	8.662	8.750	14.610	19.860	27.640	**19.659**
flows	Low	20.820	13.050	10.210	7.891	7.025	5.411	4.445	3.965	4.429	4.933	5.152	9.272	**10.267**
(m^3s^{-1})	High	52.530	81.270	59.290	39.800	28.060	23.060	22.050	16.600	14.200	31.970	35.860	46.890	**25.542**
Peak flow (m^3s^{-1})		194.10	215.70	173.60	158.40	142.20	118.70	156.20	153.60	71.96	146.50	94.65	214.70	**215.70**
Runoff (mm)		82	69	68	48	34	27	21	20	19	33	44	63	**527**
Rainfall (mm)		115	75	97	61	69	77	63	78	84	93	94	106	**1012**

Factors affecting flow regime: S P EI
Station type: FVVA

1989 runoff is 79% of previous mean
rainfall 90%

028080 Tame at Lea Marston Lakes 1989

Measuring authority NRA-ST | Grid reference 42 (SP) 207 937 | Catchment area (sq km) 799 0
First year 1957 | Level stn (m OD) 66.20 | Max alt (m OD) 267

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	10 880	13 750	14 100	19 580	9 499	10 030	9 841	8 612	8 413	11 710	11 530	26 970	**12 908**
(m^3s^{-1})	Peak	35 00	82 61	52 49	61 27	26 40	34 93	62 61	45 79	51 99	69 35	72 04	139 30	**139.30**
Runoff (mm)		36	42	47	64	32	33	33	29	27	39	37	90	**509**
Rainfall (mm)		33	53	56	92	21	54	49	48	34	88	44	140	**712**

Monthly and yearly statistics for previous record (Oct 1957 to Dec 1988—incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	17 830	16 980	15 680	13 820	12 630	11 520	10 400	11 120	11 180	12 110	14 340	16 450	**13 658**
flows	Low	8 994	8 855	8 797	7 259	7 321	6 655	6 369	6 978	6 655	7 852	7 876	9 057	**9.699**
(m^3s^{-1})	High	26 700	35 140	26 590	22 000	24 690	18 990	17 210	16 970	19 440	25 600	27 880	32 880	**17 355**
Peak flow (m^3s^{-1})		122 20	94 05	86 27	110 80	121 60	159 70	94 78	153 20	92 33	76 24	127 60	219 20	**219.20**
Runoff (mm)		60	52	53	45	42	37	35	37	36	41	47	55	**539**
Rainfall (mm)		66	49	56	53	60	60	56	72	62	59	65	71	**729**

Factors affecting flow regime. EI
Station type. C

1989 runoff is 94% of previous mean
rainfall 98%

028082 Soar at Littlethorpe 1989

Measuring authority. NRA-ST | Grid reference 42 (SP) 542 973 | Catchment area (sq km) 183 9
First year 1971 | Level stn (m OD). 61 40 | Max alt. (m OD) 151

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1 028	1 262	1 448	2 815	0 712	0 607	0 542	0 463	0 455	0 541	0 887	3 924	**1.224**
(m^3s^{-1})	Peak	3 37	7 54	4 96	10 86	1 70	3 22	3 73	2 14	2 14	1 92	6 32	20 60	**20.60**
Runoff (mm)		15	17	21	40	10	9	8	7	6	8	13	57	**210**
Rainfall (mm)		35	41	48	97	26	71	65	56	38	58	43	119	**697**

Monthly and yearly statistics for previous record (Aug 1971 to Dec 1988—incomplete or missing months total 0.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	2.776	2 712	2 437	1 550	1 098	0 988	0 545	0 696	0 557	0 926	1 312	2 280	**1.485**
flows	Low	0 713	0 568	0.424	0 346	0 350	0 245	0 164	0 224	0 307	0 338	0 398	0 643	**0.644**
(m^3s^{-1})	High	4 661	6 868	5 031	3 105	2 654	2 346	1 447	2 242	1 608	2 921	2 714	5 101	**2.133**
Peak flow (m^3s^{-1})		23 49	24 47	20 78	21 18	14 93	15 78	13 71	20 41	15 94	19 81	16 59	22 46	**24.47**
Runoff (mm)		40	36	35	22	16	14	8	10	8	13	18	33	**255**
Rainfall (mm)*		56	45	55	41	55	64	44	61	53	52	52	60	**638**

*(1972-1988)

Factors affecting flow regime. E
Station type EM

1989 runoff is 82% of previous mean
rainfall 109%

029003 Lud at Louth 1989

Measuring authority. NRA-A | Grid reference 53 (TF) 337 879 | Catchment area (sq km) 55 2
First year 1968 | Level stn (m OD) 15 40 | Max alt (m OD). 159

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 320	0 284	0 329	0 372	0 317	0 258	0 203	0 166	0 147	0 141	0 134	0 212	**0.240**
(m^3s^{-1})	Peak	0 48	0 47	0 67	0 66	0 50	0 66	0 53	2 37	0 15	0 42	0 39	0 39	**2.37**
Runoff (mm)		16	12	16	17	15	12	10	8	7	7	6	10	**137**
Rainfall (mm)		26	31	56	62	12	50	19	40	34	56	51	98	**535**

Monthly and yearly statistics for previous record (Aug 1968 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0 658	0 831	0 788	0 727	0 590	0 454	0 350	0 292	0 248	0 258	0 324	0 418	**0.493**
flows	Low	0 139	0 157	0 162	0 150	0 156	0 131	0 112	0 102	0 112	0 130	0 132	0 125	**0.178**
(m^3s^{-1})	High	1 279	1 428	1 338	1 289	1 177	0 687	0 507	0 414	0 625	0 719	1 158	0 911	**0 703**
Peak flow (m^3s^{-1})		3 70	3 81	3 58	5 06	3 51	3 27	3 40	3 10	3 30	2 96	6 77	3 10	**6.77**
Runoff (mm)		32	37	38	34	29	21	17	14	12	13	15	20	**282**
Rainfall (mm)		68	47	65	52	56	58	52	63	53	57	68	64	**703**

Factors affecting flow regime G
Station type C

1989 runoff is 49% of previous mean
rainfall 76%

030004 Partney Lymn at Partney Mill 1989

Measuring authority: NRA-A | Grid reference 53 (TF) 402 676 | Catchment area (sq km) 61 6
First year 1962 | Level stn (m OD) 14 90 | Max alt (m OD) 142

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 503	0 369	0 489	0 502	0 241	0 178	0 176	0 159	0 160	0 210	0 296	0 583	**0.322**
(m^3s^{-1})	Peak	1 19	0 68	1 21	1 40	0 37	0 83	0 84	0 31	0 18	0 37	2 05	0 47	**2.05**
Runoff (mm)		22	14	21	21	10	7	8	7	7	9	12	25	**165**
Rainfall (mm)		32	26	57	59	10	56	37	33	29	50	55	81	**525**

Monthly and yearly statistics for previous record (Jun 1962 to Dec 1988—incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0.867	0 787	0 735	0 631	0 469	0 332	0 279	0 293	0 288	0 401	0 555	0 727	**0.529**
flows	Low	0 351	0 300	0 276	0 278	0 200	0 116	0 088	0 107	0 151	0 190	0 193	0 210	**0.292**
(m^3s^{-1})	High	1 574	1 838	1 538	1 518	0 886	0 691	0 862	0 593	0 917	1 144	1 112	1 804	**0 754**
Peak flow (m^3s^{-1})		10 01	12 59	7 71	13 34	11 30	8 13	13 38	7 06	6 64	8 07	10 17	8 48	**13.38**
Runoff (mm)		38	31	32	27	20	14	12	13	12	17	23	32	**271**
Rainfall (mm)		62	47	62	54	59	58	53	66	57	53	69	63	**698**

Factors affecting flow regime. P I
Station type C

1989 runoff is 61% of previous mean
rainfall 75%

031002 Glen at Kates Brdg and King St Brdg 1989

Measuring authority: NRA-A
First year: 1960

Grid reference: 53 (TF) 106 149
Level stn. (m OD): 6.10

Catchment area (sq km): 341.9
Max alt. (m OD): 129

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	0.138	0.153	0 407	2 245	0 364	0.211	0 144	0 075	0 083	0 051	0.064	1.293	0.436
(m^3s^{-1}):	Peak													
Runoff (mm)		1	1	3	17	3	2	1	1	1	0	0	10	40
Rainfall (mm)		25	29	46	99	31	64	45	39	39	42	45	86	590

Monthly and yearly statistics for previous record (Oct 1960 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	2.145	2 535	2 410	1 922	1.489	0 801	0.439	0 374	0.319	0.533	0.846	1.408	1.262
flows	Low	0 093	0.048	0 033	0 018	0 008	0 004	0 000	0 001	0 008	0 024	0 020	0 078	0 154
(m^3s^{-1})	High	6.351	10.110	6 317	4.903	5 060	2.182	1 465	1 615	1 873	2 810	5 552	7.868	2.333
Peak flow (m^3s^{-1})														
Runoff (mm)		17	18	19	15	12	6	3	3	2	4	6	11	117
Rainfall (mm)		53	40	50	52	53	53	48	63	50	51	56	55	624

Factors affecting flow regime: G I
Station type: FV

1989 runoff is 35% of previous mean
rainfall 95%

031007 Welland at Barrowden 1989

Measuring authority: NRA-A
First year 1968

Grid reference: 42 (SP) 948 999
Level stn (m OD). 34.90

Catchment area (sq km): 411.6
Max alt. (m OD): 228

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	1.468	1 800	2.641	6 192	1 402	0 706	0 498	0 310	0 382	0 332	0 983	6.190	1.908
(m^3s^{-1}).	Peak	6 36	9 87	11 65	24 13	6 88	2 08	3 61	1 44	2 93	0.72	12 83	32 08	32.08
Runoff (mm)		10	11	17	39	9	4	3	2	2	2	6	40	146
Rainfall (mm)		36	35	49	105	37	62	68	48	50	50	49	98	687

Monthly and yearly statistics for previous record (Feb 1968 to Dec 1988—incomplete or missing months total 0.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	5.089	5 079	4 442	3 027	1.730	1 169	0.793	0.811	0 670	1 302	2 090	3.536	2.467
flows	Low	0 516	0.425	0 352	0 257	0 232	0.159	0 092	0 154	0 271	0 226	0 318	0 410	1.034
(m^3s^{-1})	High	10 300	17 030	9 701	7 700	7 310	3.093	4.477	4 500	4 322	5 150	6 436	7 509	3.667
Peak flow (m^3s^{-1})		58 91	74 42	107 80	79 43	46 95	27 44	38 23	39.91	12 55	22 87	50.37	40 13	107.80
Runoff (mm)		33	30	29	19	11	7	5	5	4	8	13	23	189
Rainfall (mm)		58	43	55	46	56	58	51	66	49	51	57	58	648

Factors affecting flow regime. S EI
Station type: C

1989 runoff is 77% of previous mean
rainfall 106%

032003 Harpers Brook at Old Mill Bridge 1989

Measuring authority: NRA-A
First year: 1938

Grid reference 42 (SP) 983 799
Level stn (m OD) 30 30

Catchment area (sq km): 74 3
Max alt. (m OD). 146

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 247	0 266	0.432	1 049	0.751	0.143	0.135	0 102	0 132	0 095	0 251	1 070	0.348
(m^3s^{-1}):	Peak	0 80	0 80	2 75	4 27	1 62	0 48	1 07	0 60	1 52	0 29	4 06	7 05	7.05
Runoff (mm)		9	9	16	37	9	5	5	4	5	3	9	39	148
Rainfall (mm)		32	32	47	103	41	48	50	46	59	41	50	95	644

Monthly and yearly statistics for previous record (Dec 1938 to Dec 1988—incomplete or missing months total 0.6 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	0 794	0 810	0 723	0 488	0 312	0.201	0.147	0 154	0 143	0 218	0 429	0 581	0.415
flows	Low	0.097	0 080	0 076	0 066	0 056	0 049	0 052	0 048	0 049	0 057	0 069	0 077	0.159
(m^3s^{-1})	High	2 766	2.485	2.363	1 334	1.246	0 606	0 685	0.791	1 147	1 176	1.688	1.762	0.676
Peak flow (m^3s^{-1})		16 06	18 58	17 01	22 00	18 65	10 54	12 49	20 50	7 27	16 58	11 74	17 90	22.00
Runoff (mm)		29	27	26	17	11	7	5	6	5	8	15	21	176
Rainfall (mm)		58	42	49	43	52	52	52	63	49	54	60	56	630

Factors affecting flow regime: N
Station type: CC

1989 runoff is 84% of previous mean
rainfall 102%

033012 Kym at Meagre Farm 1989

Measuring authority: NRA A
First year: 1960

Grid reference: 52 (TL) 155 631
Level stn. (m OD): 17.20

Catchment area (sq km). 137 5
Max alt. (m OD) 101

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 454	0 572	0.977	2 076	0 181	0 054	0 044	0 024	0 043	0 034	0.083	2 168	0.559
(m^3s^{-1}):	Peak	2 84	7.00	12 80	11 40	0 69	0 17	0.32	0 10	0 22	0 09	0 67	16.20	16 20
Runoff (mm)		9	10	19	39	4	1	1	0	1	1	2	42	128
Rainfall (mm)		29	35	50	94	27	44	37	43	46	36	43	110	594

Monthly and yearly statistics for previous record (May 1960 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	1 414	1.380	1 189	0 779	0 377	0 241	0.141	0 106	0 055	0 419	0 652	0 972	0.641
flows	Low	0 074	0.047	0 044	0 041	0 024	0 009	0 001	0 004	0 017	0 015	0 022	0 050	0.103
(m^3s^{-1})	High	3.296	5 577	3 474	2 107	1 469	1 489	2 438	1 096	0.158	3.515	3 718	3 328	1.048
Peak flow (m^3s^{-1})		25 26	22 70	30 24	30 75	20 61	24 10	16 68	23 42	2 10	25.91	34.71	33 98	34.71
Runoff (mm)		28	24	23	15	7	5	3	2	1	8	12	19	147
Rainfall (mm)		50	38	47	47	53	58	50	57	47	53	54	55	609

Factors affecting flow regime: EI
Station type. CB

1989 runoff is 87% of previous mean
rainfall 98%

033013 Sapiston at Rectory Bridge 1989

Measuring authority: NRA-A
First year: 1949
Grid reference: 52 (TL) 896 791
Level stn. (m OD): 15.60
Catchment area (sq km): 205.9
Max alt. (m OD): 97

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.871	0.813	1.231	0.986	0.446	0.331	0.228	0.155	0.131	0.133	0.172	0.460	0.495
(m^3s^{-1})	Peak	1.88	3.03	5.30	2.59	0.74	0.55	0.40	0.35	0.15	0.23	0.32	2.56	5.30
Runoff (mm)		11	10	16	12	6	4	3	2	2	2	2	6	76
Rainfall (mm)		41	41	53	64	5	67	33	38	13	40	33	98	526

Monthly and yearly statistics for previous record (Jan 1949 to Dec 1988—incomplete or missing months total 2.8 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1.247	1.238	1.057	0.816	0.615	0.470	0.326	0.304	0.300	0.415	0.630	0.862	0.687
flows	Low	0.226	0.221	0.150	0.079	0.193	0.133	0.015	0.045	0.051	0.066	0.087	0.139	0.219
(m^3s^{-1})	High	3.511	3.295	2.491	1.947	1.802	1.744	0.651	1.441	1.682	2.922	2.404	2.396	1.141
Peak flow (m^3s^{-1})		11.00	10.90	10.85	8.76	7.31	5.20	2.39	10.59	8.95	12.60	6.97	10.45	12.60
Runoff (mm)		16	15	14	10	8	6	4	4	4	5	8	11	105
Rainfall (mm)*		53	35	45	44	48	51	52	52	54	57	61	54	606

*(1960-1988)

Factors affecting flow regime: GEI
Station type: TP

1989 runoff is 72% of previous mean
rainfall 87%

033024 Cam at Dernford 1989

Measuring authority: NRA-A
First year: 1949
Grid reference: 52 (TL) 466 506
Level stn (m OD): 14.70
Catchment area (sq km): 198.0
Max alt (m OD): 146

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.928	1.055	1.319	1.351	0.843	0.609	0.585	0.432	0.370	0.381	0.381	0.996	0.769
(m^3s^{-1})	Peak	2.30	5.21	8.94	3.91	1.09	0.83	2.48	0.54	0.47	0.71	0.49	7.87	8.94
Runoff (mm)		13	13	18	18	11	8	8	6	5	5	5	13	123
Rainfall (mm)		35	42	50	72	6	37	73	32	17	44	24	120	552

Monthly and yearly statistics for previous record (Mar 1949 to Dec 1988—incomplete or missing months total 1.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1.471	1.496	1.367	1.205	0.994	0.791	0.639	0.609	0.581	0.766	0.966	1.186	1.004
flows	Low	0.449	0.400	0.562	0.465	0.408	0.318	0.184	0.248	0.155	0.313	0.361	0.356	0.416
(m^3s^{-1})	High	3.592	2.703	2.608	2.431	2.144	1.338	1.608	1.542	1.965	2.970	2.790	3.492	1.506
Peak flow (m^3s^{-1})		13.30	14.09	10.22	9.94	13.63	6.94	5.28	10.70	10.99	12.70	12.50	12.06	14.09
Runoff (mm)		20	18	18	16	13	10	9	8	8	10	13	16	160
Rainfall (mm)*		50	38	43	41	48	50	54	59	53	54	58	53	601

*(1950-1988)

Factors affecting flow regime: GEI
Station type: TP

1989 runoff is 77% of previous mean
rainfall 92%

033032 Heacham at Heacham 1989

Measuring authority: NRA-A
First year: 1965
Grid reference: 53 (TF) 685 375
Level stn (m OD): 9.40
Catchment area (sq km): 59.0
Max alt (m OD): 88

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	0.111	0.116	0.121	0.131	0.134	0.114	0.095	0.072	0.060	0.051	0.047	0.051	0.092
(m^3s^{-1}).	Peak	0.14	0.20	0.13	0.16	0.16	0.22	0.13	0.09	0.10	0.08	0.07	0.08	0.22
Runoff (mm)		5	5	5	6	6	5	4	3	3	2	2	2	49
Rainfall (mm)		36	35	49	64	13	66	49	40	53	44	38	82	569

Monthly and yearly statistics for previous record (Nov 1965 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	0.242	0.333	0.338	0.320	0.279	0.233	0.182	0.151	0.132	0.126	0.128	0.173	0.219
flows	Low	0.064	0.067	0.071	0.072	0.068	0.060	0.043	0.034	0.033	0.047	0.050	0.058	0.063
(m^3s^{-1})	High	0.435	0.671	0.671	0.776	0.636	0.441	0.300	0.256	0.371	0.399	0.319	0.327	0.331
Peak flow (m^3s^{-1})		0.70	0.95	1.04	1.11	0.82	0.90	0.68	1.21	0.52	0.53	0.47	0.45	1.21
Runoff (mm)		11	14	15	14	13	10	8	7	6	6	6	8	117
Rainfall (mm)		60	42	54	48	61	56	59	63	55	58	73	63	692

Factors affecting flow regime: G I
Station type: C

1989 runoff is 42% of previous mean
rainfall 82%

034001 Yare at Colney 1989

Measuring authority: NRA-A
First year: 1959
Grid reference: 63 (TG) 182 082
Level stn (m OD): 8.20
Catchment area (sq km): 231.8
Max alt (m OD): 69

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1.458	1.284	2.361	1.815	0.812	0.515	0.552	0.377	0.366	0.396	0.492	1.394	0.985
(m^3s^{-1}):	Peak	2.91	2.84	5.03	5.35	1.51	1.01	1.92	0.53	0.78	0.74	0.84	5.77	5.77
Runoff (mm)		17	13	27	20	9	6	6	4	4	5	6	16	134
Rainfall (mm)		32	41	58	65	9	79	36	31	22	43	43	98	557

Monthly and yearly statistics for previous record (Oct 1959 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	2.698	2.569	2.086	1.782	1.128	0.765	0.625	0.632	0.704	1.000	1.485	2.176	1.466
flows	Low	0.779	0.947	0.842	0.673	0.462	0.285	0.189	0.200	0.272	0.381	0.440	0.714	0.770
(m^3s^{-1})	High	5.181	4.931	4.783	3.442	2.487	2.069	1.580	2.481	3.420	3.798	3.971	5.904	2.230
Peak flow (m^3s^{-1})		18.97	18.63	16.90	20.51	10.10	4.01	7.99	16.92	21.61	13.00	11.20	21.15	21.61
Runoff (mm)		31	27	24	20	13	9	7	7	8	12	17	25	200
Rainfall (mm)		60	41	48	48	48	52	57	59	54	61	68	63	659

Factors affecting flow regime: G I
Station type: MIS

1989 runoff is 67% of previous mean
rainfall 85%

034003 Bure at Ingworth 1989

Measuring authority: NRA-A
First year: 1959
Grid reference: 63 (TG) 192 296
Level stn (m OD): 12.20
Catchment area (sq km): 164.7
Max alt. (m OD): 101

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1.079	0.978	1.071	1.215	0.799	0.700	0.711	0.675	0.700	0.714	0.876	1.396	**0.909**
(m^3s^{-1}):	Peak	1.48	1.31	1.30	3.24	1.06	1.54	2.00	1.21	1.19	0.89	1.51	4.00	**4.00**
Runoff (mm)		18	14	17	19	13	11	12	11	11	12	14	23	**174**
Rainfall (mm)		31	37	42	63	12	80	41	47	41	42	45	93	**574**

Monthly and yearly statistics for previous record (Jun 1959 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1.578	1.473	1.308	1.228	1.001	0.809	0.790	0.814	0.859	1.018	1.240	1.398	**1.125**
flows	Low	0.844	0.844	0.779	0.688	0.600	0.495	0.493	0.497	0.548	0.671	0.688	0.941	**0.798**
(m^3s^{-1})	High	2.450	2.954	2.115	2.322	1.639	1.168	1.158	1.955	1.823	2.428	2.024	2.560	**1.488**
Peak flow (m^3s^{-1})		8.27	10.65	6.45	18.30	6.07	3.79	3.47	12.82	9.26	10.17	10.05	9.63	**18.30**
Runoff (mm)		26	22	21	19	16	13	13	13	14	17	20	23	**216**
Rainfall (mm)		63	41	51	49	49	49	60	60	56	63	73	66	**680**

Factors affecting flow regime: G I
Station type: MIS

1989 runoff is 81% of previous mean
rainfall 84%

035003 Alde at Farnham 1989

Measuring authority: NRA-A
First year: 1961
Grid reference: 62 (TM) 360 601
Level stn. (m OD): 5.20
Catchment area (sq km): 63.9
Max alt. (m OD): 63

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.300	0.333	0.593	0.364	0.100	0.070	0.061	0.048	0.050	0.052	0.059	0.136	**0.180**
(m^3s^{-1}):	Peak	1.67	3.74	4.68	2.48	0.20	0.12	0.20	0.08	0.13	0.06	0.08	1.05	**4.68**
Runoff (mm)		13	13	25	15	4	3	3	2	2	2	2	6	**89**
Rainfall (mm)		32	39	58	65	5	69	25	40	29	30	21	83	**496**

Monthly and yearly statistics for previous record (Oct 1961 to Dec 1988—incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0.716	0.509	0.428	0.297	0.148	0.094	0.076	0.091	0.124	0.203	0.337	0.505	**0.293**
flows	Low	0.097	0.100	0.079	0.063	0.051	0.033	0.032	0.033	0.045	0.047	0.052	0.060	**0.081**
(m^3s^{-1})	High	2.702	1.690	1.308	0.971	0.427	0.400	0.197	0.621	0.921	2.034	1.258	1.578	**0.528**
Peak flow (m^3s^{-1})		11.02	11.70	13.90	10.29	4.22	6.27	6.17	8.02	11.33	10.24	8.50	15.63	**15.63**
Runoff (mm)		30	19	18	12	6	4	3	4	5	9	14	21	**145**
Rainfall (mm)*		51	36	45	45	45	46	49	47	55	51	65	56	**591**

*(1961-1985)

Factors affecting flow regime: G I
Station type: MIS

1989 runoff is 61% of previous mean
rainfall 84%

037001 Roding at Redbridge 1989

Measuring authority: NRA-T
First year: 1950
Grid reference: 51 (TQ) 415 884
Level stn (m OD): 5.70
Catchment area (sq km): 303.3
Max alt (m OD): 117

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1.199	2.156	3.825	3.710	0.599	0.408	0.398	0.300	0.272	0.337	0.364	2.954	**1.373**
(m^3s^{-1}):	Peak	3.92	15.90	23.60	13.20	1.85	5.97	2.61	4.57	11.60	2.20	2.14	17.20	**23.60**
Runoff (mm)		11	17	34	32	5	3	4	3	2	3	3	26	**143**
Rainfall (mm)		30	42	59	79	7	40	55	38	20	44	24	116	**554**

Monthly and yearly statistics for previous record (Feb 1950 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	3.891	3.439	2.766	1.922	1.229	0.856	0.643	0.683	0.846	1.441	2.199	2.926	**1.897**
flows	Low	0.675	0.608	0.537	0.482	0.323	0.226	0.280	0.224	0.197	0.283	0.412	0.412	**0.801**
(m^3s^{-1})	High	10.920	10.670	6.858	6.768	4.045	2.953	1.975	3.925	4.012	7.883	10.340	9.454	**2.809**
Peak flow (m^3s^{-1})		42.00	30.80	38.08	27.72	32.70	21.70	24.50	31.30	25.62	35.60	62.41	36.40	**62.41**
Runoff (mm)		34	28	24	16	11	7	6	6	7	13	19	26	**197**
Rainfall (mm)		53	41	46	42	50	52	53	57	57	57	62	56	**628**

Factors affecting flow regime: S EI
Station type: EW

1989 runoff is 72% of previous mean
rainfall 88%

037005 Colne at Lexden 1989

Measuring authority: NRA-A
First year: 1959
Grid reference: 52 (TL) 962 261
Level stn (m OD): 8.20
Catchment area (sq km): 238.2
Max alt. (m OD): 114

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1.179	1.410	2.033	1.839	0.578	0.398	0.445	0.287	0.283	0.337	0.425	1.279	**0.872**
(m^3s^{-1}):	Peak	3.87	7.80	12.44	7.25	1.04	0.97	1.79	0.50	0.66	0.97	0.94	7.27	**12.44**
Runoff (mm)		13	14	23	20	7	4	5	3	3	4	5	14	**115**
Rainfall (mm)		36	40	51	75	6	53	56	36	12	38	24	102	**529**

Monthly and yearly statistics for previous record (Oct 1959 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	2.117	1.773	1.670	1.228	0.801	0.505	0.373	0.367	0.399	0.779	1.172	1.522	**1.056**
flows	Low	0.460	0.346	0.380	0.358	0.229	0.146	0.100	0.088	0.179	0.188	0.288	0.352	**0.362**
(m^3s^{-1})	High	6.543	4.684	3.556	3.344	2.353	1.528	0.907	1.558	1.099	4.838	5.521	4.200	**1.732**
Peak flow (m^3s^{-1})		21.13	22.65	20.68	13.34	12.56	8.07	6.41	8.86	10.50	24.80	21.29	20.58	**24.80**
Runoff (mm)		24	18	19	13	9	5	4	4	4	9	13	17	**140**
Rainfall (mm)		49	33	45	41	46	48	48	50	51	55	58	53	**577**

Factors affecting flow regime: RP I
Station type: FL

1989 runoff is 82% of previous mean
rainfall 92%

037010 Blackwater at Appleford Bridge 1989

Measuring authority: NRA-A
First year: 1962

Grid reference: 52 (TL) 845 158
Level stn. (m OD): 14.60

Catchment area (sq km): 247.3
Max alt. (m OD): 127

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1.345	1.468	2.067	1.839	0.652	0.751	1.359	0.475	0.401	0.487	1.072	1.785	**1.140**
(m^3s^{-1})	Peak	4.83	7.44	11.10	6.88	1.64	1.68	3.67	0.99	0.65	1.06	2.08	7.70	**11.10**
Runoff (mm)		15	14	22	19	7	8	15	5	4	5	11	19	**145**
Rainfall (mm)		34	39	49	71	7	44	65	39	13	40	24	105	**530**

Monthly and yearly statistics for previous record (Oct 1962 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	2.203	1.929	1.926	1.477	1.009	0.738	0.535	0.518	0.537	0.840	1.186	1.641	**1.209**
flows	Low	0.532	0.460	0.479	0.479	0.341	0.356	0.187	0.161	0.215	0.288	0.325	0.379	**0.822**
(m^3s^{-1})	High	7.181	4.889	3.583	3.843	2.860	1.583	1.007	1.741	1.651	4.955	4.676	4.307	**1.659**
Peak flow (m^3s^{-1})		26.80	21.60	20.00	12.31	17.80	7.75	4.10	13.75	15.25	26.08	20.20	21.60	**26.80**
Runoff (mm)		24	19	21	15	11	8	6	6	6	9	12	18	**154**
Rainfall (mm)		49	33	48	43	48	53	47	51	51	51	59	50	**583**

Factors affecting flow regime: RPI
Station type: FL

1989 runoff is 94% of previous mean
rainfall 91%

038001 Lee at Feildes Weir 1989

Measuring authority: NRA-T
First year: 1879

Grid reference: 52 (TL) 390 092
Level stn. (m OD): 27.70

Catchment area (sq km): 1036.0
Max alt. (m OD): 229

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	3.078	4.640	6.460	7.973	2.895	1.754	2.286	1.087	0.736	0.758	0.893	7.137	**3.302**
(m^3s^{-1})	Peak	11.70	45.90	57.10	29.70	6.56	3.56	12.00	4.33	3.40	3.34	2.39	57.20	**57.20**
Runoff (mm)		8	11	17	20	7	4	6	3	2	2	2	18	**101**
Rainfall (mm)		35	46	56	92	8	37	70	36	20	49	28	129	**606**

Monthly and yearly statistics for previous record (Jun 1879 to Dec 1988—incomplete or missing months total 2.4 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	7.554	7.718	6.611	4.952	3.927	2.84[illegible]	2.[illegible]89	2.005	1.882	3.010	4.609	6.230	**4.446**
flows	Low	0.866	0.659	0.460	0.484	0.302	0.224	0.081	0.085	0.132	0.162	0.416	0.553	**0.802**
(m^3s^{-1})	High	21.670	27.570	29.430	18.110	12.640	12.620	10.320	10.580	7.063	16.190	15.570	19.760	**10.353**
Peak flow (m^3s^{-1})		85.00	74.30	88.40	52.20	96.90	65.30	26.00	27.50	49.56	73.60	52.30	77.00	**96.90**
Runoff (mm)		20	18	17	12	10	7	6	5	5	8	12	16	**135**
Rainfall (mm)*		58	41	47	43	51	51	55	58	55	62	65	57	**643**

*(1936-1988)

Factors affecting flow regime: PGEI
Station type: MIS

1989 runoff is 74% of previous mean
rainfall 94%

038018 Upper Lee at Water Hall 1989

Measuring authority: NRA-T
First year: 1971

Grid reference: 52 (TL) 299 099
Level stn. (m OD): 43.60

Catchment area (sq km): 150.0
Max alt. (m OD): 229

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1.015	1.131	1.505	1.926	1.210	0.884	0.902	0.657	0.562	0.605	0.629	1.568	**1.049**
(m^3s^{-1})	Peak	1.71	4.52	7.97	4.77	1.56	1.47	3.25	1.38	1.13	1.34	1.27	8.82	**8.82**
Runoff (mm)		18	18	27	33	22	15	16	12	10	11	11	28	**221**
Rainfall (mm)		36	52	58	96	12	33	55	37	20	53	31	144	**627**

Monthly and yearly statistics for previous record (Oct 1971 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1.562	1.609	1.683	1.588	1.467	1.312	0.999	0.922	0.895	1.055	1.153	1.316	**1.295**
flows	Low	0.708	0.667	0.601	0.531	0.452	0.423	0.373	0.289	0.439	0.533	0.496	0.546	**0.611**
(m^3s^{-1})	High	2.747	2.627	2.383	2.951	2.601	1.977	1.400	1.301	1.242	2.387	2.305	2.303	**1.702**
Peak flow (m^3s^{-1})		11.10	9.00	6.02	8.13	15.80	11.30	4.49	4.21	6.79	9.34	12.21	12.60	**15.80**
Runoff (mm)		28	26	30	27	26	23	18	16	15	19	20	23	**273**
Rainfall (mm)		60	40	60	45	59	56	44	51	58	68	59	59	**659**

Factors affecting flow regime: GEI
Station type: C

1989 runoff is 81% of previous mean
rainfall 95%

038021 Turkey Brook at Albany Park 1989

Measuring authority: NRA-T
First year: 1971

Grid reference: 51 (TQ) 359 985
Level stn. (m OD): 16.60

Catchment area (sq km): 42.2
Max alt. (m OD): 127

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.111	0.272	0.437	0.518	0.048	0.031	0.027	0.018	0.027	0.033	0.036	0.542	**0.174**
(m^3s^{-1})	Peak	0.60	3.62	7.68	4.12	0.37	0.31	0.87	0.34	1.79	0.67	0.25	7.52	**7.68**
Runoff (mm)		7	16	28	32	3	2	2	1	2	2	2	34	**130**
Rainfall (mm)		34	51	74	94	10	35	38	51	34	56	28	133	**638**

Monthly and yearly statistics for previous record (Sep 1971 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0.454	0.344	0.363	0.222	0.182	0.099	0.044	0.056	0.060	0.193	0.253	0.324	**0.216**
flows	Low	0.037	0.042	0.024	0.020	0.014	0.021	0.013	0.008	0.012	0.016	0.019	0.086	**0.057**
(m^3s^{-1})	High	1.180	0.988	0.811	0.626	0.626	0.240	0.087	0.171	0.228	0.941	1.158	0.704	**0.339**
Peak flow (m^3s^{-1})		10.50	11.00	5.14	7.72	20.69	15.30	2.38	2.76	7.55	10.70	12.75	10.50	**20.69**
Runoff (mm)		29	20	23	14	12	6	3	4	4	12	16	21	**161**
Rainfall (mm)		63	41	61	45	62	55	46	53	61	66	62	61	**676**

Factors affecting flow regime: PG
Station type: FV

1989 runoff is 81% of previous mean
rainfall 94%

039002 Thames at Days Weir 1989

Measuring authority: NRA T
First year: 1938
Grid reference: 41 (SU) 568 935
Level stn. (m OD): 46.00
Catchment area (sq km): 3444.7
Max alt. (m OD): 330

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	13.850	28.050	47.100	39.570	14 480	6 928	4 235	2.936	3.022	4 427	11.690	66.530	20.225
(m^3s^{-1}):	Peak													
Runoff (mm)		11	20	37	30	11	5	3	2	2	3	9	52	185
Rainfall (mm)		35	69	60	76	17	41	34	41	39	80	47	134	673

Monthly and yearly statistics for previous record (Oct 1938 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	56 090	56.720	45.980	31.110	20 930	14 800	8 679	7 360	8.728	15 140	31.700	44.740	28.361
flows	Low	6 250	5.554	5 620	4.253	2.855	1 502	0.399	0 296	1.741	2.778	4 040	5.312	10.095
(m^3s^{-1})	High	133 600	120 800	163 200	85 070	61.140	41.560	48 820	18 690	38 630	74 570	128.100	128.700	51.292
Peak flow (m^3s^{-1})														
Runoff (mm)		44	40	36	23	16	11	7	6	7	12	24	35	260
Rainfall (mm)		67	47	54	46	60	55	54	68	60	64	71	71	717

Factors affecting flow regime: P EI
Station type: MIS

1989 runoff is 71% of previous mean
rainfall 94%

039005 Beverley Brook at Wimbledon Common 1989

Measuring authority: NRA-T
First year: 1935
Grid reference: 51 (TQ) 216 717
Level stn. (m OD): 11.00
Catchment area (sq km): 43 6
Max alt. (m OD): 190

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	0 467	0 570	0 716	0 766	0 424	0 466	0 402	0 468	0.346	0 422	0 405	0 937	0.533
(m^3s^{-1}):	Peak	2 61	4 67	6.58	6 84	0 70	4 30	3.27	8 10	1 19	4 87	5 87	12 30	12.30
Runoff (mm)		29	32	44	46	26	28	25	29	21	26	24	58	385
Rainfall (mm)		31	41	63	83	3	38	25	59	14	53	30	121	561

Monthly and yearly statistics for previous record (Mar 1935 to Dec 1988—incomplete or missing months total 23.4 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0.724	0 597	0 569	0.544	0 482	0 478	0 434	0 445	0 498	0 521	0.590	0 632	0.543
flows	Low	0 280	0 244	0 290	0 257	0 214	0 157	0 211	0 189	0 224	0 160	0.274	0.247	0.291
(m^3s^{-1})	High	1 237	1.196	1 023	1 538	1 092	0 956	0 920	0 970	1 340	1 321	1 415	1 057	0.695
Peak flow (m^3s^{-1})		10 90	9 04	7 51	22 40	14 80	12 90	16 51	17.30	16 50	15 90	10 90	14 00	22.40
Runoff (mm)		44	33	35	32	30	28	27	27	30	32	35	39	393
Rainfall (mm)		59	38	47	41	52	54	50	56	58	62	64	62	643

Factors affecting flow regime: GE
Station type: FL

1989 runoff is 98% of previous mean
rainfall 87%

039014 Ver at Hansteads 1989

Measuring authority: NRA-T
First year: 1956
Grid reference 52 (TL) 151 016
Level stn (m OD) 61 30
Catchment area (sq km): 132 0
Max alt. (m OD): 243

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 235	0 239	0 318	0 378	0 270	0 199	0 146	0 120	0 084	0 077	0 078	0 229	0.198
(m^3s^{-1}).	Peak	0 57	0.78	1 00	0 86	0 47	0 35	0 51	0 36	0.12	0 44	0 26	1 04	1.04
Runoff (mm)		5	4	6	7	5	4	3	2	2	2	2	5	47
Rainfall (mm)		39	57	64	97	10	33	47	41	15	61	36	155	655

Monthly and yearly statistics for previous record (Oct 1956 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0 484	0 546	0 578	0 553	0.491	0 426	0.358	0 314	0 281	0 305	0.358	0 410	0.425
flows	Low	0 126	0 190	0 138	0 114	0 069	0 045	0 028	0 016	0 025	0 057	0 039	0 048	0.095
(m^3s^{-1})	High	0 981	1 336	1.312	1 254	1 028	0 857	0 651	0 564	0 660	0 668	0 791	0.977	0.752
Peak flow (m^3s^{-1})		1 77	1 91	1 88	1 90	2 07	1.65	1.44	1 13	2 34	1 50	2 31	2.64	2.64
Runoff (mm)		10	10	12	11	10	8	7	6	6	6	7	8	102
Rainfall (mm)		65	46	58	50	57	60	54	58	62	68	67	71	718

Factors affecting flow regime G
Station type. CC

1989 runoff is 46% of previous mean
rainfall 91%

039016 Kennet at Theale 1989

Measuring authority: NRA-T
First year: 1961
Grid reference 41 (SU) 649 708
Level stn (m OD) 43.40
Catchment area (sq km): 1033.4
Max alt (m OD) 297

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	6 096	8 286	11 970	11.620	8 500	6 268	5.104	3 942	3 853	3.594	4 393	10 530	7.008
(m^3s^{-1}):	Peak	7.92	22 60	25 10	22 70	10 80	8.97	13 50	5 39	5.79	6 52	7 41	40 60	40.60
Runoff (mm)		16	19	31	29	22	16	13	10	10	9	11	27	214
Rainfall (mm)		41	79	76	69	19	33	37	49	25	72	47	158	705

Monthly and yearly statistics for previous record (Oct 1961 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	13.380	14 760	14 760	12 760	10 450	8 682	6 543	5 789	5 421	6 220	8 001	10.210	9.722
flows	Low	4 144	4 401	4.190	3 429	2.739	2 041	1.620	1.377	2 787	3 897	3 943	5 159	4 056
(m^3s^{-1})	High	22 680	23 910	22 010	19 790	15 430	18 600	11 120	9 542	10 000	13 970	17 710	18 240	12.882
Peak flow (m^3s^{-1})		48 30	44 80	44 30	36 90	30 10	59 80	19 00	20 50	33 40	29 60	43 50	47 30	59.80
Runoff (mm)		35	35	38	32	27	22	17	15	14	16	20	26	297
Rainfall (mm)		75	48	70	50	64	62	49	67	67	69	75	79	775

Factors affecting flow regime: R G I
Station type: C

1989 runoff is 72% of previous mean
rainfall 91%

039019 Lambourn at Shaw 1989

Measuring authority: NRA-T
First year: 1962
Grid reference: 41 (SU) 470 682
Level stn. (m OD) 75.60
Catchment area (sq km): 234.1
Max alt (m OD): 261

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	0.985	1.061	1.363	1.774	1.713	1.473	1.167	0.963	1.089	0.779	0.809	1.122	**1.192**
(m^3s^{-1})	Peak	1.14	1.25	1.66	1.94	2.19	1.72	1.66	1.15	1.37	1.41	1.01	2.16	**2.19**
Runoff (mm)		11	11	16	20	20	16	13	11	12	9	9	13	**161**
Rainfall (mm)		38	78	71	69	20	34	34	46	20	66	44	151	**671**

Monthly and yearly statistics for previous record (Oct 1962 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1.780	2.258	2.516	2.451	2.169	1.870	1.540	1.310	1.179	1.155	1.231	1.412	**1.736**
flows	Low	0.826	0.796	0.743	0.695	0.639	0.573	0.538	0.485	0.681	0.683	0.757	0.855	**0.739**
(m^3s^{-1})	High	3.410	3.719	3.583	3.550	2.979	2.764	2.359	2.048	1.699	1.921	2.392	2.551	**2.151**
Peak flow (m^3s^{-1})		3.93	4.20	4.39	4.08	3.76	4.34	3.06	3.54	3.75	3.17	5.02	3.72	**5.02**
Runoff (mm)		20	24	29	27	25	21	18	15	13	13	14	16	**234**
Rainfall (mm)		68	46	66	48	62	60	51	63	64	64	73	75	**740**

Factors affecting flow regime: R G
Station type: C

1989 runoff is 69% of previous mean
rainfall 91%

039021 Cherwell at Enslow Mill 1989

Measuring authority: NRA-T
First year: 1965
Grid reference: 42 (SP) 482 183
Level stn. (m OD) 65.00
Catchment area (sq km): 551.7
Max alt (m OD): 239

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	2.224	3.451	5.620	6.800	2.423	1.245	0.918	0.701	0.787	0.889	2.083	7.772	**2.907**
(m^3s^{-1})	Peak	4.00	13.20	11.70	14.40	4.31	1.98	2.18	1.05	2.37	1.87	8.10	19.00	**19.00**
Runoff (mm)		11	15	27	32	12	6	4	3	4	4	10	38	**166**
Rainfall (mm)		35	54	57	86	13	46	37	42	47	67	53	114	**651**

Monthly and yearly statistics for previous record (Feb 1965 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	7.474	7.183	6.435	4.451	3.407	2.448	1.549	1.455	1.400	2.165	3.289	5.726	**3.902**
flows	Low	0.919	0.905	0.754	0.566	0.445	0.309	0.156	0.132	0.479	0.630	0.730	0.915	**1.370**
(m^3s^{-1})	High	12.040	15.900	12.090	8.710	8.674	6.632	4.997	2.618	4.610	5.780	8.567	13.330	**5.373**
Peak flow (m^3s^{-1})		22.50	23.80	26.70	20.70	19.30	17.60	24.50	10.30	9.80	17.40	22.00	30.20	**30.20**
Runoff (mm)		36	32	31	2[illegible]	17	12	8	7	7	11	15	28	**223**
Rainfall (mm)		62	44	57	43	61	60	55	65	56	57	58	67	**685**

Factors affecting flow regime: P E
Station type: C

1989 runoff is 74% of previous mean
rainfall 95%

039023 Wye at Hedsor 1989

Measuring authority: NRA-T
First year: 1964
Grid reference: 41 (SU) 896 867
Level stn. (m OD) 26.80
Catchment area (sq km): 137.3
Max alt (m OD): 244

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.740	0.751	0.835	0.891	0.783	0.746	0.678	0.652	0.629	0.682	0.585	0.773	**0.729**
(m^3s^{-1})	Peak	1.88	1.93	1.71	1.77	2.06	1.12	1.60	2.83	1.99	1.80	1.84	3.19	**3.19**
Runoff (mm)		14	13	16	17	15	14	13	13	12	13	11	15	**167**
Rainfall (mm)		42	71	70	80	16	32	30	52	39	66	39	155	**692**

Monthly and yearly statistics for previous record (Dec 1964 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0.982	1.081	1.180	1.210	1.179	1.138	1.034	0.981	0.887	0.852	0.842	0.880	**1.020**
flows	Low	0.419	0.483	0.488	0.470	0.432	0.380	0.370	0.314	0.381	0.395	0.375	0.340	**0.442**
(m^3s^{-1})	High	1.518	1.933	1.976	1.891	1.842	1.582	1.434	1.317	1.187	1.180	1.329	1.373	**1.365**
Peak flow (m^3s^{-1})		3.49	2.76	3.21	3.26	3.98	3.51	2.94	4.17	4.43	3.15	2.79	2.85	**4.43**
Runoff (mm)		19	19	23	23	23	2[illegible]	20	19	17	17	16	17	**234**
Rainfall (mm)		72	48	62	52	66	63	57	66	67	69	70	76	**768**

Factors affecting flow regime: G I
Station type: C

1989 runoff is 71% of previous mean
rainfall 90%

039029 Tillingbourne at Shalford 1989

Measuring authority: NRA-T
First year: 1968
Grid reference: 51 (TQ) 000 478
Level stn. (m OD): 31.70
Catchment area (sq km): 59.0
Max alt. (m OD): 294

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.518	0.565	0.616	0.579	0.444	0.413	0.373	0.371	0.367	0.398	0.427	0.605	**0.472**
(m^3s^{-1})	Peak	0.61	1.27	1.20	1.29	0.85	0.82	0.58	0.54	0.52	0.60	0.72	1.60	**1.60**
Runoff (mm)		24	23	28	25	20	18	17	17	16	18	19	27	**253**
Rainfall (mm)		35	72	83	88	10	58	25	36	24	73	45	140	**689**

Monthly and yearly statistics for previous record (Jun 1968 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0.682	0.644	0.639	0.609	0.571	0.519	0.473	0.467	0.488	0.531	0.569	0.614	**0.567**
flows	Low	0.457	0.423	0.398	0.398	0.376	0.353	0.340	0.326	0.357	0.362	0.354	0.392	**0.389**
(m^3s^{-1})	High	0.998	0.909	0.900	0.897	0.819	0.830	0.599	0.619	0.885	0.938	0.883	0.840	**0.686**
Peak flow (m^3s^{-1})		4.54	3.04	3.23	3.00	1.91	2.79	1.65	2.36	6.09	5.09	3.65	3.25	**6.09**
Runoff (mm)		31	27	29	27	26	23	21	21	21	24	25	28	**303**
Rainfall (mm)		88	47	71	53	64	57	53	62	75	80	82	80	**812**

Factors affecting flow regime: N G I
Station type: C

1989 runoff is 83% of previous mean
rainfall 85%

039049 Silk Stream at Colindeep Lane 1989

Measuring authority: NRA-T
First year: 1973

Grid reference: 51 (TQ) 217 895
Level stn. (m OD): 39.90

Catchment area (sq km): 29.0
Max alt. (m OD): 146

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.159	0 272	0 396	0 374	0.067	0 082	0.130	0.113	0 067	0 143	0 118	0.565	**0.207**
(m^3s^{-1}):	Peak	2.50	4 16	6 26	3 39	0 41	2 96	15 20	8.14	0 98	6 84	2.80	13 20	**15.20**
Runoff (mm)		15	23	37	33	6	7	12	10	6	13	11	52	**225**
Rainfall (mm)		36	49	72	81	8	31	45	43	13	64	32	133	**607**

Monthly and yearly statistics for previous record (Dec 1973 to Dec 1988—incomplete or missing months total 4.4 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0 395	0 265	0 353	0.264	0.265	0.214	0 144	0.128	0.135	0 341	0 351	0 311	**0.264**
flows	Low	0 204	0.102	0.151	0 030	0 035	0 061	0 047	0 053	0 057	0 062	0 096	0 106	**0.178**
(m^3s^{-1})	High	0.790	0 472	0 676	0.574	0 602	0 643	0.231	0.204	0 363	0 904	1.086	0 659	**0.314**
Peak flow (m^3s^{-1})		9 00	6 20	8.89	10 26	39 80	32.80	16 50	30.50	27.90	40.50	24 30	36 31	**40.50**
Runoff (mm)		36	22	33	24	24	19	13	12	12	31	31	29	**287**
Rainfall (mm)		63	36	64	46	72	60	50	52	66	76	62	58	**705**

Factors affecting flow regime:
Station type: FV

1989 runoff is 78% of previous mean
rainfall 86%

039069 Mole at Kinnersley Manor 1989

Measuring authority: NRA-T
First year: 1972

Grid reference. 51 (TQ) 262 462
Level stn. (m OD): 48 00

Catchment area (sq km): 142 0
Max alt. (m OD): 178

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	1 261	3 219	3 798	3 347	0 843	1 065	0 644	0 577	0 573	0.783	0.832	4 285	**1.761**
(m^3s^{-1}):	Peak	3 08	25 20	21.70	30 40	1.70	9.90	4 15	1 79	2 29	3 52	4 20	35 70	**35 70**
Runoff (mm)		24	55	72	61	16	19	12	11	10	15	15	81	**391**
Rainfall (mm)		32	71	80	87	3	61	20	30	32	71	41	146	**674**

Monthly and yearly statistics for previous record (Dec 1972 to Dec 1988—incomplete or missing months total 1.5 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	3.987	2.802	2 679	1 806	1 480	0 985	0 680	0 818	0 996	2.119	2.444	3 505	**2.024**
flows	Low	1 364	0 829	0 833	0 388	0 305	0 221	0 296	0 169	0 281	0 207	0 260	1 071	**0.950**
(m^3s^{-1})	High	9 375	5 883	4 668	3 666	3 552	1 874	1 709	2 864	5 419	8 486	5 668	5 474	**2.424**
Peak flow (m^3s^{-1})		41.90	46 50	22 30	47 00	32.90	23 30	14 90	29 80	40 70	56 40	56 10	68 50	**68.50**
Runoff (mm)		75	48	51	33	28	18	13	15	18	40	45	66	**450**
Rainfall (mm)		82	50	69	46	62	58	49	60	68	92	80	91	**807**

Factors affecting flow regime: E
Station type: MIS

1989 runoff is 87% of previous mean
rainfall 84%

040004 Rother at Udiam 1989

Measuring authority: NRA-S
First year: 1962

Grid reference. 51 (TQ) 773 245
Level stn. (m OD): 1.90

Catchment area (sq km): 206 0
Max alt (m OD): 197

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 719	2 348	3 301	3 855	0.582	0.350	0 274	0 213	0 198	0 150	0 336	3 784	**1 336**
(m^3s^{-1})	Peak	5 58	16 98	17 13	22 51	1 72	3 06	3 11	0 31	0 42	0 55	1 65	24 91	**24.91**
Runoff (mm)		9	28	43	49	8	4	4	3	2	2	4	49	**205**
Rainfall (mm)		35	68	74	93	6	47	32	27	54	97	56	137	**726**

Monthly and yearly statistics for previous record (Oct 1962 to Dec 1988—incomplete or missing months total 1.6 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	4.182	3.419	3 214	2 287	1 378	0 976	0 649	0 689	0 843	1 887	3 146	3.529	**2.178**
flows	Low	0 945	0 792	0 657	0 343	0 338	0 268	0 231	0 182	0 245	0.179	0 184	0 427	**0.756**
(m^3s^{-1})	High	11.990	10.370	6 927	4 533	2 817	4 157	2 790	2 682	3 952	10 750	12.360	9.547	**3.322**
Peak flow (m^3s^{-1})		41.57	44.74	49 84	25 43	24 09	23 08	22 20	14.36	33 98	42.76	50 43	51 82	**51 82**
Runoff (mm)		54	40	42	29	18	12	8	9	11	25	40	46	**334**
Rainfall (mm)		88	59	74	55	59	61	53	64	77	90	100	89	**869**

Factors affecting flow regime: S GE
Station type: VA

1989 runoff is 61% of previous mean
rainfall 84%

040009 Teise at Stone Bridge 1989

Measuring authority. NRA-S
First year 1·61

Grid reference: 51 (TQ) 718 399
Level stn (m OD): 24.50

Catchment area (sq km): 136 2
Max alt (m OD): 201

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 463	0 815	0 806	1 322	0 436	0 846	0.861	0 907	0 905	0 781	0 589	1 437	**0.847**
(m^3s^{-1}).	Peak	2 07	7 30	14 41	19 50	1 07	3 32	1 80	1 00	1 05	1.10	0 99	13 01	**19.50**
Runoff (mm)		9	14	16	25	9	16	17	18	17	15	11	28	**198**
Rainfall (mm)		31	62	70	104	3	44	31	31	41	85	52	135	**689**

Monthly and yearly statistics for previous record (Oct 1961 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	2 546	2 045	1 864	1 444	1 103	0 804	0 586	0 577	0 697	1 085	1 736	1 952	**1.367**
flows	Low	0 553	0 522	0 413	0 323	0 238	0 130	0 23[illegible]	0 100	0 170	0 128	0 276	0 471	**0 559**
(m^3s^{-1})	High	5 757	6 241	3 928	2 781	2 306	2 628	1 359	1 132	2 359	4 786	6 344	5 334	**2.101**
Peak flow (m^3s^{-1})		41 63	48.27	34 43	24 78	38 95	29 22	13 87	10 61	23 88	29 17	47 12	48 29	**48.29**
Runoff (mm)		50	37	37	27	22	15	12	11	13	21	33	38	**317**
Rainfall (mm)		81	52	69	51	58	56	51	60	72	82	89	83	**804**

Factors affecting flow regime: RPGE
Station type. B VA

1989 runoff is 62% of previous mean
rainfall 86%

040011 Great Stour at Horton 1989

Measuring authority. NRA-S
First year 1964

Grid reference 61 (TR) 116 554
Level stn (m OD) 12.50

Catchment area (sq km) 345 0
Max alt (m OD). 205

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1 777	2 026	3 139	4 042	1 558	1 304	1 364	0 978	1 010	1 057	1 410	3 021	**1 889**
(m^3s^{-1})	Peak	2 63	8 26	12 1[illegible]	17 95	2 63	2 33	3 08	2 30	4 06	2 92	4 79	11 72	**17.95**
Runoff (mm)		14	14	24	30	12	10	11	8	8	8	11	23	**173**
Rainfall (mm)		27	47	65	97	2	53	39	21	41	73	48	108	**621**

Monthly and yearly statistics for previous record (Oct 1964 to Dec 1988 — incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	5 449	4 846	4 503	3 625	2 872	2 114	1 858	1 803	1 910	2 755	3 669	4 519	**3.321**
flows	Low	2 293	2 366	1 812	1 654	1 324	1 079	0 965	0 877	1 119	1 085	1 328	1 687	**1 808**
(m^3s^{-1})	High	10 940	8 189	9 086	7 144	5 811	3 221	3 229	3 091	3 626	8 687	8 195	9 089	**4.717**
Peak flow (m^3s^{-1})		31 08	27 89	28 10	38 29	25 05	10 87	11 42	11 99	29 38	27 18	28 85	30 44	**38.29**
Runoff (mm)		42	34	35	27	22	16	14	14	14	21	28	35	**304**
Rainfall (mm)		76	49	61	48	54	51	59	57	70	78	83	74	**760**

Factors affecting flow regime GE
Station type. B VA

1989 runoff is 57% of previous mean
rainfall 82%

040012 Darent at Hawley 1989

Measuring authority NRA-S
First year 1963

Grid reference 51 (TQ) 551 718
Level stn (m OD) 11 20

Catchment area (sq km). 191 4
Max alt (m OD) 251

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 255	0 350	0 775	0 917	0 368	0 157	0 094	0 019	0 013	0 016	0 014	0 317	**0 274**
(m^3s^{-1})	Peak	0 77	1 79	2 88	2 47	0 86	0 48	0 74	0 13	0 09	0 24	0 10	1 44	**2.88**
Runoff (mm)		4	4	11	12	5	2	1	0	0	0	0	4	**45**
Rainfall (mm)		31	58	79	100	3	39	27	33	33	57	30	140	**630**

Monthly and yearly statistics for previous record (Dec 1963 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1 026	1.026	0 948	0 838	0 647	0 489	0 335	0 301	0 317	0 415	0 575	0 797	**0.641**
flows	Low	0 194	0 219	0 124	0 174	0 076	0 041	0 000	0 000	0 000	0 000	0 000	0 011	**0 101**
(m^3s^{-1})	High	2 060	2 076	1 804	1 515	1 509	0 982	0 617	0 690	1 817	1 516	1 448	1 674	**1.067**
Peak flow (m^3s^{-1})		5 79	3 92	4 05	3 09	13 10	3 06	2 35	2 27	10 05	3 77	4 91	4 36	**13.10**
Runoff (mm)		14	13	13	11	9	7	5	4	4	6	8	11	**106**
Rainfall (mm)		71	45	60	5[illegible]	59	56	56	58	69	67	74	71	**737**

Factors affecting flow regime G
Station type C

1989 runoff is 43% of previous mean
rainfall 85%

041001 Nunningham Stream at Tilley Bridge 1989

Measuring authority NRA-S
First year. 1950

Grid reference 51 (TQ) 662 129
Level stn (m OD) 3.80

Catchment area (sq km) 16 9
Max alt (m OD) 137

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 062	0 129	0 188	0 157	0 038	0 023	0 019	0 021	0 021	0 023	0 032	0 490	**0.100**
(m^3s^{-1})	Peak	0 32	1 54	1 88	1 88	0 08	0 06	0 05	0 04	0 06	0 08	0 11	5 82	**5 82**
Runoff (mm)		10	18	30	24	6	4	3	3	3	4	5	78	**187**
Rainfall (mm)		29	62	67	80	7	48	26	24	39	80	52	129	**643**

Monthly and yearly statistics for previous record (Apr 1950 to Dec 1988 — incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0 438	0 335	0 245	0 146	0 079	0 053	0 033	0 039	0 053	0 130	0 296	0 364	**0.184**
flows	Low	0 076	0 094	0 054	0 034	0 023	0 012	0 010	0 008	0 009	0 013	0 019	0 033	**0.053**
(m^3s^{-1})	High	1 108	0 958	0 577	0 390	0 195	0 319	0 210	0 125	0 359	0 576	1 017	1 082	**0.306**
Peak flow (m^3s^{-1})		8 84	8 60	8 49	5 94	6 20	7 92	1 89	9 32	8 92	8 82	11 90	8 84	**11 90**
Runoff (mm)		69	48	39	22	13	8	5	6	8	21	45	58	**343**
Rainfall (mm)		85	58	61	49	53	55	57	72	75	91	98	94	**848**

Factors affecting flow regime R
Station type MIS

1989 runoff is 55% of previous mean
rainfall 76%

041005 Ouse at Gold Bridge 1989

Measuring authority NRA-S
First year 1960

Grid reference. 51 (TQ) 429 214
Level stn (m OD) 11.40

Catchment area (sq km) 180 9
Max alt (m OD): 203

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 887	1 943	3 260	3 005	1 054	0 597	0 676	0 583	0 591	0 531	0 561	2 580	**1.353**
(m^3s^{-1})	Peak	2 03	10 41	13 11	16 98	1 98	0 97	1 15	0 99	1 49	1 88	2 35	18 04	**18.04**
Runoff (mm)		13	26	48	43	16	9	10	9	8	8	8	38	**236**
Rainfall (mm)		34	68	82	87	4	38	16	32	36	77	51	147	**.672**

Monthly and yearly statistics for previous record (Mar 1960 to Dec 1988 — incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	4 449	3 574	3 107.	2 392	1 724	1 102	0 681	0 756	1 040	1 998	3 313	3 511	**2.298**
flows	Low	1 142	1 240	0 793	0 611	0 450	0 283	0 219	0 157	0 230	0 275	0 384	0 723	**0.934**
(m^3s^{-1})	High	10 330	8 214	6 888	4 318	3 657	3 829	1 903	2 458	4 296	12 660	12 030	7 657	**3.334**
Peak flow (m^3s^{-1})		49 14	71 85	29 86	31 57	26 35	27 91	16 52	33 15	49 01	73 71	86 92	81 06	**86 92**
Runoff (mm)		66	48	46	34	26	16	10	11	15	30	47	52	**401**
Rainfall (mm)		88	54	69	58	62	62	54	66	80	92	100	89	**874**

Factors affecting flow regime SRPGE
Station type. CBVA

1989 runoff is 59% of previous mean
rainfall 77%

041006 Uck at Isfield 1989

Measuring authority: NRA-S
First year: 1964
Grid reference: 51 (TQ) 459 190
Level stn. (m OD): 11.30
Catchment area (sq km): 87.8
Max alt. (m OD): 221

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	0.473	1.051	1.391	1.692	0.438	0.275	0.206	0.143	0.178	0.201	0.336	1.854	**0.684**
(m^3s^{-1}):	Peak	1.87	14.10	10.25	45.22	0.83	1.07	2.05	0.49	0.93	0.90	1.17	32.56	**45.22**
Runoff (mm)		14	29	42	50	13	8	6	4	5	6	10	57	**246**
Rainfall (mm)		30	65	72	93	6	44	27	26	43	91	51	128	**676**

Monthly and yearly statistics for previous record (Dec 1964 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	2.397	1.789	1.437	1.081	0.755	0.520	0.352	0.360	0.524	1.078	1.706	1.984	**1.163**
flows	Low	0.579	0.627	0.413	0.324	0.252	0.170	0.142	0.106	0.170	0.160	0.211	0.342	**0.480**
(m^3s^{-1})	High	6.355	4.195	3.317	2.183	1.854	1.657	1.489	1.506	2.868	6.692	6.536	4.033	**1.945**
Peak flow (m^3s^{-1})		55.60	75.63	39.12	23.74	28.97	29.59	46.63	33.74	36.40	63.04	64.43	55.58	**75.63**
Runoff (mm)		73	50	44	32	23	15	11	11	15	33	50	61	**418**
Rainfall (mm)		87	57	67	48	57	62	53	64	74	87	91	87	**834**

Factors affecting flow regime: E
Station type: C

1989 runoff is 59% of previous mean
rainfall 81%

041019 Arun at Alfoldean 1989

Measuring authority: NRA-S
First year: 1970
Grid reference: 51 (TQ) 117 331
Level stn. (m OD): 21.40
Catchment area (sq km): 139.0
Max alt. (m OD): 294

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.621	2.705	3.184	2.169	0.430	0.306	0.216	0.184	0.204	0.259	0.343	3.649	**1.181**
(m^3s^{-1})	Peak	1.28	34.75	31.63	30.19	0.98	1.64	1.24	0.35	0.57	0.98	1.37	53.02	**53.02**
Runoff (mm)		12	47	61	40	8	6	4	4	4	5	6	70	**268**
Rainfall (mm)		29	69	81	79	3	43	21	25	27	71	42	138	**628**

Monthly and yearly statistics for previous record (May 1970 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	3.969	2.444	2.382	1.707	1.117	0.726	0.330	0.394	0.654	1.809	2.597	2.975	**1.757**
flows	Low	0.664	0.689	0.469	0.277	0.223	0.131	0.138	0.078	0.161	0.150	0.167	0.492	**0.589**
(m^3s^{-1})	High	10.770	6.708	4.413	3.829	3.313	3.055	1.116	1.618	5.443	11.580	10.030	6.152	**2.845**
Peak flow (m^3s^{-1})		68.63	67.53	54.45	76.97	47.48	46.54	7.27	23.86	56.14	71.12	69.14	77.65	**77.65**
Runoff (mm)		76	43	46	32	22	14	6	8	12	35	48	57	**399**
Rainfall (mm)		88	48	71	50	60	57	48	59	70	86	86	84	**807**

Factors affecting flow regime: E
Station type: CC

1989 runoff is 67% of previous mean
rainfall 78%

041027 Rother at Princes Marsh 1989

Measuring authority: NRA-S
First year: 1972
Grid reference: 41 (SU) 772 270
Level stn. (m OD): 56.40
Catchment area (sq km): 37.2
Max alt. (m OD): 252

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.493	0.606	0.807	0.550	0.260	0.195	0.163	0.144	0.147	0.166	0.251	0.865	**0.387**
(m^3s^{-1})	Peak	1.07	5.31	7.02	8.75	0.48	0.82	0.47	0.42	0.30	0.59	1.09	7.98	**8.75**
Runoff (mm)		36	39	58	38	19	14	12	10	10	12	17	62	**328**
Rainfall (mm)		40	103	109	82	9	43	34	42	39	101	54	179	**835**

Monthly and yearly statistics for previous record (Nov 1972 to Dec 1988—incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0.884	0.700	0.669	0.498	0.389	0.282	0.218	0.227	0.275	0.511	0.605	0.789	**0.503**
flows	Low	0.273	0.320	0.237	0.194	0.158	0.121	0.120	0.106	0.164	0.165	0.167	0.348	**0.288**
(m^3s^{-1})	High	1.485	1.409	1.220	0.694	0.641	0.471	0.300	0.493	0.949	1.088	1.855	1.299	**0.696**
Peak flow (m^3s^{-1})		15.63	13.72	10.71	6.83	7.20	4.68	2.17	4.55	12.97	68.03	16.60	22.19	**68.03**
Runoff (mm)		64	46	48	35	28	20	16	16	19	37	42	57	**427**
Rainfall (mm)		99	55	83	46	65	54	57	63	79	97	86	104	**888**

Factors affecting flow regime: GE
Station type: C

1989 runoff is 77% of previous mean
rainfall 94%

042003 Lymington at Brockenhurst Park 1989

Measuring authority: NRA-S
First year: 1960
Grid reference: 41 (SU) 318 019
Level stn. (m OD): 6.10
Catchment area (sq km): 98.9
Max alt. (m OD): 114

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.519	1.448	2.058	1.017	0.225	0.088	0.087	0.035	0.052	0.240	0.515	2.123	**0.698**
(m^3s^{-1})	Peak	1.69	10.11	10.11	10.05	1.25	0.68	2.69	0.13	0.31	2.05	4.31	10.03	**10.11**
Runoff (mm)		14	35	56	27	6	2	2	1	1	7	14	58	**222**
Rainfall (mm)		34	98	98	77	15	37	28	35	34	97	55	190	**798**

Monthly and yearly statistics for previous record (Oct 1960 to Dec 1988—incomplete or missing months total 0.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1.872	1.646	1.466	1.033	0.802	0.445	0.242	0.264	0.437	1.025	1.370	1.569	**1.012**
flows	Low	0.330	0.439	0.327	0.168	0.128	0.042	0.013	0.014	0.084	0.128	0.198	0.522	**0.407**
(m^3s^{-1})	High	3.723	3.459	3.089	2.169	1.569	1.247	1.603	0.847	2.308	4.841	5.283	3.294	**1.340**
Peak flow (m^3s^{-1})		10.13	13.62	10.13	10.13	13.98	7.95	11.38	8.16	8.47	11.28	13.54	14.91	**14.91**
Runoff (mm)		51	41	40	27	22	12	7	7	11	28	36	43	**323**
Rainfall (mm)		90	57	71	51	67	56	45	63	74	88	91	91	**839**

Factors affecting flow regime: N
Station type: VN

1989 runoff is 69% of previous mean
rainfall 95%

042004 Test at Broadlands 1989

Measuring authority NRA-S
First year 1957

Grid reference: 41 (SU) 354 188
Level stn. (m OD) 10.10

Catchment area (sq km) 1040.0
Max alt. (m OD) 297

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	7.458	9.291	11.720	10.750	8.697	7.676	5.367	6.018	5.189	5.489	6.179	10.400	7.846
(m^3s^{-1})	Peak													
Runoff (mm)		19	22	30	27	22	19	14	16	13	14	15	27	238
Rainfall (mm)		36	86	90	61	17	32	25	42	30	82	48	171	720

Monthly and yearly statistics for previous record (Oct 1957 to Dec 1988 – incomplete or missing months total 0.6 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	15.010	15.820	15.400	13.760	11.770	9.834	8.037	7.445	7.609	8.994	9.799	11.670	11.239
flows	Low	7.172	6.932	6.686	6.107	4.861	4.558	3.708	4.263	5.377	5.786	5.633	6.069	6.597
(m^3s^{-1})	High	34.670	32.680	24.430	19.050	16.320	13.540	10.850	10.440	12.810	27.060	16.460	17.450	16.057
Peak flow (m^3s^{-1})														
Runoff (mm)		39	37	40	34	30	25	2[illegible]	19	19	23	24	30	341
Rainfall (mm)		86	52	69	50	60	58	49	65	70	80	83	90	812

Factors affecting flow regime: N
Station type: VA

1989 runoff is 70% of previous mean
rainfall 89%

042006 Meon at Mislingford 1989

Measuring authority: NRA-S
First year: 1958

Grid reference: 41 (SU) 589 141
Level stn (m OD) 29.30

Catchment area (sq km). 72.8
Max alt (m OD) 233

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.355	0.467	1.142	1.298	0.871	0.568	0.295	0.197	0.145	0.123	0.150	0.335	0.495
(m^3s^{-1})	Peak	0.4[illegible]	1.35	1.79	2.32	1.18	1.03	0.43	0.31	0.25	0.20	0.27	1.29	2.32
Runoff (mm)		13	16	42	46	32	20	[illegible]	7	5	5	5	12	215
Rainfall (mm)		38	104	99	76	5	45	23	42	34	97	57	171	791

Monthly and yearly statistics for previous record (Oct 1958 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	1.573	1.820	1.652	1.394	1.040	0.752	0.535	0.402	0.354	0.529	0.838	1.128	0.997
flows	Low	0.463	0.480	0.427	0.335	0.164	0.120	0.079	0.068	0.102	0.110	0.124	0.186	0.334
(m^3s^{-1})	High	3.470	3.310	2.820	2.021	1.738	1.220	0.827	0.657	0.882	2.309	4.126	3.917	1.815
Peak flow (m^3s^{-1})		3.84	4.10	3.26	2.83	2.06	1.50	1.23	1.07	0.96	1.68	2.83	3.77	4.10
Runoff (mm)		58	61	61	50	38	27	20	15	13	19	30	42	432
Rainfall (mm)		99	58	77	58	67	57	56	71	81	95	100	102	921

Factors affecting flow regime: G
Station type: FL

1989 runoff is 50% of previous mean
rainfall 86%

042008 Cheriton Stream at Sewards Bridge 1989

Measuring authority: NRA-S
First year: 1970

Grid reference: 41 (SU) 574 323
Level stn (m OD) 55.80

Catchment area (sq km). 75.1
Max alt. (m OD). 234

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.393	0.435	0.694	0.799	0.634	0.437	0.318	0.235	0.208	0.215	0.254	0.411	0.419
(m^3s^{-1})	Peak	0.52	0.83	0.96	1.17	0.84	0.59	0.53	0.35	0.41	0.45	0.41	1.18	1.18
Runoff (mm)		14	14	25	28	23	15	11	8	7	8	9	15	176
Rainfall (mm)		38	104	103	78	9	49	26	38	34	100	53	176	808

Monthly and yearly statistics for previous record (Jul 1970 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0.837	0.960	0.907	0.842	0.690	0.570	0.472	0.408	0.379	0.431	0.529	0.695	0.642
flows	Low	0.521	0.495	0.409	0.320	0.271	0.2[illegible]8	0.183	0.165	0.207	0.279	0.278	0.320	0.408
(m^3s^{-1})	High	1.293	1.481	1.410	1.065	0.857	0.959	0.797	0.708	0.560	0.672	0.980	1.278	0.768
Peak flow (m^3s^{-1})		1.69	1.83	1.68	1.39	1.26	2.02	1.25	1.28	0.77	0.91	1.23	1.85	2.02
Runoff (mm)		30	31	37	29	25	20	17	15	13	15	18	25	270
Rainfall (mm)		99	59	81	49	63	58	57	65	75	90	97	100	893

Factors affecting flow regime: N
Station type: C

1989 runoff is 65% of previous mean
rainfall 90%

043006 Nadder at Wilton Park 1989

Measuring authority: NRA-W
First year: 1966

Grid reference: 41 (SU) 098 308
Level stn (m OD) 51.10

Catchment area (sq km) 220.6
Max alt (m OD). 277

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1.860	2.746	4.789	4.197	2.686	1.5[illegible]3	1.212	1.030	0.932	0.953	1.156	3.598	2.221
(m^3s^{-1})	Peak	3.49	14.12	10.38	9.03	20.31	2.05	2.22	1.60	1.40	2.22	4.20	10.34	20.31
Runoff (mm)		23	30	58	49	33	18	15	13	11	12	14	44	318
Rainfall (mm)		39	104	94	80	55	37	22	42	45	93	60	184	850

Monthly and yearly statistics for previous record (Jan 1966 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	4.766	5.097	4.368	3.303	2.492	1.955	1.512	1.337	1.343	1.816	2.579	3.819	2.855
flows	Low	1.011	1.263	1.358	1.048	0.993	0.839	0.684	0.595	0.823	0.829	0.905	1.219	1.535
(m^3s^{-1})	High	6.773	8.196	6.732	5.936	4.044	3.283	2.234	2.040	3.093	3.537	6.413	7.030	3.821
Peak flow (m^3s^{-1})		22.71	17.57	18.80	14.27	28.13	8.83	13.39	6.61	16.68	10.99	22.90	47.88	47.88
Runoff (mm)		58	56	53	39	30	23	18	16	16	22	30	46	408
Rainfall (mm)		97	70	81	51	69	62	53	72	77	87	88	101	908

Factors affecting flow regime: N
Station type: C

1989 runoff is 78% of previous mean
rainfall 94%

043007 Stour at Throop Mill 1989

Measuring authority: NRA-W
First year: 1973
Grid reference: 40 (SZ) 113 958
Level stn. (m OD): 4.40
Catchment area (sq km): 1073.0
Max alt. (m OD): 277

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	7 689	16.140	22.290	17 080	8.162	4 576	3 272	2.596	2.551	3 255	6 397	29 830	**10.301**
(m^3s^{-1}):	Peak	18.78	85.92	58.57	60.07	24 12	8 29	6 44	4.81	4 30	8.72	17.42	112.70	**112.70**
Runoff (mm)		19	36	56	41	20	11	8	6	6	8	15	74	**303**
Rainfall (mm)		38	96	95	82	25	30	31	41	44	99	55	182	**818**

Monthly and yearly statistics for previous record (Jan 1973 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	24 830	24.950	20 790	14 400	9.705	6 657	4.574	4.345	5 117	9.119	13.530	22 050	**13.290**
flows	Low	4 319	6.826	7.548	4 483	3 157	2 231	1.614	1 358	2.413	2.716	2.823	6.386	**6.138**
(m^3s^{-1})	High	38.730	42.200	32.620	27 070	18 900	16 940	7.932	8 998	20 340	29.770	36.730	40.270	**17.377**
Peak flow (m^3s^{-1})		116.60	131.50	110.20	88 74	150 00	180 00	47 60	32 41	90 33	101.90	133 40	280 00	**280.00**
Runoff (mm)		62	57	52	35	24	16	11	11	12	23	33	55	**391**
Rainfall (mm)		90	64	80	42	61	56	52	65	75	86	80	105	**856**

Factors affecting flow regime: PGE
Station type: CC

1989 runoff is 77% of previous mean
rainfall 96%

044002 Piddle at Baggs Mill 1989

Measuring authority: NRA-W
First year: 1963
Grid reference: 30 (SY) 913 876
Level stn. (m OD): 2.10
Catchment area (sq km): 183 1
Max alt. (m OD): 275

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1 235	1 595	3.135	3 055	1 959	1 310	0 892	0 684	0 623	0 708	1.106	2 486	**1.568**
(m^3s^{-1}):	Peak	1 40	4 46	6 81	4.77	2 65	1.67	1 27	1 24	0 89	1 61	1 75	8 56	**8.56**
Runoff (mm)		18	21	46	43	29	19	13	10	9	10	16	36	**270**
Rainfall (mm)		38	110	115	86	15	28	20	38	44	109	65	196	**864**

Monthly and yearly statistics for previous record (Oct 1963 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	3 689	4 424	3 907	3 017	2 204	1 680	1 245	1 091	1 100	1 438	2 103	2 890	**2.388**
flows	Low	1.045	1 020	1 093	0 945	0 757	0 571	0 483	0 433	0 604	0 805	0 721	0 853	**1 328**
(m^3s^{-1})	High	5 959	7 062	6 202	4 782	3.376	2 907	1 755	1 576	2 300	3 106	5.047	5 654	**3.233**
Peak flow (m^3s^{-1})		11 87	9 18	9 37	6 48	8 11	9 23	4 79	4 50	8.18	9 29	9 20	8 62	**11.87**
Runoff (mm)		54	59	57	43	32	24	18	16	16	21	30	42	**412**
Rainfall (mm)		110	78	86	51	69	59	49	65	83	95	105	112	**962**

Factors affecting flow regime: G
Station type: FL

1989 runoff is 66% of previous mean
rainfall 90%

045003 Culm at Wood Mill 1989

Measuring authority: NRA-SW
First year: 1962
Grid reference: 31 (ST) 021 058
Level stn (m OD): 44.00
Catchment area (sq km): 226 1
Max alt (m OD): 293

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	2.733	5 937	5 810	3 683	1 840	1.180	1 047	0 898	1 288	1 988	3.732	8 449	**3.201**
(m^3s^{-1}):	Peak	12 67	64 22	28 88	16 87	16 76	2 04	6 41	7 01	11.29	15 69	25 85	70 98	**70.98**
Runoff (mm)		32	64	69	42	22	14	12	11	15	24	43	100	**446**
Rainfall (mm)		46	118	90	83	24	24	47	52	79	115	81	171	**930**

Monthly and yearly statistics for previous record (Oct 1962 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	6 765	6 338	5 087	3 478	2 838	2 025	1 793	1 630	1 921	3 052	4 399	5 963	**3.764**
flows	Low	1 930	2 251	2.392	1 318	1 085	0 803	0 650	0 569	0 971	0 971	1.287	2 479	**2.277**
(m^3s^{-1})	High	12 870	11.820	9.184	7 445	6 337	4 449	5 200	2 787	7.328	11 430	8 191	11 880	**4.840**
Peak flow (m^3s^{-1})		110.70	100 10	50 11	61 98	33.82	30 58	202.20	58 62	94 16	49.07	134.50	142 80	**202.20**
Runoff (mm)		80	68	60	40	34	23	21	19	22	36	50	71	**525**
Rainfall (mm)		111	80	88	58	71	63	60	68	77	90	96	109	**971**

Factors affecting flow regime: PGEI
Station type: VA

1989 runoff is 85% of previous mean
rainfall 96%

045004 Axe at Whitford 1989

Measuring authority: NRA-SW
First year: 1964
Grid reference: 30 (SY) 262 953
Level stn (m OD): 7.30
Catchment area (sq km): 288.5
Max alt (m OD): 316

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	3 460	8 387	9.131	4 916	2 051	1 529	1.195	1 221	1.783	2 862	4 520	14 410	**4.607**
(m^3s^{-1}):	Peak	21 05	114 60	56.18	38 72	4 77	3 73	5.09	6 49	12 12	17 47	43.92	166 00	**166.00**
Runoff (mm)		32	70	85	44	19	14	11	11	16	27	41	134	**504**
Rainfall (mm)		49	121	114	85	14	32	36	67	90	115	69	211	**998**

Monthly and yearly statistics for previous record (Oct 1964 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	9 417	8 257	6 484	4 268	3.698	2 549	2 021	2 162	2 567	4 315	5 769	8 264	**4.969**
flows	Low	1 891	2 448	2.551	1 567	1.176	0 817	0 626	0 554	1 242	1 243	1 714	3 125	**2.669**
(m^3s^{-1})	High	15 740	15 860	11 690	8 346	7.274	4 678	5 312	4 941	9 909	16 440	11.980	14 440	**6 409**
Peak flow (m^3s^{-1})		110.60	113 20	93 02	75 41	173 40	75 04	228.80	128 00	88 95	99 72	116 90	244 00	**244.00**
Runoff (mm)		87	70	60	38	34	23	19	20	23	40	52	77	**544**
Rainfall (mm)		123	84	83	55	74	65	61	72	80	96	95	117	**1005**

Factors affecting flow regime: PGEI
Station type: CC

1989 runoff is 93% of previous mean
rainfall 99%

046003 Dart at Austins Bridge 1989

Measuring authority: NRA-SW
First year: 1958
Grid reference: 20 (SX) 751 659
Level stn (m OD): 22.40
Catchment area (sq km): 247.6
Max alt (m OD): 604

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	6.612	15.910	21.590	9.441	3.314	1.786	1.216	1.166	4.728	8.653	13.940	21.620	**9.128**
(m^3s^{-1})	Peak	34.33	108.80	179.80	68.01	6.78	2.39	1.81	3.94	50.21	73.26	51.72	154.00	**179.80**
Runoff (mm)		72	155	234	99	36	19	13	13	50	94	146	234	**1163**
Rainfall (mm)		99	239	273	134	7	48	20	77	195	235	132	307	**1716**

Monthly and yearly statistics for previous record (Oct 1958 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	20.000	16.890	13.840	10.090	7.319	5.007	3.870	4.827	5.889	11.090	14.870	19.230	**11.057**
flows	Low	5.435	4.270	5.731	3.566	2.220	1.456	0.996	0.713	0.905	1.229	5.048	8.232	**7.304**
(m^3s^{-1})	High	36.680	37.760	33.520	22.720	14.530	14.260	10.930	12.590	26.290	28.000	33.400	35.540	**15.592**
Peak flow (m^3s^{-1})		284.00	309.40	236.10	187.40	98.88	253.00	206.50	222.20	327.60	168.20	317.80	549.70	**549.70**
Runoff (mm)		216	167	150	106	79	52	42	52	62	120	156	208	**1409**
Rainfall (mm)		231	156	166	113	109	93	94	122	134	180	199	231	**1828**

Factors affecting flow regime: SR
Station type: VA

1989 runoff is 82% of previous mean
rainfall 94%

047007 Yealm at Puslinch 1989

Measuring authority: NRA-SW
First year: 1963
Grid reference: 20 (SX) 574 511
Level stn (m OD): 5.50
Catchment area (sq km): 54.9
Max alt. (m OD): 492

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	1.101	2.633	3.828	1.370	0.622	0.322	0.188	0.191	0.384	0.654	1.656	3.119	**1.333**
(m^3s^{-1})	Peak	6.30	23.04	26.63	8.16	1.46	0.63	0.28	1.61	4.68	9.37	9.10	16.86	**26.63**
Runoff (mm)		54	116	187	65	30	15	9	9	18	32	78	152	**766**
Rainfall (mm)		81	185	185	112	5	44	16	67	141	158	104	225	**1323**

Monthly and yearly statistics for previous record (Oct 1963 to Dec 1988—incomplete or missing months total 0.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	3.061	2.796	2.094	1.398	0.983	0.791	0.572	0.676	0.816	1.455	2.210	2.867	**1.638**
flows	Low	0.563	1.015	0.659	0.572	0.327	0.171	0.095	0.057	0.183	0.121	0.373	1.171	**1.052**
(m^3s^{-1})	High	4.947	5.806	5.290	3.646	1.997	2.377	1.863	1.957	3.630	3.808	4.881	6.108	**2.210**
Peak flow (m^3s^{-1})		27.49	23.24	24.54	24.11	17.53	23.47	25.22	28.32	21.33	26.66	26.62	25.18	**28.32**
Runoff (mm)		149	124	102	66	48	37	28	33	39	71	104	140	**942**
Rainfall (mm)		170	125	131	78	95	91	84	103	111	135	158	170	**1451**

Factors affecting flow regime: P I
Station type: FLVA

1989 runoff is 81% of previous mean
rainfall 91%

047008 Thrushel at Tinhay 1989

Measuring authority: NRA-SW
First year: 1969
Grid reference: 20 (SX) 398 856
Level stn (m OD): 55.50
Catchment area (sq km): 112.7
Max alt. (m OD): 375

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	2.023	4.842	4.184	1.792	0.609	0.159	0.091	0.153	0.669	1.780	3.035	3.880	**1.917**
(m^3s^{-1})	Peak	10.49	39.45	30.03	20.68	3.56	0.38	0.44	3.69	6.41	19.45	28.11	29.38	**39.45**
Runoff (mm)		48	104	99	41	14	4	2	4	15	42	70	92	**538**
Rainfall (mm)		60	151	109	92	15	43	37	83	120	156	100	161	**1127**

Monthly and yearly statistics for previous record (Nov 1969 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	5.219	3.930	3.150	1.652	1.128	0.715	0.442	0.784	1.043	2.539	3.733	4.790	**2.423**
flows	Low	1.317	0.951	1.428	0.481	0.237	0.110	0.028	0.019	0.116	0.069	0.442	2.405	**1.640**
(m^3s^{-1})	High	9.701	8.826	7.477	4.038	4.209	2.491	1.417	2.916	6.671	6.878	7.195	8.122	**3.750**
Peak flow (m^3s^{-1})		53.32	61.78	61.46	27.72	38.72	57.13	10.91	33.64	75.12	66.18	57.07	124.40	**124.40**
Runoff (mm)		124	85	75	38	27	16	11	19	24	60	86	114	**679**
Rainfall (mm)*		146	94	104	58	70	73	70	89	93	116	130	139	**1182**

*(1970-1988)

Factors affecting flow regime: S H
Station type: CC

1989 runoff is 79% of previous mean
rainfall 95%

048004 Warleggan at Trengoffe 1989

Measuring authority: NRA-SW
First year: 1969
Grid reference: 20 (SX) 159 674
Level stn (m OD): 70.30
Catchment area (sq km): 25.3
Max alt. (m OD): 308

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.648	0.918	1.375	0.727	0.412	0.274	0.194	0.174	0.213	0.334	0.954	1.123	**0.610**
(m^3s^{-1})	Peak	1.59	5.17	3.87	1.44	0.64	0.37	0.75	0.53	0.94	2.12	2.33	3.35	**5.17**
Runoff (mm)		69	88	146	75	44	28	21	18	22	35	98	119	**761**
Rainfall (mm)		84	186	138	90	16	50	24	75	110	182	142	182	**1279**

Monthly and yearly statistics for previous record (Oct 1969 to Dec 1988—incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1.478	1.386	1.019	0.735	0.526	0.422	0.346	0.392	0.470	0.717	1.011	1.342	**0.818**
flows	Low	0.744	0.751	0.585	0.403	0.288	0.208	0.151	0.118	0.177	0.208	0.233	0.843	**0.624**
(m^3s^{-1})	High	2.584	2.906	1.588	1.234	0.978	0.904	0.688	0.950	1.677	1.557	1.775	1.949	**1.228**
Peak flow (m^3s^{-1})		14.31	14.85	5.27	4.59	3.19	5.96	4.35	8.60	14.85	7.86	15.38	11.25	**15.38**
Runoff (mm)		156	134	108	75	56	43	37	42	48	76	104	142	**1020**
Rainfall (mm)*		186	117	131	70	83	87	92	107	122	146	165	175	**1481**

*(1970-1988)

Factors affecting flow regime: N
Station type: CC

1989 runoff is 75% of previous mean
rainfall 86%

048005 Kenwyn at Truro — 1989

Measuring authority: NRA-SW
First year: 1968
Grid reference: 10 (SW) 820 450
Level stn. (m OD): 7.20
Catchment area (sq km): 19.1
Max alt. (m OD): 152

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	0.293	0.515	0.724	0.310	0.147	0.088	0.058	0.043	0.048	0.088	0.309	0.892	**0.292**
(m^3s^{-1}):	Peak	1.79	6.25	3.85	1.15	0.26	0.25	0.23	0.37	0.53	1.28	3.43	4.03	**6.25**
Runoff (mm)		41	65	102	42	21	12	8	6	7	12	42	125	**483**
Rainfall (mm)		65	123	108	76	11	41	14	49	63	136	109	195	**990**

Monthly and yearly statistics for previous record (Oct 1968 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	0.837	0.772	0.545	0.331	0.197	0.140	0.091	0.090	0.114	0.272	0.475	0.734	**0.382**
flows	Low	0.283	0.333	0.228	0.162	0.124	0.070	0.043	0.026	0.037	0.034	0.046	0.436	**0.264**
(m^3s^{-1})	High	1.505	1.536	0.917	0.613	0.418	0.358	0.162	0.179	0.564	0.714	1.093	1.091	**0.544**
Peak flow (m^3s^{-1})		22.50	7.19	5.74	4.07	1.82	3.71	2.79	2.29	4.10	30.37	9.74	13.35	**30.37**
Runoff (mm)		117	99	76	45	28	19	13	13	15	38	65	103	**631**
Rainfall (mm)		148	100	100	55	65	64	57	75	85	111	128	139	**1127**

Factors affecting flow regime: N
Station type: CC

1989 runoff is 76% of previous mean
rainfall 88%

048011 Fowey at Restormel — 1989

Measuring authority: NRA-SW
First year: 1961
Grid reference: 20 (SX) 098 624
Level stn. (m OD) 9.20
Catchment area (sq km): 169.1
Max alt. (m OD): 420

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	3.187	6.095	9.377	3.479	1.606	1.199	0.851	0.767	0.925	1.380	5.187	6.817	**3.391**
(m^3s^{-1}):	Peak	7.80	32.94	29.88	8.48	2.60	2.51	1.62	2.15	3.46	7.28	16.60	20.11	**32.94**
Runoff (mm)		50	87	149	53	25	18	13	12	14	22	80	108	**632**
Rainfall (mm)		84	187	148	90	16	52	21	69	101	177	145	191	**1281**

Monthly and yearly statistics for previous record (Oct 1961 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	9.414	8.293	6.048	4.152	3.050	2.192	1.864	2.084	2.632	4.658	6.685	9.115	**5.003**
flows	Low	3.071	3.304	2.727	1.808	1.048	0.693	0.563	0.343	0.673	0.617	0.921	4.401	**3.493**
(m^3s^{-1})	High	17.330	21.780	12.130	7.641	6.447	5.479	4.859	6.044	10.490	11.720	15.450	20.890	**7.440**
Peak flow (m^3s^{-1})		104.80	111.90	45.62	24.57	22.62	39.44	31.10	48.51	70.02	35.07	223.70	126.60	**223.70**
Runoff (mm)		149	120	96	64	48	34	30	33	40	74	102	144	**934**
Rainfall (mm)		183	118	133	80	94	88	95	109	121	141	169	183	**1514**

Factors affecting flow regime: SRP
Station type: CC

1989 runoff is 68% of previous mean
rainfall 85%

049001 Camel at Denby — 1989

Measuring authority: NRA-SW
First year: 1964
Grid reference: 20 (SX) 017 682
Level stn. (m OD): 4.60
Catchment area (sq km): 208.8
Max alt. (m OD): 420

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	5.007	9.057	11.310	4.634	2.422	1.484	0.915	0.787	1.572	2.999	8.172	10.050	**4.843**
(m^3s^{-1}):	Peak	16.54	79.34	41.48	10.77	4.45	3.25	1.52	2.53	7.72	15.93	27.00	38.41	**79.34**
Runoff (mm)		64	105	145	58	31	18	12	10	20	38	101	129	**731**
Rainfall (mm)		82	165	134	85	21	56	22	79	117	159	123	184	**1227**

Monthly and yearly statistics for previous record (Sep 1964 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	11.410	9.580	6.989	4.598	3.315	2.434	2.291	2.547	3.000	5.660	7.795	10.940	**5.868**
flows	Low	4.833	4.249	2.835	2.081	0.960	0.888	0.582	0.421	0.798	0.882	1.371	6.135	**4.081**
(m^3s^{-1})	High	19.600	20.940	16.420	9.395	8.491	5.463	7.322	7.858	11.920	16.640	17.990	19.110	**8.165**
Peak flow (m^3s^{-1})		73.18	80.21	94.75	35.42	23.98	45.32	40.59	63.98	125.80	92.14	94.75	227.90	**227.90**
Runoff (mm)		146	112	90	57	43	30	29	33	37	73	97	140	**887**
Rainfall (mm)		171	105	120	72	85	86	95	103	115	138	152	165	**1407**

Factors affecting flow regime: SRP E
Station type: VA

1989 runoff is 82% of previous mean
rainfall 87%

049002 Hayle at St Erth — 1989

Measuring authority: NRA-SW
First year: 1957
Grid reference: 10 (SW) 549 342
Level stn. (m OD): 7.00
Catchment area (sq km): 48.9
Max alt. (m OD): 238

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.963	1.098	2.177	1.225	0.706	0.425	0.297	0.234	0.249	0.273	0.724	1.589	**0.830**
(m^3s^{-1}):	Peak	1.73	3.45	4.99	1.80	0.98	0.53	0.37	0.30	0.48	0.58	2.17	4.10	**4.99**
Runoff (mm)		53	54	119	65	39	23	16	13	13	15	38	87	**535**
Rainfall (mm)		64	112	126	82	9	29	17	46	75	123	110	182	**975**

Monthly and yearly statistics for previous record (Oct 1957 to Dec 1988—incomplete or missing months total 9.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1.992	2.069	1.564	1.093	0.690	0.514	0.405	0.347	0.361	0.509	0.932	1.559	**0.998**
flows	Low	0.746	0.863	0.810	0.573	0.445	0.335	0.237	0.167	0.193	0.179	0.181	0.503	**0.653**
(m^3s^{-1})	High	3.009	3.426	2.582	1.643	1.464	0.859	1.063	0.743	1.067	1.180	2.297	2.584	**1.265**
Peak flow (m^3s^{-1})		9.16	7.38	5.83	3.87	2.36	1.72	1.99	2.27	1.88	4.02	3.81	6.31	**9.16**
Runoff (mm)		109	103	86	58	38	27	22	19	19	28	49	85	**644**
Rainfall (mm)		139	105	104	54	65	68	60	76	90	107	122	134	**1124**

Factors affecting flow regime: G I
Station type: CC

1989 runoff is 83% of previous mean
rainfall 87%

050002 Torridge at Torrington 1989

Measuring authority: NRA-SW
First year: 1962

Grid reference: 21 (SS) 500 185
Level stn. (m OD): 13.90

Catchment area (sq km): 663.0
Max alt. (m OD): 621

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	14 350	28 940	29 840	10 380	3 560	1 254	0 779	0 633	4 291	15 290	26.120	33 780	**14.019**
(m^3s^{-1})	Peak	68 56	151.60	177 80	63 47	42 07	1 94	3 11	3 40	40 32	153 70	191.50	196.70	**196.70**
Runoff (mm)		58	106	121	41	14	5	3	3	17	62	102	136	**667**
Rainfall (mm)		78	148	131	87	22	48	37	69	140	160	101	177	**1198**

Monthly and yearly statistics for previous record (Oct 1962 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	30 460	23 840	18 620	11 130	8 137	4 758	4 433	5 265	7.167	16 130	26.300	31 140	**15.588**
flows	Low	5 018	4 695	5 792	3 082	1.594	1 092	0 443	0 252	0 954	0 668	3 798	10.270	**8.968**
(m^3s^{-1})	High	57 510	47 590	51 280	28 120	31 290	14 960	21 540	19 690	45 910	49 230	55 730	64 530	**21.036**
Peak flow (m^3s^{-1})		391 10	294 40	535 60	164 40	205 70	181 30	310 60	228 50	415 00	276 40	370 40	730 00	**730.00**
Runoff (mm)		123	88	75	43	33	19	18	21	28	65	103	126	**742**
Rainfall (mm)		129	86	99	65	75	73	75	86	96	114	134	131	**1183**

Factors affecting flow regime: SHP EI
Station type: VA

1989 runoff is 90% of previous mean
rainfall 103%

052007 Parrett at Chiselborough 1989

Measuring authority: NRA-W
First year: 1966

Grid reference: 31 (ST) 461 144
Level stn (m OD): 20 70

Catchment area (sq km): 74.8
Max alt. (m OD): 219

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 722	1.967	2 424	1 211	0 442	0 251	0 230	0 191	0 216	0 364	0 708	4 219	**1.077**
(m^3s^{-1})	Peak	9 74	26 59	25 59	21 20	4 08	0 55	1 79	1 05	0 71	1 73	7 23	32.76	**32 76**
Runoff (mm)		26	64	87	42	16	9	8	7	7	13	25	151	**454**
Rainfall (mm)		47	98	109	87	24	28	49	48	58	109	60	205	**922**

Monthly and yearly statistics for previous record (Aug 1966 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	2 435	1 907	1 541	0 842	0 741	0 506	0 360	0 360	0 444	1 006	1 326	2.056	**1.125**
flows	Low	0 258	0 593	0 523	0 285	0 206	0 130	0 106	0 090	0.145	0 186	0 218	0 523	**0.584**
(m^3s^{-1})	High	4 914	3.865	3 055	1 867	2 048	1 053	0 921	0 988	2 225	4 819	3 789	3.917	**1.534**
Peak flow (m^3s^{-1})		36 38	27 14	27 46	17 95	57 21	12 81	16 14	23 88	15 29	27 22	29.12	44 94	**57.21**
Runoff (mm)		87	62	55	29	27	18	13	13	15	36	46	74	**475**
Rainfall (mm)		107	72	82	44	72	65	55	69	74	88	85	104	**917**

Factors affecting flow regime: E
Station type: C

1989 runoff is 96% of previous mean
rainfall 101%

052010 Brue at Lovington 1989

Measuring authority: NRA-W
First year: 1964

Grid reference: 31 (ST) 590 318
Level stn. (m OD): 19 80

Catchment area (sq km): 135.2
Max alt (m OD): 244

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1 629	2 932	3 679	2 364	0 731	0 378	0 314	0.248	0 251	0 307	0 851	4 941	**1.547**
(m^3s^{-1})	Peak	14 87	28 07	18 79	20 82	3 59	0 55	2 42	1 00	0 86	1 55	4 63	61 06	**61.06**
Runoff (mm)		32	52	73	45	14	7	6	5	5	6	16	98	**361**
Rainfall (mm)		52	92	90	90	32	31	38	51	53	82	59	166	**836**

Monthly and yearly statistics for previous record (Oct 1964 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	3 589	3 244	2 575	1 557	1 222	0 810	0 865	0 804	0 825	1 446	2.267	3 432	**1.882**
flows	Low	0 743	0 910	0 844	0 526	0 313	0 217	0 150	0.130	0 247	0 190	0 407	1 034	**1.153**
(m^3s^{-1})	High	5 752	6 872	5 263	3 352	3 554	2 203	4 081	2 449	4 873	4.380	4 883	6.158	**2.427**
Peak flow (m^3s^{-1})		47 28	47 07	43.49	27 19	95 48	35 46	83 00	48 42	69 42	61 06	74.62	57 76	**95.48**
Runoff (mm)		71	59	51	30	24	16	17	16	16	29	43	68	**439**
Rainfall (mm)		88	65	75	51	70	67	71	74	77	75	86	93	**892**

Factors affecting flow regime: N
Station type: C VA

1989 runoff is 82% of previous mean
rainfall 94%

053004 Chew at Compton Dando 1989

Measuring authority: NRA-W
First year: 1958

Grid reference: 31 (ST) 648 647
Level stn (m OD): 16 80

Catchment area (sq km): 129 5
Max alt. (m OD): 305

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 844	1 665	2 212	1 645	0 730	0 450	0 402	0.394	0 372	0 432	0 658	2.218	**0.999**
(m^3s^{-1})	Peak	2 86	30.96	28 40	8 00	1 64	0 60	0 67	0 58	0 52	1 60	4.10	32 76	**32.76**
Runoff (mm)		17	31	46	33	15	9	8	8	7	9	13	46	**243**
Rainfall (mm)		65	117	125	91	27	49	30	47	54	119	68	163	**955**

Monthly and yearly statistics for previous record (Mar 1958 to Dec 1988—incomplete or missing months total 1.0 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1 906	1 717	1 400	1 001	0 836	0 607	0 466	0 462	0 578	0 833	1 245	1 736	**1.063**
flows	Low	0 444	0 557	0 410	0 469	0 333	0 287	0 243	0 195	0 232	0 300	0 264	0.622	**0.540**
(m^3s^{-1})	High	3.935	4 166	4 210	2 185	2 493	1.211	0.811	1.245	2.135	3.251	3 898	5 017	**1.786**
Peak flow (m^3s^{-1})		39 43	48.99	50 00	14 19	67 50	13 00	6 23	6 09	59 26	49 56	38.83	63.78	**67.50**
Runoff (mm)		39	32	29	20	17	12	10	10	12	17	25	36	**259**
Rainfall (mm)		102	68	80	60	73	70	71	85	93	92	102	112	**1008**

Factors affecting flow regime: S P
Station type: FL

1989 runoff is 94% of previous mean
rainfall 95%

053006 Frome(Bristol) at Frenchay 1989

Measuring authority: NRA-W
First year: 1961

Grid reference: 31 (ST) 637 772
Level stn. (m OD): 20.00

Catchment area (sq km): 148.9
Max alt. (m OD): 193

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	1.190	3.743	3.144	1.927	0.509	0.326	0.276	0.313	0.314	0.874	1.485	4.470	1.535
(m^3s^{-1}):	Peak	4.30	20.16	15.52	10.61	5.53	3.19	3.44	5.25	3.28	12.68	13.68	18.67	20.16
Runoff (mm)		21	61	57	34	9	6	5	6	5	16	26	80	325
Rainfall (mm)		46	98	82	70	24	41	29	63	54	109	55	133	804

Monthly and yearly statistics for previous record (Sep 1961 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	3.439	2.797	2.387	1.411	1.204	0.795	0.622	0.552	0.743	1.256	2.231	3.092	1.707
flows	Low	0.670	0.613	0.636	0.476	0.290	0.270	0.122	0.139	0.208	0.162	0.211	0.820	0.804
(m^3s^{-1})	High	6.152	6.040	5.762	3.434	5.028	2.973	3.516	2.398	5.113	4.691	5.434	9.807	2.255
Peak flow (m^3s^{-1})		35.05	41.09	33.84	29.63	49.00	29.01	70.79	17.75	29.73	42.93	39.90	66.55	70.79
Runoff (mm)		62	46	43	25	22	14	11	10	13	23	39	56	362
Rainfall (mm)		76	52	66	49	66	63	56	70	74	71	76	85	804

Factors affecting flow regime: N
Station type: FL

1989 runoff is 90% of previous mean
rainfall 100%

053007 Frome(Somerset) at Tellisford 1989

Measuring authority: NRA-W
First year: 1961

Grid reference: 31 (ST) 805 564
Level stn. (m OD): 35.10

Catchment area (sq km): 261.6
Max alt. (m OD): 305

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	3.269	6.286	8.859	4.977	1.846	1.002	0.675	0.569	0.574	0.805	2.066	9.291	3.341
(m^3s^{-1}):	Peak	16.26	32.66	41.39	23.16	4.49	1.70	1.62	1.95	1.70	3.09	9.31	81.89	81.89
Runoff (mm)		33	58	91	49	19	10	7	6	6	8	20	95	403
Rainfall (mm)		60	106	123	91	30	38	30	45	54	102	66	179	924

Monthly and yearly statistics for previous record (Sep 1961 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	6.961	6.271	5.487	3.688	2.745	1.863	1.437	1.475	1.771	2.872	4.614	6.382	3.787
flows	Low	1.684	2.072	1.938	1.510	0.843	0.518	0.329	0.291	0.649	0.612	0.962	2.627	2.334
(m^3s^{-1})	High	12.340	12.460	12.690	8.314	6.317	4.812	4.931	4.605	7.459	8.841	10.730	14.860	4.872
Peak flow (m^3s^{-1})		77.99	64.75	68.83	57.51	98.80	37.52	108.10	82.49	71.03	59.90	84.58	83.64	108.10
Runoff (mm)		71	59	56	37	28	18	15	15	18	29	46	65	457
Rainfall (mm)		97	67	86	60	76	66	65	80	87	84	95	102	965

Factors affecting flow regime: PG
Station type: FL

1989 runoff is 88% of previous mean
rainfall 96%

054012 Tern at Walcot 1989

Measuring authority: NRA-ST
First year: 1960

Grid reference: 33 (SJ) 592 123
Level stn. (m OD): 44.60

Catchment area (sq km): 852.0
Max alt. (m OD): 366

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	4.804	6.444	7.099	10.360	4.110	2.423	2.570	2.572	2.712	3.103	4.171	14.330	5.388
(m^3s^{-1}):	Peak	5.83	26.12	14.34	32.25	6.16	3.39	5.21	3.22	4.32	5.78	9.23	39.64	39.64
Runoff (mm)		15	18	22	32	13	7	8	8	8	10	13	45	199
Rainfall (mm)		26	51	51	81	30	48	32	37	28	73	58	120	635

Monthly and yearly statistics for previous record (Oct 1960 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	11.290	10.350	9.033	7.379	6.546	4.690	3.948	3.977	4.009	5.689	8.080	10.570	7.118
flows	Low	4.018	4.002	4.800	3.557	2.917	2.199	1.393	1.171	1.680	2.227	2.538	3.563	3.757
(m^3s^{-1})	High	20.320	22.280	17.810	12.320	22.390	9.069	14.060	6.655	9.490	16.920	21.830	24.950	10.266
Peak flow (m^3s^{-1})		47.51	45.98	40.53	40.73	40.35	27.00	48.71	38.53	32.17	37.59	44.54	55.82	55.82
Runoff (mm)		35	30	28	22	21	14	12	13	12	18	25	33	264
Rainfall (mm)		61	45	56	50	64	57	55	65	62	60	70	66	711

Factors affecting flow regime: GEI
Station type: FV

1989 runoff is 76% of previous mean
rainfall 89%

054019 Avon at Stareton 1989

Measuring authority: NRA-ST
First year: 1962

Grid reference: 42 (SP) 333 715
Level stn. (m OD): 54.70

Catchment area (sq km): 347.0
Max alt. (m OD): 214

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	2.348	2.904	3.773	6.356	1.238	1.000	0.912	0.724	0.724	0.760	1.381	5.822	2.323
(m^3s^{-1})	Peak	7.21	14.06	13.55	23.92	3.04	3.45	6.05	3.83	4.73	2.17	7.72	22.90	23.92
Runoff (mm)		18	20	29	47	10	7	7	6	5	6	10	45	211
Rainfall (mm)		39	42	53	96	16	71	53	64	45	51	45	100	675

Monthly and yearly statistics for previous record (Oct 1962 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	4.581	4.481	4.309	2.789	2.145	1.428	1.016	1.067	1.016	1.580	2.400	3.943	2.556
flows	Low	0.798	0.777	0.545	0.485	0.474	0.368	0.247	0.356	0.442	0.507	0.549	0.667	1.094
(m^3s^{-1})	High	9.678	12.890	8.577	5.945	6.149	4.862	5.379	3.332	2.858	5.274	5.587	10.400	3.588
Peak flow (m^3s^{-1})		55.83	59.60	55.89	42.67	39.05	42.89	71.36	26.08	16.59	32.89	34.11	56.28	71.36
Runoff (mm)		35	32	33	21	17	11	8	8	8	12	18	30	232
Rainfall (mm)		55	44	56	47	59	60	55	69	53	52	58	61	669

Factors affecting flow regime: S EI
Station type: C

1989 runoff is 91% of previous mean
rainfall 101%

054020 Perry at Yeaton 1989

Measuring authority: NRA-ST
First year: 1963

Grid reference: 33 (SJ) 434 192
Level stn (m OD): 61.30

Catchment area (sq km): 180.8
Max alt (m OD): 356

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1.021	1.867	2.058	2.433	0.810	0.518	0.550	0.400	0.381	0.450	0.776	3.639	**1.239**
(m^3s^{-1})	Peak	1.69	9.83	7.02	8.99	1.13	0.90	1.49	0.53	0.48	0.69	1.94	11.53	**11.53**
Runoff (mm)		15	25	30	35	12	7	8	6	5	7	11	54	**216**
Rainfall (mm)		30	69	59	78	24	45	58	41	29	65	63	143	**704**

Monthly and yearly statistics for previous record (Oct 1963 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	2.931	2.737	2.386	1.762	1.431	0.967	0.736	0.722	0.728	1.152	1.795	2.589	**1.657**
flows	Low	0.901	0.859	1.257	0.742	0.583	0.379	0.271	0.208	0.350	0.412	0.427	0.848	**0.809**
(m^3s^{-1})	High	4.870	6.507	4.265	3.041	4.232	2.046	2.735	1.416	1.785	3.308	3.103	6.244	**2.335**
Peak flow (m^3s^{-1})		14.23	11.29	11.12	10.83	10.41	8.49	7.87	5.49	7.32	7.52	10.02	12.57	**14.23**
Runoff (mm)		43	37	35	25	21	14	11	11	10	17	26	38	**289**
Rainfall (mm)		68	53	64	48	65	58	57	64	66	66	79	77	**765**

Factors affecting flow regime: GEI
Station type: C

1989 runoff is 75% of previous mean
rainfall 92%

054022 Severn at Plynlimon flume 1989

Measuring authority: IH
First year: 1953

Grid reference: 22 (SN) 853 872
Level stn (m OD): 331.00

Catchment area (sq km): 8.7
Max alt (m OD): 740

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.569	0.908	1.253	0.353	0.131	0.144	0.138	0.197	0.273	1.007	0.701	0.789	**0.537**
(m^3s^{-1})	Peak	5.90	10.34	7.84	2.47	0.47	2.33	0.90	1.30	1.43	18.85	6.36	7.77	**18.85**
Runoff (mm)		175	253	386	105	40	43	42	61	81	310	209	243	**1948**
Rainfall (mm)		195	309	362	137	50	137	58	175	108	381	181	315	**2408**

Monthly and yearly statistics for previous record (Oct 1953 to Dec 1988—incomplete or missing months total 10.4 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	0.762	0.559	0.599	0.337	0.241	0.224	0.284	0.404	0.521	0.618	0.774	0.763	**0.507**
flows	Low	0.363	0.136	0.171	0.046	0.046	0.045	0.043	0.032	0.073	0.059	0.268	0.174	**0.317**
(m^3s^{-1})	High	1.567	1.104	1.566	0.878	0.818	0.638	0.754	0.935	1.092	1.464	1.420	1.313	**0.646**
Peak flow (m^3s^{-1})		14.49	13.90	14.53	11.64	9.86	10.66	8.83	32.22	15.38	16.99	17.77	17.11	**32.22**
Runoff (mm)		235	157	184	100	74	67	88	124	155	190	231	235	**1840**
Rainfall (mm)		287	175	213	128	135	135	154	184	228	243	280	280	**2442**

Factors affecting flow regime: N
Station type: FL

1989 runoff is 106% of previous mean
rainfall 99%

054029 Teme at Knightsford Bridge 1989

Measuring authority: NRA-ST
First year: 1970

Grid reference: 32 (SO) 735 557
Level stn. (m OD): 21.00

Catchment area (sq km): 1480.0
Max alt (m OD): 546

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	10.010	17.600	25.900	26.700	6.783	3.572	2.166	1.269	1.120	2.083	9.561	55.010	**13.483**
(m^3s^{-1})	Peak	16.22	123.90	74.13	90.33	9.76	5.24	5.67	2.87	3.54	8.91	35.79	174.10	**174.10**
Runoff (mm)		18	29	47	47	12	6	4	2	2	4	17	100	**287**
Rainfall (mm)		35	71	65	77	24	30	41	45	40	98	60	179	**765**

Monthly and yearly statistics for previous record (Apr 1970 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	37.140	32.310	28.290	19.730	12.090	8.442	4.682	5.031	5.037	11.750	19.610	29.380	**17.732**
flows	Low	10.940	12.000	10.230	6.526	3.354	2.010	1.381	1.000	2.050	2.127	3.791	6.973	**11.235**
(m^3s^{-1})	High	60.220	70.950	61.880	41.850	34.430	16.000	9.482	10.020	10.420	45.190	44.930	53.130	**23.901**
Peak flow (m^3s^{-1})		198.60	220.40	184.30	230.80	131.00	98.93	40.69	82.81	115.90	119.40	161.60	284.60	**284.60**
Runoff (mm)		67	53	51	35	22	15	8	9	9	21	34	53	**378**
Rainfall (mm)		90	59	75	55	61	63	51	71	73	69	80	84	**831**

Factors affecting flow regime: N P E
Station type: VA

1989 runoff is 76% of previous mean
rainfall 92%

054034 Dowles Brook at Dowles 1989

Measuring authority: NRA-ST
First year: 1971

Grid reference: 32 (SO) 768 764
Level stn (m OD): 24.20

Catchment area (sq km): 40.8
Max alt (m OD): 198

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.195	0.444	0.332	0.865	0.117	0.062	0.046	0.037	0.043	0.056	0.103	1.414	**0.309**
(m^3s^{-1})	Peak	0.76	7.37	1.40	5.70	0.53	0.14	0.31	0.38	0.22	0.46	1.42	7.97	**7.97**
Runoff (mm)		13	26	22	55	8	4	3	2	3	4	7	93	**239**
Rainfall (mm)		30	55	39	80	26	27	47	44	44	83	42	173	**690**

Monthly and yearly statistics for previous record (Oct 1971 to Dec 1988—incomplete or missing months total 3.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	0.834	0.793	0.740	0.453	0.332	0.213	0.095	0.070	0.138	0.230	0.309	0.632	**0.402**
flows	Low	0.097	0.220	0.283	0.116	0.073	0.033	0.017	0.019	0.036	0.036	0.046	0.072	**0.240**
(m^3s^{-1})	High	1.617	1.738	1.637	1.090	1.016	0.691	0.254	0.130	0.880	1.047	0.765	1.313	**0.508**
Peak flow (m^3s^{-1})		15.38	9.63	12.43	12.90	12.14	16.28	4.73	2.69	19.35	5.09	7.72	18.90	**19.35**
Runoff (mm)		55	48	49	29	22	14	6	5	9	15	20	42	**311**
Rainfall (mm)		71	52	69	49	58	60	54	61	68	61	57	73	**733**

Factors affecting flow regime: N
Station type: FV

1989 runoff is 77% of previous mean
rainfall 94%

054038 Tanat at Llanyblodwel 1989

Measuring authority: NRA-ST
First year: 1973

Grid reference: 33 (SJ) 252 225
Level stn. (m OD): 77.00

Catchment area (sq km): 229.0
Max alt. (m OD): 827

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	5.037	10.810	15.730	7.751	1.474	0.699	0.670	0.443	0.570	2.544	7.383	13.640	**5.531**
(m^3s^{-1})	Peak	15.13	51.12	60.02	31.54	2.64	1.36	8.51	1.34	1.42	19.28	33.98	53.11	**60.02**
Runoff (mm)		59	114	184	88	17	8	8	5	6	30	84	160	**762**
Rainfall (mm)		69	169	157	105	23	61	55	66	44	121	99	207	**1176**

Monthly and yearly statistics for previous record (Jun 1973 to Dec 1988—incomplete or missing months total 0.4 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	11.840	9.491	8.741	5.364	3.483	2.375	1.365	2.680	3.636	7.408	9.811	11.590	**6.473**
flows	Low	5.203	3.707	2.693	1.392	0.867	0.728	0.348	0.190	1.199	1.701	2.895	5.738	**4.185**
(m^3s^{-1})	High	19.720	19.900	17.800	9.686	10.250	4.660	2.589	7.609	9.885	15.020	17.370	21.410	**7.510**
Peak flow (m^3s^{-1})		93.99	64.77	85.77	39.85	31.27	56.87	15.68	118.20	69.56	82.17	76.12	87.99	**118.20**
Runoff (mm)		138	101	102	61	41	27	16	31	41	87	111	136	**892**
Rainfall (mm)		134	89	113	64	79	69	62	92	111	122	135	145	**1215**

Factors affecting flow regime: N EI
Station type: VA

1989 runoff is 85% of previous mean
rainfall 97%

055008 Wye at Cefn Brwyn 1989

Measuring authority: IH
First year: 1951

Grid reference: 22 (SN) 829 838
Level stn (m OD): 341.00

Catchment area (sq km): 10.6
Max alt. (m OD): 752

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.654	0.961	1.357	0.415	0.136	0.148	0.135	0.336	0.470	1.422	0.929	0.955	**0.655**
(m^3s^{-1})	Peak	10.66	15.34	12.16	3.19	0.87	3.22	1.08	2.82	2.43	27.84	9.04	12.98	**27.84**
Runoff (mm)		166	220	344	102	35	36	34	85	103	361	228	242	**1958**
Rainfall (mm)		180	288	366	147	57	135	60	189	117	395	183	276	**2393**

Monthly and yearly statistics for previous record (Aug 1951 to Dec 1988—incomplete or missing months total 2.5 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0.966	0.729	0.685	0.520	0.394	0.352	0.441	0.577	0.682	0.808	1.028	1.121	**0.692**
flows	Low	0.492	0.144	0.206	0.064	0.054	0.074	0.053	0.036	0.050	0.091	0.376	0.198	**0.447**
(m^3s^{-1})	High	1.870	1.486	1.735	1.312	1.144	0.954	1.264	1.478	1.478	2.031	1.797	2.655	**0.994**
Peak flow (m^3s^{-1})		23.47	19.20	23.51	19.12	17.89	25.49	19.11	48.87	22.87	24.32	29.15	32.27	**48.87**
Runoff (mm)		245	169	174	128	100	87	112	146	167	205	253	285	**2070**
Rainfall (mm)		262	165	199	145	136	139	165	195	208	240	271	307	**2432**

Factors affecting flow regime: N
Station type: CC

1989 runoff is 95% of previous mean
rainfall 98%

055013 Arrow at Titley Mill 1989

Measuring authority: NRA WEL
First year: 1966

Grid reference: 32 (SO) 328 585
Level stn (m OD): 129.00

Catchment area (sq km): 126.4
Max alt (m OD): 542

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1.528	2.858	4.767	2.778	0.774	0.379	0.341	0.227	0.188	0.506	2.556	8.464	**2.115**
(m^3s^{-1})	Peak	3.35	17.62	15.35	7.06	1.21	0.61	2.60	0.56	0.54	3.89	11.90	39.77	**39.77**
Runoff (mm)		32	55	[illegible]	57	16	8	7	5	4	11	52	179	**528**
Rainfall (mm)		59	130	114	74	18	35	65	56	50	137	83	210	**1031**

Monthly and yearly statistics for previous record (Oct 1966 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	4.839	4.075	3.537	2.288	1.789	1.149	0.741	0.647	0.886	2.093	3.113	4.154	**2.437**
flows	Low	1.886	1.912	1.629	0.962	0.526	0.332	0.210	0.154	0.235	0.294	0.662	1.366	**1.309**
(m^3s^{-1})	High	9.003	7.677	8.933	5.028	5.001	2.559	3.842	1.546	2.459	6.916	6.625	7.566	**3.418**
Peak flow (m^3s^{-1})		101.10	39.94	57.85	37.95	32.49	13.09	30.68	24.79	18.85	36.45	28.98	63.34	**101.10**
Runoff (mm)		103	79	75	47	38	24	16	14	18	44	64	88	**608**
Rainfall (mm)		110	78	88	58	77	66	55	77	91	95	98	109	**1002**

Factors affecting flow regime: N
Station type: VA

1989 runoff is 87% of previous mean
rainfall 103%

055014 Lugg at Byton 1989

Measuring authority: NRA-WEL
First year: 1966

Grid reference: 32 (SO) 364 647
Level stn (m OD): 124.10

Catchment area (sq km): 203.3
Max alt (m OD): 660

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	2.605	3.986	8.844	5.099	1.874	1.024	0.768	0.583	0.517	0.782	3.213	11.560	**3.410**
(m^3s^{-1})	Peak	3.46	14.60	23.56	8.99	2.85	1.31	1.83	0.89	0.89	3.28	10.00	31.00	**31.00**
Runoff (mm)		34	47	117	65	25	13	10	8	7	10	41	152	**529**
Rainfall (mm)		52	116	109	78	22	33	55	52	49	135	81	212	**994**

Monthly and yearly statistics for previous record (Oct 1966 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	7.584	6.877	5.844	4.197	3.203	2.068	1.449	1.193	1.358	2.838	4.484	6.306	**3.938**
flows	Low	2.991	2.630	2.947	2.016	[illegible]	0.772	0.557	0.414	0.678	0.657	1.219	2.443	**2.321**
(m^3s^{-1})	High	11.940	12.870	13.980	8.648	7.994	4.113	5.253	1.997	3.079	7.962	8.774	10.350	**4.954**
Peak flow (m^3s^{-1})		54.27	37.53	33.24	30.08	45.56	14.18	26.16	13.32	12.46	28.51	27.22	37.49	**54.27**
Runoff (mm)		100	83	77	54	42	26	19	16	17	37	57	83	**611**
Rainfall (mm)		116	81	92	64	81	65	57	77	91	93	99	110	**1026**

Factors affecting flow regime:
Station type: FVVA

1989 runoff is 87% of previous mean
rainfall 97%

055018 Frome at Yarkhill 1989

Measuring authority NRA-WEL
First year 1968

Grid reference 32 (SO) 615 428
Level stn. (m OD): 55 40

Catchment area (sq km) 144.0
Max alt. (m OD) 244

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 439	1 226	1 040	1 995	0 740	0 390	0 171	0 102	0 096	0 149	0 335	4 230	**0.909**
(m^3s^{-1})	Peak	1 20	11 19	3 52	13 38	1 80	0 55	0 92	0 44	0 18	1 18	2.73	18 16	**18 16**
Runoff (mm)		8	21	19	36	14	7	3	2	2	3	6	79	**199**
Rainfall (mm)		31	56	40	70	23	26	40	49	41	94	54	164	**688**

Monthly and yearly statistics for previous record (Oct 1968 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	2 743	2 528	2 192	1 314	1 108	0 648	0 369	0 338	0 319	0 498	1 015	1 930	**1.245**
flows	Low	0 214	0 389	0 560	0 359	0 274	0 146	0 091	0 063	0 146	0 155	0 171	0 210	**0.672**
(m^3s^{-1})	High	4 668	5 456	5 176	3 299	3 972	1 349	0 630	0 759	0 970	2 405	2 266	3 594	**1.628**
Peak flow (m^3s^{-1})		23 84	24 99	24 28	24 57	25 89	16 99	5 96	9 61	15 68	10 34	18 51	25 14	**25 89**
Runoff (mm)		51	43	41	24	21	12	7	6	6	9	18	36	**273**
Rainfall (mm)		74	50	64	45	62	59	47	67	61	58	64	69	**720**

Factors affecting flow regime E
Station type VA

1989 runoff is 73% of previous mean
rainfall 96%

055023 Wye at Redbrook 1989

Measuring authority NRA-WEL
First year 1936

Grid reference 32 (SO) 528 110
Level stn (m OD) 9 20

Catchment area (sq km) 4010 0
Max alt (m OD) 752

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	64 630	106 700	179 600	95 250	23 690	14 050	13 050	8 083	11 670	45 790	86 650	213 300	**71 804**
(m^3s^{-1})	Peak	188 80	343 60	435 90	217 30	42 72	17 62	51 54	19 09	38 89	382 50	290 00	554 60	**554.60**
Runoff (mm)		43	64	120	62	16	9	9	5	8	31	56	142	**565**
Rainfall (mm)		59	123	110	82	22	40	58	58	54	146	81	201	**1034**

Monthly and yearly statistics for previous record (Oct 1936 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	132 000	120 700	91 870	64 850	44 710	34 740	24 600	28 270	40 020	60 580	101 300	122 800	**71.966**
flows	Low	25 050	30 760	22 110	17 930	12 340	10 970	7 426	5 180	7 271	9 582	31 730	46 890	**39 916**
(m^3s^{-1})	High	241 900	234 000	325 400	143 600	125 000	131 600	95 830	83 680	174 000	174 700	252 400	246 000	**113.382**
Peak flow (m^3s^{-1})		688 80	700 40	905 40	493 30	387 90	467 20	368 30	347 80	531 70	472 90	600 30	812 70	**905 40**
Runoff (mm)		88	73	61	42	30	22	16	19	26	40	65	82	**566**
Rainfall (mm)		111	77	77	63	75	63	67	84	88	95	112	113	**1025**

Factors affecting flow regime S P E
Station type VA

1989 runoff is 100% of previous mean
rainfall 101%

056013 Yscir at Pontaryscir 1989

Measuring authority NRA-WEL
First year 1972

Grid reference 32 (SO) 003 304
Level stn (m OD) 161 20

Catchment area (sq km) 62 8
Max alt (m OD) 474

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	2 147	3 386	4 258	1 930	0 430	0 247	0 250	0 184	0 261	2 101	3 025	4 926	**1 923**
(m^3s^{-1})	Peak	9 91	17 96	22 88	6 64	1 79	0 44	1 23	0 73	2 04	29 24	16 45	34 20	**34.20**
Runoff (mm)		92	130	182	80	18	10	11	8	11	90	125	210	**966**
Rainfall (mm)		103	204	169	93	18	65	64	80	69	206	113	258	**1442**

Monthly and yearly statistics for previous record (May 1972 to Dec 1988—incomplete or missing months total 0 2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	3 480	2 608	2 584	1 452	1 056	0 768	0 527	0 737	1 186	2 186	3 004	3 508	**1.923**
flows	Low	1 146	0 998	0 852	0 431	0 269	0 214	0 150	0 104	0 283	0 214	0 941	1 540	**1.286**
(m^3s^{-1})	High	5 795	4 959	6 303	3 211	3 041	1 788	1 758	2 964	3 947	4 279	5 291	6 324	**2 465**
Peak flow (m^3s^{-1})		36 98	31 78	40 55	13 74	14 81	74 33	11 06	30 69	21 44	85 01	34 02	59 93	**85.01**
Runoff (mm)		148	101	110	60	45	32	22	31	49	93	124	150	**966**
Rainfall (mm)*		164	100	139	70	89	74	77	101	136	146	157	181	**1434**

*(1973-1988)

Factors affecting flow regime N
Station type: C

1989 runoff is 100% of previous mean
rainfall 101%

057008 Rhymney at Llanedeyrn 1989

Measuring authority NRA-WEL
First year 1973

Grid reference 31 (ST) 225 821
Level stn (m OD) 11 80

Catchment area (sq km) 178 7
Max alt. (m OD) 617

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	4 671	13 160	14 320	5 834	1 893	1 145	1 186	0 931	0 965	5 880	7 172	11 140	**5 651**
(m^3s^{-1})	Peak	18 20	88 25	103 70	24 46	3 43	2 68	13 99	5 45	14 80	75 97	50 28	102 80	**103.70**
Runoff (mm)		70	178	215	85	28	17	18	14	14	88	104	167	**997**
Rainfall (mm)		95	222	203	96	10	54	69	65	73	226	99	221	**1433**

Monthly and yearly statistics for previous record (Jan 1973 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	9 689	7 690	6 996	4 262	3 118	2 096	1 595	2 632	3 737	6 178	7 917	9 300	**5.427**
flows	Low	3 313	3 199	2 889	1 754	1 276	0 873	0 602	0 571	0 913	0 748	2 355	3 218	**2.903**
(m^3s^{-1})	High	17 500	15 620	20 960	9 695	8 340	4 604	4 735	10 450	11 500	13 700	16 560	15 730	**7 153**
Peak flow (m^3s^{-1})		108 30	72 22	110 50	41 55	31 31	54 30	27 39	87 41	101 60	118 50	113 50	147 30	**147.30**
Runoff (mm)		145	105	105	62	47	30	24	39	54	93	115	139	**959**
Rainfall (mm)		162	106	130	68	87	69	72	106	140	146	148	169	**1403**

Factors affecting flow regime S PGE
Station type FVVA

1989 runoff is 104% of previous mean
rainfall 102%

058006 Mellte at Pontneddfechan 1989

Measuring authority: NRA-WEL — Grid reference: 22 (SN) 915 082 — Catchment area (sq km): 65.8
First year: 1971 — Level stn. (m OD): 90.00 — Max alt. (m OD): 734

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	3.446	6.072	6.454	1.702	0.466	0.343	0.380	0.418	0.928	4.610	3.856	8.317	3.073
(m^3s^{-1})	Peak	30.35	56.42	46.90	7.29	0.99	0.91	2.40	2.50	9.98	43.94	22.70	79.41	79.41
Runoff (mm)		140	223	263	67	19	13	15	17	37	188	152	339	1473
Rainfall (mm)		169	294	261	104	19	87	57	113	96	310	138	285	1933

Monthly and yearly statistics for previous record (Oct 1971 to Dec 1988—incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	5.011	3.572	3.761	2.118	1.719	1.273	1.127	1.796	2.499	3.541	4.708	5.219	3.029
flows	Low	1.932	0.913	1.378	0.497	0.383	0.322	0.242	0.207	0.562	0.548	1.883	2.166	1.985
(m^3s^{-1})	High	8.274	7.231	10.670	5.095	4.283	3.559	4.269	6.802	6.876	6.305	9.471	8.739	3.814
Peak flow (m^3s^{-1})		82.30	66.12	82.30	39.02	21.45	33.56	44.98	58.52	81.01	96.78	106.80	127.60	127.60
Runoff (mm)		204	133	153	83	70	50	46	73	98	144	185	212	1453
Rainfall (mm)		246	148	194	103	126	107	106	154	179	208	237	257	2065

Factors affecting flow regime: S P — 1989 runoff is 101% of previous mean
Station type: FVVA — rainfall 94%

060002 Cothi at Felin Mynachdy 1989

Measuring authority: NRA-WEL — Grid reference: 22 (SN) 508 225 — Catchment area (sq km): 297.8
First year: 1961 — Level stn. (m OD): 16.10 — Max alt. (m OD): 484

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	10.590	16.690	24.690	8.928	2.098	0.966	0.638	0.838	1.934	14.010	20.860	23.570	10.459
(m^3s^{-1})	Peak	38.58	64.66	153.10	61.26	4.75	1.72	1.61	3.28	8.73	92.63	194.50	136.50	194.50
Runoff (mm)		95	136	222	78	19	8	6	8	17	126	182	212	1108
Rainfall (mm)		128	206	227	114	24	74	40	108	85	223	137	238	1604

Monthly and yearly statistics for previous record (Oct 1961 to Dec 1988—incomplete or missing months total 2.0 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	18.140	13.820	12.880	8.767	6.678	4.381	3.648	6.475	8.145	15.490	18.130	20.220	11.397
flows	Low	2.990	3.708	2.821	1.444	0.835	0.824	0.418	0.362	1.500	1.610	7.211	6.723	7.174
(m^3s^{-1})	High	37.580	31.100	40.710	20.380	14.820	13.070	11.810	23.350	23.920	37.940	36.270	41.140	14.950
Peak flow (m^3s^{-1})		141.60	181.20	220.90	85.88	87.22	90.33	144.40	171.00	129.70	283.70	175.80	274.70	283.70
Runoff (mm)		163	113	116	76	60	38	33	58	71	139	158	182	1208
Rainfall (mm)		173	113	136	94	104	95	100	125	148	183	177	189	1637

Factors affecting flow regime: N — 1989 runoff is 92% of previous mean
Station type: VA — rainfall 98%

060003 Taf at Clog-y-fran 1989

Measuring authority: NRA-WEL — Grid reference: 22 (SN) 238 160 — Catchment area (sq km): 217.3
First year: 1965 — Level stn. (m OD): 7.00 — Max alt. (m OD): 395

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	6.792	10.690	16.990	5.256	2.471	1.527	1.167	1.190	1.410	3.910	10.800	12.240	6.183
(m^3s^{-1})	Peak	23.23	81.15	77.46	18.44	4.22	1.91	1.83	2.89	3.85	36.56	54.18	59.79	81.15
Runoff (mm)		84	119	209	63	30	18	14	15	17	48	129	151	897
Rainfall (mm)		111	142	177	93	11	58	33	104	70	173	113	184	1269

Monthly and yearly statistics for previous record (Oct 1965 to Dec 1988—incomplete or missing months total 1.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	13.420	10.730	8.590	5.767	3.829	2.597	1.934	3.028	3.918	9.630	11.710	13.960	7.417
flows	Low	4.835	3.858	3.796	2.179	1.207	0.781	0.375	0.363	0.983	1.018	3.757	5.075	4.672
(m^3s^{-1})	High	25.900	27.200	26.610	11.800	8.412	8.820	6.335	10.760	15.340	22.310	22.730	25.520	9.662
Peak flow (m^3s^{-1})		73.43	73.97	85.73	60.03	35.85	45.11	38.25	101.00	58.02	86.49	80.82	77.74	101.00
Runoff (mm)		165	120	106	69	47	31	24	37	47	119	140	172	1077
Rainfall (mm)		160	107	119	81	86	80	74	106	126	165	157	177	1438

Factors affecting flow regime: N — 1989 runoff is 83% of previous mean
Station type: VA — rainfall 88%

060010 Tywi at Nantgaredig 1989

Measuring authority: NRA-WEL — Grid reference: 22 (SN) 485 206 — Catchment area (sq km): 1090.4
First year: 1959 — Level stn. (m OD): 7.80 — Max alt. (m OD): 792

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	41.400	59.990	81.870	31.800	8.700	4.597	3.715	6.098	10.080	39.780	57.190	71.500	34.615
(m^3s^{-1})	Peak	110.30	182.10	255.20	104.00	18.30	8.72	9.65	33.41	32.70	229.10	265.80	266.50	266.50
Runoff (mm)		102	133	201	76	21	11	9	15	24	98	136	176	1001
Rainfall (mm)		121	192	211	109	28	74	45	112	81	221	138	238	1570

Monthly and yearly statistics for previous record (Oct 1958 to Dec 1988—incomplete or missing months total 2.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	66.980	47.510	40.710	31.980	23.210	15.430	13.180	20.710	27.810	49.400	60.800	65.950	38.624
flows	Low	9.473	12.210	9.657	6.201	4.503	3.736	2.752	2.699	1.523	8.708	23.910	19.470	22.516
(m^3s^{-1})	High	120.600	100.600	137.800	64.470	51.420	39.400	42.120	78.470	76.440	128.700	122.600	128.300	54.099
Peak flow (m^3s^{-1})		507.40	578.80	702.30	215.30	180.10	256.80	295.90	312.50	322.80	892.00	461.10	526.70	892.00
Runoff (mm)		165	106	100	76	57	37	32	51	66	121	145	162	1118
Rainfall (mm)		178	111	103	109	106	94	111	124	131	156	167	175	1565

Factors affecting flow regime: — 1989 runoff is 90% of previous mean
Station type: FVVA — rainfall 100%

064001 Dyfi at Dyfi Bridge 1989

Measuring authority: NRA-WEL
First year: 1962

Grid reference: 23 (SH) 745 019
Level stn (m OD): 5 90

Catchment area (sq km): 471.3
Max alt (m OD): 905

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	23 090	38 220	50 410	17 380	4 138	3.288	3 881	4 481	6 158	27 140	28 070	34 870	**20.015**
(m^3s^{-1})	Peak	103 30	214 40	230 20	89 05	11 19	59 50	34 66	28 55	14.12	211 00	155.80	188 50	**230.20**
Runoff (mm)		131	196	286	96	24	18	22	25	34	154	154	198	**1339**
Rainfall (mm)		134	257	263	117	42	116	40	137	67	235	136	235	**1779**

Monthly and yearly statistics for previous record (Oct 1962 to Dec 1988—incomplete or missing months total 9.8 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	35 090	22 640	27 460	17 440	11 610	10 910	9 076	13 930	19 280	30 750	34 450	42 370	**22.945**
flows	Low	6.245	5 174	5.789	2 626	1 295	1 618	0 822	1 819	5 986	10 770	14 530	7 501	**18 343**
(m^3s^{-1})	High	68 810	46 060	75 790	42 490	23 600	21 770	18 780	40 440	36 260	76 960	70 470	88.280	**26.520**
Peak flow (m^3s^{-1})		350 20	340 00	360 70	271 30	337 20	402 10	162 00	210 00	329.80	344 00	375 50	580 50	**580 50**
Runoff (mm)		199	117	156	96	66	60	52	79	106	175	189	241	**1536**
Rainfall (mm)		204	123	168	109	113	108	114	148	175	204	207	245	**1918**

Factors affecting flow regime: N
Station type: VA

1989 runoff is 87% of previous mean
rainfall 93%

064002 Dysynni at Pont-y-garth 1989

Measuring authority: NRA-WEL
First year: 1966

Grid reference 23 (SH) 632 066
Level stn (m OD): 2 30

Catchment area (sq km) 75 1
Max alt. (m OD) 892

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	4.773	5 567	10 990	3 727	1 298	1 343	1 512	2 362	2 019	7 319	7 448	6.286	**4.555**
(m^3s^{-1})	Peak	16 22	16 17	41 94	10 99	2 88	26.67	17.60	24 60	8 96	31 69	34 74	33 51	**41 94**
Runoff (mm)		170	179	392	129	46	46	54	84	70	261	257	224	**1913**
Rainfall (mm)		153	238	294	134	48	137	48	194	76	291	156	228	**1997**

Monthly and yearly statistics for previous record (Jan 1966 to Dec 1988—incomplete or missing months total 1.8 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	6.109	4 708	4 842	3.498	2 479	2.346	2 689	3 336	4.244	5 742	6 730	7 081	**4.485**
flows	Low	3.371	1 548	0 986	0 457	0 298	0 427	0 278	0 289	1 926	0 556	3 011	2.770	**3.612**
(m^3s^{-1})	High	11 830	8 809	14 780	7 209	7 602	5 921	5 407	8 899	7 285	12 350	12.680	12 580	**5 434**
Peak flow (m^3s^{-1})		61 40	41 34	98 71	36 85	76 32	48.42	53 35	51 62	70 14	107 70	121 30	84 70	**121.30**
Runoff (mm)		218	153	173	121	88	81	96	119	146	205	232	253	**1885**
Rainfall (mm)		222	144	188	124	130	139	147	169	201	246	249	253	**2212**

Factors affecting flow regime N
Station type VA

1989 runoff is 102% of previous mean
rainfall 90%

065005 Erch at Pencaenewydd 1989

Measuring authority: NRA-WEL
First year: 1973

Grid reference: 23 (SH) 400 404
Level stn (m OD) 56 10

Catchment area (sq km) 18 1
Max alt (m OD). 564

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 714	0.727	1.159	0 549	0 229	0 134	0 094	0.119	0 103	0 464	0 865	0 985	**0.511**
(m^3s^{-1})	Peak	3 57	4 76	9 04	3.45	0 84	0.78	0 33	1.73	0 41	3 20	5 99	6 96	**9.04**
Runoff (mm)		106	97	172	79	34	19	14	18	15	69	124	146	**891**
Rainfall (mm)		113	125	203	106	29	77	26	130	35	178	133	211	**1366**

Monthly and yearly statistics for previous record (Jan 1973 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1 007	0 809	0 754	0 479	0 334	0 220	0 189	0 324	0.428	0 797	1 015	1 087	**0.620**
flows	Low	0 629	0 365	0.311	0.177	0 120	0 089	0 081	0 061	0 167	0 236	0.264	0 600	**0.430**
(m^3s^{-1})	High	1.673	1 869	1 804	0 892	0 728	0 539	0 427	1 113	0.919	1 736	1 816	1 764	**0.739**
Peak flow (m^3s^{-1})		10 41	15 45	19 78	11 00	4 68	6 99	5 52	9 22	7 42	25 01	16 91	15 49	**25.01**
Runoff (mm)		149	109	112	69	49	31	28	48	61	118	145	161	**1081**
Rainfall (mm)		148	94	129	70	78	71	82	119	134	160	161	164	**1410**

Factors affecting flow regime N
Station type: C

1989 runoff is 82% of previous mean
rainfall 97%

066006 Elwy at Pont-y-gwyddel 1989

Measuring authority: NRA-WEL
First year: 1973

Grid reference 23 (SH) 952 718
Level stn (m OD): 87.90

Catchment area (sq km): 194.0
Max alt. (m OD) 518

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	3 695	6.726	8 943	5.275	0 824	0.557	0 583	0 357	0 249	2 353	7.983	9 074	**3 866**
(m^3s^{-1})	Peak	14 39	32.26	41 97	39.11	3 98	1.73	3 48	0 55	0 46	14 02	44 02	56 85	**56.85**
Runoff (mm)		51	84	123	70	11	7	8	5	3	32	107	125	**628**
Rainfall (mm)		71	126	150	102	39	73	48	73	40	159	118	178	**1177**

Monthly and yearly statistics for previous record (Dec 1973 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	8 046	5 845	5 267	3 018	1 791	1 321	0 707	1 331	2 615	5 460	7.233	7 724	**4.191**
flows	Low	3.115	2 650	1 539	0.823	0 479	0 359	0 278	0 242	0 629	1 360	2 263	4 644	**2.908**
(m^3s^{-1})	High	11 660	12 050	11.950	6 939	5 918	3.300	1 402	4 351	7 450	11.530	11 850	14.450	**5.094**
Peak flow (m^3s^{-1})		82.42	50 82	76 59	50 76	21 66	18 00	27 05	38 13	58.57	143 00	101 60	75 42	**143.00**
Runoff (mm)		111	74	73	40	25	18	10	18	35	75	97	107	**682**
Rainfall (mm)		130	81	105	59	75	73	69	92	124	131	144	139	**1222**

Factors affecting flow regime SRP
Station type VA

1989 runoff is 92% of previous mean
rainfall 96%

067008 Alyn at Pont-y-capel 1989

Measuring authority: NRA-WEL
First year: 1965
Grid reference: 33 (SJ) 336 541
Level stn. (m OD): 37.30
Catchment area (sq km): 227.1
Max alt. (m OD): 562

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	1.327	1.553	2.798	4.107	0.963	0.606	0.532	0.454	0.474	0.673	2.123	5.391	**1.751**
(m^3s^{-1}):	Peak	2.19	8.31	16.84	14.29	2.05	1.04	2.72	1.27	2.06	3.37	9.75	25.41	**25.41**
Runoff (mm)		16	17	33	47	11	7	6	5	5	8	24	64	**243**
Rainfall (mm)		33	70	68	103	40	55	42	61	47	106	80	135	**840**

Monthly and yearly statistics for previous record (Jun 1965 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	4.420	3.897	3.281	2.581	1.807	1.201	0.886	0.916	0.996	2.025	3.037	4.217	**2.433**
flows	Low	1.753	1.628	1.448	1.023	0.712	0.438	0.331	0.287	0.474	0.452	0.614	1.246	**1.286**
(m^3s^{-1})	High	7.219	9.085	8.027	6.474	5.657	2.873	2.098	2.456	3.906	6.896	6.168	9.480	**3.027**
Peak flow (m^3s^{-1})		27.53	28.52	26.11	25.28	26.86	18.34	23.23	20.81	59.11	26.46	28.21	35.92	**59.11**
Runoff (mm)		52	42	39	29	21	14	10	11	11	24	35	50	**338**
Rainfall (mm)		87	64	77	60	72	65	61	74	81	85	104	95	**925**

Factors affecting flow regime: S EI
Station type: CC

1989 runoff is 72% of previous mean
rainfall 91%

069002 Irwell at Adelphi Weir 1989

Measuring authority: NRA-NW
First year: 1949
Grid reference: 33 (SJ) 824 987
Level stn. (m OD): 24.10
Catchment area (sq km): 559.4
Max alt. (m OD): 473

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	13.670	20.710	26.670	18.760	7.641	9.782	8.007	7.864	5.820	15.630	22.590	16.720	**14.440**
(m^3s^{-1})	Peak	72.50	126.70	132.00	77.72	37.05	159.20	89.69	24.05	12.06	125.80	143.90	70.21	**159.20**
Runoff (mm)		65	90	128	87	37	45	38	38	27	75	105	80	**814**
Rainfall (mm)		63	134	135	105	37	120	57	95	32	158	109	102	**1142**

Monthly and yearly statistics for previous record (Oct 1949 to Dec 1988—incomplete or missing months total 2.0 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	25.360	21.650	17.580	14.190	11.800	10.240	11.210	15.900	16.670	20.610	24.860	29.470	**18.290**
flows	Low	3.705	4.787	7.803	5.408	4.348	2.750	4.031	3.676	2.991	4.990	7.534	7.469	**10.469**
(m^3s^{-1})	High	40.260	67.230	48.030	27.070	21.530	18.900	26.150	56.000	43.480	52.510	51.100	84.660	**30.469**
Peak flow (m^3s^{-1})		430.40	400.30	295.60	184.20	141.60	238.00	385.60	395.70	390.80	485.10	334.90	419.50	**485.10**
Runoff (mm)		121	94	84	66	57	47	54	76	77	99	115	141	**1032**
Rainfall (mm)		120	82	94	76	81	86	100	125	119	125	132	139	**1279**

Factors affecting flow regime: S PGEI
Station type: B

1989 runoff is 79% of previous mean
rainfall 89%

069007 Mersey at Ashton Weir 1989

Measuring authority: NRA-NW
First year: 1958
Grid reference: 33 (SJ) 772 936
Level stn. (m OD): 14.90
Catchment area (sq km): 660.0
Max alt. (m OD): 636

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	8.297	11.670	20.220	15.360	4.969	5.196	4.487	3.358	2.574	6.439	10.550	12.310	**8.766**
(m^3s^{-1}):	Peak	30.37	76.59	164.50	53.68	23.06	54.80	49.21	10.15	6.80	51.67	56.86	69.34	**164.50**
Runoff (mm)		34	43	82	60	20	20	18	14	10	26	41	50	**419**
Rainfall (mm)		54	112	115	111	46	102	40	65	29	143	81	107	**1005**

Monthly and yearly statistics for previous record (Jan 1981 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	21.930	12.360	16.540	10.910	6.755	7.307	4.843	7.193	8.199	12.540	15.500	18.450	**11.889**
flows	Low	11.010	7.399	5.544	4.698	3.585	3.847	2.447	2.760	4.367	5.978	7.300	8.686	**8.438**
(m^3s^{-1})	High	29.220	23.100	36.210	17.190	11.420	18.090	7.866	12.560	11.110	25.500	25.190	36.810	**15.876**
Peak flow (m^3s^{-1})		188.80	125.00	176.70	113.00	56.25	157.50	37.99	216.70	87.70	202.50	303.70	502.90	**502.90**
Runoff (mm)		89	46	67	43	27	29	20	29	32	51	61	75	**589**
Rainfall (mm)		130	53	123	71	70	83	70	107	101	122	124	122	**1176**

Factors affecting flow regime: S PGEI
Station type: CB

1989 runoff is 74% of previous mean
rainfall 85%

069015 Etherow at Compstall 1989

Measuring authority: NRA-NW
First year: 1977
Grid reference: 33 (SJ) 962 908
Level stn. (m OD): 73.50
Catchment area (sq km): 156.0
Max alt. (m OD): 628

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	2.141	3.575	6.952	4.582	1.224	1.197	1.235	0.860	0.637	1.627	2.695	4.360	**2.586**
(m^3s^{-1}):	Peak	9.45	30.60	38.16	16.41	4.42	14.14	5.12	2.25	1.48	20.76	16.62	22.94	**38.16**
Runoff (mm)		37	55	119	76	21	20	21	15	11	28	45	75	**523**
Rainfall (mm)		68	134	145	128	52	103	44	72	32	175	94	140	**1187**

Monthly and yearly statistics for previous record (Jan 1977 to Dec 1988—incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	6.032	4.387	5.019	3.273	2.029	1.721	1.302	1.884	2.086	3.322	4.727	5.108	**3.405**
flows	Low	3.445	2.141	1.365	1.070	0.539	0.835	0.718	0.691	1.178	1.264	1.846	2.413	**2.440**
(m^3s^{-1})	High	8.964	8.539	10.080	6.325	4.870	4.758	2.265	3.572	4.192	9.424	7.471	9.286	**4.169**
Peak flow (m^3s^{-1})		42.63	44.46	46.03	32.66	18.79	28.64	15.47	35.56	43.08	42.12	40.15	62.95	**62.95**
Runoff (mm)		104	69	86	54	35	29	22	32	35	57	79	88	**689**
Rainfall (mm)		154	89	148	83	78	105	79	128	120	137	146	153	**1420**

Factors affecting flow regime: S PGEI
Station type: C

1989 runoff is 76% of previous mean
rainfall 84%

071001 Ribble at Samlesbury 1989

Measuring authority: NRA-NW
First year: 1960
Grid reference: 34 (SD) 589 304
Level stn. (m OD): 6.00
Catchment area (sq km): 1145.0
Max alt. (m OD): 680

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	26.570	49.450	52.670	30.190	9.522	13.260	9.210	8.145	4.265	34.820	34.530	33.980	**25.409**
(m^3s^{-1})	Peak	237.80	197.20	367.60	185.90	41.39	183.70	155.90	33.40	12.05	249.40	207.30	191.50	**367.60**
Runoff (mm)		62	104	123	68	22	30	22	19	10	81	78	79	**700**
Rainfall (mm)		71	144	144	95	41	111	47	101	27	186	89	114	**1170**

Monthly and yearly statistics for previous record (May 1960 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	51.770	36.440	34.530	25.930	18.310	14.320	16.620	24.920	30.680	42.020	52.320	56.560	**33.712**
flows	Low	10.610	9.565	11.790	5.601	4.048	5.031	2.638	2.958	5.782	5.716	20.770	15.190	**22.045**
(m^3s^{-1})	High	82.510	80.890	104.700	54.820	46.460	33.520	40.500	68.920	65.820	118.400	88.610	120.200	**45.022**
Peak flow (m^3s^{-1})		754.60	513.10	643.30	466.60	319.10	494.80	399.80	520.80	619.30	810.00	613.20	891.30	**891.30**
Runoff (mm)		121	78	81	59	43	32	39	58	69	98	118	132	**929**
Rainfall (mm)*		135	82	108	79	84	89	94	119	134	139	143	150	**1356**

*(1961-1988)

Factors affecting flow regime: S E
Station type: MIS

1989 runoff is 75% of previous mean
rainfall 86%

071004 Calder at Whalley Weir 1989

Measuring authority: NRA-NW
First year: 1963
Grid reference: 34 (SD) 729 360
Level stn. (m OD): 39.90
Catchment area (sq km): 316.0
Max alt. (m OD): 558

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	6.969	9.716	12.160	8.796	3.050	4.147	2.904	2.852	1.921	7.781	9.125	9.660	**6.571**
(m^3s^{-1})	Peak	79.76	65.78	118.00	52.42	38.77	70.43	29.23	13.32	3.15	80.50	45.13	68.47	**118.00**
Runoff (mm)		59	74	103	72	26	34	25	24	16	66	75	82	**656**
Rainfall (mm)		59	124	129	97	37	115	51	86	25	160	85	110	**1078**

Monthly and yearly statistics for previous record (Oct 1963 to Dec 1988—incomplete or missing months total 2.6 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	13.340	9.461	9.184	6.558	5.198	4.334	3.961	6.119	7.588	11.070	12.860	13.710	**8.617**
flows	Low	5.766	3.320	3.989	2.272	2.053	1.888	1.773	1.564	2.065	2.397	5.625	4.886	**6.225**
(m^3s^{-1})	High	20.590	17.170	25.320	13.010	9.916	7.609	9.059	16.280	18.620	23.910	21.990	25.610	**11.485**
Peak flow (m^3s^{-1})		183.20	146.10	185.20	108.40	91.66	135.50	230.60	171.60	206.00	229.50	148.60	194.30	**230.60**
Runoff (mm)		113	73	78	54	44	36	34	52	62	94	105	116	**861**
Rainfall (mm)		125	75	104	70	79	85	83	111	121	130	131	131	**1245**

Factors affecting flow regime: EI
Station type: FV

1989 runoff is 76% of previous mean
rainfall 87%

072002 Wyre at St Michaels 1989

Measuring authority: NRA-NW
First year: 1963
Grid reference: 34 (SD) 463 411
Level stn. (m OD): 4.40
Catchment area (sq km): 275.0
Max alt. (m OD): 560

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	5.282	9.786	8.542	5.960	1.109	1.358	0.859	1.290	0.671	6.429	6.986	6.896	**4.564**
(m^3s^{-1})	Peak	27.23	59.03	31.90	51.36	3.84	23.53	15.61	21.21	2.37	41.02	53.59	54.24	**59.03**
Runoff (mm)		51	86	83	56	11	13	8	13	6	63	66	67	**523**
Rainfall (mm)		64	138	121	87	36	98	35	115	22	173	88	103	**1080**

Monthly and yearly statistics for previous record (Oct 1963 to Dec 1988—incomplete or missing months total 0.2 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	10.160	6.888	7.097	4.776	3.302	2.882	3.113	4.859	6.724	9.529	10.360	11.350	**6.758**
flows	Low	3.983	1.746	2.270	0.774	0.732	0.444	0.431	0.248	0.902	0.617	4.859	2.581	**3.186**
(m^3s^{-1})	High	17.820	16.030	25.920	12.090	10.450	7.096	7.477	16.240	13.290	25.500	18.510	26.530	**10.329**
Peak flow (m^3s^{-1})		156.50	145.60	168.90	123.00	128.20	146.60	148.10	162.10	176.50	180.40	163.10	190.50	**190.50**
Runoff (mm)		99	61	69	45	32	27	30	47	63	93	98	111	**776**
Rainfall (mm)		121	70	101	70	80	89	94	115	133	140	137	133	**1283**

Factors affecting flow regime: S PG
Station type: FV

1989 runoff is 67% of previous mean
rainfall 84%

073005 Kent at Sedgwick 1989

Measuring authority: NRA-NW
First year: 1968
Grid reference: 34 (SD) 509 874
Level stn. (m OD): 18.90
Catchment area (sq km): 209.0
Max alt. (m OD): 817

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	9.863	16.600	21.480	6.841	1.957	1.040	0.791	4.112	2.368	10.040	12.680	6.666	**7.822**
(m^3s^{-1})	Peak	44.01	55.22	194.60	36.14	3.99	2.59	2.52	43.25	7.42	40.27	177.80	31.99	**194.60**
Runoff (mm)		126	192	275	85	25	13	10	53	29	129	157	85	**1180**
Rainfall (mm)		127	265	297	95	39	66	31	187	32	229	141	120	**1629**

Monthly and yearly statistics for previous record (Nov 1968 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	12.920	9.505	9.409	6.485	4.281	3.850	3.974	5.858	8.385	10.780	13.620	13.470	**8.543**
flows	Low	5.998	3.094	3.348	2.038	1.222	0.872	0.658	0.740	1.753	1.396	5.484	5.466	**5.995**
(m^3s^{-1})	High	20.950	16.800	22.850	12.620	11.580	13.010	10.570	18.810	15.630	17.960	21.430	23.210	**10.316**
Peak flow (m^3s^{-1})		197.70	114.00	166.10	111.10	53.44	72.86	94.65	88.68	120.70	123.50	175.00	231.40	**231.40**
Runoff (mm)		166	111	121	80	55	48	51	75	104	138	169	173	**1290**
Rainfall (mm)		194	105	154	88	90	101	115	133	178	183	208	197	**1746**

Factors affecting flow regime: N I
Station type: CBVA

1989 runoff is 91% of previous mean
rainfall 93%

074002 Irt at Galesyke 1989

Measuring authority: NRA-NW | Grid reference: 35 (NY) 136 038 | Catchment area (sq km): 44.2
First year: 1967 | Level stn. (m OD): 54.20 | Max alt. (m OD): 978

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	3.976	5.523	6.157	3.129	0.947	0.515	0.637	3.641	1.767	4.441	3.655	1.661	**2.991**
(m^3s^{-1}):	Peak	9.49	12.70	19.08	9.25	1.38	2.21	2.26	14.87	9.93	9.91	10.03	6.08	**19.08**
Runoff (mm)		241	302	373	183	57	30	39	221	104	269	214	101	**2134**
Rainfall (mm)		225	301	422	175	61	110	43	340	42	342	144	163	**2368**

Monthly and yearly statistics for previous record (Dec 1967 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	4.488	2.910	3.061	2.740	1.479	1.795	2.309	2.701	3.708	4.571	4.745	4.354	**3.241**
flows	Low	1.321	0.736	0.737	0.430	0.257	0.545	0.467	0.286	0.400	0.554	1.885	1.802	**2.440**
(m^3s^{-1})	High	8.242	5.117	6.575	5.947	3.901	5.216	4.667	6.757	7.630	8.174	7.094	7.645	**3.950**
Peak flow (m^3s^{-1})		31.73	18.67	20.02	34.04	6.84	10.27	27.26	18.46	17.89	27.29	21.85	20.33	**34.04**
Runoff (mm)		272	161	185	161	90	105	140	164	217	277	278	264	**2314**
Rainfall (mm)		316	174	245	150	129	163	197	219	279	311	322	310	**2815**

Factors affecting flow regime: S P I | 1989 runoff is 92% of previous mean
Station type: VA | rainfall 84%

074005 Ehen at Braystones 1989

Measuring authority: NRA-NW | Grid reference: 35 (NY) 009 061 | Catchment area (sq km): 125.5
First year: 1974 | Level stn (m OD): 10.10 | Max alt (m OD): 899

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	6.582	8.621	10.300	4.021	1.366	1.411	0.950	4.021	1.940	5.909	5.659	2.448	**4.414**
(m^3s^{-1}):	Peak	40.41	46.78	57.75	26.64	1.84	2.98	1.69	74.32	9.44	24.89	29.30	15.62	**74.32**
Runoff (mm)		140	166	220	83	29	29	20	86	40	126	117	52	**1109**
Rainfall (mm)		174	213	282	108	36	86	26	247	47	211	102	103	**1635**

Monthly and yearly statistics for previous record (Jan 1974 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	7.938	5.618	5.636	3.422	2.085	1.888	2.205	3.976	5.535	7.992	8.014	8.183	**5.210**
flows	Low	2.220	1.856	2.225	0.993	0.771	0.779	0.789	0.661	1.694	3.640	3.121	3.136	**3.963**
(m^3s^{-1})	High	16.030	15.890	10.220	7.046	6.877	4.371	5.444	12.260	12.840	14.080	12.470	13.380	**6.328**
Peak flow (m^3s^{-1})		97.85	79.36	69.47	81.07	46.97	38.25	56.92	73.04	76.40	115.90	64.49	91.47	**115.90**
Runoff (mm)		169	109	120	71	44	39	47	85	114	171	166	175	**1310**
Rainfall (mm)		202	108	176	85	82	95	133	150	196	225	202	211	**1865**

Factors affecting flow regime: S P | 1989 runoff is 85% of previous mean
Station type: VA | rainfall 88%

075002 Derwent at Camerton 1989

Measuring authority: NRA-NW | Grid reference: 35 (NY) 038 305 | Catchment area (sq km): 663.0
First year: 1960 | Level stn (m OD): 16.70 | Max alt. (m OD): 950

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	36.320	51.400	66.470	23.640	4.671	2.908	2.656	16.250	10.760	26.730	33.040	22.820	**24.666**
(m^3s^{-1}):	Peak	98.03	91.72	197.80	74.56	6.92	4.84	5.42	71.51	28.96	71.61	83.07	85.40	**197.80**
Runoff (mm)		147	188	269	92	19	11	11	66	42	108	129	92	**1173**
Rainfall (mm)		167	250	298	102	40	79	37	215	60	214	112	155	**1729**

Monthly and yearly statistics for previous record (Sep 1960 to Dec 1988—incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	38.360	27.380	24.890	19.840	12.940	10.270	11.800	18.580	25.990	35.880	40.660	41.350	**25.666**
flows	Low	9.587	4.837	7.466	4.359	2.753	2.041	2.503	2.384	2.885	2.755	14.570	14.740	**14.823**
(m^3s^{-1})	High	84.550	56.570	51.550	38.940	36.780	34.800	23.140	55.940	62.980	107.800	76.340	75.840	**34.235**
Peak flow (m^3s^{-1})		219.20	165.70	215.50	145.50	102.90	135.80	114.50	216.20	189.20	264.70	211.30	199.00	**264.70**
Runoff (mm)		155	101	101	78	52	40	48	75	102	145	159	167	**1222**
Rainfall (mm)*		181	101	144	95	102	108	119	147	184	201	194	190	**1786**

*(1961-1988)

Factors affecting flow regime: S P | 1989 runoff is 96% of previous mean
Station type: VA | rainfall 98%

078003 Annan at Brydekirk 1989

Measuring authority: SRPB | Grid reference: 35 (NY) 191 704 | Catchment area (sq km): 925.0
First year: 1967 | Level stn (m OD): 10.00 | Max alt. (m OD): 821

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	44.810	47.350	63.910	21.870	8.052	4.676	2.762	18.040	19.760	25.340	24.350	26.540	**25.530**
(m^3s^{-1})	Peak	234.90	151.00	293.30	113.40	24.69	22.78	8.10	152.70	159.40	78.41	82.00	171.50	**293.30**
Runoff (mm)		130	124	185	61	23	13	8	52	55	73	68	77	**870**
Rainfall (mm)		138	161	198	67	43	69	39	182	82	129	51	108	**1267**

Monthly and yearly statistics for previous record (Oct 1967 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	44.940	33.780	30.850	20.250	15.560	11.780	11.420	18.420	26.000	37.690	42.570	44.190	**28.112**
flows	Low	17.820	12.820	8.402	6.124	3.519	2.937	1.944	2.007	3.362	3.592	11.490	19.530	**18.402**
(m^3s^{-1})	High	83.440	55.800	53.770	40.600	53.160	32.150	34.940	76.390	76.320	86.820	77.930	87.020	**36.424**
Peak flow (m^3s^{-1})		405.40	305.00	242.80	213.30	172.50	171.30	253.10	378.90	446.60	499.10	325.00	355.40	**499.10**
Runoff (mm)		130	89	89	57	45	33	33	53	73	109	119	128	**959**
Rainfall (mm)		141	88	117	67	88	82	98	109	136	147	139	141	**1353**

Factors affecting flow regime: N | 1989 runoff is 91% of previous mean
Station type: VA | rainfall 94%

078004 Kinnel Water at Redhall 1989

Measuring authority: SRPB
First year: 1963
Grid reference: 35 (NY) 077 868
Level stn. (m OD): 53.70
Catchment area (sq km): 76.1
Max alt. (m OD): 697

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	4.618	4.622	6.263	1.643	0.544	0.306	0.163	2.070	2.018	2.676	2.146	2.532	**2.459**
(m^3s^{-1})	Peak	77.49	42.84	54.46	18.80	41.76	6.32	1.48	47.47	22.46	15.76	23.26	31.43	**77.49**
Runoff (mm)		163	147	220	56	19	10	6	73	69	94	73	89	**1019**
Rainfall (mm)		174	191	230	72	47	71	42	196	96	137	53	119	**1428**

Monthly and yearly statistics for previous record (Oct 1963 to Dec 1988—incomplete or missing months total 1.0 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	4.059	2.919	2.720	1.647	1.577	1.090	1.064	1.719	2.791	3.657	4.011	4.121	**2.615**
flows	Low	1.296	0.590	0.552	0.251	0.122	0.112	0.048	0.049	0.099	0.207	0.740	1.081	**1.507**
(m^3s^{-1})	High	8.456	5.362	5.124	4.161	5.496	3.282	3.435	7.513	6.689	7.288	7.535	8.490	**3.517**
Peak flow (m^3s^{-1})		79.34	90.99	59.19	66.70	51.79	36.09	60.14	65.25	91.37	110.90	86.69	103.60	**110.90**
Runoff (mm)		143	94	96	56	56	37	37	60	95	129	137	145	**1085**
Rainfall (mm)		147	94	123	76	99	89	98	117	151	157	152	155	**1468**

Factors affecting flow regime:
Station type: VA

1989 runoff is 94% of previous mean
rainfall 98%

080002 Dee at Glenlochar 1989

Measuring authority: SRPB
First year: 1977
Grid reference: 25 (NX) 733 641
Level stn. (m OD): 42.60
Catchment area (sq km): 809.0
Max alt. (m OD): 814

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	61.680	70.570	82.160	38.140	8.756	2.885	2.800	20.490	24.120	38.420	36.570	41.240	**35.478**
(m^3s^{-1})	Peak	164.30	126.20	196.70	104.20	54.38	4.43	4.83	90.36	137.00	90.68	103.40	176.90	**196.70**
Runoff (mm)		204	211	272	122	29	9	9	68	77	127	117	137	**1383**
Rainfall (mm)														

Monthly and yearly statistics for previous record (Nov 1977 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	62.670	50.110	51.970	27.530	18.450	14.560	13.530	29.020	39.350	62.190	64.840	66.940	**41.757**
flows	Low	32.440	23.820	21.140	17.100	6.267	3.184	2.945	2.054	8.630	25.920	17.140	32.690	**35.105**
(m^3s^{-1})	High	90.240	85.790	68.910	43.040	54.930	35.520	33.200	74.350	96.120	84.170	112.700	114.900	**48.086**
Peak flow (m^3s^{-1})		341.80	242.00	180.00	131.30	117.90	123.00	163.60	209.50	262.80	293.80	273.00	311.80	**341.80**
Runoff (mm)		208	152	172	88	61	47	45	96	126	206	208	222	**1630**
Rainfall (mm)*		196	120	177	62	78	101	97	137	217	221	215	215	**1836**

*(1977-1985)

Factors affecting flow regime:
Station type: VA

1989 runoff is 85% of previous mean

081003 Luce at Airyhemming 1989

Measuring authority: SRPB
First year: 1967
Grid reference: 25 (NX) 180 599
Level stn. (m OD): 19.00
Catchment area (sq km): 171.0
Max alt. (m OD): 438

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	7.908	7.436	8.835	6.059	0.903	0.571	0.485	4.463	2.463	10.310	5.237	7.856	**5.210**
(m^3s^{-1})	Peak	98.28	47.40	57.69	70.91	4.17	9.87	5.60	49.51	25.59	60.31	54.83	110.60	**110.60**
Runoff (mm)		124	105	138	92	14	9	8	70	37	162	79	123	**961**
Rainfall (mm)		133	134	174	127	36	92	69	167	69	207	74	140	**1422**

Monthly and yearly statistics for previous record (Jan 1967 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	10.320	6.875	6.361	3.485	2.573	1.929	2.333	3.688	6.353	8.838	9.892	9.105	**5.979**
flows	Low	4.540	0.789	1.359	0.454	0.260	0.225	0.191	0.277	0.385	1.689	3.857	2.445	**3.691**
(m^3s^{-1})	High	15.600	12.110	12.310	8.289	7.597	5.360	6.445	14.290	17.660	16.750	15.940	17.090	**7.787**
Peak flow (m^3s^{-1})		177.10	146.10	197.30	197.60	63.64	190.30	131.50	283.60	192.40	231.80	168.40	204.00	**283.60**
Runoff (mm)		162	98	100	53	40	29	37	58	96	138	150	143	**1104**
Rainfall (mm)		168	96	121	74	79	82	98	115	151	162	166	150	**1462**

Factors affecting flow regime: S P
Station type: VA

1989 runoff is 87% of previous mean
rainfall 97%

082002 Doon at Auchendrane 1989

Measuring authority: CRPB
First year: 1974
Grid reference: 26 (NS) 338 160
Level stn. (m OD): 22.20
Catchment area (sq km): 323.8
Max alt. (m OD): 844

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	9.936	10.040	11.360	6.028	2.478	2.265	2.397	5.935	4.101	7.928	6.463	7.088	**6.322**
(m^3s^{-1})	Peak	40.05	32.02	45.74	33.84	3.42	7.63	6.84	23.78	16.69	19.06	39.60	45.67	**45.74**
Runoff (mm)		82	75	94	48	21	18	20	49	33	66	52	59	**616**
Rainfall (mm)														

Monthly and yearly statistics for previous record (Jul 1974 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	10.830	7.516	8.053	4.677	4.749	3.870	4.246	5.352	8.079	10.050	10.700	10.890	**7.381**
flows	Low	5.203	3.685	4.270	3.157	2.390	2.546	2.639	2.557	4.227	4.732	4.785	6.247	**5.559**
(m^3s^{-1})	High	15.120	13.110	10.970	6.740	8.006	4.981	6.945	10.930	17.680	14.610	17.290	20.680	**8.517**
Peak flow (m^3s^{-1})		85.15	63.08	69.51	30.90	42.45	19.62	61.38	46.34	103.20	121.50	72.14	84.49	**121.50**
Runoff (mm)		90	57	67	37	35	31	35	44	65	83	86	90	**720**
Rainfall (mm)*		197	98	134	57	74	75	90	111	200	193	197	179	**1605**

*(1974-1985)

Factors affecting flow regime: S
Station type: VA

1989 runoff is 86% of previous mean

083003 Ayr at Catrine 1989

Measuring authority: CRPB
First year: 1970

Grid reference: 26 (NS) 525 259
Level stn. (m OD): 89.90

Catchment area (sq km): 166.3
Max alt. (m OD): 548

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	7.254	8 333	8.805	3.770	0.844	0 691	0.543	4 521	1.501	5 470	3.299	4.198	4 087
(m^3s^{-1}).	Peak	55.33	44 52	70.55	38 00	1 55	1.98	1.94	68.12	10 53	28 45	29 47	58.24	70.55
Runoff (mm)		117	121	142	59	14	11	9	73	23	88	51	68	775
Rainfall (mm)		138	161	173	66	35	70	47	181	59	133	50	90	1203

Monthly and yearly statistics for previous record (Sep 1970 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	8.741	5 342	5.569	2.792	2 046	1 992	2.126	3.112	5 387	6 634	8.175	7 618	4.963
flows	Low	3 182	1 534	1.480	0.733	0 593	0 639	0 417	0 410	0 597	0 631	2.147	3 312	3.613
(m^3s^{-1})	High	14.120	11 280	10 780	7 056	5 714	4.179	7.720	9.970	14 680	10 900	13 630	14 490	5.928
Peak flow (m^3s^{-1})		178 50	96 54	92.30	67.02	75 55	70 32	73 43	72 00	157.40	162.60	105.60	119 20	178.50
Runoff (mm)		141	79	90	44	33	31	34	50	84	107	127	123	942
Rainfall (mm)		143	78	110	64	71	80	90	97	132	146	153	138	1302

Factors affecting flow regime: H
Station type: VA

1989 runoff is 82% of previous mean
rainfall 92%

084012 White Cart Water at Hawkhead 1989

Measuring authority: CRPB
First year: 1963

Grid reference: 26 (NS) 499 629
Level stn. (m OD): 4 10

Catchment area (sq km). 227.2
Max alt. (m OD): 375

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	13.230	13 460	14.600	4 253	1.208	1.131	0.746	5 800	3 738	7 834	4.795	5.524	6.333
(m^3s^{-1}):	Peak	100.70	108 50	88.15			11 60	3.13	43.98	42 57	37 43	14 90	71 18	
Runoff (mm)		156	143	172	49	14	13	9	68	43	92	55	65	879
Rainfall (mm)		181	171	206	56	34	79	35	187	73	146	46	86	1300

Monthly and yearly statistics for previous record (Oct 1963 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	10 570	7.312	6 954	3 961	3 369	2 472	2 345	3 835	7 256	10 540	11.240	10 460	6.893
flows	Low	4 692	2.341	1.676	1.112	0 824	0 827	0.562	0 629	1 141	1 212	3 014	3.211	4.419
(m^3s^{-1})	High	21 190	12 830	14 000	8.523	9 188	6 542	7 863	12 640	21 990	46 570	19 470	19 610	10.946
Peak flow (m^3s^{-1})		187 40	139.20	117 00	82 46	115.10	65 13	86 31	111 30	132 90	134 40	134 00	187 10	187.40
Runoff (mm)		125	79	82	45	40	28	28	45	83	124	128	123	930
Rainfall (mm)		124	76	105	62	81	72	80	99	138	141	148	132	1258

Factors affecting flow regime. S
Station type VA

1989 runoff is 95% of previous mean
rainfall 103%

084016 Luggie Water at Condorrat 1989

Measuring authority. CRPB
First year 1966

Grid reference. 26 (NS) 739 725
Level stn (m OD): 68.00

Catchment area (sq km) 33.9
Max alt. (m OD) 107

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	1 059	1 335	1 483	0 533	0 261	0 223	0 186	0 499	0 336	0 709	0 593	0 696	0.657
(m^3s^{-1})	Peak	5 24	8 45	10 55	3 32	1.62	1 24	0 76	5 00	1 93	3 73	2.65	8.54	10.55
Runoff (mm)		84	95	117	41	21	17	15	39	26	56	45	55	611
Rainfall (mm)		109	126	151	47	28	58	26	170	56	111	37	73	992

Monthly and yearly statistics for previous record (Oct 1966 to Dec 1988—incomplete or missing months total 0.5 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	1 491	1 013	0 970	0 573	0 475	0 310	0 311	0.505	0 827	1 094	1 379	1.384	0.861
flows	Low	0 680	0 415	0 370	0 287	0 166	0 138	0 147	0 123	0 125	0 129	0 367	0 592	0.539
(m^3s^{-1})	High	3 104	1 944	1.636	1 030	1.199	0 692	1 751	1 606	3 386	2.121	2 362	2.669	1 121
Peak flow (m^3s^{-1})		30 25	19 34	28 11	10 80	14 54	6 19	27.14	22 06	44 46	32 53	30 68	36 04	44.46
Runoff (mm)		118	73	77	44	38	24	25	40	63	86	105	109	801
Rainfall (mm)		106	68	90	51	71	65	76	88	115	118	119	108	1075

Factors affecting flow regime.
Station type VA

1989 runoff is 76% of previous mean
rainfall 92%

085001 Leven at Linnbrane 1989

Measuring authority CRPB
First year. 1963

Grid reference: 26 (NS) 394 803
Level stn (m OD): 4 30

Catchment area (sq km) 784.3
Max alt. (m OD) 1130

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	84 640	104 000	88 300	47 230	11 070	11.450	11 060	26 610	38 000	46 550	52.810	17.580	44.539
(m^3s^{-1})	Peak	116 70	128 20	104 60	91 85	15 35	16 24	16 10	58 48	71 64	84 80	85 62	56 47	128.20
Runoff (mm)		289	321	302	156	38	38	38	91	126	159	175	60	1791
Rainfall (mm)		323	364	310	77	54	106	59	278	154	267	83	130	2205

Monthly and yearly statistics for previous record (Jul 1963 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	63 280	52 450	44.460	32.560	25 710	20 510	18.970	24 460	36 430	54 780	61 040	63 370	41.462
flows	Low	27 910	18 610	16 630	10 540	10 620	9 716	7 303	4 556	8 736	10 830	24.540	35 930	30.712
(m^3s^{-1})	High	119 100	102 100	98.410	52 050	73 120	51 860	44 640	85.740	91 360	90 150	115 000	125.500	52.784
Peak flow (m^3s^{-1})		150 50	140 80	122 20	83.14	92 02	78 48	86 12	115 30	121.60	138 50	145 70	148 50	150.50
Runoff (mm)		216	163	152	108	88	68	65	84	120	187	202	216	1688
Rainfall (mm)		230	138	178	99	124	112	126	146	216	229	234	227	2059

Factors affecting flow regime. S
Station type: VA

1989 runoff is 107% of previous mean
rainfall 107%

085003 Falloch at Glen Falloch 1989

Measuring authority: CRPB
First year: 1970

Grid reference: 27 (NN) 321 197
Level stn (m OD) 9 50

Catchment area (sq km): 80 3
Max alt. (m OD): 1130

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	13 280		10 810	2 018	1 488	1 510	0 906	8 966	5 675	8 286	3.501	3 463	
(m^3s^{-1})	Peak	170 70	135 70	93 14	20 35	17 57	47 73	21 21	186 40	171 00	100 30	77.26	144 50	**186.40**
Runoff (mm)		443		361	65	50	49	30	299	183	276	1'3	116	
Rainfall (mm)		524	566	421	87	72	:22	85	41/	223	403	120	134	**3174**

Monthly and yearly statistics for previous record (Oct 1970 to Dec 1988—incomplete or missing months total 0.3 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	8 346	5 087	6 090	2 923	2 910	2 286	2.784	3 609	6 666	7 309	8 688	8 570	**5.445**
flows	Low	1.926	0 489	0 853	0 408	0 133	0 328	0 634	0 339	0.751	1 362	3 069	1 416	**4.440**
(m^3s^{-1})	High	19 630	8 387	11 750	6 325	10 980	5 609	7 401	10 510	11.210	16 050	14 670	15 740	**7.003**
Peak flow (m^3s^{-1})		205 70	153 00	178.60	135 00	152 40	138 90	174.70	213 '0	197 70	226 70	187 20	187 40	**226.70**
Runoff (mm)		278	155	203	94	97	74	93	120	2'5	244	280	286	**2140**
Rainfall (mm)		349	193	251	1'9	145	136	171	189	303	316	360	359	**2891**

Factors affecting flow regime:
Station type: VA

1989 runoff is % of previous mean
rainfall 110%

090003 Nevis at Claggan 1989

Measuring authority: HRPB
First year: 1982

Grid reference 27 (NN) 116 742
Level stn (m OD): 3.6

Catchment area (sq km): 76.8
Max alt. (m OD):

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	17 790	15 510	11 920	3 017	3 470	'991	1 433	10 580	6 650	11 130	4 129	2 831	**7 511**
(m^3/s)	Peak	195 60	'56 30	70 00	33 41	31 88	69 35	22 94	119 20	'68 20	90 07	46 61	73 09	**195.60**
Runoff (mm)		620	489	416	102	121	67	50	369	224	388	139	99	**3084**
Rainfall (mm)		693	707	441	101	72	130	108	394	259	499	140	155	**3699**

Monthly and yearly statistics for previous record (Sep 1982 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	7 585	4 219	6.516	4 984	4 421	1 999	4.156	4 723	7.868	9 429	7 853	11 810	**6.320**
flows	Low	2 517	0 690	2 188	3 431	1.123	0 970	0 907	1 116	2.909	6 446	3 755	8 777	**5.186**
(m^3/s)	High	15 430	7 197	10 370	6 728	12 600	2 830	8.608	9 820	11 010	16 380	15 360	15 480	**7 202**
Peak flow (m^3/s)		95 '1	65 85	122 50	46 28	67 50	25 '1	105 00	'30 50	87 66	146 50	110 30	189 00	**189.00**
Runoff (mm)		265	135	227	'68	'54	67	145	165	266	329	265	412	**2598**
Rainfall (mm)*		299	153	371	98	191	72	227	210	293	338	342	463	**3057**

*(1986-1988)

Factors affecting flow regime
Station type: VA

1989 runoff is 119% of previous mean
rainfall 121%

094001 Ewe at Poolewe 1989

Measuring authority: HRPB
First year: 1970

Grid reference 18 (NG) 859 803
Level stn (m OD) 4 60

Catchment area (sq km): 441.1
Max alt. (m OD): 1014

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	75 470	83 670	40.960	16 600	13 320	9 939	12.120	41 430	30 190	53 630	37.500	17 170	**35.744**
(m^3s^{-1})	Peak	165 60	247 70	69.13	41 15	20 23	26 91	27 84	93 98	54 87	91 01	81 97	48 39	**247.70**
Runoff (mm)		458	459	249	98	81	58	74	252	177	326	220	104	**2556**
Rainfall (mm)		506	538	341	70	101	133	78	307	164	394	108	146	**2886**

Monthly and yearly statistics for previous record (Nov 1970 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	40 630	28 490	27 830	22 720	15.540	12 880	14 020	16 820	31.940	35 320	46.520	47 580	**28 354**
flows	Low	13 820	10 660	8 842	4 537	3 862	3 725	7 884	6 740	8 046	:3 160	21 020	'6 500	**19.389**
(m^3s^{-1})	High	81 130	46 880	54 440	38 270	36 280	27 180	26 180	33 070	57 270	66 220	78 300	81 840	**35.549**
Peak flow (m^3s^{-1})		177 10	105 00	117 00	73 59	65 63	64 43	45 08	85 46	109.20	125 50	136.10	179 80	**179.80**
Runoff (mm)		247	158	169	134	94	76	85	102	188	214	273	289	**2029**
Rainfall (mm)		258	161	209	125	114	117	142	155	254	284	327	315	**2461**

Factors affecting flow regime: N
Station type: VA

1989 runoff is 126% of previous mean
rainfall 117%

095001 Inver at Little Assynt 1989

Measuring authority: HRPB
First year: 1977

Grid reference. 29 (NC) 147 250
Level stn (m OD). 60.30

Catchment area (sq km): 137 5
Max alt (m OD): 988

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	14 920	21 150	12 460	5 154	3 396	2 484	3 835	10 050	5 938	11 410	8 660	5 620	**8.690**
(m^3s^{-1})	Peak	33 44	63 64	18 81	11 28	6 34	5 36	11 49	23 55	9.79	24 75	22.31	12.60	**63.64**
Runoff (mm)		291	372	243	97	66	47	75	196	112	222	163	109	**1993**
Rainfall (mm)		370	444	274	74	80	104	103	237	116	313	107	136	**2358**

Monthly and yearly statistics for previous record (Aug 1977 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	10 690	7 411	9 2'4	5 612	3 987	3 241	4 934	5 960	10 680	12 820	13.380	11 540	**8.298**
flows	Low	4 082	2.397	4 179	3 453	1 660	1 812	2 432	3 394	5.263	6 227	6.572	4 631	**6.956**
(m^3s^{-1})	High	19.950	11 460	19 400	7 552	7 131	5 636	10 340	8 579	16 390	21 180	23 960	17 580	**10.784**
Peak flow (m^3s^{-1})		55 24	31 02	62.82	14 93	20 92	19 72	15.19	17 80	56 50	57 51	50 06	46 65	**62.82**
Runoff (mm)		208	132	179	106	78	61	96	116	201	250	252	225	**1904**
Rainfall (mm)*		227	115	207	94	81	104	138	156	255	253	289	259	**2178**

*(1978-1988)

Factors affecting flow regime: N
Station type: VA

1989 runoff is 105% of previous mean
rainfall 108%

096001 Halladale at Halladale 1989

Measuring authority: HRPB
First year: 1976

Grid reference: 29 (NC) 891 561
Level stn. (m OD): 23.20

Catchment area (sq km): 204.6
Max alt. (m OD): 580

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg.	4.478	10.660	5.285	2.139	0.781	0.904	0.763	0.783	0.447	4.951	3.741	5.496	**3.326**
(m^3s^{-1}):	Peak	85.03	59.64	34.64	23.93	3.85	3.88	4.82	3.05	3.42	95.30	27.89	98.79	**98.79**
Runoff (mm)		59	126	69	27	10	11	10	10	6	65	47	72	**513**
Rainfall (mm)		92	162	82	53	45	57	36	78	36	111	53	79	**884**

Monthly and yearly statistics for previous record (Jan 1976 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	8.853	6.252	6.100	2.841	2.128	1.751	1.793	2.639	4.874	7.147	8.887	7.972	**5.100**
flows	Low	5.333	1.555	2.907	0.624	0.279	0.271	0.215	0.186	2.181	1.441	2.510	3.004	**3.420**
(m^3s^{-1})	High	11.900	10.940	9.753	6.442	5.434	4.128	4.943	9.192	7.886	16.560	14.730	12.390	**6.418**
Peak flow (m^3s^{-1})		98.96	68.52	122.60	69.28	108.00	140.80	129.10	76.64	189.10	126.00	163.20	162.00	**189.10**
Runoff (mm)		116	75	80	36	28	22	23	35	62	94	113	104	**787**
Rainfall (mm)		138	68	109	64	60	64	69	79	122	131	143	126	**1173**

Factors affecting flow regime: N
Station type: VA

1989 runoff is 65% of previous mean
rainfall 75%

101002 Medina at Upper Shide 1989

Measuring authority: NRA-S
First year: 1965

Grid reference: 40 (SZ) 503 874
Level stn. (m OD): 10.40

Catchment area (sq km): 29.8
Max alt. (m OD): 167

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0.187	0.353	0.317	0.219	0.129	0.099	0.078	0.064	0.089	0.114	0.131	0.424	**0.183**
(m^3s^{-1}).	Peak	0.33	2.86	1.93	1.06	0.25	0.26	0.20	0.14	0.32	0.87	0.47	3.09	**3.09**
Runoff (mm)		17	29	28	19	12	9	7	6	8	10	11	38	**193**
Rainfall (mm)		40	84	77	67	15	28	20	25	47	107	62	152	**724**

Monthly and yearly statistics for previous record (Oct 1965 to Dec 1988—incomplete or missing months total 6.8 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	0.456	0.405	0.346	0.271	0.208	0.147	0.129	0.120	0.159	0.241	0.340	0.382	**0.266**
flows	Low	0.150	0.160	0.121	0.104	0.094	0.069	0.073	0.044	0.080	0.110	0.088	0.116	**0.122**
(m^3s^{-1})	High	0.928	0.760	0.903	0.522	0.356	0.212	0.199	0.180	0.365	0.555	0.769	0.663	**0.335**
Peak flow (m^3s^{-1})		6.47	6.00	7.28	5.44	7.00	1.79	3.72	1.74	3.74	4.73	8.64	6.30	**8.64**
Runoff (mm)		41	33	31	24	19	13	12	11	14	22	30	34	**282**
Rainfall (mm)*		95	66	97	47	63	50	52	60	60	109	79	103	**881**

*(1966-1988)

Factors affecting flow regime: G I
Station type: FL

1989 runoff is 69% of previous mean
rainfall 82%

201007 Burn Dennet at Burndennet Bridge 1989

Measuring authority: DOEN
First year: 1975

Grid reference: 24 (IC) 372 047
Level stn (m OD): 2.00

Catchment area (sq km): 145.3
Max alt (m OD): 539

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	4.400	5.904	7.811	6.115	2.838	1.769	1.385	3.038	2.185	7.019	5.456	3.203	**4.251**
(m^3s^{-1})	Peak	28.14	33.09	47.48	36.85	5.53	2.29	2.67	27.96	12.19	49.57	22.36	18.36	**49.57**
Runoff (mm)		81	98	144	109	52	32	26	56	39	129	97	59	**923**
Rainfall (mm)		93	130	147	111	39	44	50	144	63	188	62	54	**1125**

Monthly and yearly statistics for previous record (Jun 1975 to Dec 1988—incomplete or missing months total 0.1 years)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	6.393	4.724	4.585	2.780	2.335	1.780	1.872	2.485	3.454	4.557	4.865	5.516	**3.778**
flows	Low	3.410	2.244	2.441	1.687	0.925	0.843	0.832	0.579	0.664	2.596	2.130	3.208	**2.634**
(m^3s^{-1})	High	9.542	8.897	6.992	5.003	5.024	3.649	3.990	7.213	8.151	7.874	7.351	8.156	**5.012**
Peak flow (m^3s^{-1})		70.02	53.00	39.02	25.39	25.51	18.84	50.79	55.46	67.37	110.80	64.52	59.53	**110.80**
Runoff (mm)		118	80	85	50	43	32	35	46	62	84	87	102	**821**
Rainfall (mm)		132	70	109	56	72	[illegible]	90	[illegible]	[illegible]	[illegible]	[illegible]	115	**1152**

Factors affecting flow regime: E
Station type: VA

1989 runoff is 112% of previous mean
rainfall 98%

201008 Derg at Castlederg 1989

Measuring authority: DOEN
First year: 1976

Grid reference: 23 (IH) 265 842
Level stn (m OD): 43.00

Catchment area (sq km): 337.3
Max alt. (m OD): 543

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	20.410	29.140	28.480	13.690	3.439	1.258	1.143	12.700	5.441	24.750	12.060	8.233	**13.324**
(m^3s^{-1}):	Peak	103.40	93.34	159.50	78.53	13.03	8.38	10.79	98.70	37.40	223.20	48.14	64.61	**223.20**
Runoff (mm)		162	209	226	105	27	10	9	101	42	197	93	65	**1246**
Rainfall (mm)		165	243	222	111	41	68	55	191	68	246	67	82	**1559**

Monthly and yearly statistics for previous record (Jan 1976 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	22.600	14.110	16.390	7.056	6.897	5.058	6.153	9.333	14.980	17.460	20.800	21.370	**13.530**
flows	Low	12.090	2.356	8.844	1.862	0.534	1.048	1.336	0.259	1.703	9.480	7.358	13.420	**11.403**
(m^3s^{-1})	High	33.100	24.550	23.410	15.360	17.200	11.230	11.710	30.260	30.630	30.740	35.830	32.690	**15.763**
Peak flow (m^3s^{-1})		202.60	187.30	153.70	135.60	163.50	87.33	161.00	176.90	232.90	192.90	205.20	187.30	**232.90**
Runoff (mm)		179	103	130	54	55	39	49	74	115	139	160	170	**1266**
Rainfall (mm)*		200	94	165	83	100	78	124	154	157	190	144	200	**1689**

*(1983-1988)

Factors affecting flow regime: E
Station type: VA

1989 runoff is 98% of previous mean
rainfall 92%

203012 Ballinderry at Ballinderry Bridge 1989

Measuring authority: DOEN
First year: 1970

Grid reference: *23* (IH) 926 799
Level stn (m OD): 16.00

Catchment area (sq km): 419.5
Max alt. (m OD): 476

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	9 526	12 830	17 260	11 880	3 895	2 636	1 794	2 775	2 469	8 019	7 045	7 533	**7 274**
(m^3s^{-1})	Peak	30 42	38 48	67 04	55 32	13.62	12 62	4 92	16 30	9 39	73 42	27 65	59 84	**73.42**
Runoff (mm)		61	74	110	73	25	16	[illegible]	18	15	51	44	48	**547**
Rainfall (mm)		70	107	133	103	33	56	49	118	52	142	46	70	**979**

Monthly and yearly statistics for previous record (Jul 1970 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	16.510	12 220	10 570	6 423	5.374	3 753	2 864	5 102	6.244	9.317	12.740	14 280	**8.733**
flows	Low	9.339	4 805	5.502	3 515	2 454	1 627	1.518	1 060	1 965	2 331	5 122	4 946	**5 251**
(m^3s^{-1})	High	24.690	24 430	16 560	13 140	12.740	7 524	7 496	17 640	21 020	17 200	21 860	21.490	**11.532**
Peak flow (m^3s^{-1})		183 20	139.90	98 37	106 70	109 20	61 60	127 20	140 10	141 00	194.80	117 70	138.00	**194.80**
Runoff (mm)		105	71	67	40	34	23	18	33	39	59	76	91	**657**
Rainfall (mm)*		133	64	110	60	68	64	73	119	97	117	88	114	**1107**

*(1983-1988)

Factors affecting flow regime: N
Station type: VA

1989 runoff is 83% of previous mean
rainfall 88%

203020 Moyola at Moyola New Bridge 1989

Measuring authority: DOEN
First year: 1971

Grid reference: *23* (IH) 955 905
Level stn (m OD): 13.00

Catchment area (sq km): 306 5
Max alt (m OD): 554

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	7 707	12 880	17 150	13 280	2.921	2 424	1 689	3.286	2 927	11 410	8 001	6 606	**7 489**
(m^3s^{-1})	Peak	26 41	56 55	86.93	102 80	7 20	29 81	4 80	26.28	19 79	79.40	29 48	54.55	**102.80**
Runoff (mm)		67	102	150	112	26	21	15	29	25	100	68	58	**771**
Rainfall (mm)		82	139	170	121	43	72	54	124	64	164	56	78	**1167**

Monthly and yearly statistics for previous record (Feb 1971 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	15 370	11 120	9 873	5 419	4 769	3 397	2 730	4 545	6 069	8.978	11 110	13.440	**8.063**
flows	Low.	9 707	3 696	3 776	2 238	1 335	1 015	0 952	0 748	1.366	2 000	4 567	5 088	**4 961**
(m^3s^{-1})	High	23.280	21 510	15.590	11 140	12 360	6 900	6 496	15 310	19 100	15 880	20 770	22 170	**10 598**
Peak flow (m^3s^{-1})		152 20	121.90	81.02	70 38	114 10	67 84	83 33	111 00	112 70	134 80	116.50	154.60	**154.60**
Runoff (mm)		134	89	86	46	42	29	24	40	51	78	94	117	**830**
Rainfall (mm)*		161	77	127	65	78	65	82	126	112	135	105	131	**1264**

*(1983-1988)

Factors affecting flow regime: S PG I
Station type: VA

1989 runoff is 93% of previous mean
rainfall 92%

205004 Lagan at Newforge 1989

Measuring authority: DOEN
First year: 1972

Grid reference: *33* (IJ) 329 693
Level stn. (m OD): 2 00

Catchment area (sq km): 490 4
Max alt. (m OD): 532

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	8 509	8 163	11 220	17 430	2 163	1 832	1 348	1 943	1 587	7.187	8 567	12 790	**6.879**
(m^3s^{-1})	Peak	16 62	13 43	26 24	56 98	4 85	11 61	11.17	11.49	9 25	45 78	17 16	48.12	**56.98**
Runoff (mm)		46	40	61	92	12	10	7	11	8	39	45	70	**442**
Rainfall (mm)														

Monthly and yearly statistics for previous record (Aug 1972 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg	17.750	12 180	11 000	6 257	4 749	3 420	2 634	4 680	6 277	11.170	11.900	16.290	**9.024**
flows	Low	10 300	5 311	2.820	2 064	1 208	0 944	0 789	0 615	0 902	1 075	3 059	3 843	**4 810**
(m^3s^{-1})	High	26 460	22.330	18 740	19 170	16 600	11.230	8 018	19 470	18 090	27 600	27 690	43 090	**12.235**
Peak flow (m^3s^{-1})		84 30	66 22	69.56	112 20	55 15	62 72	24 30	76 10	70 53	121 00	91 08	128.40	**128 40**
Runoff (mm)		97	61	60	33	26	18	14	26	33	61	63	89	**581**
Rainfall (mm)*		96	63	86	47	58	53	47	87	106	71	68	100	**882**

*(1983-1985)

Factors affecting flow regime: GEI
Station type: VA

1989 runoff is 76% of previous mean

205005 Ravernet at Ravernet 1989

Measuring authority: DOEN
First year: 1972

Grid reference: *33* (IJ) 267 613
Level stn (m OD): 31.00

Catchment area (sq km): 69.5
Max alt (m OD): 163

Hydrometric statistics for 1989

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Flows	Avg	0 689	0 696	1 103	2 422	0 080	0 052	0 024	0 045	0 050	0 646	0 657	1 561	**0.667**
(m^3s^{-1})	Peak	1 46	1 27	4 17	10 31	0 30	0 51	0.25	0 21	0 23	7 03	1 33	10 27	**10.31**
Runoff (mm)		27	24	43	90	3	2	.	2	2	25	25	60	**303**
Rainfall (mm)		43	63	79	108	23	64	38	87	43	109	42	95	**794**

Monthly and yearly statistics for previous record (Aug 1972 to Dec 1988)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
Mean	Avg.	2.260	1.621	1 223	0 735	0 490	0 300	0 140	0 382	0.605	1 315	1 315	1 896	**1.022**
flows	Low	0 931	0 502	0.313	0 195	0 054	0 040	0 006	0 008	0 013	0 066	0 260	0.573	**0 678**
(m^3s^{-1})	High	4.045	3 653	2 089	2 374	1 761	1 260	0 356	2 103	2.232	4 361	2 994	5 916	**1.278**
Peak flow (m^3s^{-1})		15 44	18 89	14.98	19 75	3 82	11 9[illegible]	2 60	17 52	11 32	24 15	17 04	22.79	**24 15**
Runoff (mm)		87	57	47	27	19	11	5	15	23	51	49	73	**464**
Rainfall (mm)		101	59	78	47	64	62	58	80	89	94	81	95	**908**

Factors affecting flow regime: N
Station type: FV

1989 runoff is 65% of previous mean
rainfall 87%

THE SURFACE WATER DATA RETRIEVAL SERVICE

The Surface Water Archive comprises some 26,000 station-years of daily river flows and incorporates data from over 1400 gauging stations throughout the United Kingdom. In addition to gauged flow data, naturalised data have been derived from the records of a small number of gauging stations. Catchment areal rainfall and the highest instantaneous flow, when available, are also archived on a monthly basis.

In order that the contents of the archive may be readily accessible, a suite of programs has been developed to provide a selection of retrieval options. Descriptions of these options are listed below, and examples of the computer output are given on pages 145 to 153. The data retrieval programs have been designed to allow flexibility in the presentation of the options, particularly those producing graphical output. Before finalising a data request it is recommended that the Concise Register of Gauging Stations on pages 154 to 159, and the Summary of Archived Data on pages 160 to 168, be consulted to check the availability of suitable data sets.

In response to user requirements the data retrieval facilities are being continually extended. A wide range of specialist analyses and presentations is now available. Individuals having data requirements not catered for in the standard retrieval suite are invited to discuss their particular needs - address opposite.

Retrievals are normally available on line-printer listings, magnetic tape or IBM compatible disk, or as hydrograph plots.

Cost of Service

To cover the computing and handling costs, a moderate charge will be made depending on the output options selected. Estimates of these charges may be obtained on request; the right to amend or waive charges is reserved.

Requests for Retrieval Options

Requests for retrieval options should include: the name and address to which output should be directed, the gauging stations for which data are required together with the period of record of interest and the title of the required options. Where possible, a daytime telephone number should be given.

Requests should be addressed to:

Surface Water Archive Office
Institute of Hydrology
Maclean Building
Crowmarsh Gifford
WALLINGFORD
OXFORDSHIRE OX10 8BB

Tel: (0491) 38800 Fax: (0491) 32256

Hydrological Data at the Institute of Hydrology

The Surface Water Archive is one of several major sources of hydrological data held at Wallingford. Others include an archive of flood peaks from over 600 catchments, a flood event archive comprising rainfall and river flows at short time intervals for over 4000 individual events and experimental catchment data for Plynlimon (mid-Wales) and Balquhidder (Scotland) Data may be retrieved from these sources in a variety of formats. Advice can also be given on equivalent European data through staff involved in the FRIEND project of the International Hydrological Programme.

The Surface Water Archive is part of ENDNET, the environmental data network of the Natural Environment Research Council.

LIST OF SURFACE WATER RETRIEVAL OPTIONS*

OPTION NUMBER	TITLE	NOTES
1	Table of daily mean gauged discharges	Includes monthly and annual summary statistics. Flows in cubic metres per second.
	Table of daily mean naturalised discharges	Includes monthly and annual summary statistics. Flows in cubic metres per second.
	Yearbook data tabulation (daily)	River flow and catchment rainfall data for a specified year with basic gauging station and catchment details and flow statistics derived from the historical record.
	Table of monthly mean gauged discharges	Includes monthly and annual summary statistics. Flows in cubic metres per second.

*To enable the suitability of individual flow records for particular applications to be assessed more effectively all retrievals are accompanied by the relevant gauging station and catchment details (where available).

	Table of monthly mean naturalised discharges	Includes monthly and annual summary statistics. Flows in cubic metres per second.
	Yearbook data tabulation (monthly)	Monthly river flow and catchment rainfall data for a specified year together with comparative statistics derived from the historical record. Naturalised flows (where available) - and the corresponding runoff - may also be tabulated.
	Table of monthly extreme flows	The lowest and highest daily mean flows, together with the highest instantaneous flow and date of occurrence (where available). Flows in cubic metres per second. Includes summary statistics.
	Table of catchment monthly rainfall	Rainfall totals in millimetres and as a percentage of the 1941-70 catchment average. Includes summary statistics.
	Table of catchment monthly areal rainfall and runoff	Runoff is normally derived from the monthly mean gauged flow. An additional listing is provided for catchments with naturalised flow records. Includes summary statistics. Rainfall and runoff totals are in millimetres.
10	Hydrographs of daily mean flows	Choices of scale, units, truncation level and overlay grid pattern are available. The period of record maximum and minimum flows, or the mean flow, may be included. The plots may be based on single or n-day means, or on n-day running mean flows.
	Hydrographs of monthly mean flows	Choices of scale, units and overlay grid pattern are available. The period of record maximum, minimum and mean flows may be included.
	Flow duration statistics	Tabulation of the 1-99 percentile flows with optional plot of the flow duration curve. The percentiles may be derived from daily flows or n-day averages and the analysis may be restricted to nominated periods within the year, e.g. April-September only. Choices of scales, grid marking and units are available and the percentiles may be expressed as a percentage of the average flow or of a nominated flow.
	Table of gauging station reference information	Tabulation of selected gauging station details and catchment characteristics for nominated gauging stations.
	Table of hydrometric statistics	Provides a comparison between summary statistics for a selected year, or a group of years, and the corresponding statistics for a nominated period of record.
	Gauging station and catchment description	A brief summary of the gauging station, its history and major influences on the flow regime, together with catchment details.
16	River flow pattern plots	Three plots on an A4 sheet: a) daily mean flow hydrograph for a selected year b) monthly mean flow hydrograph for the selected year. The maximum and minimum monthly flows, together with the 30-day running mean for the preceding period of record may be included c) flow duration curve for the specified year. A flow duration curve for the period of record may be included.
	Gauging station summary sheet	Includes a daily flow hydrograph (with period of record extreme values) and flow duration curve together with summary statistics relating to river flow, catchment runoff and catchment rainfall. A description of the gauging station and catchment is also provided together with selected catchment characteristics and a concise summary of the archived data.

OPTION 1 TABLE OF DAILY MEAN GAUGED DISCHARGES

050001 TAW AT UMBERLEIGH DAILY MEAN GAUGED DISCHARGES IN CUBIC METRES PER SECOND

1961

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	19.190	10.920	37.280	13.900	8.927	16.710	3.006	3.249	1.272	39.130	44.220	33.430
2	19.140	11.980	40.710	12.020	13.230	29.010	3.125	2.242	1.305	63.770	35.000	27.270
3	23.450	43.450	28.700	10.650	18.080	16.470	3.740	1.919	1.235	105.200	29.010	23.160
4	17.560	26.340	23.290	9.823	18.300	15.690	3.109	1.857	1.157	76.200	24.630	20.440
5	15.950	22.470	21.020	8.913	17.550	13.840	3.043	2.091	1.109	56.640	20.230	17.690
6	15.520	19.190	21.440	8.200	19.040	17.160	3.231	8.561	1.078	44.100	17.230	18.600
7	13.830	17.750	33.840	7.679	17.730	11.390	2.662	4.332	1.079	33.600	15.170	31.070
8	12.870	16.930	37.610	7.318	15.710	10.670	2.441	3.152	1.106	30.360	13.260	69.430
9	16.190	20.630	223.400	7.043	13.770	9.451	2.263	2.787	1.096	33.360	11.630	41.100
10	14.200	16.420	173.500	6.694	29.540	10.960	2.174	2.405	1.228	31.090	10.560	40.460
11	11.690	15.290	136.900	7.144	17.620	17.560	2.037	2.200	1.630	30.730	10.360	69.490
12	14.250	15.010	107.300	5.962	14.770	10.980	2.084	2.037	2.238	29.440	9.672	41.650
13	15.650	13.250	95.870	5.422	12.960	9.766	2.115	1.920	2.266	23.360	6.364	104.300
14	80.200	11.940	64.940	5.040	12.020	9.056	2.013	1.646	2.418	21.270	7.645	136.100
15	59.900	11.250	47.040	4.626	18.640	8.388	1.993	1.610	4.037	34.210	7.235	74.980
16	59.230	10.400	36.300	4.563	18.690	7.624	1.997	1.686	2.511	23.060	7.329	48.700
17	59.010	9.654	28.140	4.267	33.340	7.013	1.939	1.564	4.231	28.540	8.770	35.680
18	61.550	8.956	23.000	4.017	28.820	6.398	1.814	1.518	21.100	25.060	31.920	26.640
19	51.280	8.265	19.490	3.848	21.890	5.996	1.918	1.597	42.060	32.680	45.490	22.760
20	51.260	7.799	16.960	3.671	24.980	5.551	1.682	2.931	34.500	76.020	55.820	83.240
21	57.170	13.540	54.130	3.520	18.270	4.922	2.531	2.170	23.510	57.400	41.600	40.630
22	44.360	14.310	57.040	3.454	16.660	4.532	8.875	2.847	17.760	42.990	37.140	29.310
23	36.600	31.930	44.340	3.370	18.970	4.320	5.221	1.727	14.530	32.740	27.840	23.180
24	32.140	16.980	39.990	3.736	23.800	4.180	3.528	1.605	20.270	79.240	22.910	18.880
25	25.910	14.590	38.440	4.100	31.200	3.912	2.786	1.517	16.820	100.000	19.190	16.110
26	21.520	13.620	49.640	10.110	25.570	3.759	2.607	1.422	15.610	63.880	19.650	18.300
27	18.590	24.220	32.660	24.990	24.870	3.541	2.319	1.355	15.740	49.610	35.840	42.330
28	16.460	22.710	26.900	13.750	20.850	3.346	2.151	1.310	12.460	40.030	38.720	65.270
29	14.910		22.310	14.700	18.340	3.165	2.000	1.279	12.950	58.140	30.400	74.130
30	13.190		18.360	10.390	16.400	3.035	1.692	1.246	18.350	60.950	44.110	88.900
31	11.850		15.890		15.370		2.710	1.224		52.880		53.640
MISSING DAYS	0	0	0	0	0	0	0	0	0	0	5	0
MEAN	29.827	16.857	52.144	7.776	19.552	9.114	2.749	2.206	9.896	47.732	24.213	46.348
MIN	11.690	7.799	15.890	3.320	8.922	3.035	1.814	1.224	1.078	21.270	7.235	16.110
MAX	80.200	43.450	223.400	24.990	33.340	29.010	8.875	8.561	42.060	105.200	55.820	136.100
MONTHLY TOTALS (CUMEC.DAYS)	924.64	471.99	1616.45	233.29	606.13	273.42	85.23	68.44	296.87	1479.68	726.39	1436.79

SUMMARY: MAX 223.400 ON 9 MAR
MIN 1.078 ON 6 SEP
MEAN 22.519

OPTION 2 TABLE OF DAILY MEAN NATURALISED DISCHARGES

039001 THAMES AT KINGSTON DAILY MEAN NATURALISED DISCHARGES IN CUBIC METRES PER SECOND

1961

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	73.100	67.000	83.100	228.000	104.000	99.200	52.600	72.200	31.700	113.000	85.400	82.800
2	71.700	66.200	159.000	227.000	86.200	192.000	50.700	50.600	31.000	104.000	84.000	72.400
3	67.600	68.300	232.000	192.000	87.300	209.000	50.700	52.200	31.700	80.300	76.600	66.600
4	65.700	79.100	196.000	135.000	95.700	142.000	46.700	42.500	30.900	77.500	53.600	69.100
5	65.200	81.100	139.000	132.000	93.400	106.000	48.900	43.600	29.000	72.100	66.100	68.800
6	68.500	63.000	127.000	117.000	84.000	102.000	45.600	120.000	29.200	93.300	61.100	69.400
7	69.300	60.200	128.000	115.000	81.800	91.100	45.500	125.000	29.600	111.000	61.800	72.400
8	74.300	62.700	189.000	109.000	78.200	93.400	46.600	79.100	30.300	75.400	61.000	116.000
9	74.000	63.200	216.000	96.300	77.600	89.100	45.100	67.600	29.700	79.100	60.500	127.000
10	75.700	65.700	242.000	105.000	92.800	82.000	43.500	64.400	26.300	79.100	57.100	104.000
11	82.300	67.800	267.000	101.000	97.100	90.300	39.800	60.600	31.300	78.900	57.600	98.900
12	80.300	67.300	277.000	97.900	89.900	87.100	44.900	36.500	39.100	78.600	57.500	87.000
13	76.700	63.500	273.000	96.000	74.000	78.300	42.800	40.100	37.700	63.600	57.200	90.100
14	76.800	61.000	289.000	120.000	71.400	73.800	41.200	41.500	38.500	67.200	55.400	230.000
15	99.400	56.700	274.000	114.000	77.700	70.300	43.200	45.600	48.600	67.800	53.100	314.000
16	107.000	59.900	253.000	84.900	92.300	69.300	40.600	38.600	41.300	66.700	56.600	279.000
17	111.000	55.500	218.000	85.100	91.200	67.600	41.600	37.000	36.300	69.600	73.700	228.000
18	121.000	55.300	160.000	80.900	93.100	65.400	42.000	37.700	39.900	85.700	96.800	145.000
19	112.000	54.500	139.000	74.200	92.200	66.300	41.600	37.600	49.600	81.300	97.600	116.000
20	109.000	56.300	127.000	76.500	100.000	64.400	41.400	37.400	134.000	136.000	121.000	110.000
21	109.000	53.100	117.000	75.100	122.000	64.200	40.300	36.200	67.300	179.000	146.000	156.000
22	113.000	53.800	173.000	75.300	102.000	59.800	55.700	36.400	61.800	147.000	131.000	162.000
23	111.000	58.100	208.000	73.100	90.400	61.000	55.400	36.100	40.100	102.000	97.900	132.000
24	95.600	60.100	204.000	72.400	111.000	61.700	55.300	35.100	42.700	92.600	90.400	101.000
25	86.100	59.200	204.000	79.500	177.000	61.000	48.000	34.900	51.900	94.100	72.000	102.000
26	78.800	61.000	203.000	128.000	266.000	57.100	47.400	32.800	131.000	167.000	75.600	99.300
27	77.500	61.000	161.000	183.000	267.000	57.700	39.100	34.300	162.000	90.900	74.600	94.800
28	72.500	64.800	131.000	194.000	212.000	57.400	37.800	32.700	98.300	85.500	100.000	111.000
29	71.800		135.000	174.000	171.000	54.200	39.400	32.400	73.600	80.300	89.500	218.000
30	71.700		145.000	160.000	122.000	50.700	37.500	32.200	101.000	81.400	87.700	295.000
31	67.500		204.000		108.000		44.500	30.300		82.100		264.000
MISSING DAYS	0	0	0	0	0	0	0	0	0	0	0	0
MEAN	85.003	62.336	189.455	119.373	113.203	84.113	45.090	48.245	53.247	91.045	79.030	138.116
MIN	65.200	53.100	83.100	72.400	71.400	50.700	37.500	30.300	28.300	63.800	53.100	66.600
MAX	121.000	81.100	289.000	228.000	267.000	209.000	55.700	125.000	162.000	179.000	146.000	314.000
MONTHLY TOTALS (CUMEC.DAYS)	2635.10	1745.40	5873.10	3581.20	3509.30	2523.40	1397.80	1495.60	1597.40	2822.40	2370.90	4281.60

SUMMARY. MAX 314.000 ON 15 DEC
MIN 26.300 ON 10 SEP
MEAN 92.694

OPTION 3 YEARBOOK DATA TABULATION (DAILY)

050001 Taw at Umberleigh 1986

Measuring authority: NRA-SW | Grid reference: 21 (SS) 608 237 | Catchment area (sq km): 826.2

First year: 1958 | Level stn. (m OD): 14.1 | Max alt. (m OD): 604

DAILY MEAN GAUGED DISCHARGES (cubic metres per second)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	45.922	16.995	3.461	31.022	11.699	6.456	4.737	3.765	15.832	3.336	42.747	24.618
2	45.671	15.510	3.541	26.433	10.668	5.673	3.970	3.945	13.766	3.249	31.469	22.266
3	33.091	14.188	3.499	21.680	9.470	5.371	3.617	3.033	13.607	3.018	28.826	13.010
4	37.536	12.495	9.708	18.030	12.338	5.018	4.544	9.236	10.314	2.961	23.450	16.196
5	33.756	11.366	21.279	15.390	10.192	4.621	8.672	5.398	9.181	2.784	22.010	21.573
6	28.560	10.417	10.379	13.834	8.294	4.282	5.403	5.377	8.412	2.708	19.350	19.573
7	62.257	9.347	5.387	14.586	8.795	4.127	4.203	7.406	7.693	2.657	19.707	24.982
8	47.615	8.383	7.566	19.408	5.632	3.935	4.538	5.801	7.056	2.578	23.676	68.161
9	33.912	7.508	10.315	14.122	8.156	12.460	3.770	4.976	6.326	2.552	29.678	47.764
10	70.537	7.269	9.515	11.702	8.123	36.598	3.414	12.831	5.789	2.663	37.135	37.830
11	59.433	6.796	7.759	13.316	7.324	37.555	3.799	45.093	5.436	2.570	31.705	69.360
12	51.120	6.554	7.043	10.111	7.486	20.524	3.544	14.651	5.058	2.405	25.056	49.855
13	44.068	6.359	6.513	11.176	7.135	16.077	3.184	11.316	17.067	2.403	40.861	68.780
14	60.020	5.735	6.018	21.978	44.508	13.286	2.978	9.582	21.159	2.425	127.383	50.537
15	36.537	5.361	5.759	31.328	37.785	11.171	2.812	7.743	11.432	2.325	57.152	89.636
16	32.206	5.179	5.368	25.399	25.283	9.558	2.468	6.513	9.663	2.167	47.402	75.175
17	31.718	4.861	5.915	22.478	27.619	8.339	2.272	5.821	7.866	2.037	48.472	66.540
18	36.256	4.414	6.608	19.092	21.358	7.399	2.158	21.257	6.809	2.156	109.704	50.550
19	33.584	4.273	7.124	23.908	17.116	6.633	2.062	13.415	6.159	3.303	176.727	63.493
20	32.951	4.099	7.807	43.695	16.262	5.986	2.131	9.174	5.758	19.324	104.940	60.592
21	52.761	3.944	6.675	50.704	15.449	7.548	2.236	8.659	5.431	29.031	80.859	45.165
22	74.491	3.726	7.247	44.683	12.802	8.406	2.109	20.983	5.104	55.352	66.497	36.562
23	89.058	3.703	14.096	47.316	11.208	6.503	1.961	20.255	4.871	45.550	56.009	29.293
24	60.162	3.641	37.112	41.626	10.076	7.160	1.861	20.968	4.563	34.370	63.318	25.077
25	44.132	4.131	23.093	34.778	9.168	5.670	1.992	70.878	4.244	43.962	71.474	67.277
26	34.841	4.776	22.505	27.679	9.683	4.666	2.253	57.460	4.032	34.072	75.556	45.610
27	30.785	4.649	29.560	22.322	7.809	4.137	2.141	44.335	3.899	56.152	56.160	37.013
28	30.342	4.296	45.032	18.819	7.238	3.957	2.764	38.560	3.790	77.885	45.063	34.930
29	26.791		62.068	15.700	6.561	5.983	3.030	29.169	3.607	60.458	33.020	32.121
30	21.077		49.238	13.274	5.330	6.086	3.301	22.587	3.408	47.319	26.239	70.373
31	18.521		39.862		5.266		4.837	18.122		37.569		79.129
Average	42.730	7.155	15.190	24.090	13.250	9.540	3.313	18.010	7.911	19.150	54.320	47.040
Lowest	18.521	3.641	3.461	10.111	6.330	3.935	1.861	3.033	3.408	2.037	19.707	16.196
Highest	89.085	16.995	49.238	50.704	44.508	37.555	8.672	70.828	21.159	77.885	176.727	89.636
Peak flow	105.526	18.283	60.897	65.314	99.689	79.066	10.853	174.530	41.049	97.651	251.996	123.939
Day of peak	10	1	26	21	15	10	5	11	14	28	19	15
Monthly total (million cu m)	114.50	17.31	40.67	62.43	35.56	24.73	8.87	48.23	20.51	51.30	140.80	126.00
Runoff (mm)	139	21	49	76	43	30	11	58	25	62	170	152
Rainfall (mm)	148	5	106	97	93	92	65	151	40	138	183	196

STATISTICS OF MONTHLY DATA FOR PREVIOUS RECORD (Oct 1958 to Dec 1985)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean flows:	Avg.	35.970	28.910	20.510	13.710	9.658	5.213	4.628	5.676	7.776	18.720	25.260	37.230
	Low	6.557	3.244	7.449	3.889	2.073	1.329	0.793	0.423	0.861	1.043	3.653	13.210
	(year)	1963	1959	1984	1974	1976	1984	1984	1976	1959	1978	1978	1963
	High	62.100	54.760	52.140	32.800	37.000	16.630	23.390	19.130	47.670	77.360	58.500	73.670
	(year)	1984	1970	1981	1966	1983	1972	1968	1985	1974	1960	1963	1965
Runoff:	Avg.	117	85	67	43	31	16	15	18	24	61	89	121
	Low	22	10	24	12	7	4	3	1	3	3	11	43
	High	201	160	169	103	120	52	76	62	150	251	184	239
Rainfall:	Avg.	132	86	90	69	72	66	71	87	95	112	128	140
	Low	28	5	18	5	28	10	23	24	14	14	56	41
	High	242	173	183	145	146	164	152	160	247	278	239	271

SUMMARY STATISTICS

	FOR 1986		FOR RECORD PRECEDING 1986		1986 AS % OF PRE-1986
Mean flow (m3/s)	21.910		17.990		122
Lowest yearly mean			11.310	1964	
Highest yearly mean			27.590	1960	
Lowest monthly mean	3.313	Jul	0.423	Aug 1976	
Highest monthly mean	54.320	Nov	77.360	Oct 1960	
Lowest daily mean	1.861	24 Jul	0.200	23 Aug 1976	
Highest daily mean	176.727	19 Nov	363.800	4 Dec 1960	
Peak	251.996	19 Nov	644.900	4 Dec 1960	
10 %ile	53.770		46.690		115
50 %ile	11.450		9.291		123
95 %ile	2.472		1.174		211
Annual total (million cu m)	691.00		567.70		122
Annual runoff (mm)	836		687		122
Annual rainfall (mm)	1316		1148		115
[1941-70 rainfall average (mm)			1183]		

FACTORS AFFECTING FLOW REGIME

- Reservoir(s) in catchment.
- Abstraction for public water supplies.
- Augmentation from effluent returns.

STATION AND CATCHMENT DESCRIPTION

Velocity-area station, main channel 36m wide, cableway span 54.9m. Rock step d/s forms the control. Bypassing begins at about 3.7m on the rb, but a good rating accomodates this. Significant modification to flows owing to PWS abstraction. Some naturalised flow data available.
Large rural catchment - drains both Dartmoor (granite) to the south and Devonian shales and sandstones of Exmoor to the north. Central area is underlain mainly by Culm shales and sandstones (Carboniferous). Agriculture is conditioned by the grade 3 and 4 soils.

OPTION 4 TABLE OF MONTHLY MEAN GAUGED DISCHARGES

050001 Taw at Umberleigh

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
1980	28.100	43.825	27.459	14.490	2.415	9.960	3.700	3.630	11.430	40.530	28.950	33.390	21.170
1981	29.813	16.860	52.140	7.777	19.550	9.113	2.760	2.209	9.897	47.730	26.210	46.353	22.525
1982	40.860	18.540	42.170	6.040	2.462	2.722	8.563	2.585	4.278	24.260	52.833	55.450	21.730
1983	44.920	19.183	14.440	17.890	37.000	4.472	1.650	0.836	3.243	14.980	11.153	46.910	18.413
1984	42.130	34.470	7.449	5.457	2.255	1.329	0.793	0.802	3.589	20.440	49.390	37.380	18.920
1985	26.030	19.953	15.450	25.020	3.563	5.986	3.967	19.130	9.417	9.488	6.456	36.830	15.150
1986	42.730	7.155	15.190	24.080	13.280	9.560	3.313	10.010	7.911	19.130	54.320	47.863	21.910
1987	20.000	19.450	27.283	26.850	3.581	5.087	3.591	1.763	1.014	32.380	34.170	15.960	16.120
Mean	37.533	22.853	25.220	16.200	10.510	6.011	4.377	6.368	6.472	26.140	32.710	39.910	19.510
Min	20.000	7.155	7.449	5.457	2.255	1.329	0.793	0.802	1.014	9.488	6.456	15.960	15.150
	1987	1986	1984	1984	1984	1984	1984	1984	1987	1985	1985	1987	1985
Max	42.130	43.825	52.140	26.850	37.000	9.960	8.563	19.130	11.430	47.730	54.320	55.450	22.520
	1984	1980	1981	1987	1983	1980	1982	1985	1980	1981	1986	1982	1981

The summary relates exclusively to the years shown.

OPTION 5 TABLE OF MONTHLY MEAN NATURALISED DISCHARGES

039001 Thames at Kingston

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
1980	136.630	151.400	131.730	107.800	51.790	50.460	46.070	40.750	41.460	75.730	75.490	86.550	82.450
1981	95.020	62.345	199.500	119.400	115.200	84.110	45.090	48.250	53.250	91.050	79.830	138.300	92.690
1982	196.900	119.400	181.000	99.760	59.560	52.550	38.720	31.320	31.900	89.750	129.600	177.200	99.660
1983	126.830	111.230	84.760	126.500	136.800	82.100	43.430	34.560	34.820	37.880	39.160	78.090	77.970
1984	144.590	129.600	135.430	68.040	60.670	43.910	25.710	25.370	30.710	38.440	105.130	127.280	75.240
1985	130.330	134.600	130.730	93.010	76.790	99.190	58.350	55.600	36.770	37.240	36.230	136.100	81.960
1986	201.100	117.500	96.150	125.500	82.450	52.140	37.470	44.100	37.750	41.750	122.800	136.800	91.820
1987	113.630	83.790	111.400	149.100	66.530	68.220	45.660	36.640	34.770	125.900	148.430	82.590	78.800
Mean	141.630	115.800	125.020	109.500	80.960	66.540	41.560	39.550	37.480	67.250	91.913	120.300	86.220
Min	95.300	62.343	84.760	68.040	51.790	43.910	25.713	25.370	30.710	37.240	36.230	78.090	75.240
	1981	1981	1983	1984	1980	1984	1984	1984	1984	1985	1985	1983	1984
Max	201.100	151.400	199.500	149.100	136.800	99.190	58.350	55.600	53.250	125.900	148.430	177.200	99.660
	1986	1980	1981	1987	1983	1985	1985	1985	1981	1987	1987	1982	1982

The summary relates exclusively to the years shown.

OPTION 6 YEARBOOK DATA TABULATION (MONTHLY)

0 5 0 0 0 1 — a t U m b e r l e i g h — 1 9 8 2

Measuring authority: SWWA | Grid reference: SS608237 | Catchment area (sq km): 826.2

First year: 1958 | Level stn. (m OD): 14.14 | Max alt. (m OD): 604

HYDROMETRIC STATISTICS FOR 1982

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Flows	Avg.	40.860	18.540	42.170	6.041	2.462	2.723	8.563	2.585	4.278	24.260	52.830	55.450	21.730
(m3/s):	Peak	127.60	55.38	143.90	23.89	5.54	12.48	162.20	7.73	25.40	72.35	215.20	241.10	241.10
Runoff	(mm)	132	54	137	19	8	9	28	8	13	79	166	180	833
Rainfall	(mm)	106	78	143	24	37	116	67	87	81	129	192	179	1239

MONTHLY AND YEARLY STATISTICS FOR PREVIOUS RECORD (Oct 1958 to Dec 1981)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean	Avg.	34.490	29.840	20.620	13.730	9.404	5.488	4.782	5.648	8.228	18.950	27.980	36.080	17.891
flows	Low	6.657	3.244	7.918	3.889	2.073	1.434	0.796	0.423	0.861	1.043	3.653	13.210	11.312
(m3/s):	High	50.890	54.760	52.140	32.800	22.140	16.630	23.390	14.440	47.670	77.360	58.500	73.670	27.587
Peak flow (m3/s)		580.60	278.40	339.90	149.40	91.74	160.10	206.00	183.50	312.30	422.10	249.70	644.90	644.90
Runoff	(mm)	112	88	67	43	30	17	16	18	26	61	88	117	683
Rainfall	(mm)	127	91	89	70	72	66	74	87	93	112	127	137	1145

Factors affecting flow regime: S P E — 1982 runoff is 122% of previous mean

Station type: VA — rainfall 108%

OPTION 7 TABLE OF MONTHLY EXTREME FLOWS

050001 Taw at Umberleigh

Date		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
1985	HI	111.900	76.210	55.420	96.250	7.826	29.990	9.017	78.233	39.110	46.930	12.760	249.800	249.800
	HD	78.400	55.450	41.360	81.750	6.012	21.370	7.505	61.570	23.960	29.900	9.705	136.670	136.670
	LO	5.653	5.208	5.178	5.981	2.076	1.677	2.231	5.141	4.264	3.238	2.856	10.090	1.677
1986	HI	130.500	18.230	65.900	65.310	97.690	79.070	10.850	124.500	41.030	97.650	252.000	123.900	252.000
	HD	89.293	16.990	49.240	53.730	44.510	57.550	8.672	70.430	21.160	77.885	176.785	59.640	176.750
	LO	18.520	3.562	5.661	10.120	6.330	3.955	1.862	3.731	3.438	2.037	19.710	16.203	1.861
1987	HI	167.200	67.800	152.600	205.500	15.620	51.960	15.650	3.630	6.172	113.900	155.430	65.150	205.500
	HD	90.960	45.150	96.440	169.800	6.136	12.410	9.105	3.273	3.775	79.910	105.100	43.330	169.800
	LO	5.682	5.616	5.363	4.037	2.675	2.048	2.152	1.199	1.141	1.811	10.020	6.192	1.141
Max	HI	167.200	76.210	152.600	205.500	99.690	79.070	15.650	124.500	41.030	113.900	252.000	249.800	249.800
		2 Jan	9 Feb	23 Mar	5 Apr	15 May	13 Jun	19 Jul	31 Aug	14 Sep	27 Oct	19 Nov	24 Dec	24 Dec
		1987	1985	1987	1987	1986	1986	1987	1986	1986	1987	1986	1985	1985
Max	HD	79.760	59.430	96.440	168.900	44.510	57.550	9.105	73.930	23.960	79.910	176.700	136.620	176.700
		1 Jan	9 Feb	23 Mar	3 Apr	16 May	11 Jun	19 Jul	29 Aug	5 Sep	27 Oct	19 Nov	24 Dec	19 Nov
		1987	1985	1987	1987	1986	1986	1987	1986	1985	1987	1986	1985	1986
Min	LO	5.482	5.661	5.445	4.407	2.076	1.677	1.861	1.197	1.141	1.811	2.856	6.192	1.141
		11 Jan	26 Feb	1 Mar	10 Apr	31 May	4 Jun	24 Jul	31 Aug	1 Sep	1 Oct	4 Nov	14 Dec	1 Sep
		1987	1986	1986	1987	1985	1985	1985	1987	1987	1987	1985	1987	1987

The summary relates exclusively to the years shown.

HI = Highest instantaneous discharge
HD = Highest daily mean gauged discharge
LO = Lowest daily mean gauged discharge

OPTION 8 TABLE OF CATCHMENT MONTHLY RAINFALL

050001 Taw at Umberleigh

Date		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
1985	Rainfall (mm)	95	60	97	90	50	108	70	160	51	60	71	159	1051
	% 1961-70 Mean	75	63	123	125	62	177	85	157	49	53	53	117	89
1986	Rainfall (mm)	148	3	136	97	93	97	65	151	39	138	183	196	1316
	% 1961-70 Mean	117	3	136	135	115	159	79	148	38	122	137	146	111
1987	Rainfall (mm)	29	57	106	97	61	92	61	51	65	222	130	75	1066
	% 1961-70 Mean	23	108	132	135	75	151	74	50	63	196	97	55	90
Mean	(mm)	91	67	102	95	68	99	65	114	52	140	128	145	1144
	(%)	72	51	130	132	86	162	79	112	50	124	96	105	97
Min	(mm)	29	3	97	90	50	92	61	51	39	60	71	75	1051
	(%)	23	3	123	125	62	151	74	50	38	53	53	55	89
	Year	1987	1986	1985	1985	1985	1987	1987	1987	1986	1985	1985	1987	1985
Max	(mm)	148	99	136	97	93	108	70	160	65	222	183	196	1316
	(%)	117	108	136	135	115	177	85	157	63	196	137	146	111
	Year	1986	1987	1986	1987	1986	1985	1985	1985	1987	1987	1986	1986	1986
1961-70 Mean		127	52	79	72	81	61	82	102	104	113	134	136	1182

The summary relates exclusively to the years shown.

OPTION 9 TABLE OF CATCHMENT MONTHLY AREAL RAINFALL AND RUNOFF

050001 Taw at Umberleigh

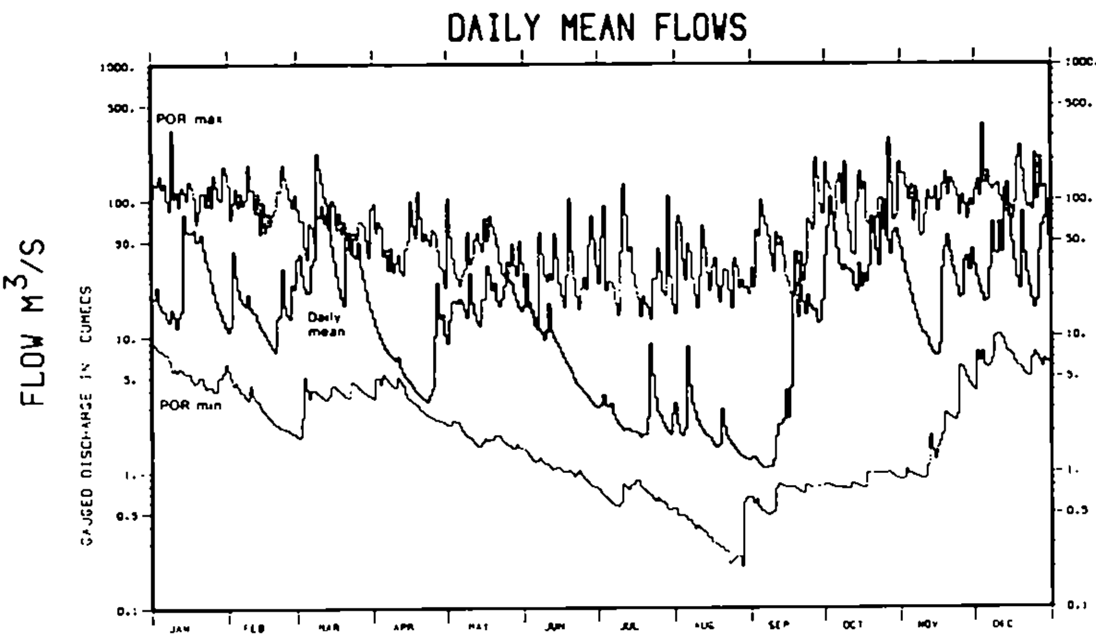
Date		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
1985 Rainfall		95	60	97	90	50	108	70	160	51	60	71	159	1051
Runoff		84	58	51	78	12	19	13	62	30	31	21	119	578
1986 Rainfall		148	3	136	97	93	97	65	151	39	138	183	196	1316
Runoff		139	21	49	76	43	30	11	58	25	62	170	152	836
1987 Rainfall		29	99	106	97	61	92	61	51	65	222	130	75	1066
Runoff		65	57	88	91	12	16	12	6	6	105	107	52	617
Rainfall Mean	(mm)	91	67	102	95	68	99	65	116	52	140	128	143	1144
Min	(mm)	29	3	97	90	50	92	61	51	39	60	71	75	1051
	Year	1987	1986	1985	1985	1985	1987	1987	1987	1986	1985	1985	1987	1985
Max	(mm)	148	99	136	97	93	108	70	160	65	222	183	196	1316
	Year	1986	1987	1986	1987	1986	1985	1985	1985	1987	1987	1986	1986	1986
Runoff Mean	(mm)	96	45	63	82	22	22	12	42	20	66	99	108	677
Min	(mm)	65	21	49	76	12	16	11	6	6	31	21	52	578
	Year	1987	1986	1986	1986	1987	1987	1986	1987	1987	1985	1985	1987	1985
Max	(mm)	139	58	88	91	43	30	13	62	30	105	170	152	836
	Year	1986	1985	1987	1987	1986	1986	1985	1985	1985	1987	1986	1986	1986
% Runoff Mean	(%)	>100	96	62	86	32	22	18	37	38	47	77	74	59
Min	(%)	88	58	46	78	20	17	17	19	9	45	30	69	55
	Year	1985	1987	1986	1986	1987	1987	1986	1987	1987	1986	1985	1987	1985
Max	(%)	>100	>100	83	94	46	31	20	39	66	57	93	78	64
	Year	1987	1986	1987	1987	1986	1986	1987	1985	1986	1985	1986	1986	1986

The summary relates exclusively to the years shown.

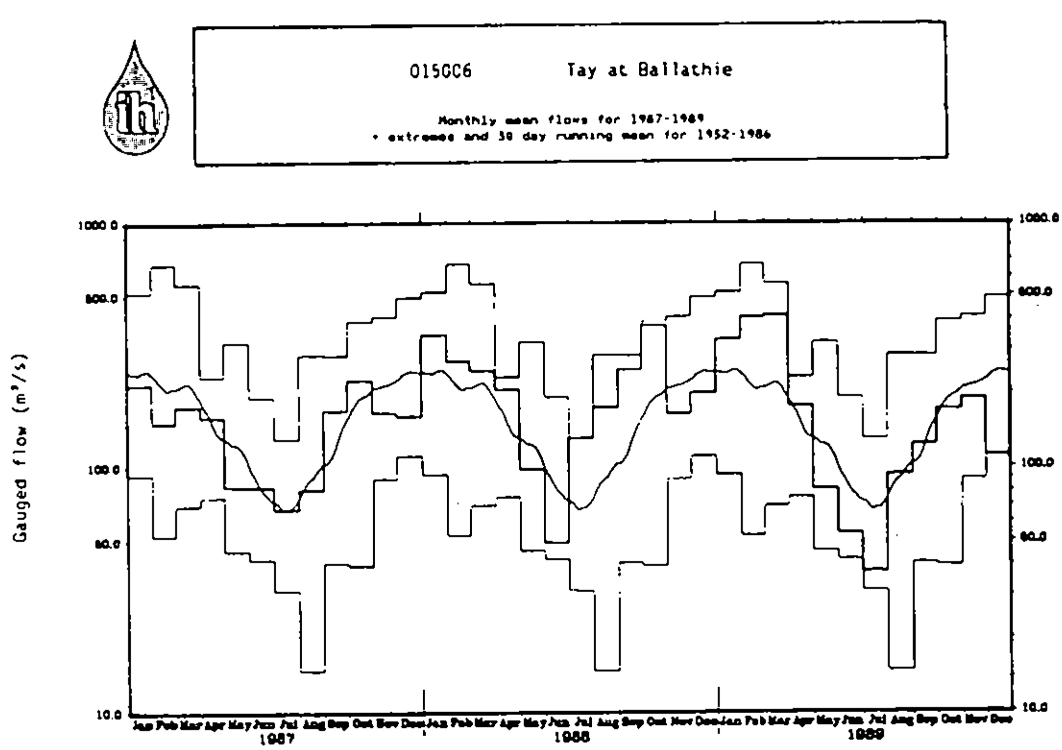
OPTION 10 HYDROGRAPH OF DAILY MEAN FLOWS

050001 TAW AT UMBERLEIGH 1981

Previous record 1958-1980 Catchment area 826.2 km



OPTION 11 HYDROGRAPH OF MONTHLY MEAN FLOWS



OPTION 12 FLOW DURATION STATISTICS

FLOW DURATION TABLE

050001 TAW AT UMBERLEIGH GAUGED FLOWS.USED

1 DAY MEAN FLOW EXCEEDED STATED AMOUNT IN CUMECS FOR GIVEN PERCENTAGE OF TIME

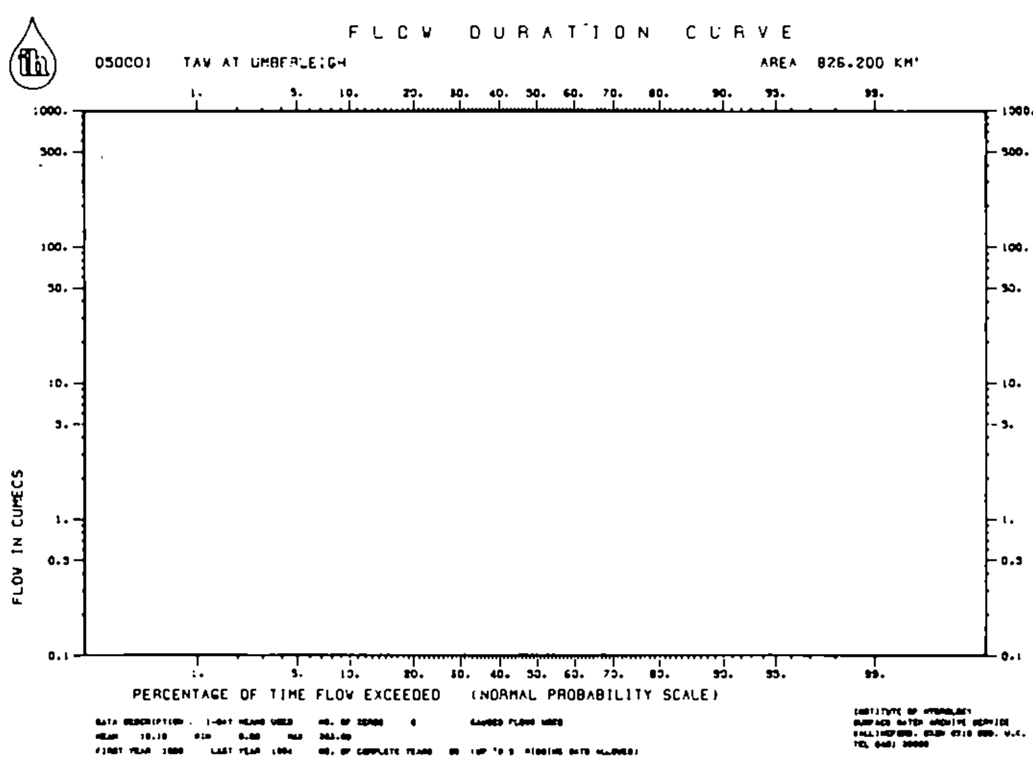
		1	2	3	4	5	6	7	8	9
0		112.467	88.953	78.112	70.827	64.442	59.554	56.125	53.098	50.148
10	47.474	44.176	41.967	39.864	37.968	36.202	34.286	32.813	31.533	30.169
20	28.878	27.620	26.450	25.366	24.302	23.328	22.350	21.282	20.533	19.756
30	19.052	18.294	17.592	16.975	16.450	15.836	15.263	14.737	14.189	13.691
40	13.254	12.847	12.340	11.914	11.529	11.129	10.807	10.436	10.088	9.725
50	9.366	9.020	8.678	8.390	8.073	7.801	7.535	7.219	6.945	6.673
60	6.428	6.187	5.971	5.755	5.522	5.313	5.090	4.900	4.691	4.492
70	4.292	4.101	3.916	3.738	3.564	3.398	3.239	3.055	2.915	2.783
80	2.659	2.534	2.418	2.287	2.178	2.071	1.976	1.890	1.822	1.734
90	1.647	1.567	1.493	1.391	1.268	1.141	1.019	0.941	0.808	0.685

MAX FLOW= 363.800 MIN FLOW= 0.200 MEAN FLOW= 18.160 CATCHMENT AREA 826.2 SQ.KM

NUMBER OF ZEROS= 0 NUMBER OF VALUES USED= 9497

FIRST YEAR USED= 1959 LAST YEAR USED= 1984
NUMBER OF YEARS USED= 26

ONLY YEARS CONTAINING NOT MORE THAN 5 MISSING DAYS USED



OPTION 13 TABLE OF GAUGING STATION REFERENCE INFORMATION

NUMBER	RIVER	STATION	GRID REF	OPERATOR	RECORD 1ST YEAR	RECORD LAST YEAR	STN TYPE	BASIN AREA SQ KM	LEVEL STN AOD	MAX ALT AOD	ABSTRACTIONS & RETURNS	FG
048001	Fowey	Trekelvesteps	SX227695	NRA-SW	1969		CC	36.8	197.9	420	SRPG	
048002	Fowey	Restormel one	SX098613	NRA-SW	1961	1977	VA	171.2	3.5	420	SRP FI	
048003	Fal	Tregony	SW921447	NRA-SW	1977		FLVA	87.0	6.9	226	GEI	
048004	Warleggan	Trengoffe	SX159674	NRA-SW	1969		CC	25.3	70.3	309	G	
048005	Kenwyn	Truro	SW820450	NRA-SW	1969		CC	19.1	7.7	152	G	
048006	Cober	Helston	SW654273	NRA-SW	1968		VA	40.1	4.7	251	PG I	
048007	Kennall	Ponsanooth	SW762377	NRA-SW	1968		C	26.6	13.6	251	SRPG I	
048008	St Austell	Pellingey	SX037695	NRA-SW	1971	1976	FL	29.9	11.5	313	G I	
048009	St Neot	Craigshill wood	SX184662	NRA-SW	1971		CC	22.7	70.5	339	GF	
048010	Seaton	Trebrownbridge	SX298596	NRA-SW	1972		CC	39.1	26.6	369	G I	
048011	Fowey	Restormel	SX098624	NRA-SW	1961		CC	169.1	9.2	420	SRPGEI	

OPTION 14 TABLE OF HYDROMETRIC STATISTICS

STATION NUMBER	TERM	AAR 1941 1970 MM	AREAL RAIN FALL MM	ANNUAL GAUGED RUNOFF MM	MEAN GAUGED FLOW CU M/S	NO. YRS REC	%POR MEAN FLOW	HIGHEST DAILY MEAN CU M/S	DATE	LOWEST DAILY MEAN CU M/S	DATE	10 %ILE CU M/S	50 %ILE CU M/S	95 %ILE CU M/S
021005	POR	1320	1250	676	7.99	15		185.50	30/01/74	1.19	07/10/72	16.70	5.39	1.97
	1977		1436	829	9.80		123	92.38	31/10	1.39	22/08	20.26	7.03	1.65
	1978		1317	757	8.95		112	75.74	15/11	1.75	19/06	20.23	6.03	2.25
	1979		1367	913	10.80		135	82.15	26/11	2.73	23/07	24.29	6.77	2.60
	1980		1268	793	9.38		117	49.29	24/11	2.01	01/06	19.96	7.00	2.19
021006	POR	1227	1180	694	32.99	15		393.40	30/01/74	3.46	07/10/72	68.79	22.22	6.23
	1977		1277	845	40.20		122	555.30	31/10	4.13	18/08	84.42	29.40	5.44
	1978		1244	731	34.77		105	320.30	15/11	5.62	20/06	78.17	22.26	7.01
	1979		1230	881	41.90		127	262.70	26/11	7.23	23/07	93.82	27.64	6.51
	1980		1187	746	35.48		108	171.60	20/11	5.37	19/05	78.63	24.91	7.46
021007	POR	1413	1321	878	13.89	15		209.80	30/01/74	0.57	07/09/76	31.59	8.50	1.71
	1977		1524	1108	17.54		126	268.30	31/10	0.87	18/08	41.40	10.84	1.11
	1978		1394	886	14.02		101	210.80	15/11	0.97	19/07	32.60	8.24	1.21
	1979		1420	1105	17.48		126	120.90	26/11	1.42	24/07	41.36	10.83	1.83
	1980		1366	944	14.93		107	98.07	20/11	1.18	19/05	35.27	9.16	1.55
021008	POR	1006	949	504	17.74	16		308.66	06/03/63	1.71	22/08/76	38.44	11.05	2.89
	1977		1019	604	21.25		120	187.20	31/10	1.99	17/08	44.36	14.61	2.58
	1978		1008	541	19.03		107	177.90	15/11	2.04	20/07	43.34	11.09	2.53
	1979		1005	693	24.40		138	273.10	25/03	2.22	05/08	55.84	15.33	3.67
	1980		982	586	20.62		116	122.00	20/11	3.35	03/06	45.35	14.30	4.14

NOTE: This example illustrates only a limited amount of the statistical information that may be output.

OPTION 15 GAUGING STATION AND CATCHMENT DESCRIPTION

48003 Fal at Tregony

Originally a velocity-area station in a formalised trapezoidal channel; augmented by a low flow, side contracted flume 2.8m wide in August 1967. Site not ideal for high flows. Data available from June 1978. Earlier data unreliable due to silting of inlet pipes. Moderate modification to flows owing to industrial abstractions and returns.

Moderate to low relief catchment draining Devonian slates, shales and grits. Upper reaches plateau-like alluvial flats. Traverses the kaolinised St Austell Granite. Low grade agriculture and grazing.

48004 Warleggan at Trengoffe

Three-bay compound Crump profile weir, crest lengths 1.52m and 8.53m (total). Wing walls at 1.67m. Flood banks contain flows up to wing wall height. Overtopped at the highest flows. The only gauged natural catchment on Bodmin Moor.

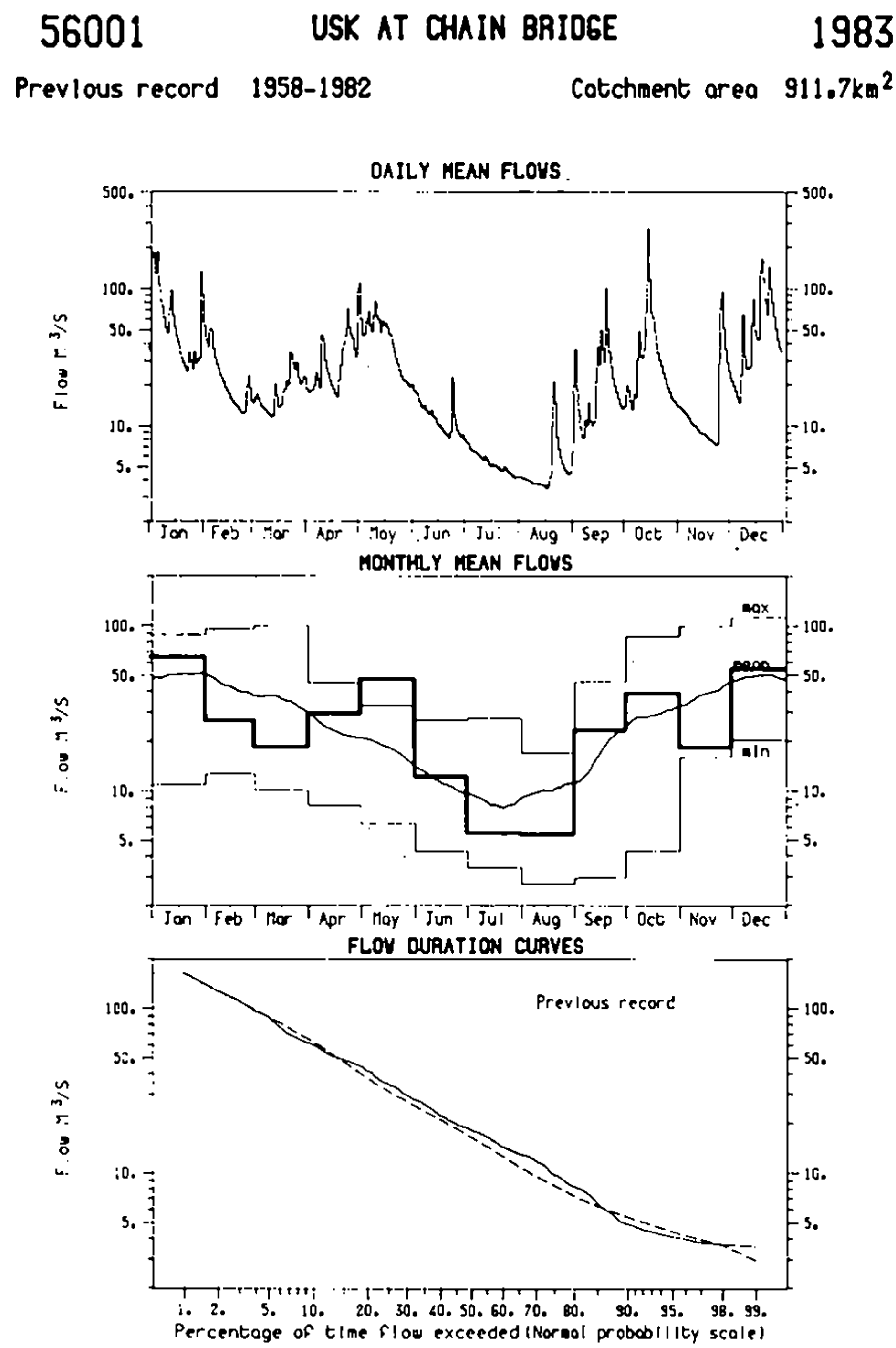
The upper 70% drains the kaolinised granite of Bodmin Moor. The relief is moderate to steep. The lower 30% traverses metamorphosed Devonian slates. Baseflow high for an upland catchment owing to storage in the granite.

48005 Kenwyn at Truro

Three-bay compound Crump profile weir, crest lengths 1.22m and 3.05 (total). Pier and wing wall height 1.98m. Contains all flows; potential for non-modularity at the highest flows. Variable shoaling affects low flow precision. Substantially natural catchment. High baseflow, low percentage runoff catchment for the relief.

Catchment of moderate relief, with wooded, incised valleys. Geology is Devonian grits and shales.

OPTION 16 RIVER FLOW PATTERN PLOTS



OPTION 17 GAUGING STATION SUMMARY SHEET

Gauging Station Summary

TAW AT UMBERLEIGH

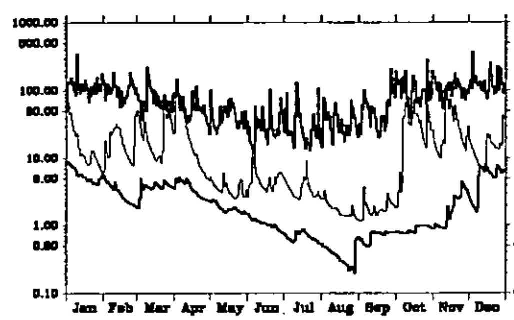
Station Number
050001

Gauged Flows
1958-1987

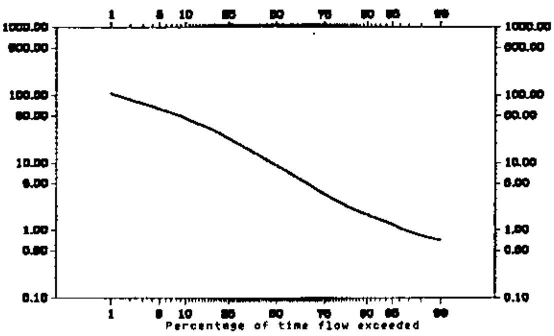
Measuring Authority: NRA - South West

Grid Reference: 21 (SS) 608 237

Daily Flow Hydrograph (m^3s^{-1})
Max. and min. daily mean flows from 1958 to 1987 with an example yearly hydrograph (1987)



Flow Duration Curve (m^3s^{-1})



Flow Statistics

Units: m^3s^{-1} unless otherwise stated

Mean flow	18.06	
Mean flow (ls^{-1}/km^2)	21.85	
Mean flow ($10^6m^3/yr$)	569.9	
Peak flow & date	644.9	4 Dec 1960
Highest daily mean & date	363.8	4 Dec 1960
Lowest daily mean & date	0.200	28 Aug 1976
10 day minimum & end date	0.237	28 Aug 1976
60 day minimum & end date	0.542	10 Sep 1976
10 percentile	46.820	
50 percentile	9.330	
95 percentile	1.219	
Mean annual flood	247.0	
Bankfull flow	170.00	

Catchment Characteristics

Catchment area (km^2)	826.2
Level stn. (mOD)	14.10
Max alt. (mOD)	604
IH Baseflow index	0.42
FSR slope (m/km)	4.80
1941-70 rainfall (mm)	1193
FSR stream freq. (junctions/km^2)	
FSR percentage urban	

Factors Affecting Flow Regime

- Reservoir(s) in catchment.
- Abstraction for public water supply.
- Augmentation from effluent returns.

Rainfall and Runoff

Rainfall (mm) (1958-1987) — Runoff (mm) (1958-1987)

	Rainfall Mean	Rainfall Max	Yr	Rainfall Min	Yr	Runoff Mean	Runoff Max	Yr	Runoff Min	Yr
Jan	129	242	1984	28	1963	116	201	1984	22	1963
Feb	84	173	1977	3	1986	82	160	1970	10	1959
Mar	91	183	1981	18	1961	67	169	1981	24	1984
Apr	71	145	1966	8	1984	46	103	1966	12	1974
May	73	146	1983	28	1961	31	120	1983	7	1976
Jun	68	164	1980	10	1975	17	52	1972	4	1984
Jul	71	152	1965	23	1976	15	76	1968	3	1984
Aug	87	160	1985	24	1983	19	62	1985	1	1976
Sep	92	247	1974	14	1959	24	150	1974	3	1959
Oct	116	278	1960	14	1978	62	251	1960	3	1978
Nov	130	239	1963	56	1961	92	184	1963	11	1978
Dec	139	271	1965	41	1963	119	239	1965	43	1963
Annual	1151	1525	1960	893	1975	689	1055	1960	432	1964

Station and Catchment Description

Velocity-area station, main channel 34m wide, cableway span 54.9m. Rock step d/s forms the control. Bypassing begins at about 3.7m on the rb, but a good rating accommodates this. Significant modification to flows owing to PWS abstraction. Some naturalised flow data available.

Large rural catchment - drains both Dartmoor (granite) to the south and Devonian shales and sandstones of Exmoor to the north. Central area is underlain mainly by Culm shales and sandstones (Carboniferous). Agriculture is conditioned by the grade 3 and 4 soils.

Summary of Archived Data

Gauged Flows and Rainfall

Key:

	All rainfall	Some or no rainfall
All daily, all peaks	A	a
All daily, some peaks	B	b
All daily, no peaks	C	c
Some daily, all peaks	D	d
Some daily, some peaks	E	e
Some daily, no peaks	F	f
No gauged flow data	*	-

	01234	56789
1950s	-----	---eA
1960s	AAAAA	AAAAA
1970s	AAAAA	AAAAA
1980s	AAAAA	AAA

Naturalised Flows

Key:

All daily, all monthly	A
All daily, some monthly	B
All daily, no monthly	C
Some daily, all monthly	D
Some daily, some monthly	E
Some daily, no monthly	F
No naturalised flow data	-

	01234	56789
1950s	-----	---DA
1960s	AAAAA	AAAAA
1970s	AAAAA	AAAAA
1980s	AAAAA	AAAD

Concise Register of Gauging Stations

Station number	River and station name	Grid reference	Authority	Area (sq km)
002001	Helmsdale at Kilphedir	2997 9181	HRPB	551.4
003001 *	Shin at Lairg	2581 9062	SE	494.6
003002	Carron at Sgodachail	2490 8921	HRPB	241.1
003003	Oykel at Easter Turnaig	2403 9001	HRPB	330.7
003004	Cassley at Rosehall	2472 9022	HRPB	187.5
003005	Shin at Inveran	2574 8974	HRPB	575.0
004001	Conon at Moy Bridge	2482 8547	HRPB	961.8
004003	Alness at Alness	2654 8695	HRPB	201.0
004004	Blackwater at Contin	2455 8563	HRPB	336.7
004005	Meig at Glenmeannie	2286 8528	HRPB	120.5
005001 *	Beauly at Erchless	2426 8405	SE	849.5
005002	Farrar at Struy	2390 8405	HRPB	311.3
006001 *	Ness at Ness Castle Farm	2639 8410	SE	1792.3
006003 *	Moriston at Invermoriston	2416 8169	SE	391.0
006006 *	Allt Bhlaraidh at Invermoriston	2377 8168	SE	27.5
006007	Ness at Ness Side	2645 8427	HRPB	1839.1
006008	Enrick at Mill of Tore	2450 8300	HRPB	105.9
007001	Findhorn at Shenachie	2826 8337	HRPB	415.6
007002	Findhorn at Forres	3018 8583	HRPB	781.9
007003	Lossie at Sheriffmills	3194 8626	NERPB	216.0
007004	Nairn at Firhall	2882 8551	HRPB	313.0
007005	Divie at Dunphail	3005 8480	HRPB	165.0
007006	Lossie at Torwinny	3135 8489	NERPB	20.0
008001 *	Spey at Aberlour	3278 8439	NERPB	2654.7
008002	Spey at Kinrara	2881 8082	NERPB	1011.7
008003 *	Spey at Ruthven Bridge	2759 7996	NERPB	533.8
008004	Avon at Delnashaugh	3186 8352	NERPB	542.8
008005	Spey at Boat of Garten	2946 8191	NERPB	1267.8
008006	Spey at Boat o Brig	3318 8518	NERPB	2861.2
008007	Spey at Invertruim	2687 7962	NERPB	400.4
008008	Tromie at Tromie Bridge	2789 7995	NERPB	130.3
008009	Dulnain at Balnaan Bridge	2977 8247	NERPB	272.2
008010	Spey at Grantown	3033 8268	NERPB	1748.8
008011	Livet at Minmore	3201 8291	NERPB	104.0
009001	Deveron at Avochie	3532 8464	NERPB	441.6
009002	Deveron at Muiresk	3705 8498	NERPB	954.9
009003	Isla at Grange	3494 8506	NERPB	176.1
009004	Bogie at Redcraig	3519 8373	NERPB	179.0
009005	Allt Deveron at Cabrach	3378 8291	GRWD	67.0
010002	Ugie at Inverugie	4101 8485	NERPB	325.0
010003	Ythan at Ellon	3947 8303	NERPB	523.0
011001	Don at Parkhill	3887 8141	NERPB	1273.0
011002	Don at Haughton	3756 8201	NERPB	787.0
011003	Don at Bridge of Alford	3566 8170	NERPB	499.0
011004	Urie at Pitcaple	3721 8260	NERPB	198.0
012001	Dee at Woodend	3635 7956	NERPB	1370.0
012002	Dee at Park	3798 7983	NERPB	1844.0
012003	Dee at Polhollick	3344 7965	NERPB	690.0
012004	Girnock Burn at Littlemill	3324 7956	NERPB	30.3
012005	Muick at Invermuick	3364 7947	NERPB	110.0
012006	Gairn at Invergairn	3353 7971	NERPB	150.0
012007	Dee at Mar Lodge	3098 7895	NERPB	289.0
012008	Feugh at Heugh Head	3687 7928	NERPB	229.0
013001	Bervie at Inverbervie	3826 7733	NERPB	123.0
013002	Luther Water at Luther Bridge	3660 7668	TRPB	138.0
013003 *	South Esk at Stannochy Bridge	3583 7593	TRPB	487.0
013004	Prosen Water at Prosen Bridge	3396 7586	TRPB	104.0
013005	Lunan Water at Kirkton Mill	3655 7494	TRPB	124.0
013007	North Esk at Logie Mill	3699 7640	TRPB	730.0
013008	South Esk at Brechin	3600 7596	TRPB	490.0
013009	West Water at Dalhousie Bridge	3592 7680	TRPB	127.2
013010	Brothock Water at Brothock Beidge	3639 7418	TRPB	50.0
014001	Eden at Kemback	3415 7158	TRPB	307.4
014002	Dighty Water at Balmossie Mill	3477 7324	TRPB	126.9
014005	Motray Water at St Michaels	3441 7224	TRPB	52.0
014006	Monikie Burn at Panbride	3574 7361	TRPB	16.0
014007	Craigmill Burn at Craigmill	3575 7360	TRPB	29.0
015001 *	Isla at Forter	3187 7647	TRWS	70.7
015002 *	Newton Burn at Newton	3230 7605	TRWS	15.4
015003	Tay at Caputh	3082 7395	TRPB	3211.0
015004 *	Inzion at Loch of Lintrathen	3280 7559	TRWS	24.7
015005 *	Melgan at Loch of Lintrathen	3275 7558	TRWS	40.9
015006	Tay at Ballathie	3147 7367	TRPB	4587.1
015007	Tay at Pitnacree	2924 7534	TRPB	1149.4
015008	Dean Water at Cookston	3340 7479	TRPB	177.1
015010	Isla at Wester Cardean	3295 7466	TRPB	366.5
015011	Lyon at Comrie Bridge	2786 7486	TRPB	391.1
015012	Tummel at Port-na-craig	2940 7577	TRPB	1649.0
015013	Almond at Almondbank	3067 7258	TRPB	174.8
015014	Ardle at Kindrogan	3056 7631	TRPB	103.0
015015	Almond at Newton Bridge	2888 7316	TRPB	84.0
015016	Tay at Kenmore	2782 7467	TRPB	600.9
015017 *	Braan at Ballinloan	2979 7406	TRPB	197.0
015018 *	Lyon at Moar	2534 7448	SE	161.4
015021	Lunan Burn at Mill Bank	3182 7400	TRPB	94.0
015023	Braan at Hermitage	3014 7422	TRPB	210.0
015024	Dochart at Killin	2567 7320	TRPB	239.0
015025	Ericht at Craighall	3174 7472	TRPB	432.0
015027	Garry Burn at Loakmill	3075 7339	TRPB	20.0
015028	Ordie Burn at Luncarty	3093 7306	TRPB	54.0
016001	Earn at Kinkell Bridge	2933 7167	TRPB	590.5
016002 *	Earn at Aberuchill	2754 7216	TRPB	176.9
016003	Ruchill Water at Cultybraggan	2764 7204	TRPB	99.5
016004	Earn at Forteviot Bridge	3043 7184	TRPB	782.2
016006	Dunning Burn at Granco	3019 7147	TRPB	1208.0
017001	Carron at Headswood	2832 6820	FRPB	122.3
017002	Leven at Leven	3369 7006	FRPB	424.0
017003	Bonny Water at Bonnybridge	2824 6804	FRPB	50.5
017004	Ore at Balfour Mains	3330 6997	FRPB	162.0
017005	Avon at Polmonthill	2952 6797	FRPB	195.3
017008	South Queich at Kinross	3122 7015	ITE	33.7
017012	Red Burn at Castlecary	2788 6780	FRPB	22.0
017016	Lochty Burn at Whinnyhall	3221 6987	FRPB	14.0
017017	Greens Burn at Killyford Bridge	3150 7053	FRPB	7.9
018001	Allan Water at Kinbuck	2792 7053	FRPB	161.0
018002	Devon at Glenochil	2858 6960	FRPB	181.0
018003	Teith at Bridge of Teith	2725 7011	FRPB	518.0
018005	Allan Water at Bridge of Allan	2786 6980	FRPB	210.0
018007	Devon at Fossoway Bridge	3011 7018	FRPB	69.5
018008	Leny at Anie	2585 7096	FRPB	190.0
018010	Forth at Gargunnock	2714 6953	FRPB	397.0
018011	Forth at Craigforth	2775 6955	FRPB	1036.0
018012	Ardoch Burn at Doune Castle	2729 7008	FRPB	48.0
018013	Black Devon at Fauld Mill	2914 6924	FRPB	67.0
018014	Bannockburn at Bannock Burn	2812 6908	FRPB	23.7
018016	Kelty Water at Clashmore	2468 6968	FRPB	2.8
018017	Monachyle Burn at Balquhidder	2475 7230	IH	7.7
018018	Kirkton Burn at Balquhidder	2532 7219	IH	6.9
018019	Comer Burn at Comer	2386 7043	FRPB	0.9
019001	Almond at Craigiehall	3165 6752	FRPB	369.0
019002	Almond at Almond Weir	3004 6652	FRPB	43.8
019003 *	Breich Water at Breich Weir	3014 6639	FRPB	51.8
019004	North Esk at Dalmore Weir	3252 6616	FRPB	81.6
019005	Almond at Almondell	3086 6686	FRPB	229.0
019006	Water of Leith at Murrayfield	3228 6732	FRPB	107.0
019007	Esk at Musselburgh	3339 6723	FRPB	330.0
019008	South Esk at Prestonholm	3325 6623	FRPB	112.0
019010	Braid Burn at Liberton	3273 6707	FRPB	16.2
019011	North Esk at Dalkeith Palace	3333 6678	FRPB	137.0
019012	Water of Leith at Colinton	3212 6688	FRPB	72.0
019014	Brox Burn at Newliston	3114 6732	FRPB	34.1
019017	Gogar Burn at Turnhouse	3161 6733	FRPB	38.8
020001	Tyne at East Linton	3591 6768	FRPB	307.0
020002	West Peffer Burn at Luffness	3489 6811	FRPB	26.2
020003	Tyne at Spilmersford	3456 6689	FRPB	161.0
020004	East Peffer Burn at Lochhouses	3610 6824	FRPB	31.1
020005	Birns Water at Saltoun Hall	3457 6688	FRPB	93.0
020006	Biel Water at Belton House	3645 6768	FRPB	51.8
020007	Gifford Water at Lennoxlove	3511 6717	FRPB	64.0
020008	Brox Burn at Broxmouth	3697 6776	FRPB	19.7
021001 *	Fruid Water at Fruid	3088 6205	LRWD	23.7
021002 *	Whiteadder Water at Hungry Snout	3663 6633	LRWD	45.6
021003	Tweed at Peebles	3257 6400	TWRP	694.0
021004 *	Watch Water at Watch Water Reservoir	3664 6566	BRWD	10.7
021005	Tweed at Lyne Ford	3206 6397	TWRP	373.0
021006	Tweed at Boleside	3498 6334	TWRP	1500.0
021007	Ettrick Water at Lindean	3486 6315	TWRP	499.0
021008	Teviot at Ormiston Mill	3702 6280	TWRP	1110.0
021009	Tweed at Norham	3898 6477	TWRP	4390.0
021010 *	Tweed at Dryburgh	3588 6320	TWRP	2080.0
021011	Yarrow Water at Philiphaugh	3439 6277	TWRP	231.0
021012	Teviot at Hawick	3522 6159	TWRP	323.0
021013	Gala Water at Galashiels	3479 6374	TWRP	207.0
021014	Tweed at Kingledores	3109 6285	TWRP	139.0
021015	Leader Water at Earlston	3565 6388	TWRP	239.0
021016	Eye Water at Eyemouth Mill	3942 6635	TWRP	119.0
021017	Ettrick Water at Brockhoperig	3234 6132	TWRP	37.5
021018	Lyne Water at Lyne Station	3209 6401	TWRP	175.0
021019	Manor Water at Cademuir	3217 6369	TWRP	61.6
021020	Yarrow Water at Gordon Arms	3309 6247	TWRP	155.0
021021	Tweed at Sprouston	3752 6354	TWRP	3330.0
021022	Whiteadder Water at Hutton Castle	3881 6550	TWRP	503.0
021023	Leet Water at Coldstream	3839 6396	TWRP	113.0
021024	Jed Water at Jedburgh	3655 6214	TWRP	139.0
021025	Ale Water at Ancrum	3534 6244	TWRP	174.0
021026	Tima Water at Deephope	3278 6138	TWRP	31.0
021027	Blackadder Water at Mouth Bridge	3826 6530	TWRP	159.0
021030	Megget Water at Henderland	3231 6232	TWRP	56.2
021031 *	Till at Etal	3927 6396	NRA-N	648.0
021032	Glen at Kirknewton	3919 6310	NRA-N	198.9
021034	Yarrow Water at Craig Douglas	3288 6244	TWRP	116.0
022001	Coquet at Morwick	4234 6044	NRA-N	569.8
022002 *	Coquet at Bygate	3870 6083	NRA-N	59.5
022003 *	Usway Burn at Shillmoor	3886 6077	NRA-N	21.4
022004 *	Aln at Hawkhill	4211 6129	NRA-N	205.0
022006	Blyth at Hartford Bridge	4243 5800	NRA-N	269.4
022007	Wansbeck at Mitford	4175 5858	NRA-N	287.3
022008 *	Alwin at Clennell	3925 6063	NRA-N	27.7
022009	Coquet at Rothbury	4067 6016	NRA-N	346.0
023001	Tyne at Bywell	4038 5617	NRA-N	2175.6
023002	Derwent at Eddys Bridge	4041 5508	NRA-N	118.0
023003	North Tyne at Reaverhill	3906 5732	NRA-N	1007.5
023004	South Tyne at Haydon Bridge	3856 5647	NRA-N	751.1
023005	North Tyne at Tarset	3776 5861	NRA-N	284.9
023006 *	South Tyne at Featherstone	3672 5611	NRA-N	321.9
023007	Derwent at Rowlands Gill	4168 5581	NRA-N	242.1
023008	Rede at Rede Bridge	3868 5832	NRA-N	343.8
023009 *	South Tyne at Alston	3716 5465	NRA-N	118.5
023010 *	Tarset Burn at Greenhaugh	3789 5879	NRA-N	96.0
023011	Kielder Burn at Kielder	3644 5946	NRA-N	58.8
023012 *	East Allen at Wide Eals	3802 5583	NRA-N	88.0
023013 *	West Allen at Hindley Wrae	3791 5583	NRA-N	75.1
023014 *	North Tyne at Kielder temporary	3631 5931	NRA-N	27.0
023015 *	North Tyne at Barrasford	3924 5721	NGWC	1043.8
023016	Ouse Burn at Crag Hall	4254 5674	NRA-N	55.0
023022	North Tyne at Uglydub	3712 5875	NRA-N	241.5
023023	Tyne at Riding Mill	4026 5619	NRA-N	2174.5
024001	Wear at Sunderland Bridge	4264 5376	NRA-N	657.8
024002 *	Gaunless at Bishop Auckland	4215 5306	NRA-N	93.0
024003	Wear at Stanhope	3984 5391	NRA-N	171.9
024004	Bedburn Beck at Bedburn	4118 5322	NRA-N	74.9
024005	Browney at Burn Hall	4259 5387	NRA-N	178.5
024006 *	Rookhope Burn at Eastgate	3952 5390	NRA-N	36.5
024007 *	Browney at Lanchester	4165 5462	NRA-N	44.6
024008	Wear at Witton Park	4174 5309	NRA-N	455.0
024009	Wear at Chester le Street	4283 5512	NRA-N	1008.3
025001	Tees at Broken Scar	4259 5137	NRA-N	818.4
025002 *	Tees at Dent Bank	3932 5260	NRA-N	217.3
025003 *	Trout Beck at Moor House	3759 5336	NRA-N	11.4
025004	Skerne at South Park	4284 5129	NRA-N	250.1
025005	Leven at Leven Bridge	4445 5122	NRA-N	196.3
025006	Greta at Rutherford Bridge	4034 5122	NRA-N	86.1
025007 *	Clow Beck at Croft	4282 5101	NRA-N	78.2
025008	Tees at Barnard Castle	4047 5166	NRA-N	509.2
025009	Tees at Low Moor	4364 5105	NRA-N	1264.0
025010 *	Baydale Beck at Mowden Bridge	4260 5156	NRA-N	31.1

Station number	River and station name	Grid reference	Authority	Area (sq km)
025011 *	Langdon Beck at Langdon	3852 5309	NRA-N	13.0
025012	Harwood Beck at Harwood	3849 5309	NRA-N	25.1
025013 *	Billingham Beck at Thorpe Thewles	4408 5237	NRA-N	61.4
025014 *	Mordon Stell at Mordon School	4323 5274	NRA-N	2.5
025015 *	Woodham Burn at South Farm	4285 5263	NRA-N	29.1
025018	Tees at Middleton in Teesdale	3950 5250	NRA-N	242.1
025019	Leven at Easby	4585 5087	NRA-N	14.8
025020	Skerne at Preston le Skerne	4292 5238	NRA-N	147.0
025021	Skerne at Bradbury	4318 5285	NRA-N	70.1
025022 *	Balder at Balderhead Reservoir	3931 5182	NRA-N	20.4
025023	Tees at Cow Green Reservoir	3813 5288	NRA-N	58.2
025024 *	Chapel Beck at Guisborough	4599 5163	NRA-N	13.4
026001 *	West Beck at Wansford Bridge	5064 4560	NRA-Y	192.0
026002	Hull at Hempholme Lock	5080 4498	NRA-Y	378.1
026003	Foston Beck at Foston Mill	5093 4548	NRA-Y	57.2
026004 *	Gypsey Race at Bridlington	5165 4675	NRA-Y	253.8
026005	Gypsey Race at Boynton	5137 4677	NRA-Y	240.0
026006	Elmswell Beck at Little Driffield	5009 4575	NRA-Y	136.0
026007 *	Catchwater at Withernwick	5171 4403	NRA-Y	15.5
026008	Mires Beck at North Cave	4890 4316	NRA-Y	
027001 *	Nidd at Hunsingore Weir	4428 4530	NRA-Y	484.3
027002	Wharfe at Flint Mill Weir	4422 4473	NRA-Y	758.9
027003	Aire at Beal Weir	4534 4255	NRA-Y	1932.1
027004 *	Calder at Newlands	4365 4220	NRA-Y	899.0
027006 *	Don at Hadfields Weir	4390 3910	NRA-Y	373.0
027007	Ure at Westwick Lock	4356 4671	NRA-Y	914.6
027008 *	Swale at Leckby Grange	4415 4748	NRA-Y	1345.6
027009	Ouse at Skelton	4568 4554	NRA-Y	3315.0
027010 *	Hodge Beck at Bransdale Weir	4627 4944	NRA-Y	18.9
027012 *	Hebden Water at High Greenwood	3973 4309	NRA-Y	36.0
027013 *	Ewden Beck at More Hall Reservoir	4289 3957	NRA-Y	26.4
027014 *	Rye at Little Habton	4743 4771	NRA-Y	679.0
027015 *	Derwent at Stamford Bridge	4714 4557	NRA-Y	1634.3
027018 *	Ryburn at Ryburn Reservoir	4025 4187	NRA-Y	10.7
027019 *	Booth Dean Clough at Booth Wood Mill	4033 4166	NRA-Y	15.9
027021 *	Don at Doncaster	4569 4040	NRA-Y	1256.2
027022 *	Don at Rotherham Weir	4427 3928	NRA-Y	826.0
027023	Dearne at Barnsley Weir	4350 4073	NRA-Y	118.9
027024 *	Swale at Richmond	4146 5006	NRA-Y	381.0
027025	Rother at Woodhouse Mill	4432 3857	NRA-Y	352.2
027026	Rother at Whittington	4394 3744	NRA-Y	165.0
027027 *	Wharfe at Ilkley	4112 4481	NRA-Y	443.0
027028	Aire at Armley	4281 4340	NRA-Y	691.5
027029	Calder at Elland	4124 4219	NRA-Y	341.9
027030	Dearne at Adwick	4477 4020	NRA-Y	310.8
027031	Colne at Colne Bridge	4174 4199	NRA-Y	245.0
027032	Hebden Beck at Hebden	4025 4643	NRA-Y	22.2
027033	Sea Cut at Scarborough	5028 4908	NRA-Y	33.2
027034	Ure at Kilgram Bridge	4190 4860	NRA-Y	510.2
027035	Aire at Kildwick Bridge	4013 4457	NRA-Y	282.3
027036 *	Derwent at Malton	4789 4715	NRA-Y	1421.0
027038	Costa Beck at Gatehouses	4774 4836	NRA-Y	7.8
027040	Doe Lea at Staveley	4443 3746	NRA-Y	67.9
027041	Derwent at Buttercrambe	4731 4587	NRA-Y	1586.0
027042	Dove at Kirkby Mills	4705 4855	NRA-Y	59.2
027043	Wharfe at Addingham	4092 4494	NRA-Y	427.0
027044	Blackfoss Beck at Sandhills Bridge	4725 4475	NRA-Y	47.0
027047	Snaizeholme Beck at Low Houses	3833 4883	NRA-Y	10.2
027048	Derwent at West Ayton	4990 4853	NRA-Y	127.0
027049	Rye at Ness	4696 4791	NRA-Y	238.7
027050	Esk at Sleights	4865 5081	NRA-Y	308.0
027051	Crimple at Burn Bridge	4284 4519	NRA-Y	8.1
027052	Whitting at Sheepbridge	4376 3747	NRA-Y	50.2
027053	Nidd at Birstwith	4230 4603	NRA-Y	217.6
027054	Hodge Beck at Cherry Farm	4652 4902	NRA-Y	37.1
027055	Rye at Broadway Foot	4560 4883	NRA-Y	131.7
027056	Pickering Beck at Ings Bridge	4791 4819	NRA-Y	68.6
027057	Seven at Normanby	4736 4821	NRA-Y	121.6
027058	Riccal at Crook House Farm	4661 4810	NRA-Y	57.6
027059	Laver at Ripon	4301 4710	NRA-Y	87.5
027060	Kyle at Newton On Ouse	4509 4602	NRA-Y	167.6
027061	Colne at Longroyd Bridge	4136 4161	NRA-Y	72.3
027062	Nidd at Skip Bridge	4482 4561	NRA-Y	516.0
027064	Went at Walden Stubbs	4551 4163	NRA-Y	83.7
027065	Holme at Queens Mill	4142 4157	NRA-Y	97.4
027066	Blackburn Brook at Ashlowes	4393 3914	NRA-Y	42.8
027067	Sheaf at Highfield Road	4357 3863	NRA-Y	49.1
027068	Ryburn at Ripponden	4035 4188	NRA-Y	33.0
027069	Wiske at Kirby Wiske	4375 4844	NRA-Y	215.5
027070	Eller Beck at Skipton	1984 4502	NRA-Y	35.3
027071	Swale at Crakehill	4425 4734	NRA-Y	1363.0
027072	Worth at Keighley	4064 4408	NRA-Y	71.7
027073	Brompton Beck at Snainton Ings	4936 4794	NRA-Y	12.9
027074	Spen Beck at Northorpe	4225 4210	NRA-Y	46.3
027075	Bedale Beck at Leeming	4306 4902	NRA-Y	160.3
027076	Bielby Beck at Thornton Lock	4760 4444	NRA-Y	103.1
027077	Bradford Beck at Shipley	4151 4375	NRA-Y	58.0
027080	Aire at Fleet Weir	4381 4285	NRA-Y	
027082	Cundall Beck at Bat Bridge	4419 4724	NRA-Y	
027083	Foss at Huntington	4612 4543	NRA-Y	
028001	Derwent at Yorkshire Bridge	4198 3851	NRA-ST	126.0
028002 *	Blithe at Hamstall Ridware	4109 3192	NRA-ST	163.0
028003 *	Tame at Water Orton	4169 2915	NRA-ST	408.0
028004 *	Tame at Lea Marston	4206 2935	NRA-ST	795.0
028005 *	Tame at Elford	4173 3105	NRA-ST	1475.0
028006 *	Trent at Great Haywood	3994 3231	NRA-ST	325.0
028007 *	Trent at Shardlow	4448 3299	NRA-ST	4400.0
028008	Dove at Rocester Weir	4112 3397	NRA-ST	399.0
028009	Trent at Colwick	4620 3399	NRA-ST	7486.0
028010 *	Derwent at Longbridge Weir/St.Marys	4356 3363	NRA-ST	1054.0
028011	Derwent at Matlock Bath	4296 3586	NRA-ST	690.0
028012	Trent at Yoxall	4131 3177	NRA-ST	1229.0
028013 *	Soar at Zouch	4498 3240	NRA-ST	1289.8
028014 *	Sow at Milford	3975 3215	NRA-ST	591.0
028015	Idle at Mattersey	4690 3895	NRA-ST	529.0
028016 *	Ryton at Serlby Park	4641 3897	NRA-ST	231.0
028017 *	Devon at Cotham	4787 3476	NRA-ST	284.0
028018	Dove at Marston on Dove	4235 3288	NRA-ST	883.2
028019	Trent at Drakelow Park	4239 3204	NRA-ST	3072.0
028020 *	Churnet at Rocester	4103 3389	NRA-ST	236.0
028021 *	Derwent at Draycott	4443 3327	NRA-ST	1175.0
028022 *	Trent at North Muskham	4801 3601	NRA-ST	8231.0
028023 *	Wye at Ashford	4182 3696	NRA-ST	154.0
028024	Wreake at Syston Mill	4615 3124	NRA-ST	413.8
028025 *	Sence at Ratcliffe Culey	4321 2996	NRA-ST	169.4
028026	Anker at Polesworth	4263 3034	NRA-ST	368.0
028027 *	Erewash at Stapleford	4482 3364	NRA-ST	182.2
028029 *	Kingston Brook at Kingston Hall	4503 3277	NRA-ST	57.0
028030 *	Black Brook at Onebarrow	4466 3171	NRA-ST	8.4
028031	Manifold at Ilam	4140 3507	NRA-ST	148.5
028032 *	Meden at Church Warsop	4558 3680	NRA-ST	62.8
028033 *	Dove at Hollinsclough	4063 3668	NRA-ST	8.0
028035 *	Leen at Nottingham	4549 3392	NRA-ST	111.0
028036 *	Poulter at Twyford Bridge	4700 3752	NRA-ST	128.2
028038 *	Manifold at Hulme End	4106 3595	NRA-ST	46.0
028039	Rea at Calthorpe Park	4071 2847	NRA-ST	74.0
028040	Trent at Stoke on Trent	3892 3467	NRA-ST	53.2
028041 *	Hamps at Waterhouses	4082 3502	NRA-ST	35.1
028043	Derwent at Chatsworth	4261 3683	NRA-ST	335.0
028044 *	Poulter at Cuckney	4570 3713	NRA-ST	32.2
028045 *	Meden/Maun at Bothamsall/Haughton	4681 3732	NRA-ST	262.6
028046	Dove at Izaak Walton	4146 3509	NRA-ST	83.0
028047 *	Oldcoates Dyke at Blyth	4615 3876	NRA-ST	85.2
028048	Amber at Wingfield Park	4376 3520	NRA-ST	139.0
028049 *	Ryton at Worksop	4575 3794	NRA-ST	77.0
028050 *	Torne at Auckley	4646 4012	NRA-ST	135.5
028052	Sow at Great Bridgford	3883 3270	NRA-ST	163.0
028053 *	Penk at Penkridge	3923 3144	NRA-ST	272.0
028054 *	Sence at Blaby	4566 2985	NRA-ST	133.0
028055 *	Ecclesbourne at Duffield	4320 3447	NRA-ST	50.4
028056	Rothley Brook at Rothley	4580 3121	NRA-ST	94.0
028058 *	Henmore Brook at Ashbourne	4176 3463	NRA-ST	42.0
028059 *	Maun at Mansfield	4548 3623	NRA-ST	28.8
028060 *	Dover Beck at Lowdham	4653 3479	NRA-ST	69.0
028061	Churnet at Basford Bridge	3983 3520	NRA-ST	139.0
028062 *	Trent at Fledborough	4815 3715	NRA-ST	8433.0
028065 *	Trent at Torksey	4827 3780	NRA-ST	8547.0
028066	Cole at Coleshill	4183 2874	NRA-ST	130.0
028067	Derwent at Church Wilne	4438 3316	NRA-ST	1177.5
028070 *	Burbage Brook at Burbage	4259 3804	NRA-ST	9.1
028072 *	Greet at Southwell	4711 3541	NRA-ST	46.2
028073 *	Ashop at Ashop diversion	4171 3896	NRA-ST	42.0
028075 *	Derwent at Slippery Stones	4169 3951	NRA-ST	17.0
028079	Meece at Shallowford	3874 3291	NRA-ST	86.3
028080	Tame at Lea Marston Lakes	4207 2937	NRA-ST	799.0
028081	Tame at Bescot	4012 2958	NRA-ST	169.0
028082	Soar at Littlethorpe	4542 2973	NRA-ST	183.9
028083	Trent at Darlaston	3885 3355	NRA-ST	195.2
028085	Derwent at St. Marys Bridge	4355 3368	NRA-ST	1054.0
028086	Sence at South Wigston	4588 2977	NRA-ST	113.0
028091	Ryton at Blyth	4631 3871	NRA-ST	231.0
028093	Soar at Pillings Lock	4565 3182	NRA-ST	1108.4
028094	Blythe at Castle Farm	4213 2888	NRA-ST	183.8
028095	Tame at Hopwas Bridge	4182 3052	NRA-ST	1421.7
028101	Tame at Sheepwash	3974 2918	NRA-ST	27.9
028102	Blythe at Whitacre	4212 2911	NRA-ST	194.3
029001	Waithe Beck at Brigsley	5253 4016	NRA-A	108.3
029002	Great Eau at Claythorpe Mill	5416 3793	NRA-A	77.4
029003	Lud at Louth	5337 3879	NRA-A	55.2
029004	Ancholme at Bishopbridge	5032 3911	NRA-A	54.7
029005	Rase at Bishopbridge	5032 3912	NRA-A	66.6
029009	Ancholme at Toft Newton	5033 3877	NRA-A	27.2
030001	Witham at Claypole Mill	4842 3480	NRA-A	297.9
030002	Barlings Eau at Langworth Bridge	5066 3766	NRA-A	210.1
030003	Bain at Fulsby Lock	5241 3611	NRA-A	197.1
030004	Partney Lymn at Partney Mill	5402 3676	NRA-A	61.6
030005	Witham at Saltersford total	4927 3335	NRA-A	126.1
030006	Slea at Leasingham Mill	5088 3485	NRA-A	48.4
030011	Bain at Goulceby Bridge	5246 3795	NRA-A	62.5
030012	Stainfield Beck at Stainfield	5127 3739	NRA-A	37.4
030013	Heighington Beck at Heighington	5042 3696	NRA-A	21.2
030014	Pointon Lode at Pointon	5128 3313	NRA-A	11.9
030015	Cringle Brook at Stoke Rochford	4925 3297	NRA-A	50.5
030017	Witham at Colsterworth	4929 3246	NRA-A	51.3
031001	Eye Brook at Eye Brook Reservoir	4853 2941	CDWC	60.1
031002	Glen at Kates Brdg and King St Brdg	5106 3149	NRA-A	341.9
031005	Welland at Tixover	4970 2997	NRA-A	417.0
031006	Gwash at Belmesthorpe	5038 3097	NRA-A	150.0
031007	Welland at Barrowden	4948 2999	NRA-A	411.6
031010	Chater at Fosters Bridge	4961 3030	NRA-A	68.9
031012 *	Tham at Little Bytham	5016 3179	NRA-A	24.9
031016	North Brook at Empingham	4957 3089	NRA-A	36.5
031021	Welland at Ashley	4819 2915	NRA-A	250.7
031023	West Glen at Easton Wood	4965 3258	NRA-A	4.4
031025	Gwash South Arm at Manton	4875 3051	NRA-A	24.5
031026	Egleton Brook at Egleton	4878 3073	NRA-A	2.5
031028	Gwash at Church Bridge	4951 3082	NRA-A	76.5
032001	Nene at Orton	5166 2972	NRA-A	1634.3
032002	Willow Brook at Fotheringhay	5067 2933	NRA-A	89.6
032003	Harpers Brook at Old Mill Bridge	4983 2799	NRA-A	74.3
032004	Ise Brook at Harrowden Old Mill	4898 2715	NRA-A	194.0
032006	Nene/Kislingbury at Upton	4721 2592	NRA-A	223.0
032007	Nene Brampton at St Andrews	4747 2617	NRA-A	232.8
032008	Nene/Kislingbury at Dodford	4627 2607	NRA-A	107.0
032029 *	Flore at Experimental Catchment	4660 2610	NRA-A	7.0
032031	Wootton Brook at Wootton Park	4726 2577	NRA-A	73.9
033001 *	Bedford Ouse at Brownshill Staunch	5369 2727	NRA-A	3030.0
033002	Bedford Ouse at Bedford	5055 2495	NRA-A	1460.0
033003	Cam at Bottisham	5508 2657	NRA-A	803.0
033004 *	Lark at Isleham	5648 2760	NRA-A	466.2
033005	Bedford Ouse at Thornborough Mill	4736 2353	NRA-A	388.5
033006	Wissey at Northwold	5771 2965	NRA-A	274.5
033007	Nar at Marham	5723 3119	NRA-A	153.3
033008 *	Little Ouse at Thetford No1 Staunch	5860 2832	NRA-A	699.0
033009	Bedford Ouse at Harrold Mill	4951 2565	NRA-A	1320.0
033011	Little Ouse at County Bridge Euston	5892 2801	NRA-A	128.7
033012 *	Kym at Meagre Farm	5155 2631	NRA-A	137.5
033013	Sapiston at Rectory Bridge	5896 2791	NRA-A	205.9
033014	Lark at Temple	5758 2730	NRA-A	272.0
033015	Ouzel at Willen	4882 2408	NRA-A	277.1
033016 *	Cam at Jesus Lock	5450 2593	NRA-A	761.5
033018	Tove at Cappenham Bridge	4714 2488	NRA-A	138.1
033019	Thet at Melford Bridge	5880 2830	NRA-A	316.0
033020	Alconbury Brook at Brampton	5208 2717	NRA-A	201.5
033021	Rhee at Burnt Mill	5415 2523	NRA-A	303.0
033022	Ivel at Blunham	5153 2509	NRA-A	541.3
033023	Lea Brook at Beck Bridge	5662 2733	NRA-A	101.8
033024	Cam at Dernford	5466 2506	NRA-A	198.0
033025 *	Babingly at West Newton Mill	5696 3256	NRA-A	39.6
033026	Bedford Ouse at Offord	5216 2669	NRA-A	2570.0

Station number	River and station name	Grid reference	Authority	Area (sq km)
033027	Rhee at Wimpole	5333 2485	NRA-A	119.1
033028	Flit at Shefford	5143 2393	NRA-A	119.6
033029	Stringside at White Bridge	5716 3006	NRA-A	98.8
033030 *	Clipstone Brook at Clipstone	4933 2255	NRA-A	40.2
033031	Broughton Brook at Broughton	4889 2408	NRA-A	66.6
033032	Heacham at Heacham	5685 3375	NRA-A	59.0
033033	Hiz at Arlesey	5190 2379	NRA-A	108.0
033034	Little Ouse at Abbey Heath	5851 2844	NRA-A	699.3
033035	Ely Ouse at Denver Complex	5588 3010	NRA-A	3430.0
033037	Bedford Ouse at Newp't Pagnell Wr	4877 2443	NRA-A	800.0
033039	Bedford Ouse at Roxton	5160 2535	NRA-A	1660.0
033040	Rhee at Ashwell	5267 2401	NRA-A	
033044	Thet at Bridgham	5957 2855	NRA-A	277.8
033045	Wittle at Quidenham	6027 2878	NRA-A	28.3
033046	Thet at Red Bridge	5996 2923	NRA-A	145.3
033048	Larling Brook at Stonebridge	5928 2907	NRA-A	21.4
033049 *	Stanford Water at Buckenham Tofts	5834 2953	NRA-A	43.5
033050	Snail at Fordham	5631 2703	NRA-A	60.6
033051	Cam at Chesterford	5505 2426	NRA-A	141.0
033052	Swaffham Lode at Swaffham Bulbeck	5553 2628	NRA-A	36.4
033053	Granta at Stapleford	5471 2515	NRA-A	114.0
033054	Babingley at Castle Rising	5680 3252	NRA-A	47.7
033055	Granta at Babraham	5510 2504	NRA-A	98.7
033056	Quy Water at Lode	5531 2627	NRA-A	76.4
033057	Ouzel at Leighton Buzzard	4917 2241	NRA-A	119.0
033058	Ouzel at Bletchley	4883 2322	NRA-A	215.0
033059 *	Cut-off Channel at Tolgate	5729 2757	NRA-A	
033060 *	Kings Dike at Stanground	5208 2973	NRA-A	
033062	Guilden Brook at Fowlmere two	5403 2457	NRA-A	
033063	Little Ouse at Knettishall	5955 2807	NRA-A	101.0
033064	Whaddon Brook at Whaddon	5359 2466	NRA-A	16.0
033065	Hiz at Hitchin	5185 2290	NRA-A	6.8
033066	Granta at Linton	5570 2464	NRA-A	59.8
033067	New River at Burwell	5608 2696	NRA-A	19.6
033068	Cheney Water at Gatley End	5296 2411	NRA-A	5.0
034001	Yare at Colney	6182 3082	NRA-A	231.8
034002	Tas at Shotesham	6226 2994	NRA-A	146.5
034003	Bure at Ingworth	6192 3296	NRA-A	164.7
034004	Wensum at Costessey Mill	6177 3128	NRA-A	536.1
034005	Tud at Costessey Park	6170 3113	NRA-A	73.2
034006	Waveney at Needham Mill	6229 2811	NRA-A	370.0
034007	Dove at Oakley Park	6174 2772	NRA-A	133.9
034008	Ant at Honing Lock	6331 3270	NRA-A	49.3
034010	Waveney at Billingford Bridge	6168 2782	NRA-A	149.4
034011	Wensum at Fakenham	5919 3294	NRA-A	127.1
034012	Burn at Burnham Overy	5842 3428	NRA-A	80.0
034013	Waveney at Ellingham Mill	6364 2917	NRA-A	670.0
034014	Wensum at Swanton Morley Total	6020 3184	NRA-A	363.0
034018	Stiffkey at Warham All Saints	5944 3414	NRA-A	77.1
034019	Bure at Horstead Mill	6267 3194	NRA-A	313.0
035001	Gipping at Constantine Weir	6154 2441	NRA-A	310.8
035002	Deben at Naunton Hall	6322 2534	NRA-A	163.1
035003	Alde at Farnham	6360 2601	NRA-A	63.9
035004	Ore at Beversham Bridge	6359 2583	NRA-A	54.9
035008	Gipping at Stowmarket	6058 2578	NRA-A	128.9
035010	Gipping at Bramford	6127 2465	NRA-A	298.0
035013	Blyth at Holton	6406 2769	NRA-A	92.9
036001	Stour at Stratford St Mary	6042 2340	EWC	844.3
036002	Glem at Glemsford	5846 2472	NRA-A	87.3
036003	Box at Polstead	5985 2378	NRA-A	53.9
036004	Chad Brook at Long Melford	5868 2459	NRA-A	47.4
036005	Brett at Hadleigh	6025 2429	NRA-A	156.0
036006	Stour at Langham	6020 2344	NRA-A	578.0
036007	Belchamp Brook at Bardfield Bridge	5848 2421	NRA-A	58.6
036008	Stour at Westmill	5827 2463	NRA-A	224.5
036009	Brett at Cockfield	5914 2525	NRA-A	25.7
036010	Bumpstead Brook at Broad Green	5689 2418	NRA-A	28.3
036011	Stour Brook at Sturmer	5696 2441	NRA-A	34.5
036012	Stour at Kedington	5708 2450	NRA-A	76.2
036013	Brett at Higham	6032 2354	NRA-A	195.0
036015	Stour at Lamarsh	5897 2358	NRA-A	480.7
036016 *	Ramsey at Great Oakley	6206 2288	NRA-A	13.9
036017 *	Ely Ouse Outfall at Kirtling Green	5681 2559	NRA-A	
037001	Roding at Redbridge	5415 1884	NRA-T	303.3
037002	Chelmer at Rushes Lock	5794 2090	NRA-A	533.9
037003	Ter at Crabbs Bridge	5786 2107	NRA-A	77.8
037005	Colne at Lexden	5962 2261	NRA-A	238.2
037006	Can at Beachs Mill	5690 2072	NRA-A	228.4
037007	Wid at Writtle	5686 2060	NRA-A	136.3
037008	Chelmer at Springfield	5713 2071	NRA-A	190.3
037009	Brain at Guithavon Valley	5818 2147	NRA-A	60.7
037010	Blackwater at Appleford Bridge	5845 2158	NRA-A	247.3
037011	Chelmer at Churchend	5629 2233	NRA-A	72.6
037012	Colne at Poolstreet	5771 2364	NRA-A	65.1
037013	Sandon Brook at Sandon Bridge	5755 2055	NRA-A	60.6
037014	Roding at High Ongar	5561 2040	NRA-T	95.1
037015	Cripsey Brook at Chipping Ongar	5548 2035	NRA-T	62.2
037016	Pant at Copford Hall	5668 2313	NRA-A	62.5
037017	Blackwater at Stisted	5793 2243	NRA-A	139.2
037018	Ingrebourne at Gaynes Park	5553 1862	NRA-T	47.9
037019	Beam at Bretons Farm	5515 1853	NRA-T	49.7
037020	Chelmer at Felsted	5670 2193	NRA-A	132.1
037021	Roman at Bounstead Bridge	5985 2205	NRA-A	52.6
037022	Holland Brook at Thorpe le Soken	6179 2212	NRA-A	54.9
037024	Colne at Earls Colne	5855 2298	NRA-A	154.2
037025 *	Bourne Brook at Perces Bridge	5822 2276	NRA-A	32.1
037026 *	Tenpenny Brook at Tenpenny Bridge	6079 2207	NRA-A	29.0
037027 *	Sixpenny Brook at Ship House Bridge	6054 2214	NRA-A	5.1
037028 *	Bentley Brook at Saltwater Bridge	6109 2193	NRA-A	12.1
037029 *	St Osyth Brook at Main Road Bridge	6134 2159	NRA-A	8.0
037030 *	Holland Brook at Cradle Bridge	6171 2217	NRA-A	48.6
037031	Crouch at Wickford	5748 1934	NRA-A	71.8
037033	Eastwood Brook at Eastwood	5859 1888	NRA-A	10.4
037034	Mardyke at Stifford	5596 1806	NRA-A	90.7
037036 *	Ely Ouse Outfall at Great Sampford	5646 2351	NRA-A	
037037	Toppesfield Brook at Cornish Hall End	5675 2377	NRA-A	1.3
037038 *	Wid at Margaretting	5672 2000	NRA-A	98.6
037039	Blackwater at Langford (low flows)	5835 2090	NRA-A	337.0
038001	Lee at Feildes Weir	5390 2092	NRA-T	1036.0
038002 *	Ash at Mardock	5393 2148	NRA-T	78.7
038003	Mimram at Panshanger Park	5282 2133	NRA-T	133.9
038004	Rib at Wadesmill	5360 2174	NRA-T	136.5
038005 *	Ash at Easneye	5380 2138	NRA-T	85.2
038006 *	Rib at Herts Training School	5335 2158	NRA-T	148.1
038007	Canons Brook at Elizabeth Way	5431 2104	NRA-T	21.4
038011 *	Mimram at Fulling Mill	5225 2169	NRA-T	98.7
038012	Stevenage Brook at Bragbury Park	5274 2211	NRA-T	36.0
038013	Upper Lee at Luton Hoo	5118 2185	NRA-T	70.7
038014	Salmon Brook at Edmonton	5343 1937	NRA-T	20.5
038015 *	Intercepting Drain at Enfield	5355 1932	NRA-T	7.4
038016	Stanstead Springs at Mountfitchet	5500 2246	NRA-T	20.5
038017	Mimram at Whitwell	5184 2212	NRA-T	39.1
038018	Upper Lee at Water Hall	5299 2099	NRA-T	150.0
038020	Cobbins Brook at Sewardstone Road	5387 1999	NRA-T	38.4
038021	Turkey Brook at Albany Park	5359 1985	NRA-T	42.2
038022	Pymmes Brook at Edmonton Silver Street	5340 1925	NRA-T	42.6
038024	Small River Lee at Ordnance Road	5370 1988	NRA-T	41.5
038026	Pincey Brook at Sheering Hall	5495 2126	NRA-T	54.6
038027	Stort at Glen Faba	5393 2093	NRA-T	280.2
038028	Stansted Brook at Gypsy Lane	5506 2241	NRA-T	25.9
038029	Quin at Griggs Bridge	5392 2248	NRA-T	50.4
038030	Beane at Hartham	5325 2131	NRA-T	175.1
039001	Thames at Kingston	5177 1698	NRA-T	9948.0
039002	Thames at Days Weir	4568 1935	NRA-T	3444.7
039003	Wandle at Connollys Mill	5265 1705	NRA-T	176.1
039004	Wandle at Beddington Park	5296 1655	NRA-T	122.0
039005	Beverley Brook at Wimbledon Common	5216 1717	NRA-T	43.6
039006	Windrush at Newbridge	4402 2019	NRA-T	362.6
039007	Blackwater at Swallowfield	4731 1648	NRA-T	354.8
039008	Thames at Eynsham	4445 2087	NRA-T	1616.2
039010	Colne at Denham	5052 1864	NRA-T	743.0
039011	Wey at Tilford	4874 1433	NRA-T	396.3
039012	Hogsmill at Kingston upon Thames	5182 1688	NRA-T	69.1
039013	Colne at Berrygrove	5123 1982	NRA-T	352.2
039014	Ver at Hansteads	5151 2016	NRA-T	132.0
039016	Kennet at Theale	4649 1708	NRA-T	1033.4
039017	Ray at Grendon Underwood	4680 2211	NRA-T	18.6
039019	Lambourn at Shaw	4470 1682	NRA-T	234.1
039020	Coln at Bibury	4122 2062	NRA-T	106.7
039021	Cherwell at Enslow Mill	4482 2183	NRA-T	551.7
039022	Loddon at Sheepbridge	4720 1652	NRA-T	164.5
039023	Wye at Hedsor	4896 1867	NRA-T	137.3
039025	Enbourne at Brimpton	4568 1648	NRA-T	147.6
039026	Cherwell at Banbury	4458 2411	NRA-T	199.4
039027	Pang at Pangbourne	4634 1766	NRA-T	170.9
039028	Dun at Hungerford	4321 1685	NRA-T	101.3
039029	Tillingbourne at Shalford	5000 1478	NRA-T	59.0
039030	Gade at Croxley Green	5082 1952	NRA-T	184.0
039031 *	Lambourn at Welford	4411 1731	NRA-T	176.0
039032 *	Lambourn at East Shefford	4390 1745	NRA-T	154.0
039033	Winterbourne St at Bagnor	4453 1694	NRA-T	49.2
039034	Evenlode at Cassington Mill	4448 2099	NRA-T	430.0
039035	Churn at Cerney Wick	4076 1963	NRA-T	124.3
039036	Law Brook at Albury	5045 1468	NRA-T	16.0
039037	Kennet at Marlborough	4187 1686	NRA-T	142.0
039038	Thame at Shabbington	4670 2055	NRA-T	443.0
039040	Thames at West Mill Cricklade	4094 1942	NRA-T	185.0
039042	Leach at Priory Mill Lechlade	4227 1994	NRA-T	76.9
039043	Kennet at Knighton	4295 1710	NRA-T	295.0
039044	Hart at Bramshill House	4755 1593	NRA-T	84.0
039046	Thames at Sutton Courtenay	4516 1946	NRA-T	3414.0
039049	Silk Stream at Colindeep Lane	5217 1895	NRA-T	29.0
039051 *	Sor Brook at Adderbury	4475 2346	NRA-T	106.4
039052	The Cut at Binfield	4853 1713	NRA-T	50.2
039053	Mole at Horley	5271 1434	NRA-T	89.9
039054	Mole at Gatwick Airport	5260 1399	NRA-T	31.8
039055	Yeading Bk West at Yeading West	5083 1846	NRA-T	17.6
039056	Ravensbourne at Catford Hill	5372 1732	NRA-T	67.6
039057	Crane at Cranford Park	5103 1778	NRA-T	61.7
039058	Pool at Winsford Road	5371 1725	NRA-T	38.3
039061	Letcombe Brook at Letcombe Bassett	4375 1853	NRA-T	2.7
039065	Ewelme Brook at Ewelme	4642 1916	NRA-T	13.4
039068	Mole at Castle Mill	5179 1502	NRA-T	316.0
039069	Mole at Kinnersley Manor	5262 1462	NRA-T	142.0
039071	Thames at Ewen	4007 1973	NRA-T	63.7
039072	Thames at Royal Windsor Park	4982 1773	NRA-T	7046.0
039073	Churn at Cirencester	4020 2028	NRA-T	84.0
039074	Ampney Brook at Sheepen Bridge	4105 1950	NRA-T	74.4
039075	Marston Meysey Bk at Whetstone Bridge	4128 1964	NRA-T	25.0
039076	Windrush at Worsham	4299 2107	NRA-T	296.0
039077	Og at Marlborough Poulton Fm	4194 1697	NRA-T	59.2
039078	Wey(north) at Farnham	4838 1465	NRA-T	191.1
039079	Wey at Weybridge	5068 1641	NRA-T	1008.0
039081	Ock at Abbey Gardens	4481 1966	NRA-T	234.0
039085 *	Wandle at Wandle Park	5266 1703	NRA-T	176.1
039086	Gatwick Stream at Gatwick Link	5285 1417	NRA-T	33.6
039087	Ray at Water Eaton	4121 1935	NRA-T	84.1
039088	Chess at Rickmansworth	5066 1947	NRA-T	105.0
039089	Gade at Bury Mill	5053 2077	NRA-T	48.2
039090	Cole at Inglesham	4208 1970	NRA-T	140.0
039091 *	Misbourne at Quarrendon Mill	4975 1963	NRA-T	66.3
039092	Dollis Brook at Hendon Lane Bridge	5240 1895	NRA-T	25.1
039093	Brent at Monks Park	5202 1850	NRA-T	117.6
039094	Crane at Marsh Farm	5154 1734	NRA-T	81.0
039095	Quaggy at Manor House Gardens	5394 1748	NRA-T	
039096	Wealdstone Brook at Wembley	5192 1862	NRA-T	21.7
039097	Thames at Buscot	4230 1981	NRA-T	997.0
039098	Pinn at Uxbridge	5062 1826	NRA-T	33.3
039099	Ampney Brook at Ampney St. Peter	4076 2013	NRA-T	45.3
039100	Swill Brook at Oaksey	3997 1927	NRA-T	53.3
039101	Aldbourne at Ramsbury	4288 1717	NRA-T	53.1
039102	Misbourne at Denham Lodge	5046 1866	NRA-T	136.0
039103	Kennet at Newbury	4472 1672	NRA-T	548.1
039104	Mole at Esher	5130 1653	NRA-T	469.6
039105	Thame at Wheatley	4612 2050	NRA-T	533.8
039106	Mole at Leatherhead	5161 1564	NRA-T	371.4
040001 *	Medway at Weir Wood Reservoir	5407 1353	SW	26.9
040002 *	Darwell at Darwell Reservoir	5722 1213	SW	9.6
040003	Medway at Teston	5708 1530	NRA-S	1256.1
040004	Rother at Udiam	5773 1245	NRA-S	206.0
040005	Beult at Stile Bridge	5758 1478	NRA-S	277.1
040006	Bourne at Hadlow	5632 1497	NRA-S	50.3
040007	Medway at Chafford Weir	5517 1405	NRA-S	255.1
040008	Great Stour at Wye	6049 1470	NRA-S	230.0
040009	Teise at Stone Bridge	5718 1399	NRA-S	136.2
040010	Eden at Penshurst	5520 1437	NRA-S	224.3
040011	Great Stour at Horton	6116 1554	NRA-S	345.0
040012	Darent at Hawley	5551 1718	NRA-S	191.4
040013	Darent at Otford	5525 1584	NRA-S	100.5
040014 *	Wingham at Durlock	6276 1576	NRA-S	37.7
040015	White Drain at Fairbrook Farm	6055 1606	NRA-S	31.8

Station number	River and station name	Grid reference	Auth-ority	Area (sq km)
040016	Cray at Crayford	5511 1746	NRA-S	119.7
040017	Dudwell at Burwash	5679 1240	NRA-S	27.5
040018	Darent at Lullingstone	5530 1643	NRA-S	118.4
040020	Eridge Stream at Hendal Bridge	5522 1367	NRA-S	53.7
040021 *	Hexden Channel at Hopemill Br Sandhurst	5813 1290	NRA-S	32.4
040022 *	Great Stour at Chart Leacon	5973 1423	NRA-S	72.5
040023	East Stour at South Willesborough	6015 1407	NRA-S	58.8
040024 *	Bartley Mill St at Bartley Mill	5633 1357	NRA-S	25.1
041001	Nunningham Stream at Tilley Bridge	5662 1129	NRA-S	16.9
041002	Ash Bourne at Hammer Wood Bridge	5684 1141	NRA-S	18.4
041003	Cuckmere at Sherman Bridge	5533 1051	NRA-S	134.7
041004	Ouse at Barcombe Mills	5433 1148	NRA-S	395.7
041005	Ouse at Gold Bridge	5429 1214	NRA-S	180.9
041006	Uck at Isfield	5459 1190	NRA-S	87.8
041009 *	Rother at Hardham	5034 1178	NRA-S	345.8
041010	Adur W Branch at Hatterell Bridge	5178 1197	NRA-S	109.1
041011	Rother at Iping Mill	4852 1229	NRA-S	154.0
041012	Adur E Branch at Sakeham	5219 1190	NRA-S	93.3
041013	Huggletts Stream at Henley Bridge	5671 1138	NRA-S	14.2
041014	Arun at Pallingham Quay	5047 1229	NRA-S	379.0
041015	Ems at Westbourne	4755 1074	NRA-S	58.3
041016	Cuckmere at Cowbeech	5611 1150	NRA-S	18.7
041017	Combehaven at Crowhurst	5765 1102	NRA-S	30.5
041018	Kird at Tanyards	5044 1256	NRA-S	66.8
041019	Arun at Alfoldean	5117 1331	NRA-S	139.0
041020	Bevern Stream at Clappers Bridge	5423 1161	NRA-S	34.6
041021	Clayhill Stream at Old Ship	5448 1153	NRA-S	7.1
041022	Lod at Halfway Bridge	4931 1223	NRA-S	52.0
041023	Lavant at Graylingwell	4871 1064	NRA-S	87.2
041024	Shell Brook at Shell Brook P S	5335 1286	NRA-S	22.6
041025	Loxwood Stream at Drungewick	5060 1309	NRA-S	91.6
041026	Cockhaise Brook at Holywell	5376 1262	NRA-S	36.1
041027	Rother at Princes Marsh	4772 1270	NRA-S	37.2
041028	Chess Stream at Chess Bridge	5217 1173	NRA-S	24.0
041029	Bull at Lealands	5575 1131	NRA-S	40.8
041030	Ouse at Ardingly	5333 1283	NRA-S	37.2
042001	Wallington at North Fareham	4587 1075	NRA-S	111.0
042003	Lymington at Brockenhurst Park	4318 1019	NRA-S	98.9
042004	Test at Broadlands	4354 1188	NRA-S	1040.0
042005	Wallop Brook at Broughton	4311 1330	NRA-S	53.6
042006	Meon at Mislingford	4589 1141	NRA-S	72.8
042007	Alre at Drove Lane Alresford	4574 1326	NRA-S	57.0
042008	Cheriton Stream at Sewards Bridge	4574 1323	NRA-S	75.1
042009	Candover Stream at Borough Bridge	4568 1323	NRA-S	71.2
042010	Itchen at Highbridge+Allbrook	4467 1213	NRA-S	360.0
042011	Hamble at Frog Mill	4523 1149	NRA-S	56.6
042012	Anton at Fullerton	4379 1393	NRA-S	185.0
042014	Blackwater at Ower	4328 1174	NRA-S	104.7
042015	Dever at Weston Colley	4496 1394	NRA-S	52.7
042016 *	Itchen at Easton	4512 1325	NRA-S	236.8
042017	Hermitage at Havant	4711 1067	NRA-S	17.0
042018	Monks Brook at Eastleigh	4443 1179	NRA-S	43.3
042020	Tadburn Lake at Romsey	4362 1212	NRA-S	19.0
042021 *	Branch of Test at Nursling	4355 1159	NRA-S	1050.0
043001 *	Avon at Ringwood	4142 1054	NRA-W	1649.8
043003 *	Avon at East Mills	4158 1154	NRA-W	1477.8
043004	Bourne at Laverstock Mill	4157 1304	NRA-W	163.6
043005	Avon at Amesbury	4151 1413	NRA-W	323.7
043006	Nadder at Wilton Park	4098 1308	NRA-W	220.6
043007	Stour at Throop Mill	4113 0958	NRA-W	1073.0
043008	Wylye at South Newton	4086 1343	NRA-W	445.4
043009	Stour at Hammoon	3820 1147	NRA-W	523.1
043010 *	Allen at Loverley Mill	4006 1085	NRA-W	94.0
043011 *	Ebble at Bodenham	4162 1263	NRA-W	109.0
043012	Wylye at Norton Bavant	3909 1428	NRA-W	112.4
043013 *	Mude at Somerford	4184 0936	NRA-W	12.4
043014	East Avon at Upavon	4133 1559	NRA-W	86.2
043015 *	Wylye at Longbridge Deverill	3868 1413	NRA-W	69.0
043017	West Avon at Upavon	4133 1559	NRA-W	76.0
043018	Allen at Walford Mill	4008 1007	NRA-W	176.5
043019	Shreen Water at Colesbrook	3807 1278	NRA-W	29.1
043021	Avon at Knapp Mill	4155 0943	NRA-W	1706.0
044001 *	Frome at East Stoke total	3866 0867	NRA-W	414.4
044002	Piddle at Baggs Mill	3913 0876	NRA-W	183.1
044003 *	Asker at Bridport	3470 0928	NRA-W	49.1
044004 *	Frome at Dorchester total	3708 0903	NRA-W	206.0
044006	Sydling Water at Sydling St Nicholas	3632 0997	NRA-W	12.4
044008 *	Sth Winterbourne at W'bourne Steepleton	3629 0897	NRA-W	19.9
044009	Wey at Broadwey	3666 0839	NRA-W	7.0
045001	Exe at Thorverton	2936 1016	NRA-SW	600.9
045002	Exe at Stoodleigh	2943 1178	NRA-SW	421.7
045003	Culm at Wood Mill	3021 1058	NRA-SW	226.1
045004	Axe at Whitford	3262 0953	NRA-SW	288.5
045005	Otter at Dotton	3087 0885	NRA-SW	202.5
045006 *	Quarme at Enterwell	2919 1356	NRA-SW	20.4
045008	Otter at Fenny Bridges	3115 0986	NRA-SW	104.2
045009	Exe at Pixton	2935 1260	NRA-SW	147.6
045010 *	Haddeo at Hartford	2952 1294	NRA-SW	50.0
045011 *	Barle at Brushford	2927 1258	NRA-SW	128.0
045012	Creedy at Cowley	2901 0967	NRA-SW	261.6
046002	Teign at Preston	2856 0746	NRA-SW	380.0
046003	Dart at Austins Bridge	2751 0659	NRA-SW	247.6
046005	East Dart at Bellever	2657 0775	NRA-SW	21.5
046006	Erme at Ermington	2642 0532	NRA-SW	43.5
046007 *	West Dart at Dunnabridge	2643 0742	NRA-SW	47.9
046008 *	Avon at Loddiswell	2719 0476	NRA-SW	102.3
047001	Tamar at Gunnislake	2426 0725	NRA-SW	916.9
047003 *	Tavy at Lopwell	2474 0650	NRA-SW	205.9
047004	Lynher at Pillaton Mill	2369 0626	NRA-SW	135.5
047005 *	Ottery at Werrington Park	2336 0866	NRA-SW	120.7
047006 *	Lyd at Lifton Park	2388 0842	NRA-SW	218.1
047007	Yealm at Puslinch	2574 0511	NRA-SW	54.9
047008	Thrushel at Tinhay	2398 0856	NRA-SW	112.7
047009	Tiddy at Tideford	2343 0595	NRA-SW	37.2
047010	Tamar at Crowford Bridge	2290 0991	NRA-SW	76.7
047011 *	Plym at Carn Wood	2522 0613	NRA-SW	79.2
047013	Withey Brook at Bastreet	2244 0763	NRA-SW	16.2
047014	Walkham at Horrabridge	2513 0699	NRA-SW	43.2
047015 *	Tavy at Denham / Ludbrook	2476 0681	NRA-SW	197.3
047016	Lumburn at Lumburn Bridge	2459 0731	NRA-SW	20.5
047017 *	Wolf at Combe Park Farm	2419 0898	NRA-SW	31.1

Station number	River and station name	Grid reference	Auth-ority	Area (sq km)
048001	Fowey at Trekeivesteps	2227 0698	NRA-SW	36.8
048002 *	Fowey at Restormel one	2108 0613	NRA-SW	171.2
048003	Fal at Tregony	1921 0447	NRA-SW	87.0
048004	Warleggan at Trengoffe	2159 0674	NRA-SW	25.3
048005	Kenwyn at Truro	1820 0450	NRA-SW	19.1
048006	Cober at Helston	1654 0273	NRA-SW	40.1
048007	Kennall at Ponsanooth	1762 0377	NRA-SW	26.6
048009 *	St Neot at Craigshill Wood	2184 0662	NRA-SW	22.7
048010	Seaton at Trebrownbridge	2299 0596	NRA-SW	38.1
048011	Fowey at Restormel	2098 0624	NRA-SW	169.1
049001	Camel at Denby	2017 0682	NRA-SW	208.8
049002	Hayle at St Erth	1549 0342	NRA-SW	48.9
049003	De Lank at De Lank	2132 0765	NRA-SW	21.7
049004	Gannel at Gwills	1829 0593	NRA-SW	41.0
050001	Taw at Umberleigh	2608 1237	NRA-SW	826.2
050002	Torridge at Torrington	2500 1185	NRA-SW	663.0
050004 *	Hole Water at Muxworthy	2705 1373	NRA-SW	5.4
050005	West Okement at Vellake	2557 0903	NRA-SW	13.3
050006	Mole at Woodleigh	2660 1211	NRA-SW	327.5
050007	Taw at Taw Bridge	2673 1068	NRA-SW	71.4
051001	Doniford Stream at Swill Bridge	3088 1428	NRA-W	75.8
051002 *	Horner Water at West Luccombe	2898 1458	NRA-W	20.8
051003	Washford at Beggearn Huish	3040 1395	NRA-W	36.3
052001 *	Axe at Wookey	3527 1458	NRA-W	18.2
052002 *	Yeo at Sutton Bingham Res.	3556 1116	NRA-W	30.3
052003	Halse Water at Bishops Hull	3206 1253	NRA-W	87.8
052004	Isle at Ashford Mill	3361 1188	NRA-W	90.1
052005	Tone at Bishops Hull	3206 1250	NRA-W	202.0
052006	Yeo at Pen Mill	3573 1162	NRA-W	213.1
052007	Parrett at Chiselborough	3461 1144	NRA-W	74.8
052008 *	Tone at Clatworthy Reservoir	3044 1313	NRA-W	18.1
052009	Sheppey at Fenny Castle	3498 1439	NRA-W	59.6
052010	Brue at Lovington	3590 1318	NRA-W	135.2
052011	Cary at Somerton	3498 1291	NRA-W	82.4
052014	Tone at Greenham	3078 1202	NRA-W	57.2
052015 *	Land Yeo at Wraxall Bridge	3483 1716	NRA-W	23.3
052016	Currypool Stream at Currypool Farm	3221 1382	NRA-W	15.7
052017 *	Congresbury Yeo at Iwood	3452 1631	NRA-W	66.6
052020 *	Gallica Stream at Gallica Bridge	3571 1100	NRA-W	16.4
053001 *	Avon at Melksham	3903 1641	NRA-W	665.6
053002	Semington Brook at Semington	3907 1605	NRA-W	157.7
053003 *	Avon at Bath St James	3753 1645	NRA-W	1595.0
053004	Chew at Compton Dando	3648 1647	NRA-W	129.5
053005	Midford Brook at Midford	3763 1611	NRA-W	147.4
053006	Frome(Bristol) at Frenchay	3637 1772	NRA-W	148.9
053007	Frome(Somerset) at Tellisford	3805 1564	NRA-W	261.6
053008	Avon at Great Somerford	3966 1832	NRA-W	303.0
053009	Wellow Brook at Wellow	3741 1581	NRA-W	72.6
053013	Marden at Stanley	3955 1729	NRA-W	99.2
053017	Boyd at Bitton	3681 1698	NRA-W	48.0
053018	Avon at Bathford	3786 1671	NRA-W	1552.0
053019	Woodbridge Brook at Crab Mill	3949 1866	NRA-W	46.6
053020	Gauze Brook at Rodbourne	3937 1840	NRA-W	28.2
053022 *	Avon at Bath ultrasonic	3738 1651	NRA-W	1605.0
053023	Sherston Avon at Fosseway	3891 1870	NRA-W	89.7
053024	Tetbury Avon at Brokenborough	3914 1893	NRA-W	73.6
053025	Mells at Vallis	3757 1491	NRA-W	119.0
053026	Frome(Bristol) at Frampton Cotterell	3667 1822	NRA-W	78.5
053028	By Brook at Middlehill	3815 1688	NRA-W	102.0
053029	Biss at Trowbridge	3854 1579	NRA-W	
054001	Severn at Bewdley	3782 2762	NRA-ST	4325.0
054002	Avon at Evesham	4040 2438	NRA-ST	*2210.0
054004	Sowe at Stoneleigh	4332 2731	NRA-ST	262.0
054005	Severn at Montford	3412 3144	NRA-ST	*2025.0
054006	Stour at Kidderminster	3829 2768	NRA-ST	324.0
054007	Arrow at Broom	4086 2536	NRA-ST	319.0
054008	Teme at Tenbury	3597 2686	NRA-ST	1134.4
054010 *	Stour at Alscot Park	4208 2507	NRA-ST	319.0
054011 *	Salwarpe at Harford Mill	3868 2618	NRA-ST	184.0
054012	Tern at Walcot	3592 3123	NRA-ST	852.0
054013 *	Clywedog at Cribynau	2944 2855	NRA-ST	57.0
054014	Severn at Abermule	3164 2958	NRA-ST	580.0
054015 *	Bow Brook at Besford Bridge	3927 2463	NRA-ST	156.0
054016	Roden at Rodington	3589 3141	NRA-ST	259.0
054017 *	Leadon at Wedderburn Bridge	3777 2234	NRA-ST	293.0
054018	Rea Brook at Hookagate	3466 3092	NRA-ST	178.0
054019	Avon at Stareton	4333 2715	NRA-ST	347.0
054020	Perry at Yeaton	3434 3192	NRA-ST	180.8
054022	Severn at Plynlimon flume	2853 2872	IH	8.7
054023 *	Badsey Brook at Offenham	4063 2449	NRA-ST	95.8
054024	Worfe at Burcote	3747 2953	NRA-ST	258.0
054025	Dulas at Rhos-y-pentref	2950 2824	NRA-ST	52.7
054026 *	Chelt at Slate Mill	3892 2264	NRA-ST	34.5
054027 *	Frome at Ebley Mill	3831 2047	NRA-ST	198.0
054028	Vyrnwy at Llanymynech	3252 3195	NRA-ST	778.0
054029	Teme at Knightsford Bridge	3735 2557	NRA-ST	1480.0
054032	Severn at Saxons Lode	3863 2390	NRA-ST	6850.0
054034	Dowles Brook at Dowles	3768 2764	NRA-ST	40.8
054036 *	Isbourne at Hinton on the Green	4023 2408	NRA-ST	90.7
054038	Tanat at Llanyblodwel	3252 3225	NRA-ST	229.0
054040	Meese at Tibberton	3680 3205	NRA-ST	167.8
054041	Tern at Eaton On Tern	3649 3230	NRA-ST	192.0
054042 *	Clywedog at Clywedog Dm Lower Weir	2914 2867	NRA-ST	49.0
054043 *	Severn at Upton On Severn	3863 2399	NRA-ST	6850.0
054044	Tern at Ternhill	3629 3316	NRA-ST	92.6
054045 *	Perry at Perry Farm	3347 3303	NRA-ST	49.1
054046 *	Worfe at Cosford	3781 3046	NRA-ST	54.9
054047 *	Perry at Ruyton Bridge	3403 3223	NRA-ST	155.0
054048 *	Dene at Wellesbourne	4273 2556	NRA-ST	102.0
054049	Leam at Princes Drive Weir	4307 2654	NRA-ST	362.0
054052 *	Bailey Brook at Ternhill	3629 3316	NRA-ST	34.4
054054 *	Onny at Onibury	3455 2789	NRA-ST	235.0
054055 *	Rea at Neen Sollars	3664 2724	NRA-ST	129.0
054056 *	Clun at Clungunford	3393 2786	NRA-ST	195.0
054057	Severn at Haw Bridge	3844 2279	NRA-ST	9895.0
054058 *	Stoke Park Brook at Stoke Park	3644 3260	NRA-ST	14.3
054059 *	Allford Brook at Allford	3654 3223	NRA-ST	10.2
054060 *	Potford Brook at Potford	3634 3220	NRA-ST	25.0
054061 *	Hodnet Brook at Hodnet	3628 3288	NRA-ST	5.1
054062 *	Stoke Brook at Stoke	3637 3280	NRA-ST	13.7
054063 *	Stour at Prestwood Hospital	3865 2858	NRA-ST	89.9
054065 *	Roden at Stanton	3565 3241	NRA-ST	210.0
054066 *	Platt Brook at Platt	3628 3229	NRA-ST	15.7

Station number	River and station name	Grid reference	Auth-ority	Area (sq km)
054067 *	Smestow Brook at Swindon	3861 2906	NRA-ST	81.3
054068 *	Tetchill Brook at Hordley	3379 3288	NRA-ST	21.2
054069 *	Springs Brook at Lower Hordley	3387 3297	NRA-ST	10.4
054070 *	War Brook at Walford	3432 3198	NRA-ST	22.5
054080 *	Severn at Dolwen	2996 2851	NRA-ST	187.0
054081	Clywedog at Bryntail	2913 2868	NRA-ST	49.0
054083 *	Crow Brook at Horton	3678 3141	NRA-ST	16.7
054084 *	Cannop Brook at Parkend	3616 2075	NRA-ST	31.5
054085 *	Cannop Brook at Cannop Cross	3609 2115	NRA-ST	10.4
054086	Cownwy Diversion at Cownwy Weir	2999 3179	NRA-ST	13.2
054087 *	Allford Brook at Childs Ercall	3667 3228	NRA-ST	4.7
054088	Little Avon at Berkeley Kennels	3683 1988	NRA-W	134.0
054090	Tanllwyth at Tanllwyth Flume	2844 2876	IH	0.9
054091	Severn at Hafren Flume	2843 2878	IH	3.6
054092	Hore at Hore Flume	2846 2873	IH	3.2
054094	Strine at Crudgington	3640 3175	NRA-ST	134.0
054095	Severn at Buildwas	3644 3044	NRA-ST	3717.0
054096	Hadly Brook at Wards Bridge	3870 2631	NRA-ST	53.4
055002	Wye at Belmont	3485 2388	NRA-WEL	1895.9
055003 *	Lugg at Lugwardine	3548 2405	NRA-WEL	885.8
055004 *	Irfon at Abernant	2892 2460	NRA-WEL	72.8
055005 *	Wye at Rhayader	2969 2676	NRA-WEL	166.8
055006 *	Elan at Caban Coch Reservoir	2926 2645	NRA-WEL	184.0
055007	Wye at Erwood	3076 2445	NRA-WEL	1282.1
055008	Wye at Cefn Brwyn	2829 2838	IH	10.6
055009 *	Monnow at Kentchurch	3419 2251	NRA-WEL	357.4
055010 *	Wye at Pant Mawr	2843 2825	NRA-WEL	27.2
055011 *	Ithon at Llandewi	3105 2683	NRA-WEL	111.4
055012	Irfon at Cilmery	2995 2507	NRA-WEL	244.2
055013	Arrow at Titley Mill	3328 2585	NRA-WEL	126.4
055014	Lugg at Byton	3364 2647	NRA-WEL	203.3
055015 *	Honddu at Tafolog	3277 2294	NRA-WEL	25.1
055016	Ithon at Disserth	3024 2578	NRA-WEL	358.0
055017 *	Chwefru at Carreg-y-wen	2998 2531	NRA-WEL	29.0
055018	Frome at Yarkhill	3615 2428	NRA-WEL	144.0
055021	Lugg at Butts Bridge	3502 2589	NRA-WEL	371.0
055022 *	Trothy at Mitchel Troy	3503 2112	NRA-WEL	142.0
055023	Wye at Redbrook	3528 2110	NRA-WEL	4010.0
055025	Llynfi at Three Cocks	3166 2373	NRA-WEL	132.0
055026	Wye at Ddol Farm	2976 2676	NRA-WEL	174.0
055027 *	Rudhall Brook at Sandford Bridge	3641 2257	NRA-WEL	13.2
055028	Frome at Bishops Frome	3667 2489	NRA-WEL	77.7
055029	Monnow at Grosmont	3415 2249	NRA-WEL	354.0
055030 *	Claerwen at Dol-y-mynach	2910 2620	NRA-WEL	95.3
055031	Yazor Brook at Three Elms	3492 2415	NRA-WEL	42.3
055032	Elan at Elan Village	2934 2653	NRA-WEL	184.0
055033	Wye at Gwy flume	2824 2853	IH	3.9
055034	Cyff at Cyff flume	2824 2842	IH	3.1
055035	Iago at Iago flume	2826 2854	IH	1.1
056001	Usk at Chain Bridge	3345 2056	NRA-WEL	911.7
056002	Ebbw at Rhiwderyn	3259 1889	NRA-WEL	216.5
056003 *	Honddu at The Forge Brecon	3051 2297	NRA-WEL	62.1
056004 *	Usk at Llandetty	3127 2203	NRA-WEL	543.9
056005	Lwyd at Ponthir	3330 1924	NRA-WEL	98.1
056006 *	Usk at Trallong	2947 2295	NRA-WEL	183.8
056007	Senni at Pont Hen Hafod	2928 2255	NRA-WEL	19.9
056008 *	Monks Ditch at Llanwern	3372 1885	NRA-WEL	15.4
056010 *	Usk at Trostrey Weir	3358 2042	NRA-WEL	927.2
056011 *	Sirhowy at Wattsville	3206 1912	NRA-WEL	76.1
056012 *	Grwyne at Millbrook	3241 2176	NRA-WEL	82.2
056013	Yscir at Pontaryscir	3003 2304	NRA-WEL	62.8
056014 *	Usk at Usk Reservoir	2840 2290	NRA-WEL	17.0
056015 *	Olway Brook at Olway Inn	3384 2010	NRA-WEL	105.1
056016	Caerfanell Outfall at Talybont Reservior	3104 2206	NRA-WEL	32.4
057001 *	Taf Fechan at Taf Fechan Reservoir	3060 2117	NRA-WEL	33.7
057002 *	Taf Fawr at Llwynon Reservoir	3012 2111	NRA-WEL	43.0
057003 *	Taff at Tongwynlais	3132 1818	NRA-WEL	486.9
057004	Cynon at Abercynon	3079 1956	NRA-WEL	106.0
057005	Taff at Pontypridd	3079 1897	NRA-WEL	454.8
057006	Rhondda at Trehafod	3054 1909	NRA-WEL	100.5
057007	Taff at Fiddlers Elbow	3089 1951	NRA-WEL	194.5
057008	Rhymney at Llanedeyrn	3225 1821	NRA-WEL	178.7
057009	Ely at St Fagans	3121 1770	NRA-WEL	145.0
057010	Ely at Lanelay	3034 1827	NRA-WEL	39.4
057011 *	Blaen Taf Fawr at Beacons Reservoir	2987 2193	NRA-WEL	5.1
057012 *	Garwnant at Llwynon Reservoir	3004 2129	NRA-WEL	4.3
057015	Taff at Merthyr Tydfil	3043 2068	NRA-WEL	104.1
057016	Taf Fechan at Pontsticill	3060 2115	NRA-WEL	33.8
058001	Ogmore at Bridgend	2904 1794	NRA-WEL	158.0
058002	Neath at Resolven	2815 2017	NRA-WEL	190.9
058003 *	Ewenny at Ewenny Priory	2914 1780	NRA-WEL	62.9
058005	Ogmore at Brynmenyn	2904 1844	NRA-WEL	74.3
058006	Mellte at Pontneddfechan	2915 2082	NRA-WEL	65.8
058007	Llynfi at Coytrahen	2891 1855	NRA-WEL	50.2
058008	Dulais at Cilfrew	2778 2008	NRA-WEL	43.0
058009	Ewenny at Keepers Lodge	2920 1782	NRA-WEL	62.5
058010 *	Hepste at Esgair Carnau	2969 2134	NRA-WEL	11.0
058011	Thaw at Gigman Bridge	3017 1716	NRA-WEL	49.2
058012	Afan at Marcroft Weir	2771 1910	NRA-WEL	87.8
059001	Tawe at Ynystanglws	2685 1998	NRA-WEL	227.7
059002	Loughor at Tir-y-dail	2623 2127	NRA-WEL	46.4
060002	Cothi at Felin Mynachdy	2508 2225	NRA-WEL	297.8
060003	Taf at Clog-y-fran	2238 2160	NRA-WEL	217.3
060004 *	Dewi Fawr at Glasfryn Ford	2290 2175	NRA-WEL	40.1
060005	Bran at Llandovery	2771 2343	NRA-WEL	66.8
060006	Gwili at Glangwili	2431 2220	NRA-WEL	129.5
060007	Tywi at Dolau Hirion	2762 2362	NRA-WEL	231.8
060008	Tywi at Ystradffin	2786 2472	NRA-WEL	89.8
060009 *	Sawdde at Felin-y-cwm	2712 2266	NRA-WEL	81.1
060010	Tywi at Nantgaredig	2485 2206	NRA-WEL	1090.4
060012 *	Twrch at Ddol Las	2650 2440	NRA-WEL	20.7
060013 *	Cothi at Pont Ynys Brechfa	2537 2301	NRA-WEL	261.6
061001 *	Western Cleddau at Prendergast Mill	1954 2177	NRA-WEL	197.6
061002	Eastern Cleddau at Canaston Bridge	2072 2153	NRA-WEL	183.1
061003	Gwaun at Cilrhedyn Bridge	2005 2349	NRA-WEL	31.3
061004	Western Cleddau at Redhill	1942 2184	NRA-WEL	197.6
062001 *	Teifi at Glan Teifi	2244 2416	NRA-WEL	893.6
062002 *	Teifi at Llanfair	2433 2406	NRA-WEL	510.0
063001	Ystwyth at Pont Llolwyn	2591 2774	NRA-WEL	169.6
063002 *	Rheidol at Llanbadarn Fawr	2601 2804	NRA-WEL	182.1
063003 *	Wyre at Llanrhystyd	2542 2698	NRA-WEL	40.6
063004	Ystwyth at Cwm Ystwyth	2791 2737	NRA-WEL	32.1
063005	Maesnant at Nant-y-Moch C	2778 2877	IH	0.6
063006	Maesnant Fach at Nant-y-Moch E	2765 2865	IH	0.8
064001	Dyfi at Dyfi Bridge	2745 3019	NRA-WEL	471.3
064002	Dysynni at Pont-y-garth	2632 3066	NRA-WEL	75.1
064006	Leri at Dolybont	2635 2882	NRA-WEL	47.2
064007	Delyn at Llanbrynmair	2899 3062	IH	1.1
064008	Cwm at Llanbrynmair E	2916 3087	IH	3.0
065001	Glaslyn at Beddgelert	2592 3478	NRA-WEL	68.6
065002 *	Dwyryd at Maentwrog	2670 3415	NRA-WEL	78.2
065004	Gwyrfai at Bontnewydd	2484 3599	NRA-WEL	47.9
065005	Erch at Pencaenewydd	2400 3404	NRA-WEL	18.1
065006	Seiont at Peblig Mill	2493 3623	NRA-WEL	74.4
065007	Dwyfawr at Garndolbenmaen	2499 3429	NRA-WEL	52.4
066001	Clwyd at Pont-y-cambwll	3069 3709	NRA-WEL	404.0
066002 *	Elwy at Pant yr Onen	3021 3704	NRA-WEL	220.0
066003	Aled at Bryn Aled	2957 3703	NRA-WEL	70.0
066004 *	Wheeler at Bodfari	3105 3714	NRA-WEL	62.9
066005 *	Clwyd at Ruthin Weir	3122 3592	NRA-WEL	95.3
066006	Elwy at Pont-y-gwyddel	2952 3718	NRA-WEL	194.0
066008	Aled at Aled Isaf Reservoir	2915 3598	NRA-WEL	11.6
066011	Conwy at Cwm Llanerch	2802 3581	NRA-WEL	344.5
067001	Dee at Bala	2942 3357	NRA-WEL	261.6
067002 *	Dee at Erbistock Rectory	3357 3413	NRA-WEL	1040.0
067003	Brenig at Llyn Brenig outflow	2974 3539	NRA-WEL	20.2
067005 *	Ceiriog at Brynkinalt Weir	3295 3373	NRA-WEL	113.7
067006	Alwen at Druid	3042 3436	NRA-WEL	184.7
067008	Alyn at Pont-y-capel	3336 3541	NRA-WEL	227.1
067009	Alyn at Rhydymwyn	3206 3667	NRA-WEL	77.8
067010 *	Gelyn at Cynefail	2843 3420	NRA-WEL	13.1
067011 *	Nant Aberderfel at Nant Aberderfel	2851 3392	NRA-WEL	3.7
067012 *	Tryweryn at Upper Tryweryn	2838 3398	NRA-WEL	27.2
067013 *	Hirnant at Plas Rhiwedog	2946 3349	NRA-WEL	33.9
067015	Dee at Manley Hall	3348 3415	NRA-WEL	1019.3
067016 *	Worthenbury Brook at Worthenbury	3418 3464	NRA-WEL	142.1
067017	Tryweryn at Llyn Celyn outflow	2880 3399	NRA-WEL	59.9
067018	Dee at New Inn	2874 3308	NRA-WEL	53.9
067025 *	Clywedog at Bowling Bank	3396 3483	NRA-WEL	98.6
067026 *	Dee at Eccleston Ferry	3415 3612	NRA-WEL	1816.8
067028 *	Ceidiog at Llandrillo	3034 3371	NRA-WEL	36.5
067029 *	Trystion at Pen-y-felin Fawr	3066 3405	NRA-WEL	12.3
068001	Weaver at Ashbrook	3670 3633	NRA-NW	622.0
068002 *	Gowy at Picton	3443 3714	NRA-NW	156.2
068003	Dane at Rudheath	3668 3718	NRA-NW	407.1
068004	Wistaston Brook at Marshfield Bridge	3674 3552	NRA-NW	92.7
068005	Weaver at Audlem	3653 3431	NRA-NW	207.0
068006 *	Dane at Hulme Walfield	3845 3644	NRA-NW	150.0
068007	Wincham Brook at Lostock Gralam	3697 3757	NRA-NW	148.0
068010 *	Fender at Ford	3281 3880	NRA-NW	18.4
068015	Gowy at Huxley	3497 3624	NRA-NW	49.0
068018 *	Dane at Congleton Park	3861 3632	NRA-NW	145.0
068020	Gowy at Bridge Trafford	3448 3711	NRA-NW	156.0
069001	Mersey at Irlam Weir	3728 3936	NRA-NW	679.0
069002	Irwell at Adelphi Weir	3824 3987	NRA-NW	559.4
069003	Irk at Scotland Weir	3841 3992	NRA-NW	72.5
069004 *	Etherow at Bottoms Reservoir	4023 3971	NRA-NW	78.2
069005 *	Glaze Brook at Little Woolden Hall	3685 3939	NRA-NW	152.0
069006	Bollin at Dunham Massey	3727 3875	NRA-NW	256.0
069007	Mersey at Ashton Weir	3772 3936	NRA-NW	660.0
069008 *	Dean at Stanneylands	3846 3830	NRA-NW	51.8
069011	Micker Brook at Cheadle	3855 3889	NRA-NW	67.3
069012	Bollin at Wilmslow	3850 3815	NRA-NW	72.5
069013	Sinderland Brook at Partington	3726 3905	NRA-NW	44.8
069015	Etherow at Compstall	3962 3908	NRA-NW	156.0
069017	Goyt at Marple Bridge	3964 3898	NRA-NW	183.0
069018 *	Newton Brook at Newton Le Willows	3585 3933	NRA-NW	32.8
069019 *	Worsley Brook at Eccles	3753 3980	NRA-NW	24.9
069020	Medlock at London Road	3849 3975	NRA-NW	57.5
069023	Roch at Blackford Bridge	3807 4077	NRA-NW	186.0
069024	Croal at Farnworth Weir	3743 4068	NRA-NW	145.0
069027	Tame at Portwood	3906 3918	NRA-NW	150.0
069030	Sankey Brook at Causey Bridge	3588 3922	NRA-NW	154.0
069031	Ditton Brook at Greens Bridge	3457 3865	NRA-NW	47.9
069032	Alt at Kirkby	3392 3983	NRA-NW	90.1
069034 *	Musbury Brook at Helmshore	3775 4213	NRA-NW	3.1
069035 *	Irwell at Bury Bridge	3797 4109	NRA-NW	155.0
069037	Mersey at Westy	3617 3877	NRA-NW	2030.0
069040	Irwell at Stubbins	3793 4188	NRA-NW	105.0
069042	Ding Brook at Naden Reservoir	3850 4175	NRA-NW	2.2
070002	Douglas at Wanes Blades Bridge	3476 4126	NRA-NW	198.0
070003	Douglas at Central Park Wigan	3587 4061	NRA-NW	55.3
070004	Yarrow at Croston Mill	3498 4180	NRA-NW	74.4
070005	Lostock at Littlewood Bridge	3497 4197	NRA-NW	56.0
071001	Ribble at Samlesbury	3589 4304	NRA-NW	1145.0
071003 *	Croasdale at Croasdale flume	3706 4546	NWW	10.4
071004	Calder at Whalley Weir	3729 4360	NRA-NW	316.0
071005 *	Bottoms Beck at Bottoms Beck flume	3745 4565	NWW	10.6
071006	Ribble at Henthorn	3722 4392	NRA-NW	456.0
071007 *	Ribble at Hodderfoot	3709 4379	NRA-NW	720.0
071008	Hodder at Hodder Place	3704 4399	NRA-NW	261.0
071009	Ribble at Jumbles Rock	3702 4376	NRA-NW	1053.0
071010	Pendle Water at Barden Lane	3837 4351	NRA-NW	108.0
071011	Ribble at Arnford	3839 4556	NRA-NW	204.0
071013 *	Darwen at Ewood Bridge	3677 4262	NRA-NW	39.5
071014	Darwen at Blue Bridge	3565 4278	NRA-NW	128.0
072001 *	Lune at Halton	3503 4647	NRA-NW	994.6
072002	Wyre at St Michaels	3463 4411	NRA-NW	275.0
072004	Lune at Caton	3529 4653	NRA-NW	983.0
072005	Lune at Killington New Bridge	3622 4907	NRA-NW	219.0
072006	Lune at Kirkby Lonsdale	3615 4778	NRA-NW	507.1
072007	Brock at U/S A6	3512 4405	NRA-NW	32.0
072008	Wyre at Garstang	3488 4447	NRA-NW	114.0
072009	Wenning at Wennington Road Bridge	3615 4701	NRA-NW	142.0
072011	Rawthey at Brigg Flatts	3639 4911	NRA-NW	200.0
072015	Lune at Lunes Bridge	3612 5029	NRA-NW	141.5
072016	Wyre at Scorton Weir	3501 4500	NRA-NW	88.8
073001 *	Leven at Newby Bridge	3371 4863	NRA-NW	241.0
073002	Crake at Low Nibthwaite	3294 4882	NRA-NW	73.0

Station number	River and station name	Grid reference	Auth- ority	Area (sq km)
073003	Kent at Burneside	3507 4956	NRA-NW	73.6
073005	Kent at Sedgwick	3509 4874	NRA-NW	209.0
073008	Bela at Beetham	3496 4806	NRA-NW	131.0
073009	Sprint at Sprint Mill	3514 4961	NRA-NW	34.6
073010	Leven at Newby Bridge	3367 4863	NRA-NW	247.0
073011	Mint at Mint Bridge	3524 4944	NRA-NW	65.8
073013	Rothay at Miller Bridge House	3371 5042	NRA-NW	64.0
073014	Brathay at Jeffy Knotts	3360 5034	NRA-NW	57.4
074001	Duddon at Duddon Hall	3196 4896	NRA-NW	85.7
074002	Irt at Galesyke	3136 5038	NRA-NW	44.2
074003	Ehen at Ennerdale Bridge	3084 5154	NRA-NW	44.2
074005	Ehen at Braystones	3009 5061	NRA-NW	125.5
074006	Calder at Calder Hall	3035 5045	NRA-NW	44.8
074007	Esk at Cropple How	3131 4978	NRA-NW	70.2
074008	Duddon at Ulpha	3209 4947	NRA-NW	47.9
075001	St Johns Beck at Thirlmere Reservoir	3313 5195	NRA-NW	42.1
075002	Derwent at Camerton	3038 5305	NRA-NW	663.0
075003	Derwent at Ouse Bridge	3199 5321	NRA-NW	363.0
075004	Cocker at Southwaite Bridge	3131 5281	NRA-NW	116.6
075005	Derwent at Portinscale	3251 5239	NRA-NW	235.0
075006 *	Newlands Beck at Braithwaite	3240 5239	NRA-NW	33.9
075007 *	Glenderamackin at Threlkeld	3323 5248	NRA-NW	64.5
075009	Greta at Low Briery	3286 5242	NRA-NW	145.6
075016	Cocker at Scalehill	3149 5214	NRA-NW	64.0
075017	Ellen at Bullgill	3096 5384	NRA-NW	96.0
076001	Haweswater Beck at Burnbanks	3508 5159	NRA-NW	33.0
076002	Eden at Warwick Bridge	3470 5567	NRA-NW	1366.7
076003	Eamont at Udford	3578 5306	NRA-NW	396.2
076004	Lowther at Eamont Bridge	3527 5287	NRA-NW	158.5
076005	Eden at Temple Sowerby	3605 5283	NRA-NW	616.4
076007	Eden at Sheepmount	3390 5571	NRA-NW	2286.5
076008	Irthing at Greenholme	3486 5581	NRA-NW	334.6
076009	Caldew at Holm Hill	3378 5469	NRA-NW	147.2
076010	Petteril at Harraby Green	3412 5545	NRA-NW	160.0
076011	Coal Burn at Coalburn	3693 5777	IH	1.5
076014	Eden at Kirkby Stephen	3773 5097	NRA-NW	69.4
076015	Eamont at Pooley Bridge	3472 5249	NRA-NW	145.0
077001	Esk at Netherby	3390 5718	NRA-NW	841.7
077002	Esk at Canonbie	3397 5751	SRPB	495.0
077003	Liddel Water at Rowanburnfoot	3415 5759	SRPB	319.0
077004	Kirtle Water at Mossknowe	3285 5693	SRPB	72.0
077005	Lyne at Cliff Bridge	3412 5662	NRA-NW	191.0
078001 *	Annan at St Mungos Manse	3125 5755	SRPB	730.3
078002 *	Ae at Elshieshields	3068 5852	SRPB	143.2
078003	Annan at Brydekirk	3191 5704	SRPB	925.0
078004	Kinnel Water at Redhall	3077 5868	SRPB	76.1
078005	Kinnel Water at Bridgemuir	3091 5845	SRPB	229.0
078006	Annan at Woodfoot	3099 6010	SRPB	217.0
079001 *	Afton Water at Afton Reservoir	2631 6050	SRPB	8.5
079002	Nith at Friars Carse	2923 5851	SRPB	799.0
079003	Nith at Hall Bridge	2684 6129	SRPB	155.0
079004	Scar Water at Capenoch	2845 5940	SRPB	142.0
079005	Cluden Water at Fiddlers Ford	2928 5795	SRPB	238.0
079006	Nith at Drumlanrig	2858 5994	SRPB	471.0
080001	Urr at Dalbeattie	2822 5610	SRPB	199.0
080002	Dee at Glenlochar	2733 5641	SRPB	809.0
080003	White Laggan Burn at Loch Dee	2468 5781	SRPB	5.7
080004	Greenburn at Loch Dee	2478 5797	SRPB	2.6
080005	Dargall Lane at Loch Dee	2451 5787	SRPB	2.1
080006	Blackwater at Loch Dee	2481 5791	SRPB	15.6
080007	Water of Fleet at Rusko	2592 5590	SRPB	
081001 *	Penwhirn Burn at Penwhirn Reservoir	2128 5694	DGRW	18.2
081002	Cree at Newton Stewart	2412 5653	SRPB	368.0
081003	Luce at Airyhemming	2180 5599	SRPB	171.0
081004	Bladnoch at Low Malzie	2382 5545	SRPB	334.0
081005	Piltanton Burn at Barsolus	2107 5564	SRPB	34.2
081006	Water of Minnoch at Minnoch Bridge	2363 5746	SRPB	141.0
082001	Girvan at Robstone	2217 5997	CRPB	245.5
082002	Doon at Auchendrane	2338 6160	CRPB	323.8
082003	Stinchar at Balnowlart	2108 5832	CRPB	341.0
083001 *	Caaf Water at Knockendon Reservoir	2245 6514	SRCW	6.0
083002 *	Garnock at Dalry	2293 6488	CRPB	88.8
083003	Ayr at Catrine	2525 6259	CRPB	166.3
083004	Lugar at Langholm	2508 6217	CRPB	181.0
083005	Irvine at Shewalton	2345 6369	CRPB	380.7
083006	Ayr at Mainholm	2361 6216	CRPB	574.0
083007	Lugton Water at Eglinton	2315 6420	CRPB	54.6
083008	Annick Water at Dreghorn	2352 6384	CRPB	95.3
083009	Garnock at Kilwinning	2307 6424	CRPB	183.8
083010	Irvine at Newmilns	2532 6372	CRPB	72.8
084001	Kelvin at Killermont	2558 6705	CRPB	335.1
084002 *	Calder at Muirshiel	2309 6638	SRCW	12.4
084003	Clyde at Hazelbank	2835 6452	CRPB	1092.9
084004	Clyde at Sills	2927 6424	CRPB	741.8
084005	Clyde at Blairston	2704 6579	CRPB	1704.2
084006 *	Kelvin at Bridgend	2672 6749	CRPB	63.7
084007	South Calder Wtr at Forgewood	2751 6585	CRPB	93.0
084008	Rotten Calder Wtr at Redlees	2679 6604	CRPB	51.3
084009	Nethan at Kirkmuirhill	2809 6429	CRPB	66.0
084011	Gryfe at Craigend	2415 6664	CRPB	71.0
084012	White Cart Water at Hawkhead	2499 6629	CRPB	227.2
084013	Clyde at Daldowie	2672 6616	CRPB	1903.1
084014	Avon Water at Fairholm	2755 6518	CRPB	265.5

Station number	River and station name	Grid reference	Auth- ority	Area (sq km)
084015	Kelvin at Dryfield	2638 6739	CRPB	235.4
084016	Luggie Water at Condorrat	2739 6725	CRPB	33.9
084017	Black Cart Water at Milliken Park	2411 6620	CRPB	103.1
084018	Clyde at Tulliford Mill	2891 6404	CRPB	932.6
084019	North Calder Wtr at Calderpark	2681 6625	CRPB	129.8
084020	Glazert Water at Milton of Campsie	2656 6763	CRPB	51.9
084021 *	White Cart Water at Netherlee	2587 6597	CRPB	91.6
084022	Duneaton at Maidencots	2929 6259	CRPB	110.3
084023	Bothlin Burn at Auchengeich	2680 6717	CRPB	35.7
084024	North Calder Wtr at Hillend	2828 6678	CRPB	19.9
084025	Luggie Water at Oxgang	2666 6734	CRPB	87.7
084026	Allander Water at Milngavie	2558 6738	CRPB	32.8
084027 *	North Calder Wtr at Calderbank	2765 6624	CRPB	60.6
084028	Monkland Canal at Woodhall	2765 6626	CRPB	60.6
084029	Cander Water at Candermill	2765 6471	CRPB	24.5
084030	White Cart Water at Overlee	2587 6598	CRPB	111.8
085001	Leven at Linnbrane	2394 6803	CRPB	784.3
085002	Endrick Water at Gaidrew	2485 6866	CRPB	219.9
085003	Falloch at Glen Falloch	2321 7197	CRPB	80.3
085004	Luss Water at Luss	2356 6929	CRPB	35.3
086001	Little Eachaig at Dalinlongart	2143 6821	CRPB	30.8
086002	Eachaig at Eckford	2140 6843	CRPB	139.9
089008	Eas Daimh at Eas Daimh	2239 7276	CRPB	4.5
089009	Eas ÀGhaill at Succoth	2209 7265	CRPB	9.7
090003	Nevis at Claggan	2116 7742	HRPB	76.8
091002	Lochy at Camisky	2145 7805	HRPB	1252.0
093001	Carron at New Kelso	1942 8429	HRPB	137.8
094001	Ewe at Poolewe	1859 8803	HRPB	441.1
095001	Inver at Little Assynt	2147 9250	HRPB	137.5
095002	Broom at Inverbroom	2184 8842	HRPB	141.4
096001	Halladale at Halladale	2891 9561	HRPB	204.6
096002	Naver at Apigill	2713 9568	HRPB	477.0
096003	Strathy at Strathy Bridge	2836 9652	HRPB	111.8
096004	Allnabad at Strathmore	9453 2429	HRPB	105.0
097001 *	Calder Burn at Achavarn	3085 9596	HRCW	24.5
097002	Thurso at Halkirk	3131 9595	HRPB	412.8
101001 *	Eastern Yar at Alverstone Mill	4577 0857	NRA-S	57.5
101002	Medina at Upper Shide	4503 0874	NRA-S	29.8
101003	Lukely Brook at Newport	4491 0886	NRA-S	16.2
101004	Eastern Yar at Burnt House	4583 0853	NRA-S	59.6
101005	Eastern Yar at Budbridge	4531 0835	NRA-S	22.5
101006	Wroxall Stream at Waightshale	4536 0839	NRA-S	15.8
101007	Scotchells Brook at Burnt House	4583 0852	NRA-S	9.2
201002	Fairy Water at Dudgeon Bridge	*2406 3758*	DOEN	161.2
201005	Camowen at Camowen Terrace	*2460 3730*	DOEN	274.6
201006	Drumragh at Campsie Bridge	*2458 3722*	DOEN	324.6
201007	Burn Dennet at Burndennet Bridge	*2372 4047*	DOEN	145.3
201008	Derg at Castlederg	*2265 3842*	DOEN	337.3
201009	Owenkillew at Crosh	*2418 3866*	DOEN	442.4
201010	Mourne at Drumnabuoy House	*2347 3960*	DOEN	1844.5
202001	Roe at Ardnargle	*2674 4247*	DOEN	365.6
202002	Faughan at Drumahoe	*2464 4151*	DOEN	272.3
203010	Blackwater at Maydown Bridge	*2820 3519*	DOEN	951.4
203011 *	Main at Dromona	*3052 4086*	DOEN	228.8
203012	Ballinderry at Ballinderry Bridge	*2926 3799*	DOEN	419.5
203013	Main at Andraid	*3092 3973*	DOEN	646.8
203017	Upper Bann at Dynes Bridge	*3043 3509*	DOEN	335.6
203018	Six Mile Water at Antrim	*3146 3867*	DOEN	277.3
203019	Claudy at Glenone Bridge	*2962 4037*	DOEN	130.1
203020	Moyola at Moyola New Bridge	*2955 3905*	DOEN	306.5
203021	Kells Water at Currys Bridge	*3106 3971*	DOEN	127.0
203023	Torrent at The Moor Bridge	*2858 3649*	DOEN	59.9
203024	Cusher at Gambles Bridge	*3048 3471*	DOEN	176.7
203025	Callan at Callan New Bridge	*2893 3524*	DOEN	164.1
203026	Glenavy at Glenavy	*3149 3725*	DOEN	44.6
203027	Braid at Ballee	*3097 4014*	DOEN	177.2
203028	Agivey at White Hill	*2883 4193*	DOEN	98.9
203029	Six Mile Water at Ballyclare	*3282 3902*	DOEN	58.4
203033	Upper Bann at Bannfield	*3233 3341*	DOEN	100.9
203040	Lower Bann at Movanagher	*2931 4154*	DOEN	5209.8
203042	Crumlin at Cidercourt Bridge			
203092	Main at Dunminning Lower	*3051 4111*	DOEN	211.7
203093	Main at Shane's Viaduct	*3086 3896*	DOEN	704.2
204001	Bush at Seneirl	*2942 4362*	DOEN	306.1
205003 *	Lagan at Dunmurry	*3299 3679*	DOEN	444.7
205004	Lagan at Newforge	*3329 3693*	DOEN	490.4
205005	Ravernet at Ravernet	*3267 3613*	DOEN	69.5
205006 *	Lagan at Blaris	*3259 3628*	DOEN	315.9
205008	Lagan at Drummiller	*3236 3525*	DOEN	85.2
205010	Lagan at Banoge	*3123 3540*	DOEN	189.8
205020	Enler at Comber	*3459 3697*	DOEN	54.8
206001 *	Clanrye at Mount Mill Bridge	*3086 3309*	DOEN	132.7
206002	Jerretspass at Jerretspass	*3064 3332*	DOEN	32.4
236005	Colebrooke at Ballindarragh Bridge	*2331 3359*	DOEN	309.1
236007	Sillees at Drumrainy Bridge	*2205 3400*	DOEN	167.6

italic denotes Irish Grid.

* = closed, or no data for post 1986 have been received.

Refer to page 196 for key to measuring authorities.

Summary of Archived Data – 1

Gauged daily flows, monthly peaks and monthly rainfall

KEY:

	Complete rainfall	Incomplete or missing rainfall
Complete daily and complete peaks	A	a
Complete daily and partial peaks	B	b
Complete daily and no peaks	C	c
Partial daily and complete peaks	D	d
Partial daily and partial peaks	E	e
Partial daily and no peaks	F	f
No flow data	†	–

Summary is presented in decade blocks

Stn. number	Gauged daily flows, monthly peaks and rainfall			
002001	70s	-----aaaaa	80s	aAAAAAAAAA
003001	50s	---eAAAe--	60s	----------
	70s	----------	80s	------††††
003002	70s	----aaaaaa	80s	aAAAAAAAAA
003003	70s	--------eAA	80s	AAAAAAAAAA
003004	70s	---------E	80s	AAAAAAaaaA
003005	80s	-eaaaAaaaa		
004001	40s	-------fcf	50s	cccbAEAAEA
	60s	BABABAAAAA	70s	E†††††AAAA
	80s	AAAAAAAAAA		
004003	70s	----aaaaaa	80s	aAAAAAAAAA
004004	80s	-eaaaAaaaa		
004005	80s	------aaaA		
005001	50s	---eAAAAAA	60s	AAE-††††††
	70s	††††		
005002	80s	------eaaa		
006001	30s	-----eAAAB	40s	BBBABBBBAA
	50s	E††EAAAAAA	60s	AAAE††††††
	70s	††††		
006003	20s	---------f	30s	cccccccccc
	40s	cccccf----	50s	----------
	60s	----------	70s	----------
	80s	------††††		
006006	50s	---eAAAAAB	60s	BAe-------
	70s	----------	80s	------††††
006007	70s	---AAAAAAA	80s	AAAAAAaaaa
006008	70s	---------E	80s	AAAAAAAAAA
007001	60s	eAAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
007002	50s	--------eA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
007003	60s	---eAAAAAA	70s	AAABAAAAAA
	80s	AAAAAADDAA		
007004	70s	---------a	80s	aAAAAAAAEA
007005	70s	-------fff	80s	f--aaAAAAA
007006	80s	-------eaA		
008001	30s	--------fc	40s	ffcccccccc
	50s	bBBAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAA†††††	80s	------††††
008002	50s	-eAAABAAAA	60s	AAAAAAAAAA
	70s	AAABAAAAAA	80s	AAAAAAAAAA
008003	50s	-eAAAAAAAA	60s	AAAAAAAAAA
	70s	AAAA††††††		
008004	50s	--EAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAEAAAAA
008005	50s	-eBAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAA†A
008006	50s	--eAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
008007	50s	--eAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
008008	50s	--eAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAaaaa
008009	50s	--EABBABBA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAACAAAAA
008010	50s	---eAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAACAAAAA
008011	70s	--------ff	80s	feaaaaAAAA
009001	50s	---------e	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
009002	60s	eAAAAAAAAA	70s	AAAABAAAAA
	80s	AAAAAAA†AA		
009003	60s	-††††††††E	70s	AAAAAAAAAA
	80s	AAAA†AAAAA		
009004	80s	eaaacaAAAA		
009005	40s	--------fc	50s	fffcffffcc
	60s	ccccccccfc	70s	cccccccccc
	80s	ccccccaaAA		
010002	60s	-†††††††††	70s	†EAAAAAAAA
	80s	AAAAAAAAAA		
010003	80s	---eaAAAAA		
011001	60s	-††††††††E	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
011002	60s	-††††††††F	70s	CBAAAAAAAA
	80s	AAAACAAAAA		
011003	60s	-†††††††††	70s	†††EAAAAAA
	80s	AAAACAAAAA		
011004	80s	---------a		
012001	20s	---------e	30s	BBBBBBAAAA
	40s	BABBAABCCC	50s	CCCCCCCCCC
	60s	CCCCCBAAAA	70s	BCBAAAAAAA
	80s	AAAAAAAAAA		
012002	70s	--eAAAAAAA	80s	AAAAAAAAAA
012003	70s	-----eaaaa	80s	aAAAAAAAAA
012004	60s	---------f	70s	aaaaaabaaa
	80s	bCCCCAAAA†		
012005	70s	------eaaa	80s	aAAAAAAAAA
012006	70s	--------ea	80s	aAAAAAAAAA
012007	80s	--eaaAAAAC		
012008	80s	-----dacaA		
013001	70s	---------a	80s	aAAAAAAAAA

Stn. number	Gauged daily flows, monthly peaks and rainfall			
013002	80s	--cccAAAAA		
013003	70s	---------c	80s	ccc---††††
013004	80s	-----AccaA		
013005	80s	-ecccAAAAA		
013007	70s	------CCCC	80s	CCCDAAAAAA
013008	80s	---AAAAAAA		
013009	80s	-----†AAAA		
013010	80s	---------a		
014001	60s	-††††††EAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
014002	60s	-††††††††E	70s	AAAAAAAAAA
	80s	ACCFCAAAAA		
014005	80s	----caaaaa		
014006	80s	-------caa		
014007	80s	-------aaa		
015001	50s	---ee-----	60s	eAAAAAAAE†
	70s	††††††††††	80s	††††††††††
015002	50s	---------e	60s	AAAAAAAEE†
	70s	††††††††††	80s	††††††††††
015003	40s	-------fcC	50s	CBAAAAAAAA
	60s	AAAAAAAAAA	70s	AAAAAAAAAA
	80s	ABCFCAaaaa		
015004	20s	-------CCC	30s	CCCCCCBAe-
	40s	------††††	50s	EE†††††††E
	60s	AAAAAAAEE†	70s	††††††††††
	80s	††††††††††		
015005	20s	-------CCC	30s	CCCCCCBAe-
	40s	-------†††	50s	EE†EEE†††E
	60s	AEAAAAAAE†	70s	††††††††††
	80s	††††††††††		
015006	50s	--eAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	BAAAAAAAAA
	90s	f		
015007	50s	-------eAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AACCCAaaaa
015008	50s	--------EA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	BAFCCAaaaa
015010	70s	--cAAAAAAA	80s	AFCFCAAAAA
015011	50s	--------cc	60s	cccccccccc
	70s	cCBAAAAAAA	80s	ACCCCAAAAA
015012	70s	---BAAAaaa	80s	AACCCACCAA
015013	50s	-----ccccc	60s	cCCCCCCCCC
	70s	CCCBAAAAAA	80s	AABCCAAAAA
015014	80s	-----acaaa		
015015	80s	------ccaa		
015016	70s	----bAAAAA	80s	AACCCAaaaa
015017	70s	-----eAAAA	80s	A††---††††
015018	50s	---eaaaae		
015021	80s	-----†c-cc		
015023	80s	---ccAAAAA		
015024	80s	--cccDAAAA		
015025	80s	----†Aaaaa		
015027	80s	-------caa		
015028	80s	------cca		
016001	40s	--------Cc	50s	cBAAbbAAAA
	60s	AAAAAAAAAA	70s	AAAAAAAAAA
	80s	BDFCCAAAAA	90s	f
016002	50s	-----eAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAA††		
016003	60s	-†††††††††	70s	EDAABAAAAA
	80s	AAAAAAAAAA		
016004	70s	--eAAAAAAA	80s	ADDAAAAAAA
016006	80s	--------cc		
017001	60s	---------E	70s	AAAAAAAAAB
	80s	AAAAAAAAAA		
017002	60s	---------E	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
017003	70s	†EAAAAAAAA	80s	AAAAAAAADA
017004	70s	--EAAAAAAA	80s	AAAAAAAADA
017005	70s	-EAAAAAAAB	80s	AAAAAAEADA
017008	80s	--------da		
017012	80s	----††EADA		
017016	80s	------aada		
017017	80s	-------ac		
018001	50s	-------EAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAADA
018002	50s	---------b	60s	ABAAAAAAAA
	70s	BbbAAAAAAA	80s	AAAAAAaada
018003	50s	-------ccc	60s	cccbAAAAAA
	70s	AAEAAAAAAA	80s	AAAAAAAAAA
018005	70s	†EAAAAAAAA	80s	AAAAAAAAAA
018007	80s	----††aada		
018008	70s	---eAAAAAA	80s	AAAAAAAADA
018010	80s	----††aada		
018011	80s	-fcAAAAADA		
018012	80s	----††ae		
018013	80s	----††acfa		
018014	80s	----††aada		
018016	80s	------AADA		
018017	80s	--eaaaAAAA		
018018	80s	---aaaAADE		
018019	80s	------†AF†		
019001	50s	-------AAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
019002	60s	-†AAAAAAAA	70s	AAACAAAAAA
	80s	AAAAAAAADA		

Stn. number	Gauged daily flows, monthly peaks and rainfall			
019003	60s	-eAAAAAAAA	70s	AAAAAAAAAA
	80s	D††---††††		
019004	60s	AAAAAAAAAA	70s	AAACAAAAAA
	80s	AAAAAAAADA		
019005	60s	--eAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAADA		
019006	60s	-††AAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAADA		
019007	60s	-†BAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAADA		
019008	60s	-†††BAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAADA		
019010	60s	---------A	70s	AAAAAAAAAA
	80s	AAAAAEEEEA		
019011	60s	---ccccccc	70s	ccccccaaaa
	80s	AAAAAAAADA		
019012	80s	----††eada		
019014	80s	----††cf		
019017	80s	----††AADA		
020001	60s	-AAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
020002	60s	-††††EAAA	70s	AAAAAAAAAA
	80s	AAAAAAAADA		
020003	60s	-†††AAAAA	70s	AAAAAAAAAA
	80s	AAAAAAEADA		
020004	60s	-†††††AAA	70s	AAAAAAAAAA
	80s	AAAAAEaada		
020005	60s	-††††CCCCC	70s	CCCCCCAAaa
	80s	AAAAAAEADA		
020006	70s	---cccAAAD	80s	AAAAAAAADA
020007	60s	--------††	70s	†††CCCAAAA
	80s	AAAAAAAADA		
020008	80s	----††AB††		
021001	50s	---------e	60s	AAAAEEAAE†
	70s	††††††††††	80s	------††††
021002	50s	------††-e	60s	aBCBAAAAAE†
	70s	†††††††--	80s	------††††
021003	50s	---------e	60s	AAAAAAABAA
	70s	AAAAAAAAAA	80s	ABBCCAAAAA
021004	60s	-----eAAe-	70s	-------†††
021005	60s	-EAAAAAAAB	70s	AAAAAAAAAA
	80s	AABCCAAAAA		
021006	60s	-EAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
021007	60s	-EAAAAAAAA	70s	AAAAAAAAAA
	80s	AABCCAAAAA		
021008	60s	eAAAAAAAAA	70s	AAAAAAAAAA
	80s	AABCCAAAAA		
021009	60s	-†EAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
021010	60s	†F†EAAAAAA	70s	AAAAAABAAA
	80s	A†††††††††		
021011	60s	-††EAAAAAA	70s	AAAAAAAAAA
	80s	AABCCAAAAA		
021012	60s	-††EAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
021013	60s	-†††EAAAAA	70s	AAAAAAAAAA
	80s	AACCCAAAAA		
021014	60s	-EAAAAAAAA	70s	AAAAAAAAAA
	80s	AABCCAAAAA		
021015	60s	-††††EAAA	70s	AAAAAAAAAA
	80s	AACCCAAAAA		
021016	60s	-†††††EAA	70s	AAAAAAAAAA
	80s	AACCCAAAAA		
021017	60s	-††††EAAAA	70s	AAAAAAAAAA
	80s	AABCCAAAAA		
021018	60s	-†††††††EA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
021019	60s	-††††††EA	70s	AAAAAAAAAA
	80s	AABCCAAAAA		
021020	60s	-†††††EBA	70s	AAAAAAAAAA
	80s	AABCCAAAAA		
021021	60s	---------E	70s	AAAAAAAAAA
	80s	AABCCAAAAA		
021022	60s	-††††††††E	70s	AAADAAAAAA
	80s	AAAAAAAAAA		
021023	60s	-†††††††††	70s	EAAAAAAAAA
	80s	AABCCAAAAA		
021024	60s	-††††††††	70s	†EAAAAAAAA
	80s	AACCCAAAAA		
021025	60s	-††††††††	70s	††EAAAAAAA
	80s	AACCCAAAAA		
021026	60s	-††††††††	70s	†††EAAAAAA
	80s	AACCCAAAAA		
021027	60s	-††††††††	70s	†††EAAAAAA
	80s	AACCCAAAAA		
021030	60s	-††††††EA	70s	BAAAAAAAAA
	80s	AABCCAAAAA		
021031	50s	-------eAAB	60s	AEAAAAAAAA
	70s	AAAAAAAAAE	80s	e-----††††
021032	60s	------eAAA	70s	AAAAAAAEAA
	80s	AAAE--†††E		
021034	60s	-††††††FF	70s	CCCCCAAAAA
	80s	AAACCAdaaa		
022001	60s	---fffbAAA	70s	AAAAAAAAAA
	80s	AAAAAABAAA		
022002	50s	-------eAA	60s	EAEAAAAAAA
	70s	AAAAAAAAAA	80s	e-----††††

Stn. number	Gauged daily flows, monthly peaks and rainfall			
022003	50s	-------eAA	60s	BAEAAAAAAA
	70s	AAAAAAAAAA	80s	e-----††††
022004	60s	------eAAA	70s	AAAAAAAAAE
	80s	E†††--††††		
022006	60s	------eDAA	70s	DAAAAAAAAA
	80s	BAAAAAAAAA		
022007	60s	-------†EA	70s	AAAAAAAAAA
	80s	AAAAAAAAAD		
022008	60s	---------E	70s	AAAAAAABAA
	80s	AAAE††††††		
022009	70s	--EDAAAAAA	80s	AAAAAAAAAA
023001	50s	------eAAA	60s	AAAAEAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
023002	50s	----†CCCCB	60s	AAAAAAAAAA
	70s	AAABAAAAAA	80s	AAAAAAAAEA
023003	50s	---------e	60s	AAAAAAAADA
	70s	AAAABAAAAA	80s	EAEAAAaaeA
023004	60s	--eAAAAAAA	70s	AAEAAAABAA
	80s	AAAAAAAAAA		
023005	60s	---eAAADAD	70s	AAAAAAAAAA
	80s	AAAAAAAE††		
023006	60s	------eAAA	70s	AAAAAAAEEA
	80s	AAAAAAAAAA		
023007	60s	--eAAAAAAA	70s	AAAAAAAEAA
	80s	BAAAAAAEAD		
023008	60s	--------EA	70s	AAAAAAABAA
	80s	AEAAAAAEAE		
023009	60s	---------e	70s	AAADDAAAE†
	80s	EAAE††††††		
023010	60s	---------†	70s	EAAAAAAAAA
	80s	e--††-††††		
023011	60s	---------†	70s	EDAAAAABAA
	80s	EAAAAAAEEF		
023012	70s	†EBAAAAAAA	80s	a--††-††††
023013	70s	†EAAAAAAAA	80s	A†††††††††
023014	60s	fcccccccc	70s	cBAEE†††††
	80s	------††††		
023015	40s	-†FEEEEEEE	50s	EAEAEEBBBe
023016	80s	---------e		
023022	80s	---------a		
023023	80s	---------d		
024001	50s	-------fCC	60s	CCCCCCBAAA
	70s	AAAAAAEAAA	80s	EAAAAAAAAA
024002	50s	--------eA	60s	AAAAAAAAAA
	70s	AAAABAAAAA	80s	AAAE††††††
024003	50s	--------eA	60s	AAAAAAAEAA
	70s	AAAAAAAAAA	80s	AAAAADAAAA
024004	50s	---------e	60s	AAAAAAAAAA
	70s	AAAAAAAAEA	80s	AAAAAAAAAA
024005	50s	----eeEAAA	60s	AAAAAAAEAA
	70s	AAAAAAAEEA	80s	AAAAABAAAA
024006	50s	-------fcc	60s	bAAAAAAAAA
	70s	AAAAAAAAAA	80s	e-----††††
024007	60s	-------†EA	70s	AAAAAAAAAA
	80s	AAAE††††††		
024008	70s	--eaaaeaae	80s	AAEAAAAAAA
024009	70s	-------eAA	80s	AAAAAADAAA
025001	50s	------eAAA	60s	AAAAAAADAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
025002	50s	------ff-e	60s	aAAAAAAAAB
	70s	BAAAe--†††	80s	------††††
025003	50s	-------eAA	60s	AAAEAAAAAA
	70s	AAAAAaaABA	80s	e-----††††
025004	50s	------eAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAD	80s	AAEADDDADA
025005	50s	---------e	60s	AAAAAAAAAA
	70s	AAAABAAEAA	80s	AAAAAAAAAA
025006	60s	eAAAAAAAAA	70s	AAABAABAAA
	80s	AAAAAAAAAA		
025007	60s	-eAAAAAAAA	70s	AAAAAAAAAA
	80s	E†----††††		
025008	60s	-----†EAAA	70s	AAAABAAAEA
	80s	AEAE††---f		
025009	60s	---------e	70s	ABAEEAAAAA
	80s	AAAAAAaaaA		
025010	60s	-------EAA	70s	AEAAE†††††
025011	60s	---------E	70s	AAAAAAAAAA
	80s	AAAE††††††		
025012	60s	---------E	70s	BAAAAAAAAA
	80s	AAAAAAAAAA		
025013	60s	---------E	70s	EEAEE†††††
	80s	---------†		
025014	60s	---------E	70s	AEE††††---
	80s	---------†		
025015	60s	---------e	70s	eee-------
	80s	---------†		
025018	70s	†EEAAAAAAA	80s	AEEAAAAAAA
025019	70s	†EAAAAAAAA	80s	AAAAAAAAAA
025020	70s	--EAAAEAEA	80s	AAAAAAAAAA
025021	70s	†††EBAAAAA	80s	AAAAADAAAA
025022	70s	----eabeea	80s	a---††
025023	70s	-EAEEAAEAA	80s	AAEE†††††F
025024	70s	------ee		
026001	50s	---eAAABBB	60s	BBBBBABABB
	70s	AEABE†††††	80s	---†††††††
026002	60s	-eAAAEEBBE	70s	EAAAAAAEBE
	80s	B†CCCCcccc		
026003	50s	---------e	60s	AAAAAAAAAB
	70s	AAAAEEEAAA	80s	AAAAAAAAAA
026004	70s	†EE†BEFEBA	80s	AAAAAB††††
026005	80s	-DaaAAAAAA		
026006	80s	----aaaaab		
026007	60s	-----ffccc	70s	fcccffcccc
	80s	------††††		
026008	80s	------aaaa		
027001	30s	-----eAAE†	40s	†EBAABCCF†
	50s	†††EAAAAAE	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AE††††††††
027002	30s	-------†††	40s	†††††††††
	50s	†††††EAAAA	60s	AAAAABABAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAC
027003	50s	--------eE	60s	EEAAAAAAAA
	70s	AAAAABBAEE	80s	AAAAAAaaaa
027004	60s	eAAAAAAAE†	70s	††EAAAE†††
027006	60s	------eAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
027007	50s	--------eA	60s	AAAAAAAAAA
	70s	EBDAAAAAEE	80s	AAAAAAAAAA
027008	50s	-----eAAAE	60s	AAAAAAAAAA
	70s	AAAAAEEEAE	80s	AEDEE†††††
027009	60s	-††††††††E	70s	AAABDEAAAD
	80s	ADAAAAAAAA		
027010	30s	------fcfc	40s	fffffffff
	50s	cfffbAAAAA	60s	BAAEAAAAAA
	70s	ABAAAAEEAE	80s	------††††
027012	50s	----eAAAAA	60s	AAAAAAAAAA
	70s	AAAE††††††		
027013	50s	----eBBBBB	60s	BBBBBBAAAA
	70s	AAABBBCBEE	80s	B†††††
027014	50s	--------eA	60s	AAAAAAAABA
	70s	EE††††††††	80s	---†††††††
027015	60s	-eAAAAAAAA	70s	AAAAAE††††
	80s	---†††††††		
027018	50s	------eAAB	60s	BBABBBAAAB
	70s	BBbbe--†††	80s	---†††
027019	50s	------eAAA	60s	AAEBAAAAEE
	70s	EAAAe--†††	80s	---†††
027021	50s	---------e	60s	aEEAAAAAAA
	70s	AAAAAAE†††	80s	††AaaaaAAF
027022	60s	eAAAAAABAA	70s	EE††††††††
	80s	---†††-†††		
027023	60s	eAAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAEDAA		
027024	60s	-eAAAAAAAA	70s	AAAAAAEAAA
	80s	E†-†††††††		
027025	60s	-eAAAAAAAA	70s	AAAE††AAAA
	80s	AAAAAAAAAA		
027026	60s	---eAAAAAA	70s	AAAAAAAAAE
	80s	††††AAAAAA		
027027	60s	-eAAAAAAEA	70s	AAAAAE††††
	80s	------††††		
027028	60s	-AAAAAAAAA	70s	AAAAAAAAEA
	80s	AAAAADaaaa		
027029	60s	-eAAAAAAAE	70s	†EAAAAAAAA
	80s	AAEAAAaaaa		
027030	60s	---eAAAAAA	70s	AAAAEEAAEA
	80s	AADAAAAAAA		
027031	60s	----AAAAAA	70s	AAAAAAEAEA
	80s	AAAAAAAAAD		
027032	60s	-----†EEAA	70s	AAAAAEEAAA
	80s	AEAAAAAAA†		
027033	60s	---------f	70s	CCCCCBEAAA
	80s	AAAAAAaaaa		
027034	60s	--------eBA	70s	BAAAAAAAAA
	80s	AAAAAAAAAA		
027035	60s	--------EA	70s	AAAABAEAAA
	80s	EAAAAAAAAA		
027036	60s	--------†E	70s	EE††††††††
	80s	---------f		
027038	70s	EAAAAAAAAA	80s	EAADADAAAA
027040	70s	EBAAAAAAAA	80s	AAAAAAAAAA
027041	70s	--†EAAAAAA	80s	AAAAAAAAAA
027042	70s	††EAAAAAAA	80s	AAAAAAAAAA
027043	70s	----AAAAAA	80s	EAAAAAAAAA
027044	70s	--††EAAAAA	80s	AAAADAAAAA
027047	70s	-†BAAAAAAE	80s	AEADAEDDAA
027048	70s	-†EAAAEEAA	80s	AAAAAAaadA
027049	70s	----eAAAAA	80s	AAAAAAAAAA
027050	70s	fccffff---	80s	†††addAAAA
027051	70s	--eAAEAAAE	80s	AADAAAAAAA
027052	70s	------eaaa	80s	AAAAAAAAAA
027053	70s	-----eEAAA	80s	AAAAAAAAAA
027054	70s	----FFFAAE	80s	AAAAAAAAAA
027055	70s	----fCCEAE	80s	AADAAAAAAA
027056	70s	----fFCEAE	80s	AAAAAAAAAA
027057	70s	----fFCEAE	80s	AAAAAAAAAA
027058	70s	----fCCEAE	80s	AAAAAAAAAA
027059	70s	--------eAE	80s	EAAAAAAAAA
027060	70s	---------e	80s	AAAAAAAAAA
027061	70s	--------eA	80s	AAAAAAAAAA
027062	70s	---------e	80s	AEAAAAAAAA
027064	70s	---------e	80s	aaaaADAAAA
027065	70s	---------e	80s	adaaAAAAAA
027066	80s	----AAAAAA		
027067	80s	----AAAAAA		
027068	80s	----aaaaaa		
027069	80s	----AAAAAE		
027070	80s	-edadaaaaa		
027071	80s	eaaAAAAAAA		
027072	80s	----AAAAAA		
027073	80s	----AAaaeA		
027074	80s	----AAAAAA		
027075	80s	---eaaaAAA		
027076	80s	---eaaaaaa		
027077	80s	---eaaaaaa		
027080	80s	-----eaAAA		
027082	80s	-------†††		
027083	80s	-------fcf		
028001	30s	---cccbAAA	40s	BCCCCCCCCB
	50s	AAABBAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAEAAA	80s	AAAAAAAAAA
	90s	e		
028002	30s	-------eAA	40s	AAAAAAAAAA
	50s	AABAAAAAAA	60s	AAAAAAADEE
	70s	EAAAAEAAAA	80s	AAAAE†††††
028003	50s	-----eAAAA	60s	AAAAAAAAAA
	70s	AAEAAAAAAA	80s	AAE†††---†
028004	50s	------fbAE	60s	EAAEAAAAAA
	70s	AAAAAAAAAA	80s	AAE†††
028005	50s	-----fccbA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAE†
028006	50s	-------eaA	60s	AAAAE†††††
	70s	††††††††††	80s	††††††
028007	50s	-------eAA	60s	AAAAAAE†††
	70s	††††††††††	80s	††††††
028008	50s	---eAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
028009	50s	--------eA	60s	AAAAAAAAAB
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
028010	30s	-----fFFCC	40s	CCCFCCCCCC
	50s	CCCCFCCCCC	60s	CCCCCCCCCC
	70s	CCCCBAAAAA	80s	AAAAAAA†††
028011	50s	--------eE	60s	EEBAAAAAAA
	70s	EEAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
028012	50s	---------e	60s	AAAAADAAAE
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
028013	70s	----††††††	80s	---†††
028014	60s	bBABBC†EAA	70s	AAAAAAAD††
	80s	††††††††††		
028015	60s	-----eeE†A	70s	EEE†††††††
	80s	--eAEEAAAA	90s	e
028016	60s	-----eAAAA	70s	AAAAAAAAE†
	80s	††††††††††		
028017	60s	------eaaa-	70s	aaAEAAEAE†
	80s	††††††		
028018	60s	-eAAAAAAAA	70s	AAAEAAAAAA
	80s	AAAAAAAAAA	90s	e
028019	60s	------eAAD	70s	AAAEAAAAAA
	80s	AAAAAAAAAA	90s	e
028020	50s	----fCFCFC	60s	BAAAAAAEee
	70s	aaAAAAAAAA	80s	AAE†††---†
028021	60s	----†EAAEA	70s	EEEEAAAA††
	80s	---†††††††		
028022	60s	--------ea	70s	aaAAAAAAAA
	80s	AAAAE††AAA	90s	e
028023	60s	-----eaaaa	70s	aaAAAAAE††
	80s	††-†††††††		
028024	60s	-------eea	70s	eaAAAAAAAA
	80s	AEEAEEEAAA	90s	e
028025	60s	------eaae	70s	aaAAAAAAAA
	80s	AAAAE†††††		
028026	60s	------eeaa	70s	aaAAEAAAAA
	80s	AAAAE††AAA	90s	e
028027	60s	-----EAEAA	70s	AAAAAAE†††
	80s	†EAae-††††		
028029	60s	------eeee	70s	eeEAAAAEAA
	80s	AAAAE†††††		
028030	60s	-------eEE	70s	AEEAAAAAAA
	80s	AAAAE†††††		
028031	60s	--------eE	70s	AaAAAAAAAA
	80s	AAAAAAAAAA	90s	e
028032	60s	-----EAAAA	70s	AAAAAAEAAA
	80s	AEAAE†--††		
028033	60s	-----eaeae	70s	aaAAAAAAAA
	80s	AAE†††††††		
028035	70s	----††††††	80s	†EAae----†
028036	60s	---------e	70s	aaAEAE††††
	80s	---†††--††		
028038	60s	---------e	70s	aaAEAAEAAA
	80s	AAE†††††††		
028039	60s	-------eAE	70s	AaEAEAAAAA
	80s	AAAAAAAAAA	90s	e
028040	60s	--------eE	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
028041	60s	--------ea	70s	aeAAAAAAAA
	80s	AAE†††††††		
028043	60s	----††††EA	70s	ADAAAAAAAA
	80s	AAAAEAAAAA	90s	e
028044	60s	---------e	70s	eaAAAAAAAA
	80s	AAAAE†--††		
028045	60s	-----eaaaa	70s	aaAAADAAAA
	80s	AAAAE†--††		
028046	60s	---------e	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
028047	70s	eaabAAAAAA	80s	AAEEE†--††
028048	70s	-eaAAAAAAA	80s	AAAAAAAAAA
	90s	e		
028049	70s	eaaaaaaAAA	80s	AAAAE†††††
028050	70s	-eeaAAAEAA	80s	AAAAE†††††
028052	70s	-eDEAAAAAA	80s	AAAAE††AAA
	90s	e		
028053	70s	---†††EAAA	80s	AAAE††---†
028054	70s	-eAAAAAAAA	80s	AAAAE†††††
028055	70s	-eAAAEAAAA	80s	AAE†††††††
028056	70s	---eAAAAEA	80s	AAAAE††AAA
	90s	e		
028058	70s	--††EAAAAA	80s	AAAAE†††††
028059	60s	------eaaa	70s	aaAAAAAAAA
	80s	AAAEE†--††		
028060	70s	--eaAAAAAA	80s	AAAEE†††††
028061	70s	--††-AAAAA	80s	AAAAE††AAA
	90s	e		
028062	70s	-----†††††	80s	††††††
028065	70s	-----†††††	80s	---†††
028066	70s	---eAAAAAA	80s	AAAAAEAAAA
	90s	e		
028067	70s	---eAAAAAA	80s	AAAAAAAAAA
	90s	e		
028070	60s	-----fffff	70s	eeeeeeaaaa
	80s	AAE†††††††		
028072	70s	-----EAAAA	80s	AAAEE†††††
028073	70s	------eeea	80s	aaaee
028075	70s	---------e	80s	aae---††††
028079	80s	-eaaaaAAAA	90s	e
028080	50s	-------eAE	60s	EAAEAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
028081	80s	--eaebEABA	90s	e
028082	70s	-eaAAAAAAA	80s	AAAAEAAAAA
	90s	e		
028083	80s	--eaaeEE1E	90s	e
028085	30s	-----fFFCC	40s	CCCFCCCCCC
	50s	CCCCFCCCCC	60s	CCCCCCCCCC
	70s	CCCCBAAAAA	80s	AAAADDAAAA
	90s	e		
028086	70s	-eAAAAAAAA	80s	AAAAEEAAAA
	90s	e		
028091	80s	----eeAAAA	90s	e
028093	80s	------EAAE	90s	e
028094	80s	------††††		
028095	80s	------††††		
028101	80s	--------††		
028102	80s	-------EEE	90s	e
029001	60s	eBBAAAAAAB	70s	AAAAAAAAAE
	80s	AAAAAAAAAE		

Stn. number	Gauged daily flows, monthly peaks and rainfall			
029002	60s	--eAAAAABA	70s	AAAAADAAAA
	80s	AAAAAAEAAE		
029003	60s	--------EA	70s	AAAAAAAAAA
	80s	AAAAAAAAAB		
029004	60s	--------EA	70s	AAAAAAAAAA
	80s	AAAAAAAAAE		
029005	70s	-EAAAAAAAA	80s	AAAAAAEAAE
029009	70s	----eAAAAA	80s	AAAAAAAEAE
030001	50s	---------E	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
030002	60s	eAAAAAAAAA	70s	AAAAAAAAE†
	80s	EEEEAEAA††		
030003	60s	--eAAAAABE	70s	AAAAAAAAAA
	80s	AAAAABEAAE		
030004	60s	--eEABAAAB	70s	AAAAAAAAAE
	80s	AAAAAAAAAE		
030005	60s	--------fc	70s	cccccccccc
	80s	ccccf--e		
030006	70s	----EBBBAA	80s	AEEAAAEAAE
030011	70s	-EAAAAAAAA	80s	AAAAAAEDAE
030012	70s	EAAAAAAAAA	80s	DEBABBEEEE
030013	70s	------eAAA	80s	AAAAAAAAAE
030014	70s	--eEAABAAA	80s	BAAAAAAAAE
030015	70s	------eAAA	80s	AAAAAAaaae
030017	70s	--------eA	80s	AAAAAAaaaE
031001	30s	-------fCF	40s	CCCCCf----
	50s	---fBBBBBB	60s	BBBBBBAAEA
	70s	AABAAAAEAB	80s	BAAAAAaae
031002	30s	---------†	40s	----------
	50s	----------	60s	fCCCCCCCCc
	70s	CCCCCCCCCC	80s	CCCCCCCABC
	90s	f		
031005	80s	---†††††††		
031006	60s	-------EAA	70s	BAAAAAAAAA
	80s	AAAAAAAAE†		
031007	60s	--------EE	70s	BBCCCBCBAA
	80s	AAAAAAAAAF	90s	f
031010	60s	--------DA	70s	ABAABAAAAA
	80s	AAAAAABAE†		
031012	60s	---------E	70s	EEEEEEEEEE
	80s	EEEeeeF†††		
031016	60s	---------E	70s	ABAAAAAAAA
	80s	AAAAAAAAE†		
031021	70s	eEAEEBBEAA	80s	AEEEEEEEE†
031023	70s	--EBABBBAB	80s	AAAAAAAAE†
031025	70s	--------eA	80s	EAAAAAABE†
031026	70s	-†††††††EA	80s	AAAAAAAAE†
031028	80s	--fbaeAAE†		
032001	30s	---------f	40s	eBAAAAAAAA
	50s	ABAAAAAAAB	60s	BAAABAABCC
	70s	BAAABBCCAA	80s	BAAAAAAAE†
032002	30s	--------eA	40s	AABABABABA
	50s	BABABBAAAB	60s	AABBAAAAAA
	70s	BAAAAAAAAA	80s	AAAAAAAAE†
032003	30s	--------eA	40s	ABBAABAAAB
	50s	AAAAABABAB	60s	BBAABEAAAA
	70s	AAAAAAAADA	80s	AAAAAAAAEB
	90s	f		
032004	40s	---eAABAAA	50s	AAAAAAAAAB
	60s	BBBAEEAAAB	70s	AAAAAAEAAA
	80s	AAAAAAABAB	90s	f
032006	30s	---------e	40s	BAAABAABAA
	50s	ABAAAABBBB	60s	BBBBAAAAAb
	70s	cccccccCCC	80s	CccccCAE†
032007	30s	---------e	40s	AAAAABAABA
	50s	ABAABABAAA	60s	BBAAAABAAb
	70s	cccccccCCC	80s	BccccCAE†
032008	40s	-----eAAAB	50s	ABAAABABAA
	60s	BBBBBAEABA	70s	AAAAAAAAAA
	80s	AAAAAAAAE†		
032029	70s	---eeeeeae	80s	---------†
032031	80s	--eeeeEEE†		
033001	30s	------fcCC	40s	ECCCCCCCCC
	50s	FFCCCCCCCC	60s	CCF†††††††
	70s	†††††††††	80s	------††††
033002	30s	---cCCcCBB	40s	BBBBBCCCCC
	50s	CCCCCCCCCB	60s	BAAAAAAAAB
	70s	BAAAAAAAAB	80s	BAABAABAAA
033003	30s	------fCCC	40s	CCFCFCCCCC
	50s	BAEABBABCC	60s	BAAAAACCAA
	70s	BCCCCCCCCC	80s	CCCCCFFF††
033004	30s	------fCCC	40s	CCCCCCFFCC
	50s	CCCCCBABCC	60s	CCCCCCFCFC
	70s	CCCCFCCCCC	80s	CFCCCFF†††
033005	50s	-cbCCCCCCC	60s	BAAAABBCCB
	70s	BCBBBBBBCB	80s	BBBBBBEEEE
033006	50s	------eBCC	60s	BAAAAAABBB
	70s	ABAABBABAB	80s	ABBBBBBBBA
033007	50s	---eBCCCCC	60s	CCCCCBBBAB
	70s	BAAAAABAAA	80s	AABBAAAAAA
033008	50s	--------fc	60s	cbaaabbbf-
	70s	----------	80s	------††††
033009	50s	-----eABCC	60s	BAEAAAAABA
	70s	BABBAAAAAA	80s	BAAABAE†AE
033011	40s	--------ff	50s	ffffcfccff
	60s	eaAAAAAAEA	70s	BAAAAAAAAA
	80s	BAAAAAABBA		
033012	60s	eAAAAAAAEA	70s	BAAAAAAAAA
	80s	AAAAAAAAAB		
033013	40s	---------f	50s	ffffccccff
	60s	eAAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAABABAAA		
033014	60s	eAAAAAAAAA	70s	ABAAAAAAAA
	80s	AAAAAAAAAB		
033015	60s	--AAAAAAAA	70s	AAAAAAAABB
	80s	DAAAAAEEE†		
033016	50s	---------f	60s	bAAEEEFEAB
	70s	BCCCCCCCCC	80s	CCCF††
033018	60s	--EAAAAEEA	70s	AAAAAAAAAA
	80s	BAAABBAABE		
033019	50s	------††††	60s	††eAAAAAEA
	70s	ABAAAAAAAB	80s	AAAAAABAAA
033020	50s	-------†††	60s	††-eAEBBEE
	70s	EBBBBAAAAA	80s	AABABABAAE

Stn. number	Gauged daily flows, monthly peaks and rainfall			
033021	60s	--eAAAAABB	70s	BBBAAAAAAA
	80s	BAABABbaab		
033022	50s	---------f	60s	ebeeeBAAAB
	70s	AAAAAAAAAA	80s	AAAAAABBBA
033023	60s	--eAAAAAEA	70s	AABAAAAAAA
	80s	AAAAAABBAB		
033024	40s	---------e	50s	EEBCCCFCCC
	60s	CCCeAAAAAA	70s	ABAAAAAAAA
	80s	AAAAAAAAAA		
033025	60s	---fEAAAAA	70s	AAEABCF†††
033026	70s	fcCCCCCCCC	80s	CCCCCCF†CF
033027	60s	-----eAABE	70s	BBAAAAAAAA
	80s	ABBAAAAABB		
033028	60s	------EAEE	70s	ABAAAAAAAA
	80s	ABAAAABAAE		
033029	60s	-----eAAEA	70s	ABCAAAABAA
	80s	AAAABABAAA		
033030	50s	-------fcc	60s	cccf--eaaa
	70s	aababaaaaa	80s	e-----††††
033031	70s	-AAABAABAA	80s	AAAAAAE†AD
033032	60s	-----EAAAA	70s	AAAAABAAAA
	80s	AAAAAAAAAB		
033033	70s	---EAAAAAA	80s	AAAAAAABAA
033034	60s	--------fEA	70s	AAAAAAAAAA
	80s	AAAAAAAAAB		
033035	50s	--------fC	60s	CCCCCCCCCC
	70s	CCCCCCC†††	80s	†††††††CF†
033037	60s	---------E	70s	ABAAAAAAAA
	80s	AAAAABBBAB		
033039	70s	--EAAADBAA	80s	AABBABABBE
033040	60s	-----fffff	70s	CBAAAAAAAA
	80s	AAAABBabaa		
033044	60s	--------fcc	70s	ccCABBAAAA
	80s	ABAAAABBBA		
033045	60s	-------fcc	70s	ccCAAAAAAA
	80s	BABAAABBAA		
033046	60s	--------fcc	70s	cCCAABAAAA
	80s	BAAAABBAAA		
033048	60s	---------f	70s	cccAAAAAAA
	80s	BBBAAaAA††		
033049	70s	---aaaaaaa	80s	e-----††††
033050	60s	ffffffcccc	70s	f---FCCCCC
	80s	BCCBaeaaab		
033051	60s	----fCCCCC	70s	CAAABAAAAA
	80s	AAAAAAE†A†		
033052	60s	-†-ccc-ccc	70s	caeeAAAABA
	80s	AAABAAe-a†		
033053	40s	---------f	50s	ffcccccccc
	60s	cccfcffbcc	70s	cccccccccc
	80s	ccbaabaa		
033054	70s	------fCAA	80s	AABAABaaaa
033055	60s	---fcccf--	70s	-------fBAA
	80s	AAAAAAaabA		
033056	60s	-----ccffc	70s	cfcfffCCCB
	80s	BAAAAAa-a		
033057	70s	------FBAA	80s	AAAAAAe-a
033058	70s	------††EA	80s	AAAAaaeeaD
033059	60s	---------c	70s	ccfcaccccc
	80s	ccccaa		
033060	60s	---------f	70s	cccccccccc
	80s	cccccccf		
033062	60s	----fcf---	70s	---------fc
	80s	ccccbBe-a		
033063	80s	eAAabAABAA		
033064	80s	eaaabae-a		
033065	80s	fCCcaAE†BE		
033066	80s	-eAaaBBAAA		
033067	80s	--eaaAE†A†		
033068	80s	--fcbBe-a		
034001	50s	---------e	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
034002	50s	-------eAA	60s	AAAAAAAAAA
	70s	EAAAAAAAAA	80s	AEBAAAAAAE
034003	50s	---------e	60s	AAAAAAAAAA
	70s	AAAAAAAAAB	80s	AABAAAAABB
034004	60s	eAAAAAAAAA	70s	AAAAAAAAAB
	80s	ABAAAAABEF		
034005	60s	-eAAAAAAAA	70s	AAAAAAAAAB
	80s	ABAAAAAEAB		
034006	60s	---eAAAbAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
034007	60s	-------eAAB	70s	AAAAAAAAAA
	80s	AAAAAAAAEE		
034008	60s	------EABA	70s	AAAEEAAAAF
	80s	FCFDBBBEED		
034010	60s	--------EA	70s	AAAAAAAAAA
	80s	EABAAEAAAE		
034011	60s	-------AAA	70s	ABAABAABBE
	80s	ABAAAAAABA		
034012	60s	------eAAA	70s	AADABAAAAA
	80s	AAAAAAAABA		
034013	70s	--EEEAEADB	80s	ADEDDE††EE
034014	60s	---------f	70s	cfccfccffc
	80s	ccffcbCAA†		
034018	70s	--FFCCADDE	80s	AAAAAEAEA†
034019	70s	----EAAAAA	80s	AAAAAAAAB†
035001	60s	-†††FEE†††	70s	†††††FFCFE
	80s	befababbe		
035002	60s	----eAAAAA	70s	AAAABAEAAB
	80s	AAAAAAABAE		
035003	60s	-eAAAAAAAA	70s	ABAAAAAAAA
	80s	ABBAAAaaeA		
035004	60s	-----EAAAA	70s	AAAAAAAAAB
	80s	ABBAAAAAEE		
035008	60s	----ffEAAA	70s	AAAAAAAAAA
	80s	ABBAAAAAEE		
035010	60s	---------e	70s	AAAAAAAAAE
	80s	ABBAAAaabb		
035013	60s	---------†	70s	EAAAAAAAAB
	80s	ABAAAAAAE†		
036001	20s	--------CC	30s	†FCCCCCCCC
	40s	CCCCCCCCCC	50s	CCCCCCBAAA
	60s	BBBAABAAAA	70s	BBBBABCCCC
	80s	CCCCCCF†FF		
036002	60s	eAABAAAABA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		

Stn. number	Gauged daily flows, monthly peaks and rainfall			
036003	60s	fBAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
036004	60s	-----fBAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
036005	60s	--eBAAAAAA	70s	AAAAAAAAAA
	80s	AAABAAAAAA		
036006	60s	--eBABAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
036007	60s	fCCFBDABAA	70s	AAAAAAAAAA
	80s	AAAAAB†AAA		
036008	60s	EAAAABAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
036009	60s	--------EA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
036010	60s	--------EA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
036011	60s	--------EA	70s	AAAAAAAAAA
	80s	AAAAAAAAAB		
036012	60s	--------EA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
036013	60s	††††††††††	70s	†EEEEEEEFF
	80s	FFFFFFffef		
036015	70s	--EAAAAAAA	80s	AAABAAAEAA
036016	70s	eeeeeeea		
036017	70s	-ebaaaaaaa	80s	bae
037001	50s	eAAAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
037002	30s	--FCCCCBBB	40s	BBABABABAA
	50s	BBBBBBBEBB	60s	BEBBABBBAA
	70s	BAAAAAAAAA	80s	AAAAAAAAAA
037003	30s	--FCCCCCCC	40s	CCCCCCCCCC
	50s	CCCCCCCCCC	60s	CCCBAAAAAA
	70s	AAAAAAAAAA	80s	AAAAABAEE†
037005	50s	---------e	60s	AAAABAAAAB
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	f		
037006	60s	--eAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAE		
037007	60s	----eBAAAA	70s	AAAAAAAAAA
	80s	AAAABAAAAA		
037008	60s	-----eAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
037009	60s	--eAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
037010	60s	--eBAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
037011	60s	---eAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAB		
037012	60s	---eBAAAAA	70s	AAAAAABAAA
	80s	AAAABAAAAE		
037013	60s	---eAAAAAA	70s	AAAAAAAAAA
	80s	AAAABAAAAA		
037014	60s	---fCBAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
037015	70s	--------e†E	80s	EEAAAAAAAA
	90s	e		
037016	60s	-----EAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
037017	60s	---------E	70s	AAAAAAAAAA
	80s	AAAAAAAAAE		
037018	70s	EAAAAAAAAA	80s	AAAAABAAAA
	90s	e		
037019	60s	-----EAAAE	70s	AAADAABEEA
	80s	AAAAAAAAAA	90s	e
037020	60s	---------†	70s	EAAAAAAAAA
	80s	AAAABAAAAA		
037021	60s	---------†	70s	EAAAAAAAAA
	80s	AAAAAAAEAE		
037022	60s	---------†	70s	EAAAAAAAAB
	80s	AAAABBBAAE		
037024	70s	-EAAAAAAAA	80s	AAABBBAEAA
037025	60s	-----CBAAE	70s	EEEE†††---
	80s	---†--††††		
037026	60s	-ebaaebaaa	70s	aaaaaee
037027	60s	feeeeebaaa	70s	ae
037028	60s	feeaaebaaa	70s	aaaaeee
037029	60s	eeaaabcaaa	70s	baaaeae
037030	60s	--EEEBBAAB	70s	e---------
	80s	------††††		
037031	70s	-------eBAA	80s	AAABAAAE††
037033	70s	------eAAAA	80s	AAAAAEeaae
037034	70s	----feeaaa	80s	aaedaeaaee
037036	70s	-bbaaaaaaa	80s	aaaaaaa
037037	80s	-eebbeEEEB		
037038	50s	-eaeee--ea	60s	beeebabbab
	70s	abbae		
037039	70s	---feeebeE	80s	EEEEEEeeee
038001	70s	---------f	80s	ccccfccccf
	90s	cccccfccc	00s	cccfcccccc
	10s	cccccccccc	20s	cccccccccc
	30s	cccccccCCC	40s	CCCCCCCCCC
	50s	CCCCCCCCCC	60s	CCCCCAAAAB
	70s	BAAABCF†EA	80s	AAAAAAAAAA
	90s	e		
038002	80s	eaaaaaabeA	90s	e
038003	50s	--eAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
038004	70s	----------e	80s	AAAAAAAAAA
	90s	e		
038005	30s	-------††††	40s	††††††††††
	50s	†††††-----	60s	EAAAABABAA
	70s	AAAAAAAAAE	80s	EE††††
038006	50s	-------fCCC	60s	CBAAAAAABA
	70s	AAAABAAAAA	80s	EEE
038007	60s	------EAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
038011	50s	--------fCC	60s	CCCCCBBBBB
	70s	BABBBBBAAA	80s	AAAAE†
038012	50s	---------††	60s	††††††††††
	70s	††††EAAAAA	80s	AAAAAAaaaa
	90s	e		
038013	30s	-----†††††	40s	††††††††††
	50s	††††------	60s	eaabbbaaaa
	70s	aaaaaabaaa	80s	AAAAABaaaa
	90s	e		

Stn. number	Gauged daily flows, monthly peaks and rainfall			
038014	50s	-------eCCC	60s	CCCCCCCCCC
	70s	CCCCCCBAAA	80s	EAAAAAAAAA
	90s	e		
038015	60s	---------E	70s	AAAABAAAAA
	80s	Ate		
038016	60s	---------f	70s	CCBBBCCCBA
	80s	AABCCCccba	90s	e
038017	70s	eBAAAAAAAA	80s	AAAAAAaaaa
	90s	e		
038018	70s	-eAAAABAAA	80s	AAAAAAAAAA
	90s	e		
038020	70s	-EAAAAAAAA	80s	AAEEAAAAAA
	90s	e		
038021	70s	-eAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
038022	70s	--fCCCAAAA	80s	AAAAAAAAAA
	90s	e		
038024	70s	---EAAAAAA	80s	AAAAAAAAAA
	90s	e		
038026	70s	----EAAAAA	80s	AAAAAAAAAA
	90s	e		
038027	80s	-----edade	90s	e
038028	70s	------eEAA	80s	AAAAAAAAAA
	90s	e		
038029	70s	--------eA	80s	AAAAABAAAA
	90s	e		
038030	70s	---------e	80s	AAAAAAAAAA
	90s	e		
039001	80s	---cCCCCCC	90s	CCCCCCCCCC
	00s	CCCCCCCCCC	10s	CCCCCCCCCC
	20s	CCCCCCCCCC	30s	CCCCCCCCCC
	40s	CCCCCCCCCC	50s	CCCCCCCCCC
	60s	CCCCCCCCCC	70s	CCCCCBAAAA
	80s	BBAAAAAAAA	90s	e
039002	30s	--------fC	40s	CCCCCCCCCC
	50s	CCCCCCCCCC	60s	CCCCCCCCCC
	70s	CCCCCCCCCC	80s	CCCCCCCCCC
	90s	f		
039003	60s	--eAAEEEEE	70s	eEEAEEEEDA
	80s	AAAAAAaaaa	90s	e
039004	30s	------eEEA	40s	AAE††EEEE†
	50s	††††EAAAAA	60s	AAAAEAEEEE
	70s	†EEAEEAF†E	80s	EEEEAAAAAA
	90s	e		
039005	30s	-----eAAE†	40s	††††††††††
	50s	††††EEAAAA	60s	EEAEEEEEEE
	70s	EEEAEEEEEA	80s	AEEBBAAAAA
	90s	e		
039006	50s	eAAAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAADA
	90s	e		
039007	50s	--eAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
039008	50s	-fCCCCCCCC	60s	CCCCCCCCCC
	70s	CCCCCCCCCC	80s	CCCCCCCCCC
	90s	f		
039010	50s	--eAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAaAAA
	90s	e		
039011	50s	----eAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
039012	50s	------EAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAEEEAAEAA
	90s	e		
039013	30s	----eAAAAA	40s	AAAAAAAAAA
	50s	AAAAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAEA	80s	AAAAAAaAAA
	90s	e		
039014	50s	------eAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
039016	60s	-eAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
039017	60s	--eAAAAAAA	70s	AAAAAAAAAA
	80s	AEEAAE†EEE		
039019	60s	--EAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
039020	60s	---eAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
039021	60s	-----EAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
039022	60s	-----eAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
039023	60s	----eAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
039025	60s	-------eAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
039026	60s	------eAAA	70s	AAAAAAAAAA
	80s	AAAAAAAEEA	90s	e
039027	60s	--------eA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
039028	60s	--------EA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
039029	60s	-------†EA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
039030	70s	EAAAAAAAAA	80s	AAAAADaAAA
	90s	e		
039031	60s	--eAAAAAAA	70s	AAAAAAAAAA
	80s	AAAE††††††		
039032	60s	------eAAA	70s	AAAAAAAAAA
	80s	AAAE††††††		
039033	60s	--eAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
039034	70s	eAAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
039035	60s	--------†E	70s	AAAAAAAAAA
	80s	AAAAAAaaaa	90s	e
039036	60s	--------eA	70s	AAAAAAAAAA
	80s	AAAAAEDAAA	90s	e
039037	70s	-†EAAAAAAA	80s	AAAAAAAAAA
	90s	e		
039038	60s	--------eA	70s	AAAAAAAAAA
	80s	AAEEBEEDAA	90s	e
039040	70s	-†EAAAAAAA	80s	AAAAAAAAAA
	90s	e		
039042	70s	--EAAAAAAA	80s	AAAAAAAAAA
039043	60s	--eEAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
039044	70s	--eAAAAAAA	80s	AAAAaaAAAA
	90s	e		
039046	70s	---eAEEEEA	80s	E†††EDddaD
039049	70s	---EEE†††E	80s	DAABEAAAAA
	90s	e		
039051	60s	-------EAA	70s	AAAAAAAAAA
	80s	AAEAAAAAE†		
039052	50s	-------eAA	60s	EdAAAAAAAA
	70s	aaaaaaaaaa	80s	AAAAAAAAAA
	90s	e		
039053	60s	-eAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
039054	60s	-eAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
039055	70s	---------e	80s	EEEAAAAAAA
	90s	e		
039056	70s	-------eae	80s	aeaaaaaaaA
	90s	e		
039057	70s	--------ea	80s	daaaeaaaaA
	90s	e		
039058	70s	--------ea	80s	daeaaaaaaA
	90s	e		
039061	70s	-eaaaaaaaa	80s	aeceadDEBB
	90s	f		
039065	70s	eaaaaae---	80s	ebeebbAABB
	90s	f		
039068	70s	-eAAAAE†EA	80s	AAAAAAAAAA
	90s	e		
039069	70s	--eAE†EAAA	80s	AAAAAAAAAA
	90s	f		
039071	70s	---------e	80s	eeeeeeeeda
	90s	e		
039072	70s	---------e	80s	edddeddeda
039073	70s	---------e	80s	aaaaaaAAAA
	90s	e		
039074	80s	aaaaaaAAAA		
039075	80s	eaaaaaADDD	90s	e
039076	70s	------aeaa	80s	aaaeaaAAAA
	90s	e		
039077	80s	eaaaaaAAAA	90s	e
039078	70s	--------ea	80s	aaaaaaAAAE
	90s	e		
039079	70s	---------f	80s	ffededdaaa
039081	60s	--eAAAAAAA	70s	AAAAAAAAEe
	80s	AAAaaaAAAA	90s	e
039085	30s	------eaea	40s	aae-------
	50s	----eaAAAA	60s	e
039086	70s	-----eAAAA	80s	AAAaAAaaaa
	90s	e		
039087	70s	----eAAAAA	80s	aAAAAAaAAA
	90s	e		
039088	70s	----eAaAAA	80s	AAAAABAAAA
	90s	e		
039089	70s	-----eaaaa	80s	aaaaaadaaA
	90s	e		
039090	80s	-----e-†EA	90s	e
039091	70s	--------ee	80s	aaaaae††††
039092	70s	---------e	80s	aaeaeeEAAA
039093	70s	--------ee	80s	aeeeeaaaaa
	90s	e		
039094	70s	-------fea	80s	baaaeaaaaa
	90s	e		
039095	70s	--------ea	80s	aaeeaaaaaa
	90s	e		
039096	70s	---------e	80s	aeeaeaaaaa
	90s	e		
039097	80s	fcccccCCCC	90s	f
039098	80s	----eddaaa		
039099	80s	---eaaaaaa	90s	e
039100	80s	----eeddea		
039101	80s	--eaaaAAAA	90s	e
039102	80s	----edadaA		
039103	80s	---------e	90s	e
039104	80s	--------ea		
039105	80s	---------e		
039106	80s	--------ed	90s	e
040001	50s	---EAAAAAA	60s	AAAAABAE††
	70s	††††††††††	80s	†††---††††
040002	50s	------eAAA	60s	AAAAAAAAEA
	70s	BBAAAe-†††	80s	†††---††††
040003	50s	------eAAA	60s	AAAAABEEFF
	70s	FFCFCCCCCC	80s	BBBAAACCCC
	90s	f		
040004	60s	--eAAAAEEB	70s	AAAAAEAAAE
	80s	AAAAADAAAA		
040005	50s	--------eA	60s	AAAAAAAABB
	70s	AAAEAEAAAE	80s	AAAAADDDAD
040006	50s	---------e	60s	AAAAAAABEB
	70s	AABEDEAEEE	80s	EEE††††EED
040007	60s	eAAAAAEEEA	70s	AAAAAAAAAE
	80s	EEEEEBAADA		
040008	60s	--eEAAAABA	70s	AAAABEAAEE
	80s	ADDDDDDDDA		
040009	60s	-eABBBAABA	70s	AAAAAABAAA
	80s	AAAAAAAAAA		
040010	60s	-eAAAAAAEA	70s	AAEAEAEAAA
	80s	DFFFFFFFDD		
040011	60s	----eAABAA	70s	AAAAABABAA
	80s	BADDAAAAAA		
040012	60s	---eAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
040013	60s	--------†E	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
040014	70s	-e†EEEEAEE	80s	DEDE††††††
040015	60s	---------E	70s	EEAAAAAAAE
	80s	EDEEE††EDA		
040016	60s	--------†E	70s	AAAAAAAAAA
	80s	AAAAAAaaaA	90s	e
040017	70s	-BEAEEBBDE	80s	EEDEE†DDAD
040018	60s	-------†EE	70s	AAAAAAAAAA
	80s	AAAaaaAAAA	90s	e
040020	70s	---eEAEEDE	80s	EEAE†††DAD
040021	70s	-----EEEAE	80s	DDEDE†††††
040022	80s	††††††		
040023	70s	------deeA	80s	ADDAEEDDDD
040024	70s	----eEEEAA	80s	EF††††††††
041001	50s	eaAaaAAAAA	60s	AAAAaAAAAA
	70s	AAAAAAAADA	80s	AAAAAAAAAA
041002	50s	-eAAAAAAAA	60s	AAAAAAAAAD
	70s	AAABAAAAAA	80s	ADDDDDDAAA
041003	50s	---------e	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	DDDDDDDDAA
041004	50s	------eAAA	60s	AAAAAAAAAA
	70s	ABBBAAAAAE	80s	†FCCFFCCCC
041005	60s	eAAAAAAAAA	70s	AAAAAAAAAA
	80s	AADDAAAAAA	90s	f
041006	60s	----eBAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
041009	50s	---------F	60s	CCCCCCCCCC
	70s	CCCCCCF†††	80s	---------†
041010	60s	-eEAEADDAA	70s	ABEDDDDDDA
	80s	DDDADADDAD		
041011	60s	------EAAA	70s	AAAAAAAAAA
	80s	DDADAAAAAA		
041012	60s	------†EAD	70s	AAAAAAADAA
	80s	DDAADDAAAA		
041013	50s	eAAAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	DDAEDDDAAA
041014	70s	eADAAAADAD	80s	AAADDAADAA
041015	60s	-------EAD	70s	DAADDDADDD
	80s	DDAAAAAAAA		
041016	30s	---------F	40s	fFFFFFFFFF
	50s	FFFFFFFFFF	60s	FFFFFFFEAA
	70s	AAAAAAAAAD	80s	AAAAAAAAAA
041017	60s	---------e	70s	AAEAAADDDA
	80s	AAAAAAAAAA		
041018	60s	---------e	70s	AABAAABADA
	80s	DADADDAAAB		
041019	70s	eAAAAAAAAA	80s	AAADAAAAAA
041020	60s	---------e	70s	AABAAAAAAA
	80s	AAADAAAAAA		
041021	60s	---------e	70s	EBABAABBED
	80s	AABBBABAAB		
041022	70s	eAAAAADDDD	80s	AAAAAAAAAA
041023	70s	fBBCBBBBBB	80s	BBEBEBbebc
041024	70s	-EAAAAABBA	80s	DAAAAADAAA
041025	70s	-EAAAADDDA	80s	DAAAADAAAA
041026	70s	-EAAAADAAA	80s	AAADAAADAA
041027	70s	--eAAAAADD	80s	DAAAAAAAAA
041028	60s	----eEEAAA	70s	AAAAAAAAAD
	80s	DADDDADAAA		
041029	80s	---edaAAAA		
041030	80s	------††††		
042001	50s	-fCCCCCCCC	60s	CCCCCCCCCC
	70s	CCCCCBDAAA	80s	AEDAAAAAAA
042002	50s	---------†	60s	††††††††††
	70s	††----†††-	80s	†††
042003	60s	fCCCCCCCCC	70s	CCCCCCBAAA
	80s	DAAAAAAAAA		
042004	50s	-------fCC	60s	FCCCCCCCCC
	70s	CCCCCCCCCF	80s	FCCCCCCCCC
042005	50s	-----fCCCC	60s	CCCCCCCCCC
	70s	CCCCCFCFFF	80s	FCCCCCEDAB
042006	50s	--------fC	60s	CCCCCCCCCC
	70s	CCCCCBAAAA	80s	AAAAAAAAAA
042007	70s	fCCCCFCCcc	80s	cfccccCCCC
042008	70s	FCCCCBAAAA	80s	AAAAAAAAAA
042009	70s	fCCCCBAAAA	80s	AAAAAAAAAD
042010	50s	--------fC	60s	CCCCCCCCCC
	70s	CCCCCCCCCC	80s	CCCCcCCCCC
	90s	f		
042011	70s	--fCCBAAAA	80s	AAAAAAaaaA
042012	70s	---††BBBBC	80s	CCCCCCCCCC
042014	60s	--------††	70s	††††††EDAA
	80s	AAAaaaAAAA		
042015	80s	--------aa		
042016	70s	-----fcfff	80s	cfcf
042017	80s	--------ed		
042018	80s	--------aa		
042020	80s	--------aa		
042021	70s	---------f	80s	fee
043001	60s	eAAAAE††††	70s	††††††††††
043003	60s	-----fCFCC	70s	CCCCCCCCCC
	80s	CCCcCC††††		
043004	60s	-----EAEAA	70s	AAAAAEAAAA
	80s	BEEEBEDEB	90s	e
043005	60s	-----EAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAABA	90s	e
043006	60s	------AAAA	70s	AAAAAAAAAA
	80s	AAAAAABBBB	90s	e
043007	70s	--†AAAAAAA	80s	AAAAAAABAA
	90s	e		
043008	60s	-------AAA	70s	AABAAAAAAA
	80s	AABAAABBBA	90s	e
043009	60s	--------eA	70s	AAAAAAAAAA
	80s	AAAAAAAADA	90s	e
043010	60s	---------†	70s	EAAAAAABAA
	80s	AA††††		
043011	70s	Eeccff††††	80s	------††††
043012	60s	------††††	70s	†EAAAAABAA
	80s	AAABABAAEB	90s	e
043013	60s	---------†	70s	†EBABBBAAA
	80s	AEEE††††††		
043014	60s	------††††	70s	†EAAAAAAAA
	80s	AAAAAAAEAA	90s	e
043015	60s	------††††	70s	†FFFFFF†††
	80s	---------†		
043017	60s	------††††	70s	†EAAAAAAAA
	80s	AAABABBBEA	90s	e
043018	70s	----eAAAAA	80s	AAAAAAbbbb
	90s	e		
043019	70s	---EAAAAAA	80s	AABAABaabB
	90s	e		
043021	70s	-----BBBAB	80s	BBBCCCCCFC
	90s	f		
044001	60s	------cccC	70s	CCCCCCCccc
	80s	ccccCC††††		
044002	60s	---eAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAEAA	90s	e
044003	60s	------EAAA	70s	AAAAABBAAA
	80s	e-----††††		
044004	70s	-fCCCCCccc	80s	ccbcBB††††

Stn. number	Gauged daily flows, monthly peaks and rainfall			
044006	60s	------†††E	70s	AAAAABBAAA
	80s	AAAAABBBCB	90s	e
044008	70s	---†EEAAAA	80s	AD††††††††
044009	70s	-----eAAAA	80s	ABAABBABEB
	90s	e		
045001	50s	------eAAA	60s	AAAAAAAAAA
	70s	AAAAABAAAA	80s	AAAAAAAAAA
	90s	f		
045002	60s	-eAAAAAAAB	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
045003	60s	--eAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
045004	60s	----eAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAABA		
045005	60s	---eAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	f
045006	60s	----eaAE††	70s	††††††††††
045008	70s	--††EAAAAA	80s	ABAAAAAABA
045009	80s	-AAaaaACCA		
045010	70s	---ccccccc	80s	------††††
045011	60s	---------cf	70s	-----fcccc
	80s	cf----††††		
045012	60s	----fcfccc	70s	cccccccccc
	80s	ccccccAA††		
046002	50s	------eAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAA†A
046003	50s	--------eA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	f		
046005	60s	----EAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAACA		
046006	70s	----AAAAAA	80s	AAAAAAAACA
046007	70s	--eAAAAAAA	80s	AF----††††
046008	70s	-aaaaaaaaa	80s	aF----††††
047001	50s	------eAAA	60s	AAAAAABBBB
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
047003	50s	-------eBE	60s	††††††††††
	70s	††††EEEAAE	80s	E†††††
047004	60s	---eAAEAEA	70s	AAAAAAAAAA
	80s	AAAAAAAACA		
047005	60s	---eAAAAAA	70s	AEE†††††EA
	80s	AF----††††		
047006	60s	---eAAEAEE	70s	EE†††EAAAE
	80s	AF----††††		
047007	60s	---eAAABAA	70s	AAEEAAAAAA
	80s	AAAAAAAAAA		
047008	60s	---------e	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
047009	60s	---------E	70s	AAAAAAAAAB
	80s	AAAAAAAAAA		
047010	70s	-†EAAAAAAA	80s	AAAAE†AACA
047011	70s	-EAAAAAAAA	80s	AF----††††
047013	70s	--†DAAAAAA	80s	AAAAAAAACA
047014	80s	-aaaaeAACF		
047015	80s	-aaaaa††††		
047016	70s	------fccf	80s	ffffccCC††
047017	70s	-------fcc	80s	ccccccA†††
048001	50s	--------eAA	60s	AAAAEAAEEE
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
048002	60s	-FcbAAABBA	70s	AAABABFccc
	80s	fcfcf-††††		
048003	70s	--------fc	80s	cAABAAAAAA
048004	60s	---------e	70s	AAAAAAAAAE
	80s	AAAAAAAAAA		
048005	60s	--------EA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	f
048006	60s	--------EA	70s	AAAAAAAAAA
	80s	AAAAABAACF		
048007	60s	--------EA	70s	AAAAAAAAAA
	80s	AAAAAAAACA		
048009	70s	†EAAAAAAAA	80s	A†††††††††
048010	50s	-------ff-	60s	---------f
	70s	cCBAAAAAAA	80s	AAAAAAAAAA
048011	60s	-FcbAAABBA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
049001	60s	----eAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
049002	50s	-------EE†	60s	††††††††EA
	70s	AAABAAAAAA	80s	AAAAAAAAAA
049003	60s	-------eEB	70s	CBEEEAAADA
	80s	AAAAAAAACA		
049004	60s	---------E	70s	AAAAAAAAAA
	80s	AAAAABDAAA		
050001	50s	--------eA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	f		
050002	60s	--eAAAAAAA	70s	BAAAAAAAAA
	80s	AAAAAAAAAA		
050004	60s	-----eE†††	70s	††††††††††
	80s	---†††		
050005	70s	-----fcccc	80s	cccccccaC††
050006	60s	-----daaaa	70s	aaaaaaaaaa
	80s	aaaaae††AA		
050007	70s	---fcccccc	80s	cccfccCF††
051001	60s	-------AAA	70s	AAAAAAAAAA
	80s	AAAEeaAAAA	90s	e
051002	70s	---eaaaade	80s	-----eAABA
	90s	e		
051003	60s	------febb	70s	bbbbaabfee
	80s	e--eeaAAAA	90s	e
052001	50s	------eaaa	60s	aaaaabAAE†
	70s	††††---†††		
052002	50s	------eAAB	60s	BBBBBBAAe-
	70s	-------†††		
052003	60s	-eBAAAAAAA	70s	AAAAAAAAAA
	80s	AEAAAAAAAA	90s	e
052004	60s	--eAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
052005	60s	-EAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
052006	60s	---eAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
052007	60s	------eAAA	70s	AAAAABAAAA
	80s	AAAAAAAAAA	90s	e
052008	60s	eBBBBBAAE†	70s	††††-†††††
052009	60s	----AAAAAA	70s	AAAAAAAAAA
	80s	ABBAAEEAAA	90s	e
052010	60s	----eAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
052011	60s	-----eAAAA	70s	AABAAAAAAA
	80s	AAAAAAAAAA	90s	e
052014	60s	------†EAA	70s	BAAAEEEEE†
	80s	†EEaaaBAAA	90s	e
052015	70s	-AAAAAAAAE	80s	-----eaaaa
	90s	e		
052016	70s	†EAAAAAAAA	80s	AAAAaaAAAA
	90s	e		
052017	70s	---EEE††††	80s	-----eaaaa
	90s	e		
052020	60s	------fccf	70s	fffFEAAAA†
	80s	------††††		
053001	50s	---eAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	E†
053002	50s	---eAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAaaaAAAA
	90s	e		
053003	30s	---------f	40s	fccbbbbc-b
	50s	bbabAAAAAA	60s	AAAAAAAAAE
	70s	††††††††††	80s	††----††††
053004	50s	--------EA	60s	AAAAAAAAEE
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
053005	60s	-EAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
053006	60s	-eAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
053007	60s	-eAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
053008	60s	----AAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
053009	60s	------AAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
053013	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
053017	70s	---EAAAAAA	80s	AAAAAAAAAA
	90s	e		
053018	60s	---------e	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
053019	60s	---------e	70s	aaaaaaaaaa
	80s	AAAAaaaaaA	90s	e
053020	60s	--------ea	70s	aaaaaaaaaa
	80s	AAAaaaaaaa	90s	e
053022	70s	------eAAA	80s	AAAAE†††††
053023	70s	------eAAE	80s	AAAAAAAAAA
	90s	e		
053024	70s	--------AA	80s	AAAAAAAAAA
	90s	e		
053025	80s	AAAAAAAAAA	90s	e
053026	70s	--------AA	80s	AAAAAAAAAA
	90s	e		
053028	80s	--aaaaAAAA	90s	e
053029	80s	----aaaaaa	90s	e
054001	20s	-FCCCCCCCC	30s	CCCCCCCCCC
	40s	CCCCCCCCCC	50s	CCCCCCCCCC
	60s	CCCCCCCCCC	70s	CCAAAABAAA
	80s	AAAAAAAAAA	90s	e
054002	30s	------fbAA	40s	AAAAAAAABC
	50s	CCCCBAAAAA	60s	AAAAAAAAAA
	70s	BCBABABAAA	80s	AAAAAAAAAA
	90s	e		
054004	50s	--fCBAAAAA	60s	AAAAAAAAAA
	70s	BEEEBAAAAE	80s	AAAABAAAAA
	90s	e		
054005	50s	---fCBAAAA	60s	AAAAAAAAAA
	70s	ABBAAABAAA	80s	AAAAAAAAAA
	90s	e		
054006	50s	---fBAAAAA	60s	AAAAAAAAAA
	70s	BCBAAABBAB	80s	AAAAAAAAAA
	90s	e		
054007	50s	-------eAA	60s	AAAAAAAAAA
	70s	BCEEBBBAAA	80s	AAAAE††AAA
	90s	e		
054008	50s	------eAAA	60s	AAAAAAAABB
	70s	CCAAAAAAAA	80s	AAAAAAAAAA
	90s	e		
054010	50s	---------e	60s	AAAAAAAAAA
	70s	BCbAAAAADD	80s	AADE††††††
054011	60s	-eAAAAAAAB	70s	CCBABBABAB
	80s	AAAAE†††††		
054012	60s	eAAAAAAAAB	70s	ABAAABBAAA
	80s	AAAAAAAAAA	90s	e
054013	50s	---------e	60s	AAAAAAAABA
	70s	AABABBBAAE	80s	††††--††††
054014	60s	--fBAAAAAB	70s	BAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
054015	60s	---------E	70s	EEEEEEAAAA
	80s	AaAA††††††		
054016	60s	-eAAAAAAAA	70s	BAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
054017	60s	--eAAAAAAA	70s	BBAAAAAAAA
	80s	AAAA††---†		
054018	60s	--eAAAAAAA	70s	AAAAAAAAEA
	80s	AAAAE††AAA	90s	e
054019	60s	--eAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
054020	60s	---eAAAAAB	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	e
054022	50s	---eAEAAE†	60s	††††††††EB
	70s	AEAAADAAAA	80s	AAAAAAAAAA
	90s	e		
054023	60s	--------eA	70s	BBAE††BAAA
	80s	AAAA††††††		
054024	60s	††††††††E	70s	AAAAAAAAAA
	80s	AAAAAAaaaa	90s	e
054025	60s	---------E	70s	ABAAAAAAAA
	80s	AADAAAAAAA	90s	e
054026	60s	---------F	70s	†EAAEAAAAA
	80s	AAEA††††††		
054027	60s	---------e	70s	aAAAAAAAAA
	80s	AAAAE†††††		
054028	60s	---------†	70s	FBBAAAAAAA
	80s	AAAAAAaaaa	90s	e
054029	70s	FBBAAAAAAA	80s	AAAAAAAAAA
	90s	e		
054032	70s	FBBAAAAAAA	80s	AAAAAAAAAA
	90s	e		
054034	70s	-EAAAAAAAA	80s	AAAA†††EAA
	90s	e		
054036	70s	-†EAAAAAAA	80s	AAAAE†††††
054038	70s	--†EABAAAA	80s	AAAAEAAAAA
	90s	e		
054040	70s	---FABAAAA	80s	AAAAAAaaaA
	90s	e		
054041	70s	--FCCCAAAA	80s	AAAAAAAAAA
	90s	e		
054042	70s	†EAEAAEE††		
054043	50s	-----fcccc	60s	ccccfccccc
	70s	Ft-----†††	80s	------††††
054044	70s	-†EAAAAAAA	80s	AAAAAAAAAA
	90s	e		
054045	70s	---†AAAAAE		
054046	70s	-----faaaa	80s	aAAAE†
054047	70s	-----fbae-	80s	-†††††
054048	70s	------eAAA	80s	AAAAE†††††
054049	70s	---------e	80s	aaaaaaAAEA
	90s	e		
054052	70s	fbDAAAAAAA	80s	AAAA†††E††
054054	70s	--EAAAE---	80s	---††††††
054055	70s	--ebeae---	80s	------††††
054056	70s	--EEEEE		
054057	70s	-fcccbbaaa	80s	aaaaaaAAAA
	90s	e		
054058	70s	--eaabbee		
054059	70s	--eaabaEE†	80s	------††††
054060	70s	--ebaaaaae	80s	-fcff-†EAE
	90s	e		
054061	70s	--ebaebe		
054062	70s	--EAEEBEAE	80s	AAAA††††††
054063	70s	--eababaae	80s	aaae
054065	70s	---EAABEAE	80s	------††††
054066	70s	---EBBBAAA	80s	AAAA††††††
054067	70s	----bbbae		
054068	70s	----eee		
054069	70s	----aaaae		
054070	70s	----eabaaa	80s	aaaa
054080	70s	-------fed	80s	aaae--††††
054081	70s	-------EBA	80s	AAAAAAaaaa
	90s	e		
054083	70s	--------ea	80s	aaaa--††††
054084	70s	--------ea	80s	aaaa--††††
054085	70s	---------e	80s	aaaa--††††
054086	70s	---------e	80s	eeaae--aaa
	90s	e		
054087	70s	---BAEE---	80s	aaee--†--†
054088	70s	--------ea	80s	aaaaaaAAAA
	90s	e		
054090	70s	---eaaaaaa	80s	aaaaaaAAD†
054091	70s	------AAAA	80s	AAAdadAAD†
054092	70s	---eBAAAAA	80s	AAAaaaAAD†
054094	80s	--eeeeeAA	90s	e
054095	80s	----eeeeAA	90s	e
054096	80s	--------††		
055002	30s	-----eEEAA	40s	AAAAAAAAAA
	50s	AAAAAABAAA	60s	AAAEAAAAAA
	70s	CCCBAAAAAA	80s	AAACCCAAAA
055003	30s	---------e	40s	AAAAAAAAAA
	50s	AAAAAAAAAA	60s	AAAAAAAAAA
	70s	AAAABAAAAA	80s	AE†------†
055004	30s	-------eAA	40s	AAAAAAAAAA
	50s	AAAAAAAAAA	60s	AAAEAAAAAA
	70s	AAAAAAAAAA	80s	EEF†††††††
055005	30s	-------eBA	40s	AAAAAAAAAA
	50s	AAAAAAAAAA	60s	AAAEAAAAAA
	70s	-------†††	80s	------††††
055006	00s	--------CC	10s	CCCCCCCCCC
	20s	CCCCCCCCCC	30s	CCCCCBAAAA
	40s	AAAAAAAAAA	50s	AAAAAAAAAA
	60s	AAAAAAAAAA	70s	AAAAAAABCC
	80s	cCCFC†		
055007	30s	-------eAA	40s	AAAAAAAAAA
	50s	AAAAAAAAAA	60s	AAAEAAAAAA
	70s	CCCCCCCCCC	80s	CAACCCaaaA
055008	50s	-eAAAAEEaA	60s	AAAEAAAEEA
	70s	AAAADAAAA	80s	AAAAAAAAAA
	90s	e		
055009	40s	--------eA	50s	AAAAAAAAAA
	60s	AAAEAAAAAA	70s	AAE†††††††
	80s	------††††		
055010	50s	-----eAAAA	60s	AAAEAAAAAA
	70s	AAAAAAAEAA	80s	EFF†††††††
055011	50s	---------e	60s	AAAAAAAAAA
	70s	AAAAAABAAA	80s	DBF†††††††
055012	60s	------eAAA	70s	AAAAAAAEEA
	80s	AAAAAAAAAA		
055013	60s	------eAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
055014	60s	------eAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
055015	60s	------eAAA	70s	AAAAAAAAEE
	80s	EAD†††††††		
055016	60s	--------eA	70s	EAEAAAAAAA
	80s	AAAAAAAAAA		
055017	60s	--------eA	70s	BAAEEAAAAA
	80s	AE----††††		
055018	60s	--------eA	70s	AAAAAAAAAE
	80s	AAAAAAAAAA		
055021	60s	------†††E	70s	AAAAAAAAAA
	80s	AAE†FADAAA		
055022	60s	-------†-e	70s	AAAABAAAAE
	80s	†FF†††††††		
055023	30s	------fBAA	40s	AABAAAAAAA
	50s	AAAAAAAAAA	60s	AAAAAAAAAA
	70s	CCCCCCCCCC	80s	CAAAAAAAAA

Stn. number	Gauged daily flows, monthly peaks and rainfall			
055025	60s	------††††	70s	EAAAAAAAAA
	80s	AAAAAAAAAA		
055026	30s	-------eBA	40s	AAAAAAAAAA
	50s	AAAAAAAAAA	60s	AAAEAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
055027	70s	-eAAAAAAE†	80s	†††---††††
055028	70s	-eAAAAAAAE	80s	ADAAAACAAA
055029	40s	--------eA	50s	AAAAAAAAAA
	60s	AAAEAAAAAA	70s	AAAAAAAAAA
	80s	EAAAADAAAD		
055030	20s	------fccc	30s	ccccccccfc
	40s	cccccccccc	50s	c---------
	60s	----------	70s	---††††
055031	70s	-††EAAAAAA	80s	AAAAAAAAAD
055032	00s	--------CC	10s	CCCCCCCCCC
	20s	CCCCCCCCCC	30s	CCCCCBAAAA
	40s	AAAAAAAAAA	50s	AAAAAAAAAA
	60s	AAAAAAAAAA	70s	AAAAAAABCC
	80s	cAAAAAadaa		
055033	60s	---------c	70s	---eaaaaaa
	80s	aaaaadAAAE		
055034	70s	---eeeaeaa	80s	eaaaaaAAAE
055035	70s	---eaaaaaa	80s	aaaaaaAAE†
056001	50s	-------EAA	60s	AAAAAAAAAA
	70s	AAAAAABAAA	80s	AAAAAAAAAA
056002	50s	-------eAA	60s	AAAAAAAAAE
	70s	AAAAAE††AA	80s	AAAAAAAAAA
056003	60s	---eAAAAAA	70s	AAAAABAAAA
	80s	AA†---††††		
056004	60s	-----eAAAA	70s	AAAAAAAAAA
	80s	E††---††††		
056005	60s	-----†EAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
056006	60s	---eAAAAAA	70s	AAAAAAAAAA
	80s	AA††††††††		
056007	60s	------†EAE	70s	EAAAAAAAAA
	80s	AAAAAAAAAA		
056008	70s	ebaAAEE†††	80s	††----††††
056010	60s	---------e	70s	aeeeeeeeea
	80s	ee----††††		
056011	70s	ebaAAAAAAA	80s	AA†---††††
056012	70s	-AAAAAAABB	80s	AA†---††††
056013	70s	--eAAAAAAA	80s	AAAAAAAAAA
056014	70s	---------e	80s	eedf
056015	70s	--†††EAAAE	80s	AA††--††††
056016	70s	---------a	80s	aaabaaaaa
057001	30s	------eeEB	40s	e---------
	50s	--eaAABAAA	60s	ABBBBBAAEA
	70s	AAAA††††††	80s	††††
057002	30s	-eaaaaaaAA	40s	AAAAAEAAAA
	50s	AADDAABAAA	60s	AAAAAAAAAA
	70s	ABAA††††††	80s	†††
057003	60s	-----eAAAA	70s	AAA†††††††
	80s	††††††††††		
057004	50s	-------eAA	60s	AEEAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
057005	70s	eAAAAAAAAA	80s	AAAAAAAAAA
057006	70s	eAAAAAAAAA	80s	E††FAAAAAA
057007	70s	--†EAAAAAA	80s	AAAAAAaaaD
057008	70s	--†AAAAAAA	80s	AAAAAAAAAA
057009	70s	-----AAAAA	80s	AAAAAAAAAA
057010	70s	----eAAAAA	80s	EAAAAAAAAA
057011	70s	------eaae	80s	e--------†
057012	70s	------eaae	80s	e--------†
057015	70s	--------eA	80s	ABACCCaaaA
057016	70s	---------e	80s	AAAAAAaaaa
058001	60s	---eAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAEAAA		
058002	70s	-----AAEEB	80s	EAADAAAAAA
058003	60s	--eAAE††††	70s	††††††††††
	80s	------††††		
058005	70s	eAAAAAAAAA	80s	AAADFADBAA
058006	70s	-EAAAAAAAA	80s	EAAAAAAAAA
058007	70s	eBAAAAAAAA	80s	EAAAAAAAAA
058008	70s	-EAAAAAAAA	80s	EDADADACAA
058009	70s	-EAAAAAAAA	80s	AAADAADAAA
058010	70s	-----eaaaa	80s	eE††--††††
058011	70s	------eAAA	80s	AAAAAAAAAA
058012	80s	------††††		
059001	50s	-------eEA	60s	AAABAAAAAA
	70s	AEAEEAAAAA	80s	DAAAAAAAAA
059002	60s	-------FFB	70s	AABBBBAAAA
	80s	AAAAAAAAAA		
060002	60s	-eAAAAAAE†	70s	BAAAAAAAEE
	80s	EAADAAADAA		
060003	60s	-----EAAAA	70s	AEEAAAAAAA
	80s	AAAAAADAAA		
060004	60s	-------††E	70s	EEAAAAAAAA
	80s	AA†---††††		
060005	60s	--------fe	70s	BADAAAAAAA
	80s	AAAAAAAAAA		
060006	60s	--------FB	70s	BBBABAAAAA
	80s	AAAAAAAAAA		
060007	60s	--------fA	70s	AAAAAAAAAA
	80s	AAAAAAAADA		
060008	80s	---faadaa		
060009	70s	FCCCCFF†††	80s	††††††††††
060010	50s	--------eB	60s	AAAAAAAAAA
	70s	AAAAAaaae-	80s	eaaaaaaeAA
060012	70s	fAABBBAEEA	80s	EE†---††††
060013	70s	-EBCCCF†††	80s	††----††††
061001	60s	-----eAEAE	70s	EAAE††††††
	80s	††††††††††		
061002	60s	eABAAAABBA	70s	AAEADAAAAA
	80s	AAAAAFAEDA		
061003	60s	---------e	70s	AEAAAAAAAA
	80s	AAAAAAAEEA		
061004	60s	-----eAEAE	70s	EAaaaaaaee
	80s	eaaacfAE†A		
062001	50s	---------E	60s	AAAAAAAAAA
	70s	EAAAAAAAAA	80s	AAAAAAAAAA
062002	70s	-eeaAAAEAE	80s	EE†---††††

Stn. number	Gauged daily flows, monthly peaks and rainfall			
063001	60s	---eAAAAAA	70s	AAAAAAAAAA
	80s	EAAAAAAAAD		
063002	60s	-----eAEAA	70s	AAAAAAAAEE
	80s	AAAAD†		
063003	70s	eeaeAAEAAE	80s	††----††††
063004	80s	------††††		
063005	80s	----eddadE		
063006	80s	----eddddE		
064001	60s	--EAAAAEAA	70s	AE††E†††††
	80s	†DAAAAAAAA		
064002	60s	-----†AEEA	70s	EEDDDDDAAA
	80s	AAAAAAAAAA		
064006	60s	fccccccccc	70s	cBABAAAAAA
	80s	AAAAAAAAAA		
064007	80s	---eddadeE		
064008	80s	---dadddeE		
065001	60s	-eAABAABAE	70s	EEEEAAAAAD
	80s	AAAAAAAAAA		
065002	60s	-------eee	70s	eEEEE†EE††
065004	70s	eEEEAAAAAA	80s	AAAAAAAAAA
065005	70s	--†AAAAAAA	80s	AAAAAAAAAA
065006	70s	------eAAA	80s	AAAAAAAAAE
065007	70s	----†EAAAA	80s	AAAAAAAAAA
066001	50s	---------e	60s	AAAAAAAAAA
	70s	AAAAAAACCF	80s	C††††††††A
066002	60s	-eABAAAAAC	70s	BAAAE†††††
	80s	------††††		
066003	60s	---eAE†EA†	70s	††††EEEEEE
	80s	AAD†††aaaa		
066004	70s	aAAAAAA†††	80s	†††---††††
066005	70s	-EAEAAA†††	80s	††----††††
066006	70s	---EAAAAAA	80s	AAAAAAAAAA
066008	70s	-------aaa	80s	bbaaadAAAE
066011	60s	----eEEEEA	70s	AAEAAAAAAA
	80s	AAAAAAAAAA		
067001	50s	-------eAA	60s	AAAAAAAAAA
	70s	ABAAAAAAAA	80s	AAACCCaaaa
067002	30s	-------eAA	40s	AAAAAAAAAA
	50s	AAAAAAAAAA	60s	AAAAAAAAAA
	70s	A†††††-†††		
067003	20s	--eAAAAAAA	30s	AAAAAAAAAA
	40s	AAAAAAAAAA	50s	AAAAAAAAAA
	60s	AAABBAAAAA	70s	AABAABCAAA
	80s	AAA†FAAAAA		
067005	50s	---†††EAAA	60s	AAAAAAAAAA
	70s	AAAAAAA†††	80s	†††---††††
067006	60s	eAAAAAAAAA	70s	BAAAAAAAAA
	80s	AAAAAAAAAA		
067008	60s	-----EBAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
067009	60s	-----EE†EB	70s	BBBBEBEBAB
	80s	B†DDDDdedD		
067010	60s	------EAAA	70s	AAAAAA††††
	80s	††----††††		
067011	60s	-------ccc	70s	ccffccccff
	80s	ff		
067012	60s	-------EE†	70s	††††††-†††
067013	60s	-------EDE	70s	AAAAAaa†††
	80s	------††††		
067015	30s	-------eAA	40s	AAAAAAAAAA
	50s	AAAAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
067016	60s	-------EAE	70s	††††E†††††
	80s	††-------†		
067017	60s	--------†B	70s	AAAAAAAAAA
	80s	AAAAAAaaaa		
067018	60s	--------†E	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
067025	70s	------aaaa	80s	aAAAE†††††
067026	70s	----cccccc	80s	cCCCCCc
067028	70s	--------ea	80s	ee
067029	70s	-------eaa	80s	eeddfdd
068001	30s	-------eAB	40s	AABCBBABBB
	50s	BAAAAAAAAA	60s	AAAAAAAEAE
	70s	AAAAAEAAA†	80s	EAAAAAAAAA
068002	40s	---------e	50s	AAAAAAAAAA
	60s	AAAAAAAEAA	70s	AAAAAAE†††
	80s	††----††††		
068003	40s	---------e	50s	AAAAAAAAAA
	60s	AAAAAAAEAA	70s	AAAAAE††††
	80s	†DAAAAAAAA		
068004	50s	-------eAA	60s	AAAAADADAA
	70s	AAAAAEAA††	80s	†AAAAAAAEE
068005	50s	---eAAAAAA	60s	AAAABAAEAA
	70s	AAAAAEEEAA	80s	AAAAAAAEAA
068006	50s	---eAAAAAA	60s	AAAAAAAEEA
	70s	AAAAAEE†††	80s	†EEAA†††††
068007	60s	--eBAAAAAA	70s	AAAAAEAAEA
	80s	AAEEAAAAAA		
068010	70s	---†††††††	80s	††----††††
068015	80s	-aaaaaAAAA		
068018	70s	-------†		
068020	80s	-AAAAAAADA		
069001	30s	----ebabBB	40s	BBBBBBBBBB
	50s	AAAAAAAABA	60s	BAAAAAABEA
	70s	AAABABAAA†	80s	†AAAacaaaa
069002	40s	---------e	50s	AAAAAAAAAA
	60s	AAAAAAAEAA	70s	AAEEA†AAAA
	80s	AAAAAAAAAA		
069003	30s	-------eE†	40s	†††††††††E
	50s	AAAAAAAAAA	60s	AAAAAAAEAA
	70s	AAAEE†AEAE	80s	AAAAAAAAAA
069004	40s	-----fBBBB	50s	BBBBBBBBAA
	60s	AAAAAAAAE†	70s	BBCCCCCCCC
	80s	CC††		
069005	50s	----eAEAAA	60s	AAAAAAAEAA
	70s	AAAEAAEEEA	80s	EAAE††
069006	50s	-----eAAAA	60s	AAAAAAAAAA
	70s	DAAEAEAAAA	80s	AAAAAAAAAA
069007	70s	-†††††††††	80s	†AAAAAAAEA
069008	80s	††††eaE†††		
069011	80s	††††--††††		
069012	80s	-----eAAAA		

Stn. number	Gauged daily flows, monthly peaks and rainfall			
069013	80s	--e-eeAAA†		
069015	70s	-------AEE	80s	AAAAAAAAAA
069017	70s	-------AA†	80s	†AAAAAAAAA
069018	60s	---------†	70s	††††††-††
	80s	††----††††		
069019	60s	---------e	70s	eaaaaaccbb
	80s	bae---††††		
069020	70s	------AAAA	80s	AAAAAAAAAA
069023	70s	--------EA	80s	†AAAAAaaaa
069024	80s	†AAAAAaaaa		
069027	70s	--------D†	80s	†AAAAAAAAA
069030	70s	------e†DA	80s	AAAAAAaaaa
069031	80s	-aaeeeAAA†		
069032	70s	---------A	80s	AAAAAAea-a
069034	80s	----a-††††		
069035	70s	-------AEA	80s	†AAADAa
069037	80s	-----†CCFC		
069040	80s	---aaaaaaa		
069042	80s	---------†		
070002	80s	BAABAAAAAE		
070003	70s	-------a--	80s	---aaaeaeb
070004	70s	------AAAA	80s	AAAAAAAAAA
070005	70s	--------e-	80s	-aaaaeaaaa
071001	60s	fCCCbAAAAA	70s	BCBBBAAAAA
	80s	AAAAAAAAAA		
071003	50s	-------eAA	60s	AAAAAAAAAA
	70s	AAAaE†-†††	80s	------††††
071004	60s	---eBAAAAA	70s	AE††AEAAAB
	80s	AAAAAAAAAB		
071005	60s	eAAAAAAAAA	70s	AABbE†-†††
	80s	------††††		
071006	60s	--------FC	70s	CFCCAAFAAA
	80s	DAAAAAAAAE		
071007	80s	††††		
071008	70s	-------AE†	80s	†AAAAAAAAA
071009	80s	aaaaaaAAAE		
071010	70s	-fccccfAA†	80s	†AAAAAA†AB
071011	60s	------FFFC	70s	CCFF†††EAE
	80s	EAAAAAAAAB		
071013	80s	eaeae		
071014	70s	-------aaa	80s	-aaaaaefca
072001	50s	---------c	60s	cCCCCCCBCC
	70s	CAAAAAB†††	80s	------††††
072002	60s	---eAAAAAA	70s	AAABCCAAAE
	80s	AAAAAAAAAB		
072004	50s	---------C	60s	cCCCCCCCBB
	70s	CCCCCCC†††	80s	-aaAAAAAAA
072005	60s	---------F	70s	CCCCCCFAA†
	80s	†AAAAADAAA		
072006	60s	--------††	70s	†††††††††
	80s	††††--††††		
072007	80s	-----aAAAA		
072008	60s	-------ffE	70s	EABCCCAAAA
	80s	AAAAAAEEAA		
072009	70s	†††††††††	80s	†AAAAAAAAA
072011	60s	--------fc	70s	f------EEA
	80s	†DAEEADAE†		
072015	80s	-----eDECE		
072016	80s	-aaaaaEAA		
073001	70s	fcccccf†--	80s	------††††
073002	60s	---EAAAADA	70s	BBBCAAAAAA
	80s	AAAAAAAAAA		
073003	80s	-aaaaEA††		
073005	60s	--------EB	70s	BBABAACAAA
	80s	AAAAAAAAAA		
073008	60s	---------E	70s	AAE†AAA†††
	80s	†AAAAAAAAA		
073009	70s	†††††††††	80s	†AAAAAAAAA
073010	30s	---------C	40s	CCCCCCCCCC
	50s	CCCCBCCCCC	60s	CCCCcCCCCC
	70s	CBBBCCCAAA	80s	AAAAAAAAAA
073011	70s	FCCCCC†A††	80s	†AAAAEEA††
073013	80s	††††††aa		
073014	80s	††††--††††		
074001	60s	--------EC	70s	CCBCCCBAAA
	80s	AAAAAAAAAA		
074002	60s	-------eBB	70s	AAAAABBADA
	80s	AAAAAAAAAA		
074003	70s	---eEADAAA	80s	AAAAAAAAAA
074005	70s	---†BAAAAA	80s	AAAAAAAAAA
074006	60s	----fCCFCC	70s	CCF†BBBAAA
	80s	AABAAAAAAA		
074007	70s	-----†AAAA	80s	AAAAAAAAAA
074008	70s	-------ea-	80s	-babaaaa
075001	30s	-††††EAE††	40s	†††††EAAAA
	50s	AAAAAAAAAA	60s	AAABAAAAEE
	70s	E††AAAEAAA	80s	AAAAAAAAAA
075002	60s	fcBCBBBBBA	70s	AAAAAAAAAA
	80s	AAAAAAEAAA		
075003	60s	--------eA	70s	BAABAABAAA
	80s	AAAAAAAAAA		
075004	60s	-------fBA	70s	BBABAACAAA
	80s	AAAAAAAAAA		
075005	70s	--AAABCAAA	80s	AAAAAAAAAB
075006	60s	--------eA	70s	AAAAAAAAAA
	80s	a-----††††		
075007	60s	---------e	70s	AAAAAAAAA†
	80s	------††††		
075009	70s	-eAAABBAAA	80s	ABAAAAAAAA
075016	70s	-------DDD	80s	AAABAAeaee
075017	80s	--aAAAAAAA		
076001	50s	--†EABAE††	60s	EAABAAAAAA
	70s	E†††††E†EA	80s	AEAAAAaaaa
076002	60s	----††EBBA	70s	AABABBCAAE
	80s	ABAAAAAAAA		
076003	60s	-eAAAAAEEA	70s	AAAAAAAAAA
	80s	ABBAAAaaaa		
076004	60s	--eAAAADAA	70s	AEAEAAA†AA
	80s	†AAAAAAAAA		
076005	60s	----eAABBB	70s	AAAABBBAAA
	80s	AAAAAAAAAA		

Stn. number	Gauged daily flows, monthly peaks and rainfall			
076007	60s	--------eAA	70s	AAAAAAAA††
	80s	†AAAAAAAAB		
076008	60s	-------eAA	70s	EAAAAEE†A†
	80s	†AAAAAAAAA		
076009	60s	---------eE	70s	BAAAAAE†††
	80s	.†BAAAAAAAA		
076010	60s	----------†	70s	EAAAAAE†††
	80s	†AAAAAAAA†		
076011	60s	--------eaa	70s	aaeeeeaaaa
	80s	aeeabdAADE		
076014	70s	-EAAAAAA††	80s	†AAAAAAAAE
076015	70s	EAABAABAAA	80s	AAAAADAAAA
077001	60s	---eDAEEAE	70s	EEEBAAAAA†
	80s	†AAAAAAAAA		
077002	60s	-†FCCBAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
077003	70s	---DAAAAAA	80s	AAAAAAAAAA
077004	70s	---------d	80s	aAAAAAAAAA
077005	70s	--------a--	80s	---eaaAAAE
078001	50s	---------eA	60s	AE†††-----
	70s	††††††----	80s	------††††
078002	60s	---eAE††††	70s	†††††††---
	80s	------††††		
078003	60s	-††††††DAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
078004	60s	-††EBEEAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
078005	70s	---------A	80s	AAAAAAAAAA
078006	80s	---eaaAAAA		
079001	60s	-††††EBBEF	70s	FFCCCFCCcc
	80s	cf		
079002	50s	--------eAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
079003	50s	----------e	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
079004	60s	-††FCBAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
079005	60s	-††EAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
079006	60s	-††††††EAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
080001	60s	-††EAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
080002	70s	--------dAA	80s	AAAAAAaaaa
080003	80s	daaaaaABAA		
080004	80s	--eaaa††AA		
080005	80s	---eaa††AA		
080006	80s	---aaa--Aa		
080007	80s	---------ea		
081001	60s	------eBBe-	70s	--------†††
081002	60s	-††EAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
081003	60s	-††††††AAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
081004	70s	--------dAA	80s	AAAAAAAAAA
081005	80s	------eaaaA		
081006	80s	-------eaaA		
082001	60s	-††EAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAD		
082002	70s	---†EAAAAA	80s	AAAAAAaaaa
082003	70s	---AAAEEAA	80s	AAAAAAAAAD
083001	60s	----††††--	70s	-fFFFFFfff
	80s	ff		
083002	60s	---eAAAAaa	70s	AAAAAAAe--
	80s	--------†††		
083003	60s	-†††††††††	70s	EAAAAAAAAA
	80s	AAAAAAAAAA		
083004	70s	-†EAAAAAAA	80s	AAAAAAAAAD
083005	70s	--EAAAAAAA	80s	AAAAADAAAA
083006	70s	-------edab	80s	aaaaaaAAAA

Stn. number	Gauged daily flows, monthly peaks and rainfall			
083007	70s	--------eaa	80s	aaaaaaAAAA
083008	80s	eaaaaaaeeB		
083009	70s	---------aa	80s	aaaaaaAABA
083010	70s	--------eae	80s	aaaaaaAAAA
084001	40s	---------eE	50s	EEEBBBBEEB
	60s	AAAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAB		
084002	50s	--eA†EAEEE	60s	AAEEAEEEFC
	70s	AAEEEEE†††	80s	††††††††††
084003	50s	-------eBDA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
084004	50s	--------eAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAD
084005	50s	---------eA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
084006	60s	-††EAAAAAA	70s	AAAAAAAEAA
	80s	AAAE††††††		
084007	60s	------eEAAA	70s	AAAAAAABBA
	80s	AAAAAAbaab		
084008	60s	-------eAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
084009	60s	-------eAAA	70s	AAAAAAAAAA
	80s	AAAE†E†EAA		
084011	60s	---eAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAB		
084012	60s	-††EAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAB		
084013	60s	---eAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
084014	60s	----eAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAE		
084015	60s	e††††EAAAA	70s	AAAAAAAEAA
	80s	AAAAAAAAAA		
084016	60s	-†††††EEDA	70s	AAAAABBAAA
	80s	AAAAAAAAAA		
084017	60s	--------EAA	70s	AAAAAAAAAA
	80s	AAAAAAaaaa		
084018	60s	----------A	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
084019	60s	---AAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAaaaa		
084020	60s	---------eE	70s	ADAAADAEAE
	80s	AAAAAAAAAA		
084021	60s	----------E	70s	AAEFF†††††
084022	60s	-------eEEE	70s	EEEAAEAAEA
	80s	AAAAAABAAD		
084023	70s	---EAAAAEA	80s	AAAAAAAAAA
084024	70s	--eAAAAAAE	80s	AAEAAAaaba
084025	70s	---††AAAAE	80s	AAAAAAAAAA
084026	70s	----eaabae	80s	aaaaaaAAAA
084027	60s	---------ea	70s	eaaEAEEDE†
	80s	------eeeac		
084028	70s	------eeeae	80s	abaaaaeeaa .
084029	70s	------eaaaa	80s	aaaaaaAAAE
084030	80s	-eaaaaaaad		
085001	60s	---eAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA		
085002	60s	-††EAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAEAAAA		
085003	60s	-†††††††††	70s	EAAAAEAAEE
	80s	AAAAAAAAAD		
085004	70s	-------aaaa	80s	aaae-eAAAA
086001	60s	---------eA	70s	AAAAAABBBB
	80s	AAAAABaead		
086002	60s	-†††††††EE	70s	AAAAABBAAA
	80s	AAAAAAAAAE		
089008	80s	-eeaaeeaeb		
089009	80s	-eeaaeeaaa		
090003	80s	--eaaaAAAA		
091002	80s	eAAAAAaaaa		

Stn. number	Gauged daily flows, monthly peaks and rainfall			
093001	70s	---------A	80s	AAAAAAAAAA
094001	60s	-†††††††††	70s	EAAAAAAAaa
	80s	AAAAAAAAAA		
095001	70s	-------eAA	80s	AAAAAAAAAA
095002	80s	-----eaaaa		
096001	70s	------AAAA	80s	AAAAAAAAAA
096002	70s	-------eAA	80s	AAAAAAAAAA
096003	80s	-----eaaaa		
096004	80s	--------eae		
097001	50s	-------†--	60s	----††††--
	70s	-††††††---	80s	††-†††
097002	60s	-†††††††††	70s	††AAAAAAAA
	80s	AAAAAAAAAA		
101001	60s	-fcfFFcfFF	70s	FcCCfcC†††
	80s	†††††††††		
101002	60s	------eeeef	70s	eeebbeeEEE
	80s	EBEABAAAAA		
101003	80s	†--eddDBEA		
101004	80s	--eaaaAAAA		
101005	80s	--eaaaAAAA		
101006	80s	------††FA		
101007	80s	--eaadAADA		
201002	70s	-eaaaaaeaa	80s	aaaAAAaaaa
201005	70s	-†EAAAAAAA	80s	AAAAAAAAAA
201006	70s	--eaaaaAAA	80s	AAAAAAaaaa
201007	70s	†††††EAEAA	80s	AAAAAAAAAA
201008	70s	------aaaa	80s	aaaAAAAAAA
201009	80s	eaaaaaaaaa		
201010	80s	--eaaaaaaa		
202001	80s	---aeeaAAA		
202002	70s	-----eaea	80s	aaaaaaaaaa
203010	60s	-†††††††††	70s	EAAAAAAAAA
	80s	AAAAAAAAAA		
203011	70s	eaaaaaaaaa	80s	e--†††
203012	70s	eaaaaaaaaa	80s	aaaAAAAAAA
203013	70s	eaaaaaaaaa	80s	aaaaaaaaaa
203017	70s	eAAAAAAAAA	80s	AAAAaAAAAA
203018	70s	eaaaaaaAAA	80s	AAAAAAaaaa
203019	70s	--eaaaaaae	80s	aaaaaaaaaa
203020	70s	-eaaaaaaaa	80s	aaaAAAAAAA
203021	70s	-eaaaaaaaa	80s	aaaAAAaaaa
203023	70s	--aaaaaaae	80s	eeeaaeeaaa
203024	70s	-eaaaaaaaa	80s	eaaaaaaaaa
203025	70s	-eaaaaaaaa	80s	aaaAAAaaaa
203026	70s	-eaeeaaaaa	80s	aaaaaaaaaa
203027	70s	-†EAAAAAAA	80s	AAAAAAaaea
203028	70s	-†EAAAAAAA	80s	AAAAAAAAAA
203029	70s	---eaaaaaa	80s	aaaaaaaaaa
203033	70s	-----eaaaa	80s	aAaAAEaaae
203040	80s	eaeaaaaaaa		
203042	80s	-eaaaaaaaa		
203092	80s	---eaaaaaa		
203093	80s	----aaaaaa		
204001	70s	--eaaaaaaa	80s	aaaAAAaaaa
205003	70s	-cbaaaaaaa	80s	aaaaa
205004	70s	--aaaaaaaa	80s	aaaAAAaaaa
205005	70s	--EAAAAAAA	80s	AAAAAAAAAA
205006	70s	--eaaaaaaa	80s	a
205008	70s	----eaaaaa	80s	aaaAAAaaea
205010	70s	----eaeaaa	80s	aaaaaaeaaa
205020	80s	----eaaaea	90s	e
206001	70s	------aaaa	80s	a
206002	70s	--aaaaaaaa	80s	aaaaaaaaaa
236005	70s	-----eae--	80s	-eeaaaeaaa
236007	80s	-eaaaaaaaa		

Summary of Archived Data - 2

Naturalised daily and monthly flows

KEY:

Complete daily and complete monthly	A
Partial daily and complete monthly	B
Partial daily and partial monthly	C
Partial daily and no monthly	D
No daily and complete monthly	E
No daily and partial monthly	F
No naturalised flow data	-

Summary is presented in decade blocks

Stn. number	Naturalised daily and monthly flows			
006007	70s	---EEEEEEF		
007003	60s	-----FEEEE	70s	EEEEEEEEEE
	80s	F		
008001	30s	--------FE	40s	FFEEEEEEEE
	50s	EEEEEEEEEE	60s	FEEEEF
008005	70s	-F-E		
012002	70s	--FF------	80s	F
012004	70s	-------EEE	80s	E
013007	70s	------EEEE	80s	EEEEEE

Stn. number	Naturalised daily and monthly flows			
014001	70s	------F--E		
014002	70s	------E--E		
015003	70s	---EEEEEEE	80s	EEEEEE
015006	60s	--------FEE	70s	F--EEEEEEE
	80s	EEEEEE		
015007	70s	---EEEEEEE	80s	EEEEEE
015008	70s	---EEEEEEE	80s	EEEEEE
015010	70s	---EEEEEEE	80s	EEEEEE
015011	70s	---EEEEEEE	80s	EEEEEE
015012	70s	---EEEEEEE	80s	EEEEEE
015013	70s	---EEEEEEE	80s	EEEEEE
015016	70s	----EEEEEE	80s	EEEEEE
015017	70s	---------F		

Stn. number	Naturalised daily and monthly flows			
015024	80s	--EEEE		
016001	60s	---FEEEEEE	70s	EEEEEEEEEE
	80s	EEEEEE		
016004	70s	-----EEEEE	80s	E
017001	60s	---------F	70s	EF----E
017002	60s	---------F	70s	EF----E
017003	70s	------E		
017004	70s	------E		
017005	70s	------E		
018001	70s	------E		
018002	60s	-----FEEEE	70s	F-----E

Stn. number	Naturalised daily and monthly flows			
018003	60s	----FEEEEE	70s	EF----E
018005	70s	------E		
018008	70s	------E		
019001	50s	-------EEE	60s	EEEEEEEEEE
	70s	EEEEEEE		
019002	60s	--EEEEEEEE	70s	EEE-EEE
019003	60s	-FEEEEEEEE	70s	EEEEEEE
019004	60s	EEEEEEEEEE	70s	EEE-EEE
019005	60s	--FEEEEEEE	70s	EFEEEEE
019006	60s	---EEEEEEE	70s	EEEEEEE
019007	60s	--FEEEEEEE	70s	EEEEEEE
019008	60s	----FEEEEE	70s	EEEEEEE
019010	60s	---------E	70s	EEEEEEE
019011	70s	------E		
020001	60s	-EEEEEEEEE	70s	EEEEEEE
020002	60s	--------EE	70s	EEEEEEE
020003	60s	-----EEEEE	70s	EEEEEEE
020004	60s	-------EEE	70s	EEEEEEE
020005	70s	------E		
020006	70s	------E		
020007	70s	------E		
021001	50s	---------F	60s	EEEEFFEEF
021002	50s	---------F	60s	EEEEEEEEF
021003	50s	---------F	60s	EEEEEEEEEE
	70s	EEEEEEEEEE	80s	EF----EEEE
021004	60s	-----FEEF		
021005	60s	-FEEEEEEEE	70s	EEEFEEEEEE
	80s	EF----EEEE		
021006	60s	-FEEEEEEEE	70s	EEEEEEEEEE
	80s	F-----EEEE		
021007	80s	------EEEE		
021009	60s	--FEEEEEEE	70s	EEEFEEEEEE
	80s	F-----EEEE		
021010	60s	---FEEEEEE	70s	EF-FF-EE--
	80s	E		
021011	80s	------EEEE		
021014	60s	-FEEEEEEEE	70s	EEEEEEEEEE
	80s	F-----EEEE		
021018	60s	--------FE	70s	EEEFEEEFFE
	80s	F-----EEEE		
021019	60s	--------FE	70s	EEEEEEEEEE
	80s	F-----EEEE		
021020	80s	------EEEE		
021021	60s	---------F	70s	EEEEEEEFEE
	80s	F-----EEEE		
021022	60s	---------F	70s	EEEEEEEEEE
	80s	F-----EEEE		
021025	70s	--FEEEEEFE	80s	F-----EEEE
021030	80s	------EEEE		
021034	80s	------EEEE		
023001	50s	------FEEE	60s	EEEEFBACAA
	70s	CC		
023002	60s	-----CAAAA	70s	AC
023003	50s	---------F	60s	EEEEEBAAAA
	70s	AAAC		
023007	60s	-----CAAAA	70s	BCAC
023008	70s	--CC		
023015	40s	--FFFFFFF	50s	FEFEFFEEEF
024001	60s	--------CA	70s	AC
024003	50s	--------FE	60s	EEEEEBACAA
	70s	AC-CC		
025001	50s	------FEEE	60s	EEEEEBAAAA
	70s	AC--CAAAC		
025002	70s	FFFF		
025004	50s	-------FEE	60s	EEEEEBAACC
	70s	C		
025008	60s	------CAAB	70s	BBEF
026002	60s	-----FFEEF	70s	FFFF
027001	30s	-------FF-	40s	-FEEEF----
	50s	---FEEEEEF	60s	EEEEEEEF-F
	70s	E		
027002	50s	-----FEEEE	60s	EEEEEEEEEE
	70s	E		
027003	60s	--FEEEEEEE	70s	EF
027004	60s	FEEEEEEEF		
027006	60s	-----FEEEE	70s	EF
027007	50s	--------FE	60s	EEEEEEEEEE
	70s	EF		
027009	60s	---------F	70s	EF
027012	50s	----FEEEEE	60s	EEEEEEEEEE
	70s	EF		
027013	50s	----FEEEEE	60s	EEEEEEEEFE
	70s	EF		
027015	60s	-----CAAC		
027018	50s	------FEEE	60s	EEEEEEEEEE
	70s	EEEF		
027019	50s	------FEEE	60s	EEFEEEEEFF
	70s	-FEF		
027021	60s	FFFEEEFEEE	70s	EF
027022	60s	----FEEEEE	70s	FF
027023	60s	----FEEEEE	70s	EF
027024	60s	-FEEEF		
027025	60s	-FEEEEEEEE	70s	EF
027026	60s	---FEEEEEF		
027027	60s	-FEEFFEEFE	70s	EEEF
027028	60s	-EEEEEEEEE	70s	EF
027029	60s	-FEEEEFEEF		
027030	60s	----FEEEEE	70s	EF
027031	60s	----EEEEFE	70s	EF
027032	60s	------FFEF		
028001	30s	-------FEE	40s	F--------F
	50s	EEEEEEEEEE	60s	EEEEEBAAAA
	70s	AAAAACAA		
028002	40s	-----FEEEE	50s	EEEEEEEEEE
	60s	EEEEEBAACC	70s	CC--CC
030003	60s	-----FF		

Stn. number	Naturalised daily and monthly flows			
031001	40s	FEFFEF----	50s	---FEEEEEF
	60s	EEFEEBAACA	70s	ABFEEFFFFE
	80s	CF		
031006	70s	FEEEF		
031007	60s	--------FF	70s	FF--FF
031010	70s	-FEEEF		
031012	70s	---FFF		
031016	70s	-FEEEF		
031021	70s	-FFFFF		
032001	40s	FEEEEEEEEE	50s	EEEEEEEEEE
	60s	EEEEEEEEEE	70s	FEEEF
032002	30s	--------FF	40s	EEEEEEEEEE
	50s	EEEEEF----	60s	-FEEEEEEEE
	70s	EEEEEF		
032003	70s	FEEEEF		
032004	40s	---FEEEEEE	50s	EEEEEEEEEE
	60s	EEEEFFEEEF	70s	FEEEEF
032006	30s	---------F	40s	EEEEEEEEEE
	50s	EEEEEEEEEE	60s	EEEEEEEEEF
032007	30s	---------F	40s	EEEEEEEEEE
	50s	EEEEEEEEEE	60s	EEEEEEEEEF
032008	40s	-----FFEEE	50s	EEEEEEEEEE
	60s	EEEEEFFEEE	70s	EEEEEF
033001	50s	-FEEEEEF		
033002	60s	--FEEBAAAA	70s	AAAAAAA
033003	50s	FF-FEEEF		
033004	40s	-----FFFEE	50s	EEEEFEEF
033005	50s	--FEEEEEEE	60s	EEEEEEBBAA
	70s	AC		
033006	50s	------FEEE	60s	EEEEF
033007	50s	---FEEEEEE	60s	EEEFEECCCF
	70s	EF		
033011	60s	-FEEF		
033026	70s	-CAAAAC		
033035	50s	--------CA	60s	AAAABAAAAA
	70s	AAAAAC		
036001	30s	--CAAAAAAA	40s	AAAAAAAAAA
	50s	AAAAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAC		
036002	60s	CAAAAAAAAA	70s	AAAAAC
036003	60s	-CAAAAAAAA	70s	AAAAAAC
036004	60s	-----CAAAA	70s	AAAAAAC
036005	60s	--CAAAAAAA	70s	AAAAAAC
036006	60s	--CAAAAAAA	70s	AAAAAAC
036007	60s	-----CAAAA	70s	AAAAAAC
036008	60s	CAAAAAAAAA	70s	AAAAAAC
036009	60s	--------CC	70s	AAAAAAC
036010	60s	--------CA	70s	AAAAAAC
036011	60s	--------CA	70s	AAAAAAC
036012	60s	--------CA	70s	AAAAAAC
036015	70s	--CAAAC		
037001	50s	CAAAAAAAAA	60s	AAAAAAAAC-
	70s	-CAAC		
037002	30s	--CAAAAAAA	40s	ACCAAAAAAA
	50s	AAAAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAC		
037003	30s	--CAAAAAAA	40s	AAAAAAAAAA
	50s	AAAAAAAAAA	60s	AC--CAAAAA
	70s	AAAAAAC		
037005	50s	---------C	60s	AAAAAAAAAA
	70s	AAAAAAC		
037006	60s	--CAAAAAAA	70s	AAAAAAC
037007	60s	----CAAAAA	70s	AAAAAAC
037008	60s	-----CAAAA	70s	AAAAAAC
037009	60s	--CAAAAAAA	70s	AAAAAAC
037010	60s	--CAAAAAAA	70s	AAACCAC
037011	60s	---CAAAAAA	70s	AAAAACC
037012	60s	---CAAAAAA	70s	AAAAAAC
037013	60s	---CAAAAAA	70s	AAAAAAC
037014	60s	---CAAAAAA	70s	AAAAAC
037016	60s	-----CAAAA	70s	AAAACAC
037017	60s	---------C	70s	AAAACAC
037018	70s	CAAAC		
037019	60s	-----CAAAC	70s	AAAAC
037020	70s	CAAAAAC		
037021	70s	CAAAAAC		
037022	70s	CAAAAAC		
037024	70s	-CAAAAC		
038001	80s	---DAAAAAA	90s	AAAAAAAAAA
	00s	AAAAAAAAAA	10s	AAAAAAAAAA
	20s	AAAAAAAAAA	30s	AAAAAAAAAA
	40s	AAAAAAAAAA	50s	AAAAAAAAAA
	60s	AAAAAAAAAA	70s	AAAAAAC-CA
	80s	AAAAAAAAAA	90s	C
039001	80s	---AAAAAAA	90s	AAAAAAAAAA
	00s	AAAAAAAAAA	10s	AAAAAAAAAA
	20s	AAAAAAAAAA	30s	AAAAAAAAAA
	40s	AAAAAAAAAA	50s	AAAAAAAAAA
	60s	AAAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAAA	90s	C
039002	30s	--------CA	40s	AAAAAAAAAA
	50s	AAAAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	D		
039008	50s	-CAAAAAAAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAAA
	90s	D		
040001	50s	---FEEEEF-	60s	-FEEFEEF
040002	50s	------FFEF	60s	FFFFFFFEF
040003	50s	------FEEE	60s	EEEEEEFF
040004	60s	--FEEEEF		
040005	60s	----FEE		
040006	60s	-----FEF		
040007	60s	FEEEEEFF		
040008	60s	-----FEE		
040009	60s	-----FEE		
040010	60s	-----FEE		
040011	60s	-----FEEF		
043005	60s	-----FEEEF	70s	EF
045003	60s	--FEEEEEF		

Stn. number	Naturalised daily and monthly flows			
045004	60s	--------CA	70s	C
045005	60s	---FEEEFCA	70s	C
046002	60s	FEEEEEEEF		
046003	60s	--------CA	70s	C
046006	70s	----AAAAAA	80s	AAAAAAA
047004	60s	----FBCEFF		
047005	60s	-------C		
047015	50s	-------AAA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAA
048001	60s	----FBACCC		
048002	60s	----FF---C		
048006	60s	--------CC		
048007	60s	--------CC		
049003	60s	-------CCC		
050001	50s	--------DA	60s	AAAAAAAAAA
	70s	AAAAAAAAAA	80s	AAAAAAAAD
050002	60s	--FEEBBEBA	70s	C
050006	60s	-----DAAAA	70s	AAAAAAAAAA
	80s	AAAAAAAAD		
051002	70s	---FEEEF		
052002	50s	------FEEE	60s	EEEEEBEEF
052005	60s	-FEEEBEEEE	70s	EEEEEEEF
052006	60s	---FEEEEEE	70s	EEEEEEEF
052008	60s	FEEEEBEEF		
052014	60s	-------FEE	70s	FEEEFFFF
053004	50s	--------FE	60s	EEEEEEEEFF
	70s	FEEEEEEAAA	80s	A
054001	20s	-CAAAAAAAA	30s	AAAAAAAAAA
	40s	AAAAAAAAAA	50s	AAAAAAAAAA
	60s	AAAAAAAAAA	70s	AAAAAAAAAA
	80s	AAAAA		
054005	50s	------FEEE	60s	EEEEEEBAAC
	70s	------AA		
054010	60s	-------CC		
054013	60s	------CACA	70s	C-----AA
054014	60s	-------CAA	70s	C-----AA
054017	60s	-------CC		
055002	30s	-------FEE	40s	EEEEEEEEEE
	50s	EEEEEEEEEE	60s	EEEFFEEEEE
	70s	AAAAAAAAAA	80s	AAD
055006	30s	-----FEEEE	40s	EEEEEEEEEE
	50s	EEEEEEEEEE	60s	EEEEEEEEEE
	70s	EEEEEEEF		
055007	30s	--------FE	40s	EEEEEEEEEE
	50s	EEEEEEEEEE	60s	EEEFFEEEFE
	70s	AAAAAAAAAA	80s	ADA
055023	60s	---------F	70s	AAAAAAAAAA
	80s	AAA		
056001	50s	-------FEE	60s	EEEEEEEEEE
	70s	FEEEEEFF		
056002	50s	-------FEE	60s	EEEEEEEEEF
	70s	EEEEEF		
056003	60s	----FEF		
056004	60s	-----FEEEE	70s	EEEEEEF
056006	60s	---FEEEEEE	70s	FFEEEEF
056011	70s	FEEEEEFF		
056012	70s	-EEEEEF		
057001	50s	--FEEEEEEE	60s	EEEEEEEBC
057002	30s	-------FEE	40s	EEEEEFEEEE
	50s	EEEEEFFEF-	60s	-FEEEEBAAA
	70s	C		
057003	60s	-----CAAAC		
057004	50s	-------FEE	60s	EFFEEBAAAC
058001	60s	---FEF---C	70s	C
058003	60s	--FEEF		
059001	50s	--------FE	60s	EEEEEBACC
061002	60s	FEEEEBCC		
062001	50s	---------F	60s	EEEEEEEF
064001	60s	-----FF		
066002	60s	-FEEEEEEE-	70s	FFE
066003	60s	---FEF-FE		
066011	60s	--------CA	70s	AC
067001	50s	-------FEE	60s	EEEEEEEEEA
	70s	AAAAAAAAAA	80s	AAAAAAA
067002	50s	---FEEEEEE	60s	EEEEEEFFEF
067003	60s	--------FE	70s	EEEE
067006	60s	FEEEEEEEEF		
067015	60s	---------A	70s	AAAAAAAAAA
	80s	AAAAAAA--F		
067017	60s	---------E	70s	EE
067026	70s	----AAAAAA	80s	AAAAAAA
068001	60s	-FEEEEEFEF	70s	----E
068003	40s	---------F	50s	EEEEEEEEEE
	60s	EEEEF-----	70s	---FE
068004	60s	-FEEEEEEEF	70s	---FE
068005	60s	-FEEEEEFEF	70s	---FE
068006	60s	-FEEFFEFFF	70s	----E
069004	40s	-----FEEEE	50s	EEEEEEEEEE
	60s	EEEEEEEF		
071001	60s	-----CC		
072001	60s	--FEEEEEEE	70s	FFEF
072004	80s	---------F		
073010	80s	---------F		
075001	60s	----FEF		

Stn. number	Naturalised daily and monthly flows			
075002	60s	-FEEEEF		
076001	50s	---FEEEF--	60s	FEEEEEEEEE
	70s	F		
076003	60s	-FEEEEF		
076004	60s	--FEEF		
076007	80s	---------F		
077002	60s	-------FEE	70s	EF
078004	70s	-F		
079002	50s	---------F	60s	EEEFFEEEEE
	70s	EF		
079003	50s	---------F	60s	EEEEEEEEEE
	70s	EEF		
079006	60s	-------FEE	70s	EF
081003	60s	--------FE	70s	FF
082001	60s	---FEEEEEE	70s	EF
084001	70s	FEEEF		
084002	60s	--------FE	70s	EEFFF
084003	60s	-----FEEEE	70s	EEEEF
084004	50s	-------FEE	60s	EEEEEEEEEE
	70s	FFEEF		
084005	50s	--------FE	60s	EEEEEEEEEE
	70s	EEEEEF		
084006	70s	FEEEF		
084007	60s	-------FEE	70s	FEEEF
084008	60s	-------FEE	70s	FEEEF
084009	60s	-------FFF	70s	EEEEF
084011	60s	----FEEEEE	70s	EEEEF
084012	60s	---FEEEEEE	70s	EEEEF
084013	60s	-------FEE	70s	EEEEF
084014	60s	----FEEEEE	70s	EEEEF
084015	70s	FEEEF		
084016	70s	FEEEF		
084017	60s	-------FEE	70s	EEEEF
084018	60s	---------F	70s	EEEEF
084019	60s	--------FE	70s	EEFFF
084020	70s	FEEEF		
084021	70s	FEF		
084022	70s	---FF		
084023	70s	---FF		
084024	70s	---FF		
084027	70s	---FF		
085001	60s	---FEEEEEE	70s	EEEEF
085002	60s	-------FEE	70s	EEEEF
085003	70s	FEEEF		
086001	70s	FEEEF		
086002	70s	FEEEF		
097002	70s	--EEEEEF		

Produced 17th September 1990. New summaries available on request.

GROUNDWATER LEVEL DATA

Background

Groundwater may be obtained from almost any stratum in the sedimentary succession in the British Isles, as well as from igneous and metamorphic rocks. In many, such as clays and shales, volcanics and metamorphics, the permeable zone may well be limited to the depth to which weathering may reach, this is unlikely to be more than some 50 metres beneath the ground surface. In those strata which are not generally recognised to be aquifers, well-yields tend to be small (of the order of only a few cubic metres per day), uncertain as a continuous source (tending to fail in prolonged droughts), with an indifferent groundwater quality, and with the sources vulnerable to pollution.

The more generally recognised aquifers are listed in Table 13, with the Chalk and Upper Greensand, the Lincolnshire Limestone and the Permo-Triassic sandstones as the most important from the viewpoint of public supply. From such aquifers as these, yields of 3000 to 4500 cubic metres a day are not unusual. For the next category, including the Lower Greensand and the Magnesian Limestone, yields to individual wells of 1500 to 3000 cubic metres a day can generally be expected. In the other aquifers, whilst occasional sources sufficient for large supplies may be developed, they tend to be important only locally. The outcrop areas of the major aquifers are shown in Figure 17; throughout Wales, Scotland and Northern Ireland, aquifers are less extensively developed and tend to be only of relatively local importance.

The groundwater resources of an aquifer are naturally replenished from rainfall. During the summer months, when the potential evapotranspiration is high and soil moisture deficits are appreciable, little infiltration takes place. There is a notable exception to this rule in the Eden valley of Cumbria where, enclosed between the massifs of Cross Fell and the Lake District, sufficiently heavy and continuous summer rainfall occurs to maintain infiltration through part at least of most summers. The normal recharge of an aquifer takes place during the winter months when the potential evapotranspiration is low and soil moisture deficits are negligible.

There are few artificial reservoirs in the United Kingdom which are sufficiently large to support demands through the driest summers, assuming that they were full at the start of the summer, without some continuous contributions from river intakes. Prolonged dry spells lead in many rivers to reduced flow, particularly where the natural groundwater contribution (baseflow) is limited. Consequently, while surface water droughts may be in part due to the failure of runoff from winter rainfall to fill the reservoirs, they are more frequently caused by a decrease in the summer flows of streams and rivers. Surface water droughts do, however, lead to increased consumption of groundwater (where available). By way of contrast, a groundwater drought is caused by a lack of winter rainfall. Potentially, the most serious droughts occur when, as in 1975/76, and to a lesser degree in 1988/89, a dry summer succeeds a notably dry winter.

The Observation Borehole Network

Groundwater level observation wells (in this context, a well includes both shafts - constructed by hand digging - and boreholes - constructed by machinery) are generally used for one of two purposes: to monitor levels regionally and thus to estimate groundwater resource fluctuations, or to monitor the effects locally of groundwater abstractions. The number of observation wells required in different areas varies widely. Over the last two decades, a target density was sought of one well to 25 to 35 km^2. During the last few years, it has become apparent in some districts that satisfactory information can be obtained with fewer wells, while in others the densities had to be substantially increased.

The observation well network was reviewed in 1981 by the British Geological Survey (then the Institute of Geological Sciences) with the aim of selecting 200 to 300 sites from the existing Water Data Unit archive, to be used for periodical assessments of the national groundwater situation. The selection was based upon the hydrogeological units identified in an investigation of the groundwater resources of the United Kingdom[1]; one site was chosen for each aquifer present within each unit. For Scotland and for Northern Ireland this was not possible due to the very limited number of observation wells available. In England and Wales, the total number finally selected was 175[2].

Details of the wells in this national network are given in the Register of Selected Groundwater Observation Wells (see page 178).

Measurement and Recording of Groundwater Levels

The majority of observation wells are measured manually either weekly or monthly. The usual instrument is an electric probe suspended upon a graduated cable or tape, contact being made by the water to complete a circuit which gives either an audible or visual signal at the surface. Measurements are normally made to the nearest 10 millimetres, although instruments may be accurate to 1 millimetre.

Some observation wells are equipped with continuous water level recorders, almost invariably activated by a float on the water surface. These recorders may be driven by clockwork or by electric battery power, and are capable of running unattended for periods of one to six months.

TABLE 13 GENERALISED LIST OF AQUIFERS IN THE UNITED KINGDOM

Era	System	Subsystem	Aquifer	Importance
CAINOZOIC	Quaternary	Holocene	Superficial deposits	*
		Pleistocene	Upper and Middle Pleistocene	*
			Crag	**
	Tertiary	Pliocene	Coralline Crag	**
		Oligocene		
		Eocene	Bagshot Beds	
			Lower London Tertiaries	
			Blackheath & Oldhaven Beds	
			Woolwich & Reading Beds	*
			Thanet Beds	**
MESOZOIC	Cretaceous	Upper Cretaceous	Chalk and Upper Greensand	****
		Lower Cretaceous	Lower Greensand	***
			Hastings Beds	**
	Jurassic	Upper Jurassic	Portland & Purbeck Beds	*
			(with Spilsby Sandstone)	(**)
			Corallian	**
		Middle Jurassic	Great & Inferior Oolitic limestones	**
			(with Lincolnshire Limestone)	(****)
		Lower Jurassic	Bridport & Yeovil Sands	**
			Marlstone Rock	*
UPPER PALAEOZOIC	Triassic	Keuper	Permo-Triassic sandstones	
		Bunter		
	Permian	(sandstones)		
			Magnesian Limestone	***
	Carboniferous	Upper Carboniferous	Coal Measures	**
			Millstone Grit	**
		Lower Carboniferous	Carboniferous Limestone	**
	Devonian		Old Red Sandstone	*

Key to aquifer importance:
- * aquifer of minor importance only
- ** aquifer producing small, but useful, local supplies
- *** aquifer of local importance, often providing public supplies
- **** aquifer of major importance

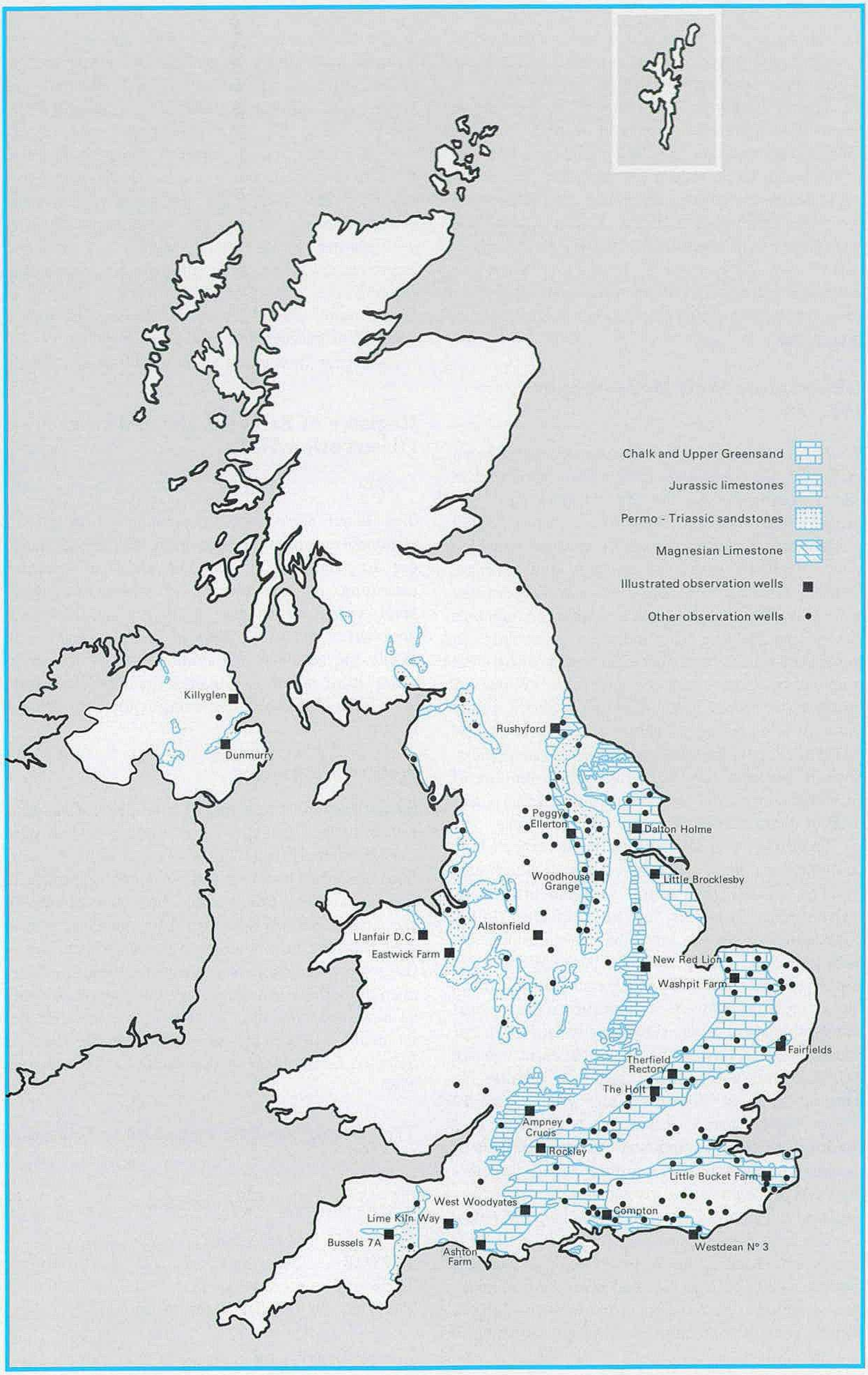


Figure 17. Principal aquifers and representative borehole locations.

Levels are usually recorded on paper charts or on punched paper tapes, but a number of solid state loggers have been deployed in recent years.

At a relatively small but increasing number of observation boreholes provision is made for the routine transmission – usually by telephone line – of groundwater levels to local, or regional, centres.

Pressure transducers have also been considered for water level measurement. However, available transducers will measure accurately over only a narrow range of fluctuation (up to 2 to 3 metres), or much less accurately over a wide range. They are being used more frequently but are still not yet in general use.

Observation Well Hydrographs 1987–89

Well hydrographs for 24 observation sites are shown in Figure 18; the format differs from that used in earlier Yearbooks in the Hydrological data UK series*. For each borehole the 1987 to 1989 groundwater hydrographs are illustrated, as a blue trace, together with the average and extreme monthly levels for the pre-1989 record (provided sufficient historical data are available). A break in the well hydrograph trace indicates an interruption in the record of greater than eight weeks. Three-year plots have been used because the volume of groundwater stored in aquifers can reflect not only the infiltration taking place during the winter months of 1988/89, but also that occurring in previous years. When comparing the hydrographs for a number of sites, account should be taken of the differing scales used to illustrate the water-table fluctuations.

The majority of observation boreholes for which contemporary data are held on the Groundwater Archive monitor the natural variation in groundwater levels. However, in parts of the United Kingdom groundwater levels have been influenced, sometimes over long periods, by pumping for water supply or other purposes which exceeds the natural rate of replenishment. As a consequence the regional water-table may become substantially depressed. For instance, the levels at the Eastwick Farm site are indicative of a significant regional decline. By contrast those at Rushyford now stand some 10 metres higher than a decade ago (due partly to a rundown of the coal industry and the consequent cessation of continuous pumping for mine dewatering). On a larger scale, groundwater levels in the confined Chalk and Upper Greensand aquifer below London have risen substantially over the last twenty-five years. Annual mean levels in the National Gallery well (Trafalgar Square) testify to a 20 metre rise since the mid-1960s. This is principally a consequence of abstractors increasingly switching to surface water supplies drawn from reservoirs in the Thames and Lee valleys. The decreased rate of groundwater abstraction initially stabilised the water-table, which had been declining steadily over the preceding 150 years in response to London's water demands, and subsequently levels have risen at the rate of approximately one metre per year. More moderate increases have been reported for other conurbations in Britain. The implications of rising groundwater levels extend beyond the potential improvement in resources that the rise represents. Groundwater quality may be adversely affected as levels more closely approach the surface and a number of geotechnical problems may result – for instance, the flooding of tunnels and foundations.

* NERC Computer Services was responsible for developing the hydrograph plotting software.

Register of Selected Groundwater Observation Wells

Scope

The listed sites were selected so as to give a reasonably representative cover for aquifers throughout England and Wales. The wells are grouped according to the aquifer to which the water level variations in the wells are attributed. A generalised list of aquifers is given on page 170. While the aquifers are tabulated in stratigraphical order, most of the local names for individual strata are omitted and the intervening aquicludes are not shown.

Network Changes

Since the original selection of boreholes for incorporation in the national network a number of changes have been made to the list of selected wells. At some locations, observations could no longer be continued, and new sites have been added from time to time. In the Coal Measures and the Millstone Grit, certain sites have not been monitored for some years due to the presence of methane in the wells; these sites have been discarded until either they have been made safe or have been replaced. Details of the wells in the national network are given in the Register of Selected Groundwater Observation Wells (see page 178).

The following sites have been added to the Register for 1989:

Chalk and Upper Greensand

SU76/46	Riseley Mill
TF73/10	Moor Farm
TL55/109	Lower Farm
TM17/1	Old Parsonage House

Lower Greensand

TR23/32	Morehall Depot

Permo-Triassic sandstones

SJ37/2H	Bowater 6
SK68/21	Crossley Hill

Magnesian Limestone

NZ33/20	Garmondsway
SE51/2	Westfield Farm

The following sites have been removed from the Register for 1989:

Chalk and Upper Greensand

SU04/2	Tilshead
TF94/1	Cuckoo Lodge
TQ66/48	Owletts
TR05/11	Portway House, Faversham
TR34/81	Church Farm

Permo-Triassic sandstones

SJ33/38	Hordley Wharf
SJ96/41	Rushton Spencer 1

The Register - data items

The six columns of the register are:

Well Number

The well numbering system is based on the National Grid. Each 100 kilometre square is designated by prefix characters, e.g. SE, and is divided into 100 squares of 10 kilometre sides designated by numbers 00 (in the south-west corner to 99 (in the north-east corner). Thus, the site SE93/4, is located in the 10 kilometre square SE93, while the number after the solidus denotes that the site is the fourth accessed in this square into the National Well Record collection. A suffix such as A, B, etc., defines the particular well when there are several at the same site. For Northern Ireland, which is on the Irish Grid, the first of the prefix characters is always 'I'.

Two asterisks following the well number indicates a well or borehole for which hydrographs are shown on pages 174 to 177. The location of the index wells, and the outcrop areas of the principal aquifers, are shown on Figure 17.

Grid Reference

The six or eight figure references given in the register relate to the 100 kilometre National (or Irish) Grid square designated by the preceding two-figure code; the corresponding two-letter code appears as the prefix characters in the Well Number. The Irish Grid References are italicised.

Site

The name by which the well or borehole is normally referenced. The location of all the sites listed in the register are shown on Figure 17.

Measuring Authority

An abbreviation referencing the organisation responsible for groundwater level measurement. A full list of codes, together with the corresponding names and addresses appears on pages 196 and 198.

Records Commence

The first year for which records are held for the groundwater archive.

Indicated % Annual Recharge

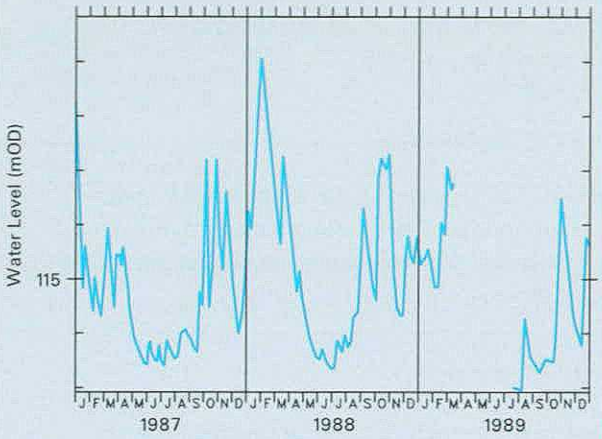
The difference between the level measured at the end of the summer recession and that measured at the beginning of the summer recession in the following year expressed as a percentage of the mean fluctuation. Details of the method of calculation are given in the *Hydrometric Register and Statistics 1981-85* (see page 199). The method is intended to provide a guide to annual recharge variations only. It is most suited to circumstances when a single peak is readily identifiable in each recharge season. Where recharge follows a very uneven pattern resulting in poorly defined or multiple peaks the percentage annual re-charge may be somewhat unrepresentative. Equally, where recharge has been very limited – as was the case over the 1988/89 winter especially in eastern areas – the effect on the hydrograph trace may only take the form of an inflection or levelling-off in the seasonal recession. Under such circumstances the calculated percentage annual recharge will be zero and clearly may underestimate actual infiltration.

References

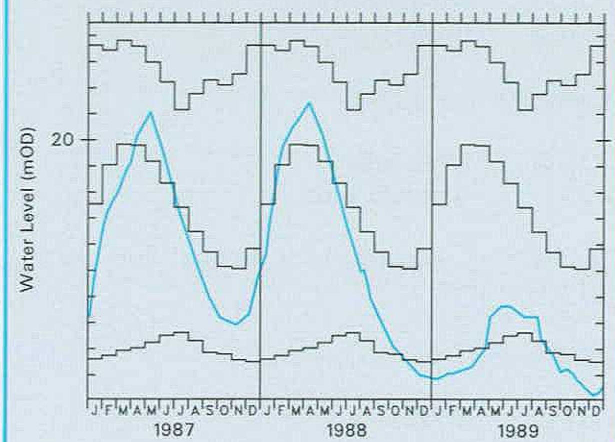
1. Monkhouse, R.A. and Richards, H.J. 1983. Groundwater resources of the United Kingdom. Commission of the European Communities, pub. Th. Schaeffer Druckerei GmbH, Hannover, 252 pages.

2. Monkhouse, R.A. and Murti, P.K. 1981. The rationalisation of groundwater observation well networks in England and Wales. Institute of Geological Sciences, Report No WD/81/1, 18 pages.

Site name: Killyglen
National grid reference: ID 3680 0300
Aquifer: Chalk and Upper Greensand
Measuring level: 140·00 mOD

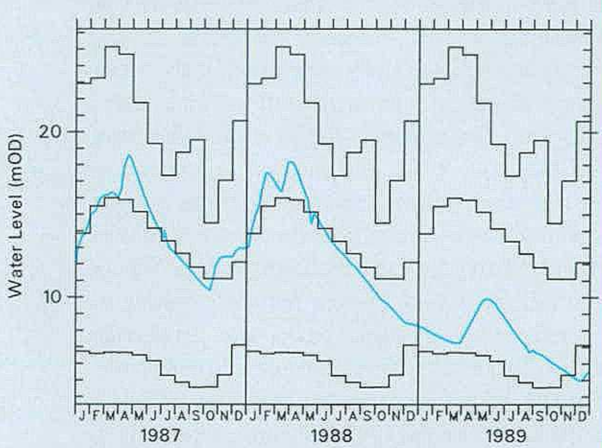


Site name: Dalton Holme
National grid reference: SE 9651 4530
Aquifer: Chalk and Upper Greensand
Measuring level: 33·50 mOD



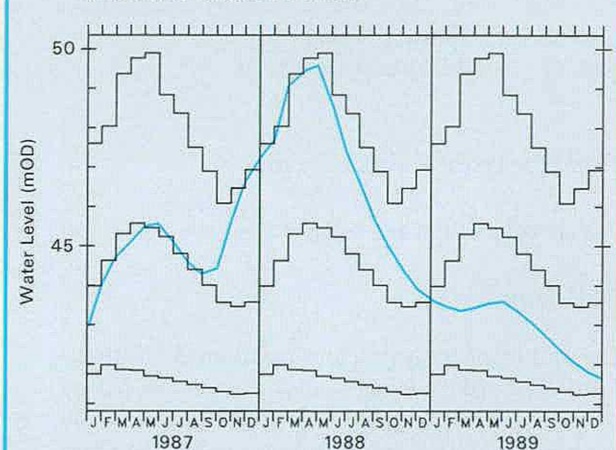
Max, Min and Mean values calculated from years 1889 to 1988

Site name: Little Brocklesby
National grid reference: TA 1371 0888
Aquifer: Chalk and Upper Greensand
Measuring level: 44·33 mOD



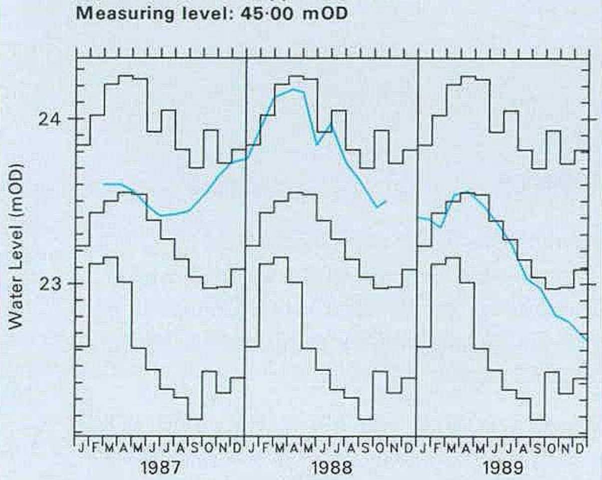
Max, Min and Mean values calculated from years 1926 to 1988

Site name: Washpit Farm
National grid reference: TF 8138 1960
Aquifer: Chalk and Upper Greensand
Measuring level: 80·20 mOD



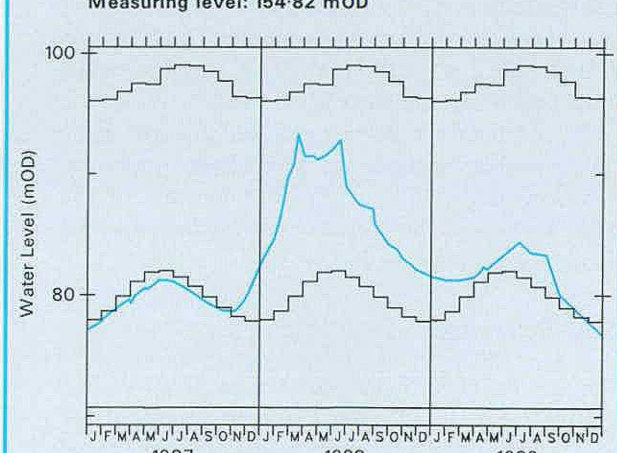
Max, Min and Mean values calculated from years 1950 to 1988

Site name: Fairfields
National grid reference: TM 2461 6109
Aquifer: Chalk and Upper Greensand
Measuring level: 45·00 mOD



Max, Min and Mean values calculated from years 1974 to 1988

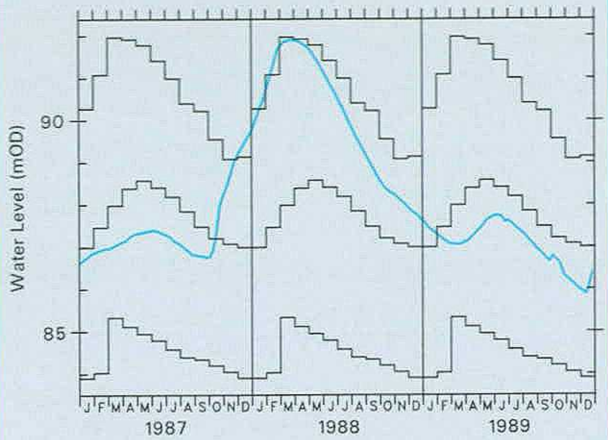
Site name: Therfield Rectory
National grid reference: TL 3330 3720
Aquifer: Chalk and Upper Greensand
Measuring level: 154·82 mOD



Max, Min and Mean values calculated from years 1883 to 1988

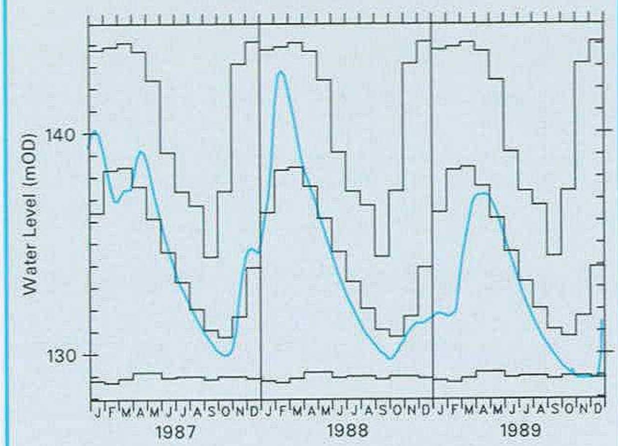
Figure 18. Hydrographs of groundwater level fluctuations.

Site name: The Holt
National grid reference: TL 1692 1965
Aquifer: Chalk and Upper Greensand
Measuring level: 140·21 mOD



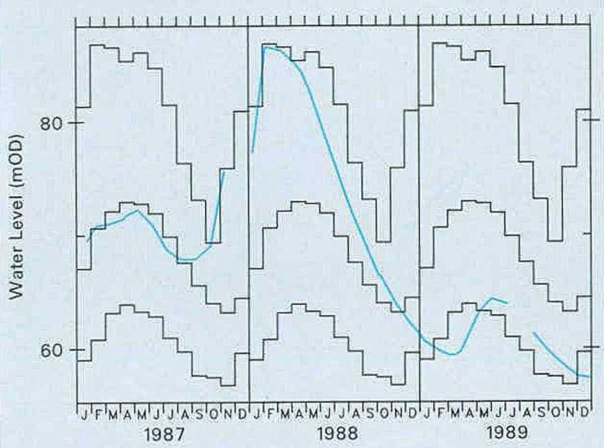
Max, Min and Mean values calculated from years 1964 to 1988

Site name: Rockley
National grid reference: SU 1655 7174
Aquifer: Chalk and Upper Greensand
Measuring level: 146·39 mOD



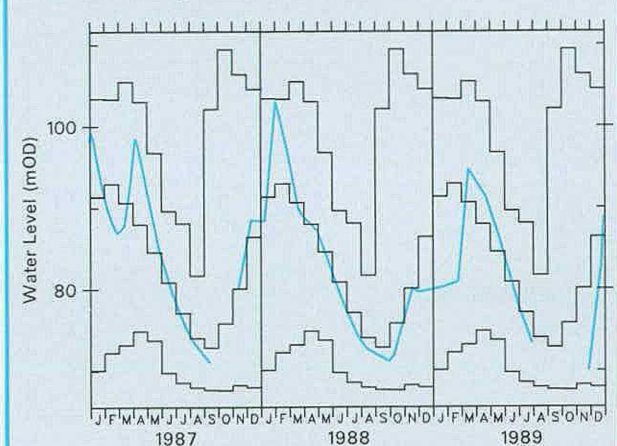
Max, Min and Mean values calculated from years 1933 to 1988

Site name: Little Bucket Farm
National grid reference: TR 1225 4690
Aquifer: Chalk and Upper Greensand
Measuring level: 87·33 mOD



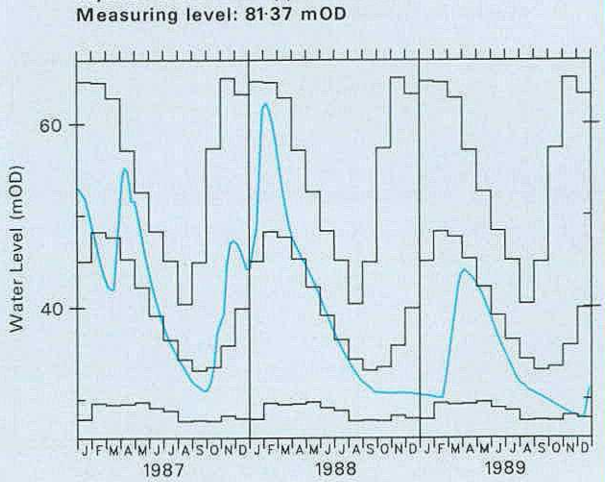
Max, Min and Mean values calculated from years 1971 to 1988

Site name: West Woodyates Manor
National grid reference: SU 0160 1960
Aquifer: Chalk and Upper Greensand
Measuring level: 110·93 mOD



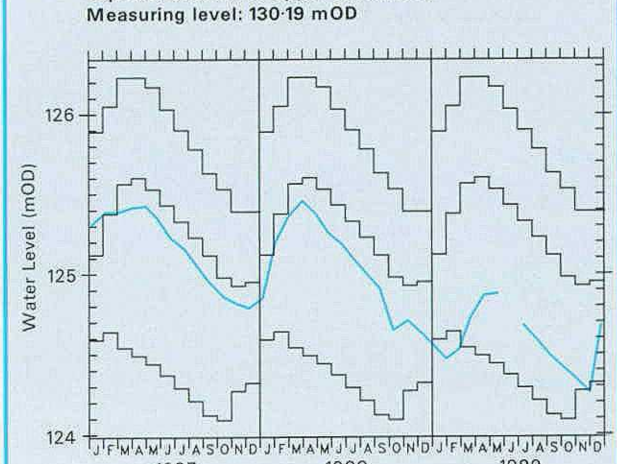
Max, Min and Mean values calculated from years 1942 to 1988

Site name: Compton House
National grid reference: SU 7755 1490
Aquifer: Chalk and Upper Greensand
Measuring level: 81·37 mOD



Max, Min and Mean values calculated from years 1894 to 1988

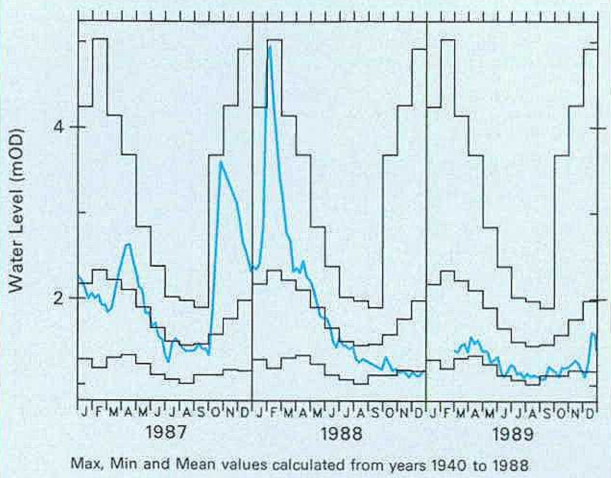
Site name: Lime Kiln Way
National grid reference: ST 3763 0667
Aquifer: Chalk and Upper Greensand
Measuring level: 130·19 mOD



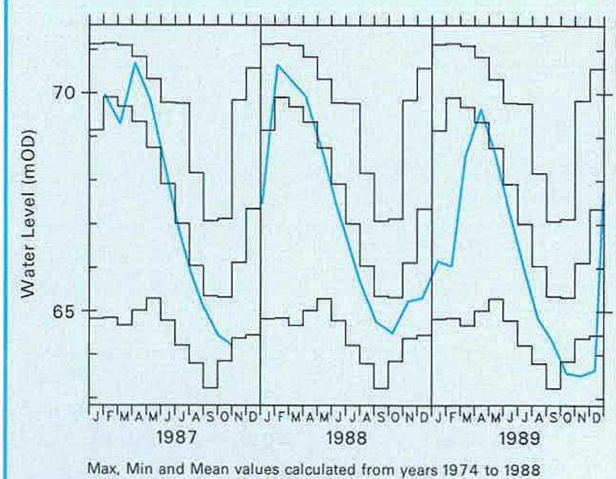
Max, Min and Mean values calculated from years 1969 to 1988

Figure 18—(continued)

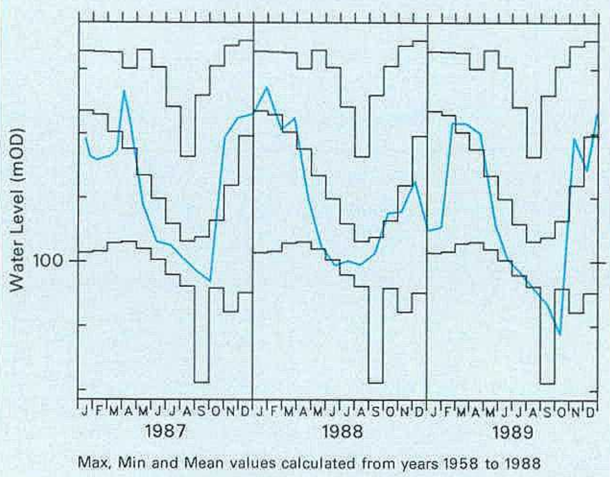
Site name: West Dean No. 3
National grid reference: TV 5290 9920
Aquifer: Chalk and Upper Greensand
Measuring level: 12·88 mOD



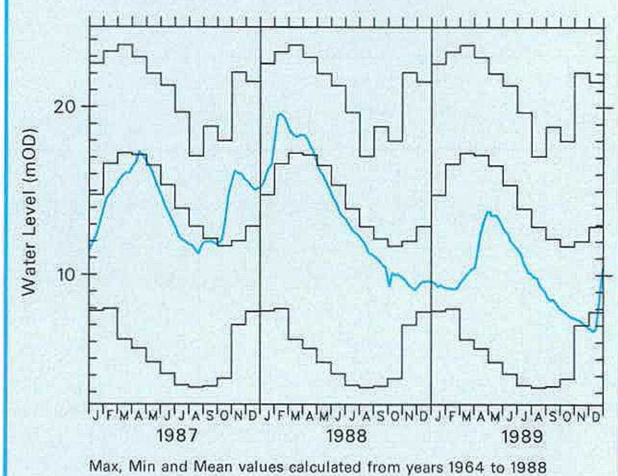
Site name: Ashton Farm
National grid reference: SY 6620 8810
Aquifer: Chalk and Upper Greensand
Measuring level: 72·16 mOD



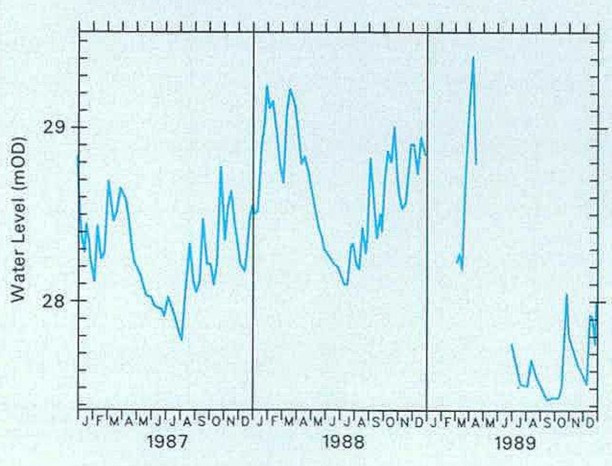
Site name: Ampney Crucis
National grid reference: SP 0595 0190
Aquifer: Middle Jurassic
Measuring level: 109·70 mOD



Site name: New Red Lion
National grid reference: TF 0885 3034
Aquifer: Lincolnshire Limestone
Measuring level: 33·82 mOD



Site name: Dunmurry
National grid reference: IJ 2910 6940
Aquifer: Permo-Triassic Sandstone
Measuring level: 32·00 mOD



Site name: Woodhouse Grange
National grid reference: SE 6784 0709
Aquifer: Permo-Triassic Sandstone
Measuring level: 4·35 mOD

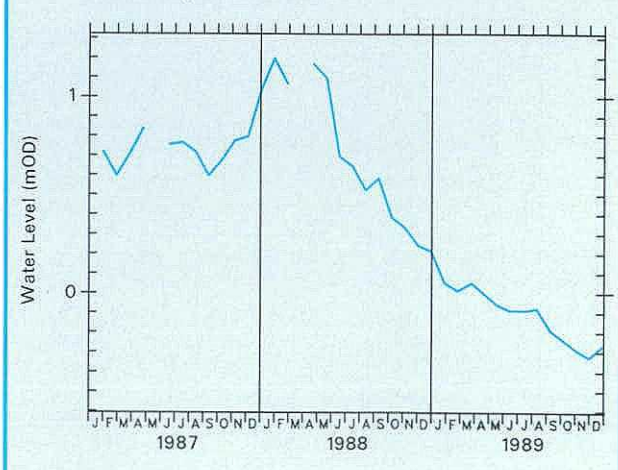
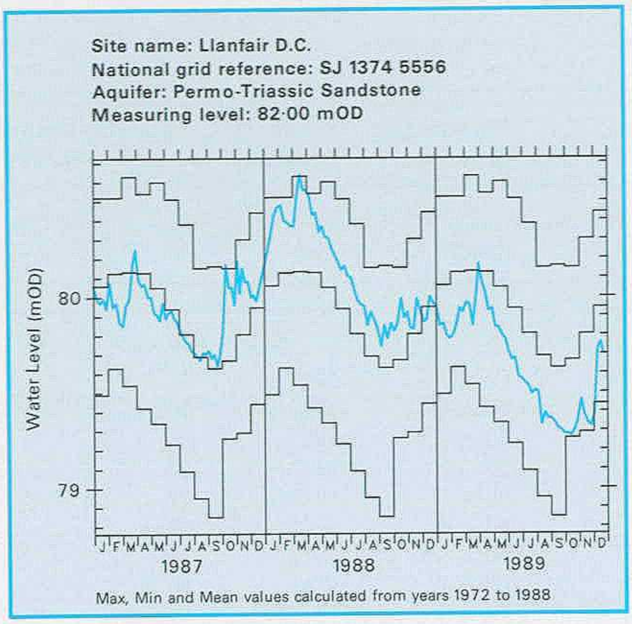
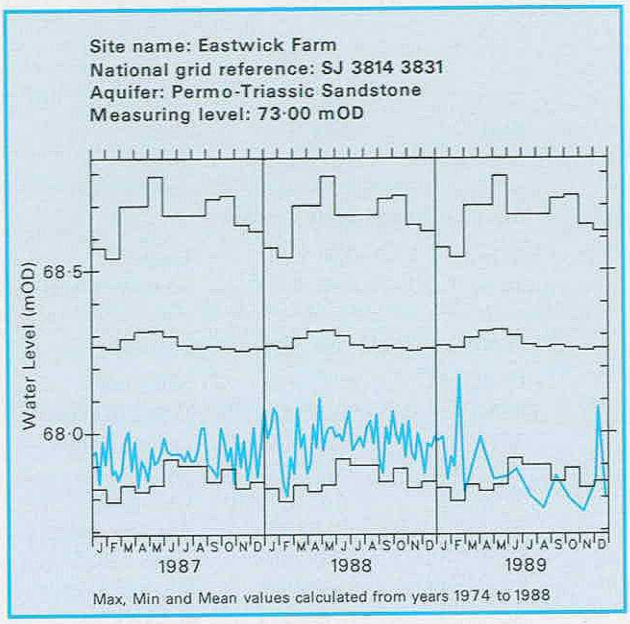
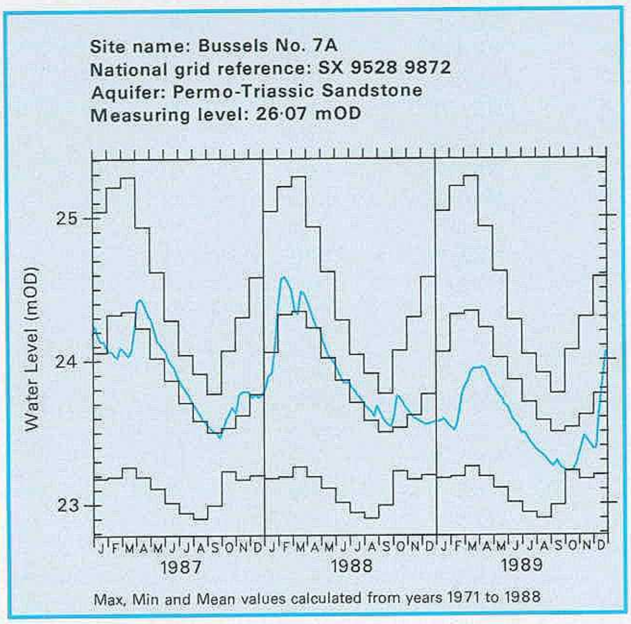
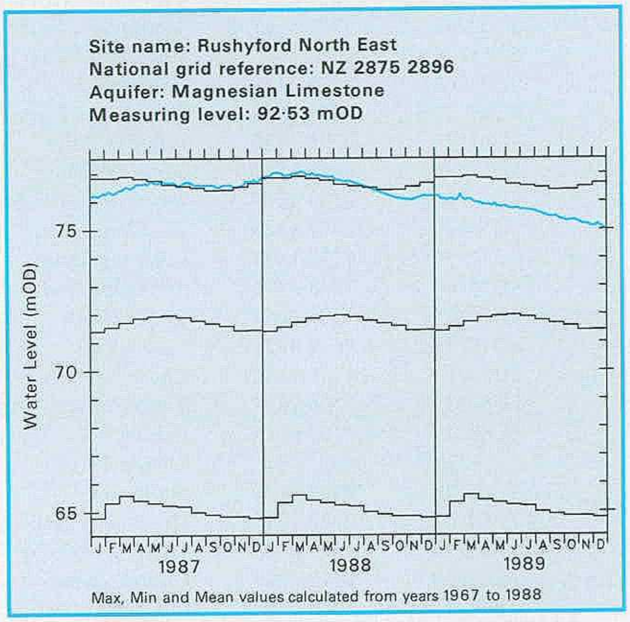


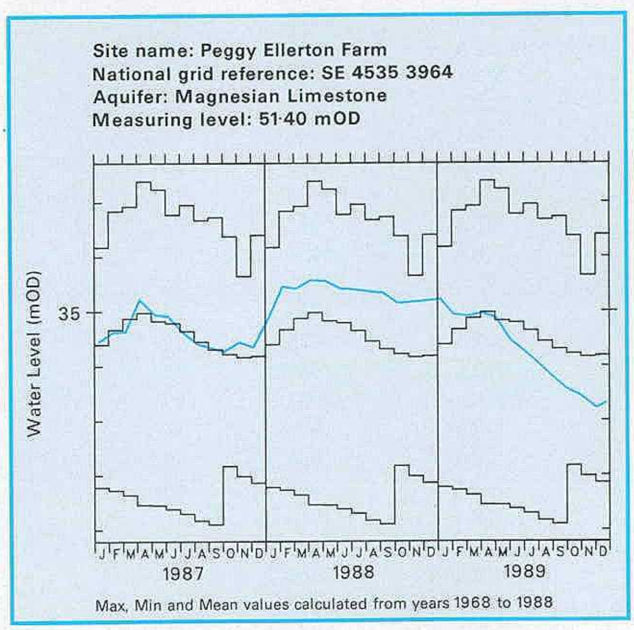
Figure 18—(continued)











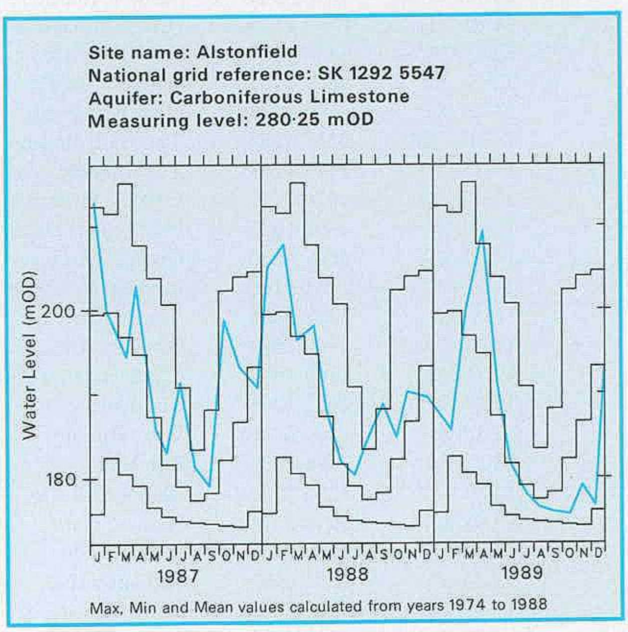


Figure 18—(continued)

Well Number	Grid Reference	Site	Measuring Authority	Records Commence	Indicated % Annual Recharge 1988/89
Aquifer: Superficial Deposits					
IJ28/1	*225 862*	Dunadry	GSNI	1985	---
SO44/4	4683 4253	Stretton Sugwas	NRA-WEL	1973	---
Aquifer : Chalk and Upper Greensand					
ID30/1**	*368 030*	Killyglen	GSNI	1985	51
SE93/4	9212 3634	Dale Plantation	NRA-Y	1970	36
SE94/5**	9651 4530	Dalton Holme	NRA-Y	1889	40
SE97/31	9345 7079	Green Lane	NRA-Y	1972	22
SP90/26	9470 0875	Champneys	NRA-T	1962	29
SP91/59	9380 1570	Pitstone Green Farm	NRA-A	1970	80
ST30/7**	3763 0667	Lime Kiln Way	NRA-SW	1969	46
SU01/5B**	0160 1946	West Woodyates Manor	NRA-W	1942	88
SU17/57**	1655 7174	Rockley	NRA-T	1933	69
SU32/3	3817 2743	Bailey's Down Farm	NRA-S	1963	60
SU35/14	3315 5645	Woodside	NRA-S	1963	60
SU51/10	5875 1655	Hill Place Farm	NRA-S	1965	67
SU53/94	5586 3498	Abbotstone	NRA-S	1976	36
SU57/159	5628 7530	Calversleys Farm	NRA-T	1973	21
SU61/32	6578 1775	Chidden Farm	NRA-S	1958	91
SU61/46	6890 1532	Hinton Manor	NRS-S	1953	40
SU64/28	6360 4049	Lower Wield Farm	NRA-S	1958	39
SU68/49	6442 8525	Well Place Farm	NRA-T	1976	70
SU71/23**	7755 1490	Compton House	NRA-S	1893	64
SU73/8	7048 3491	Faringdon Station	NRA-T	1961	70
SU76/46	7367 6251	Riseley Mill	NRA-T	1975	25
SU78/45A	7419 8924	Stonor Park	NRA-T	1961	32
SU81/1	8356 1440	Chilgrove House	NRA-S	1836	50
SU87/1	8336 7885	Farm Cottage, Coldharbour	NRA-T	1950	55
SU89/7	8103 9417	Piddington	NRA-T	1966	46
SY68/34**	662 881	Ashton Farm	NRA-W	1974	60
TA06/16	0490 6120	Nafferton	NRA-Y	1964	18
TA07/28	0940 7740	Hunmanby Hall	NRA-Y	1976	10
TA10/40**	1375 0885	Little Brocklesby	NRA-A	1926	35
TA21/14	2670 1890	Church Farm	NRA-Y	1971	36
TF72/11	7710 2330	Off Farm	NRA-A	1971	17
TF73/10	7690 3290	Moor Farm	NRA-A	1977	10
TF80/33	8738 0526	Houghton Common	NRA-A	1971	59
TF81/2**	8138 1960	Washpit Farm	NRA-A	1950	10
TF92/5	9869 2183	Tower Hills P.S.	NRA-A	1977	17
TG00/92	0440 0020	High Elm Farm,	NRA-A	1971	34
TG03/25B	0382 3583	The Hall, Brinton	NRA-A	1952	14
TG11/5	1691 1101	The Spinney, Costessey	NRA-A	1952	20
TG12/7	1126 2722	Heydon Pumping Station	NRA-A	1974	10
TG21/9	2400 1657	Frettenham Depot	NRA-A	1952	77
TG21/10	2699 1140	Grange Farm	NRA-A	1952	65
TG23/21	2932 3101	Melbourne House	NRA-A	1974	14
TG31/20	3365 1606	Woodbastwick	NRA-A	1974	23
TG32/16	3700 2682	Brumstead Hall	NRA-A	1978	19
TL11/4	1560 1555	Mackerye End House	NRA-T	1960	57
TL11/9**	1692 1965	The Holt	NRA-T	1964	29
TL13/24	1200 3026	West Hitchin	NRA-A	1970	16
TL22/10	2978 2433	Box Hall	NRA-T	1964	43
TL33/4**	3330 3720	Therfield Rectory	NRA-T	1883	48
TL42/6	4536 2676	Hixham Hall	NRA-T	1964	29
TL42/8	4669 2955	Berden Hall	NRA-T	1964	24
TL44/12	4522 4182	Redlands Hall	NRA-A	1964	55
TL55/109	5925 5605	Lower Farm	NRA-A	1983	40
TL72/54	7982 2516	Rectory Road	NRA-A	1968	18
TL84/6	8465 4106	Smeetham Cottages, Bulmer	NRA-A	1963	45

Well Number	Grid Reference	Site	Measuring Authority	Records Commence	Indicated % Annual Recharge 1988/89
TL86/110	8850 6470	Cattishall Farm	NRA-A	1969	53
TL89/37	8131 9001	Grimes Graves	NRA-A	1971	43
TL92/1	9657 2562	Lexden Pumping Station	NRA-A	1961	---
TM15/112	1201 5618	Dial Farm	NRA-A	1968	59
TM17/1	1671 7903	Old Parsonage House	NRA-A	1952	21
TM26/46**	2461 6109	Fairfields	NRA-A	1974	26
TM26/95	2786 6397	Strawberry Hill	NRA-A	1974	52
TQ01/133	0850 1170	Chantry Post, Sullington	NRA-S	1977	96
TQ21/11	2850 1289	Old Rectory, Pyecombe	NRA-S	1958	14
TQ28/119B	2996 8051	Trafalgar Square	NRA-T	1845	---
TQ31/50	3220 1180	North Bottom	NRA-S	1979	65
TQ35/5	3363 5924	Rose & Crown	NRA-T	1876	51
TQ38/9	3509 8536	Hackney Public Baths	NRA-T	1953	---
TQ50/7	5592 0380	Old Rectory, Folkington	NRA-S	1965	98
TQ56/19	5648 6124	West Kingsdown	NRA-T	1961	57
TQ57/118	5880 7943	Thurrock A13	NRA-A	1979	---
TQ58/2B	5622 8408	Bush Pit Farm	NRA-T	1967	---
TQ86/44	8595 6092	Little Pett Farm	NRA-S	1982	10
TQ99/11	947 971	Burnham	NRA-A	1975	---
TR14/9**	1225 4690	Little Bucket Farm	NRA-S	1971	39
TR14/50	1265 4167	Glebe Cottage	NRA-S	1970	---
TR35/49	3330 5090	Cross Manor Cottages	NRA-S	1971	31
TR36/62	3208 6634	Alland Grange	NRA-S	1969	31
TV59/7C**	5290 9920	Westdean 3	NRA-S	1940	25
Aquifer : Lower Greensand					
SU82/57	8888 2505	Madam's Farm	NRA-S	1984	---
SU84/8A	8716 4087	Tilford Pumping Station	NRA-T	1971	25
TL45/19	4110 5204	River Farm	NRA-A	1973	---
TQ41/82	4370 1320	Lower Barn Cottages	NRA-S	1975	32
TR13/21	1132 3881	Ashley House	NRA-S	1972	---
TR23/32	2075 3650	Morehall Depot	NRA-S	1972	10
Aquifer : Hastings Beds					
TQ22/1	2348 2770	The Bungalow	NRA-S	1964	78
TQ32/19	3760 2890	Horsted Keynes	NRA-S	1968	86
TQ42/80A	4725 2990	Kingstanding	NRA-S	1979	71
TQ61/44	6658 1803	Dallington Herrings	NRA-S	1964	57
TQ62/99	6199 2282	Whiteoaks	NRA-S	1978	56
TQ71/123	7969 1659	Red House	NRA-S	1974	78
Aquifer : Upper Jurassic					
SE68/16	6890 8590	Kirkbymoorside	NRA-Y	1973	25
SE77/76	7690 7300	Broughton	NRA-Y	1975	14
SE98/8	9910 8540	Seavegate Farm	NRA-Y	1971	33
SU49/40B	4117 9307	East Hanney	NRA-T	1978	63
Aquifer : Middle Jurassic					
SP00/62**	0595 0190	Ampney Crucis	NRA-T	1958	54
SP20/113	2721 0634	Alvescot Road	NRA-T	1975	---
ST51/57	591 169	Over Compton	NRA-W	1971	83
ST88/62A	8275 8743	Didmarton 1	NRA-W	1977	58
Aquifer : Lincolnshire Limestone					
SK97/25	9800 7817	Grange de Lings	NRA-A	1975	57
TF03/37**	0885 3034	New Red Lion	NRA-A	1964	50
TF04/14	0429 4273	Silk Willoughby	NRA-A	1972	52
Aquifer : Permo-Triassic sandstones					
IJ26/1**	291 694	Dunmurry	GSNI	1985	94
NX97/1	9667 7432	Redbank	SRPB	1981	---
NY00/328	0511 0247	Brownbank Layby	NRA-NW	1974	44
NY45/16	4947 5667	Corby Hill	NRA-NW	1977	27

Well Number	Grid Reference	Site	Measuring Authority	Records Commence	Indicated % Annual Recharge 1988/89
NY63/2	6130 3250	Skirwith	NRA-NW	1978	64
NZ41/34	4861 1835	Northern Dairies	NRA-N	1974	44
SD27/8	2172 7171	Furness Abbey	NRA-NW	1972	75
SD41/32	4400 1164	Yew Tree Farm	NRA-NW	1971	68
SD44/15	4396 4928	Moss Edge Farm	NRA-NW	1961	84
SE36/47	3945 6575	Kelly's Cafe	NRA-Y	1977	23
SE39/20B	3004 9244	Scruton Village	NRA-Y	1969	34
SE45/3	4470 5580	Cattal Maltings	NRA-Y	1969	40
SE52/4	5473 2363	Southfield Lane	NRA-Y	1955	81
SE54/32A	5532 4646	Bilborough	NRA-Y	1984	---
SE55/4	5829 5383	Clifton Hospital	NRA-Y	1967	33
SE60/76**	6784 0709	Woodhouse Grange	NRA-ST	1980	---
SE64/1	6751 4463	Wheldrake Station	NRA-Y	1971	53
SE72/3B	7047 2149	Rawcliffe Bridge	NRA-Y	1971	---
SE83/9	8040 3640	Holme on Spalding Moor	NRA-Y	1972	75
SJ15/15**	1374 5556	Llanfair D.C.	NRA-WEL	1972	53
SJ33/39**	3814 3831	Eastwick Farm	NRA-WEL	1974	---
SJ37/2H	3805 7676	Bowater 6	NRA-NW	1971	---
SJ56/45E	5042 6953	Ashton 4	NRA-NW	1969	---
SJ83/1A	8969 3474	Stone	NRA-ST	1974	71
SJ87/32	8969 7598	Dale Brow	NRA-NW	1973	14
SJ88/93	8611 8645	Bruntwood Hall	NRA-NW	1972	---
SK00/41	067 012	Nuttal's Farm	NRA-ST	1974	10
SK21/111	2731 1419	Grange Wood	NRA-ST	1967	25
SK24/22	2539 4431	Burtonshuts Farm	NRA-ST	1972	16
SK56/53	5632 6440	Peafield Lane	NRA-ST	1969	---
SK68/21	6100 8374	Crossley Hill	NRA-ST	1969	10
SK73/50	7693 3228	Woodland Farm	NRA-ST	1980	---
SO71/18	7170 1970	Stores Cottage	NRA-ST	1973	41
SO87/28	8160 7970	Hillfields	NRA-ST	1961	---
ST12/48	108 267	Milverton Bypass	NRA-W	1972	---
SX99/37B**	9528 9872	Bussels 7A	NRA-SW	1971	36
SY09/21A	0666 9235	Heathlands	NRA-SW	1951	70
Aquifer : Magnesian Limestone					
NZ22/22**	2875 2896	Rushyford NE	NRA-N	1967	19
NZ32/19	3575 2650	Heley House	NRA-N	1969	---
NZ33/20	3349 3501	Garmondsway	NRA-N	1974	10
SE28/28	2460 8520	Bedale	NRA-Y	1972	64
SE35/4	3830 5830	Castle Farm	NRA-Y	1970	18
SE43/9**	4535 3964	Peggy Ellerton Farm	NRA-Y	1968	10
SE43/14	4660 3550	Coldhill Farm 35	NRA-Y	1971	26
SE51/2	5210 1530	Westfield Farm	NRA-Y	1971	10
SK46/71	4800 6030	Stanton Hill	NRA-ST	1973	68
SK58/43	5248 8018	Southeads Lane	NRA-ST	1973	19
Aquifer : Coal Measures					
SE23/4	2850 3414	Silver Blades Ice Rink	NRA-Y	1971	30
Aquifer : Millstone Grit					
SE02/46	0771 2528	Thrum Hall	NRA-Y	1977	18
SE04/7	0295 4792	Lower Heights Farm	NRA-Y	1971	70
SE24/2B	2067 4053	Green Lane Dyeworks	NRA-Y	1971	---
SE27/8	2120 7380	Kirkby Moor Farm	NRA-Y	1971	80
Aquifer : Carboniferous Limestone					
NT95/21	9695 5055	Middle Ord	NRA-N	1974	41
SE06/1	0241 6183	Jerry Laithe Farm	NRA-Y	1971	143
SK15/16**	1292 5547	Alstonfield	NRA-ST	1974	75
SK17/13	1778 7762	Hucklow South	NRA-ST	1969	19
ST64/33	6560 4790	Oakhill 1	NRA-W	1974	103

Sites marked '**' are indicator wells; well hydrographs are shown in Figure 18. Where the annual percentage recharge cannot be estimated, the entry '---' is substituted.

THE GROUNDWATER DATA RETRIEVAL SERVICE

A suite of retrieval programs has been written in order to facilitate data usage. At the present time, retrievals using the options described below are available for most of the sites listed in the Register of Selected Groundwater Observation Wells, although not all the data contained within this archive have been validated.

Five options are available for retrieving data. A description of each option is given below and examples of the computer listings and graphical output are given on pages 182 to 184. Options 1 to 4 give details of the well site, the period of record available, and maximum and minimum recorded levels in addition to the output specific to each option. Data may be retrieved for a specific well or for groups of wells by well reference numbers, by area (using National Grid References), by aquifer, by hydrometric area, by measuring authority, or by any combination of these parameters.

Cost of Service

To cover the computing and handling costs, a moderate charge will be made depending on the output options selected. Estimates of these charges may be obtained on request; the right to amend or waive charges is reserved.

Requests for Retrieval Options

Requests for retrieval options should include: the name and address to which the output should be directed, the sites, or areas, for which data are required together with the period of record of interest (where appropriate) and the title of the required option. Where possible, a daytime telephone number should be given.

Requests should be addressed to:

The British Geological Survey
Hydrogeology Research Group
Maclean Building
Crowmarsh Gifford
WALLINGFORD
OXFORDSHIRE OX10 8BB

Telephone: (0491) 38800
Fax: (0491) 25338

LIST OF GROUNDWATER RETRIEVAL OPTIONS

OPTION	TITLE	NOTES
1	Table of groundwater levels	All recorded observations of groundwater level in metres above Ordnance Datum, with dates of observation and maximum and minimum levels for each year. Specific years, or ranges of years, may be requested, otherwise the full period of record is given.
	Table of annual maximum and minimum groundwater levels	Annual maximum and minimum groundwater levels in metres above Ordnance Datum with dates of occurrence. Specific years, or ranges of years, may be requested, otherwise the full period of record is given.
	Table of monthly maximum, minimum and mean groundwater levels	Monthly maximum, minimum and mean groundwater levels in metres above Ordnance Datum, together with the number of years contributing values to the calculation of each monthly mean. A specific period of years may be nominated, otherwise the full period of record is given.
	Hydrographs of groundwater levels	Provides a well hydrograph for a number of specified years. Castellated annual plots of monthly maximum and mean groundwater levels calculated from a nominated period of years are superimposed upon the hydrograph, provided that the nominated period exceeds 10 years. Tabulations of the monthly

maximum, minimum and mean values are also listed, together with the number of years of record used in the calculations, and the number of observations used for each month.

Site details

The output comprises the well reference number of the British Geological Survey, the original (Water Data Unit) station number (where applicable), the hydrometric area, the aquifer name and code, the site name and location, the National Grid Reference, the depth of the well, the datum points (from which measurements are made), the altitude of the ground surface, the period of record and the measuring authority area in which the well or borehole is located.

OPTION 1 TABLE OF GROUNDWATER LEVELS

Station number	TFO3/37
Station name	NEW RED LION, ASLACKBY (CONTINUES OLD RED LION)
Grid Reference	TF 0885 3034
Measuring Authority	NRA-A
Hydrometric Area	30
Aquifer	Lincolnshire Limestone
Aquifer Code	13
EEC Unit	ANO3
Surface Level (MOD)	33.82
Datum Point (MOD)	33.45
Well Depth (M)	50.00
Max. Expected (MOD)	33.45
Min. Expected (MOD)	5.00
Period of records in Archive:-	1964 to 1985

Maximum GW Level for period of records 23.69
Number of Maxima 1
Date(s):-
14 03 1977

Minimum GW Level for period of records 3.29
Number of Minima 1
Date(s):-
24 08 1976

(Note: The above reference information is also provided with the output from options 2-4)

Station Number	TF03/37
Year of record	1975
Date	Level (MOD)
03 Jan	17.29
31 Jan	16.68
28 Feb	17.85
04 Apr	20.31
24 Apr	20.12
02 May	20.13
30 May	18.58
13 Jun	17.34
11 Jul	15.77

01 Aug	14.44
29 Aug	13.24
26 Sep	12.11
10 Oct	11.57
07 Nov	10.42
21 Nov	9.85
19 Dec	8.98

Maximum GW level for year 20.31
Number of maxima 1
Dates 04 Apr
Minimum GW Level for year 8.98
Number of minima 1
Dates 19 Dec

OPTION 2 TABLE OF ANNUAL MAXIMUM AND MINIMUM GROUNDWATER LEVELS

Year	Max/Min	Level(MOD)	Date(s)	No. of occasions
1965	Max	21.50	26 Dec	1
	Min	7.85	24 Jan	
1966	Max	23.51	06 Mar	1
	Min	14.43	09 Oct–16 Oct	1 Period
1967	Max	19.79	04 Jun	
	Min	12.69	29 Oct	
1968	Max	22.06	17 Nov	
	Min	14.08	07 Jul	
1969	Max	23.17	30 Mar	
	Min	11.83	16 Nov	
1970	Max	20.21	26 Apr	
	Min	10.76	15 Nov	1

OPTION 3 TABLE OF MONTHLY MAXIMUM, MINIMUM AND MEAN GROUNDWATER LEVELS

Period maximum, minimum and mean groundwater levels for years 1964 to 1985

	Maximum	Minimum	Mean	No. of years
Jan	22.58	7.85	14.75	21
Feb	23.29	7.97	16.50	21
Mar	23.69	6.14	17.27	21
Apr	22.97	5.61	17.17	22
May	22.00	4.80	16.52	21
Jun	21.28	4.11	15.40	21
Jul	19.69	3.42	14.03	21
Aug	17.08	3.29	12.97	21
Sep	18.84	3.37	12.23	21
Oct	17.98	3.82	11.78	21
Nov	22.06	7.03	12.08	21
Dec	21.51	7.81	13.04	21

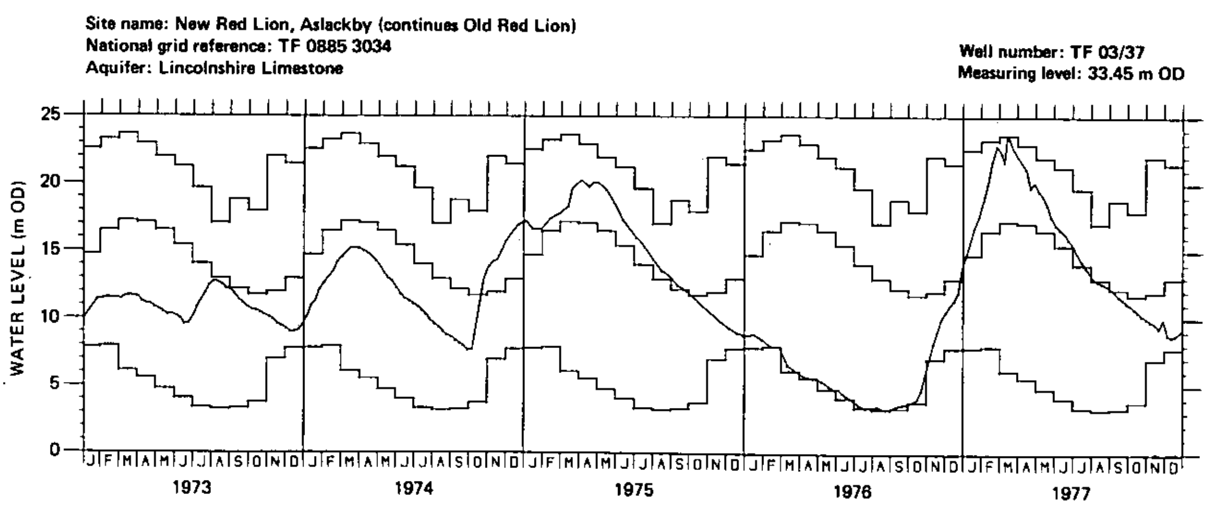
OPTION 4 HYDROGRAPHS OF GROUNDWATER LEVELS

Hydrograph of monthly maximums, minimums and means calculated from years 1964 to 1982

Therefore maximum number of years from which monthly maxs, mins and means may be calculated is 19

	Maximum	Minimum	Mean	No. of Years
Jan	22.58	7.85	14.77	18
Feb	23.29	7.97	16.47	18
Mar	23.69	6.14	17.34	18
Apr	22.97	5.61	17.23	19
May	22.00	4.80	16.42	19
Jun	21.28	4.11	15.23	19
Jul	19.69	3.42	13.97	19
Aug	17.08	3.29	12.98	19
Sep	18.84	3.37	12.28	19
Oct	17.98	3.82	11.85	19
Nov	22.06	7.03	12.20	19
Dec	21.51	7.81	13.09	19

Hydrograph(s) plotted for year ranges:- 1973 to 1977



Max, Min and Mean values calculated from years 1964 to 1982

OPTION 5 SITE DETAILS

BGS NUMBER	COMPUTER NUMBER	HA	AQ	NAME—LOCATION REC—PERIOD—MA AQUIFER	GRID REF.	DEPTH (M)	DATUM POINT	SURFACE LEVEL
NZ22/22	25624	25	17	RUSHYFORD NORTH EAST, GREAT CHILTON 1957-1985 NRA—N MAGNESIAN LIMESTONE	NZ 2875 2896	62.50	92.65	92.53
SE94/5	26352	26	6	DALTON ESTATE, DALTON HOLME 1889-1985 NRA—Y CHALK AND UPPER GREENSAND	SE 9651 4530	28.50	34.57	33.50
SE43/9	27360	27	17	PEGGY ELLERTON FARM, HAZELWOOD 1968-1985 NRA—Y MAGNESIAN LIMESTONE	SE 4535 3964	55.42	51.40	51.40
TF03/37	30229	30	13	NEW RED LION, ASLACKBY (CONTINUES OLD RED LION) 1964-1985 NRA—N LINCOLNSHIRE LIMESTONE	TF 0885 3034	50.00	33.45	33.82

SURFACE WATER QUALITY DATA

Background

A national archive of water quality data is maintained by Her Majesty's Inspectorate of Pollution (Department of the Environment)* to provide information concerning the quality of rivers throughout the United Kingdom and to satisfy certain international obligations including the estimation of riverborne inputs of selected contaminants (e.g. nutrients) to the sea. Data for this archive are collected as part of the Harmonised Monitoring programme which provides for the sampling and analysis of water quality on a national basis.

The Harmonised Monitoring Scheme was established, for England and Wales, in 1974; a similar scheme was instituted for Scotland, under the aegis of the Scottish Development Department, in July 1975. In Scotland responsibility for the collection and analysis of the samples rests with the seven River Purification Boards. In England and Wales responsibility passed, on the 1st September 1989, from the former regional Water Authorities to the newly-created National Rivers Authority.

Measuring authorities send analytical results of routinely collected samples of river water from approximately 220 monitoring stations; sampling frequencies vary substantially but are, typically, in the range 6 to 52 per year. Most of the monitoring stations are located on major rivers at, or near, the tidal limit.

The monitoring programme can embrace a large number – over 80 – of physical and chemical attributes of river water but typically only 25 are measured at any given site. A number of determinands are measured as standard but a larger proportion are monitored only where it is considered necessary to do so.

Currently no data for Northern Ireland are held on the Harmonised Monitoring Archive. Water quality data are, however, routinely collected and archived by the Environment Protection Division of the Department of the Environment (NI); data for two Northern Ireland monitoring sites are included in this publication.

The measuring authorities maintain major programmes of chemical and biological sampling of rivers for their own purposes. From the 31st July 1985, the former Water Authorities were required, under the Control of Pollution Act, to maintain registers of the results of all samples of water and effluent taken for pollution control purposes together with details of all consented discharges. Following the enactment of the Water Bill 1989 this obligation passed to the National Rivers Authority. These registers are maintained at the regional headquarters of the NRA and are open for inspection by the public – free of charge. Persons wishing to consult the registers are advised to first contact the individual regional headquarters; a list of addresses is given on pages 196 to 198.

Data Retrieval

A range of retrieval options has been developed by Her Majesty's Inspectorate of Pollution to make available the water quality data held on the Harmonised Monitoring Archive and to provide statistical summaries based on those data. Requests for data, and guidance concerning its availability, should be addressed to:

Department of the Environment
HMIP Room A4.26
Romney House
43 Marsham Street
London SW1P 3PY

Telephone: 071 276 8245

Data listings for monitoring sites in Northern Ireland may be obtained from the Environmental Protection Division of the DOE (NI) – see page 197.

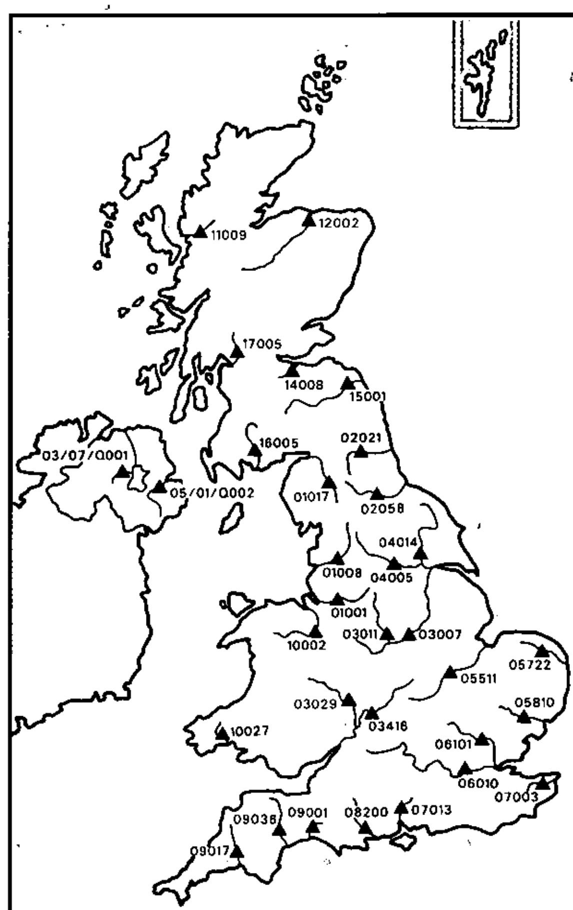


Figure 19. Water quality monitoring station location map.

* The transfer of this archive to the National Rivers Authority is currently under discussion.

Scope of the Water Quality Data Tabulations

River water quality data are presented for 32 monitoring sites on rivers throughout the United Kingdom. The location of each monitoring site is given on Figure 19 (previous page). For each site 1989, and period of record, data are given for a range of determinands; the determinands featured may differ between monitoring sites reflecting the character of the rivers themselves and differences in the sampling regimes between monitoring stations.

The following notes are provided to assist in the interpretation of particular data items.

Harmonised Monitoring Station Code

A reference number which serves as the primary identifier of the station. For stations on the Harmonised Monitoring Archive, the first two digits refer to the measuring authority, the remainder refer to individual sites within each measuring authority. For the Northern Ireland stations, the Dept. of the Environment (NI) reference code is given.

Measuring Authority

An abbreviation referencing the organisation responsible for the operation of the monitoring site. See pages 196 to 198 for a full list of the codes together with the corresponding authority names and addresses.

Grid Reference

The initial two-letter and two-figure codes each designate the relevant 100 kilometre National Grid square or Irish Grid square (see page 46); the standard six-figure map reference follows.

Associated Flow Measurement Station

For monitoring sites in Great Britain, the reference number, name, catchment area and grid reference of the gauging station whose flow record is used to determine the discharge data stored on the Harmonised Monitoring Archive. At most sites the flow corresponding to the time the quality sample was taken is archived; at other locations the corresponding daily mean flow is utilised. Where the gauging station and water quality monitoring site are not coincident some method of flow adjustment may have been employed to allow for the differing catchment areas.

For the Northern Ireland monitoring sites, reference details of the co-located gauging stations are given; the flow data for these stations are held on the Surface Water Archive at Wallingford.

1989 flow data for all but one of the relevant gauging stations may be found in the River Flow Data section. The shortness of the flow record for the Fleet Weir gauging station on the River Aire precludes its incorporation in the River Flow Data section; summary river flow data for 1989 are, however, included at the head of the water quality listing.

Determinands

Inadequate or unrepresentative sampling frequencies, or the presence of a substantial number of samples with concentrations recorded at or below the limit of detection, will normally result in the omission of a particular determinand.

Notes:

i. Conductivity results are standardised to 20°C.

ii. The biochemical oxygen demand data normally relate to the inhibited analytical results – BOD(atu).

iii. Nitrate concentrations are normally derived by subtracting the nitrite concentration from the reported Total Oxidised Nitrogen (TON) concentration; if the nitrite determination is below the limit of detection, nitrate is recorded as equivalent to TON.

Units

The standard units used to record and report each determinand. The number of significant figures given for each determinand corresponds to the way the data are stored on the Harmonised Monitoring or DOE (NI) Archives and reflects the uncertainty associated with the relevant analytical procedures.

1989 Data

Samples

The number of samples taken for each determinand during 1989. Where a proportion of analytical results were below the limit of detection, the number of samples in this category is given in parentheses. Normally determinands are not featured when the number of samples in the year is less than nine. Exclusion may also result from a very uneven sampling pattern through the year.

Mean

The average* of all the sample values for each determinand in 1989. Where concentrations below the limit of detection are held on the Harmonised Monitoring Archive, the threshold value itself is used to compute the mean.

Maximum / Date

The maximum determinand value recorded during 1989 together with its date of occurrence. Where the maximum value recurs the date refers to the initial occurrence.

Minimum / Date

The minimum determinand value together with its date of occurrence. Where the minimum value recurs the date refers to the initial occurrence. A '<' symbol indicates a value below the limit of detection.

Period of Record Data

For half of the featured sites, the pre-1989 summary statistics are presented for the fourteen-year period beginning in 1974; where individual stations were not incorporated into the Harmonised Monitoring network until after 1974, the appropriate first year of data is given. For certain stations the sampling frequency varies significantly from year to year and data for a few determinands may not extend over the full period of record; in particular the first year of data will normally be incomplete.

Where the pre-1989 data series includes values below the limit of detection, the threshold value has been used in the computation of the summary statistics.

For a number of the featured monitoring stations, a considerable amount of pre-1974 data, at least for certain determinands, may be stored on local, or regional, archives maintained by the measuring authorities. Also, for the period 1974–88, such archives may hold analytical results for substantially more samples than are represented on the Harmonised Monitoring Archive. Hence full equivalence between statistical summaries derived from national and regional databases cannot be expected for all monitoring sites.

Mean

The average* value of all the sample values for each determinand.

Percentiles

The 5, 50 and 95 percentile values for each determinand based on all the samples taken over the pre-1989 period.

Quarterly Averages

The mean quarterly average* for each of the three-monthly periods: January to March, April to June, July to September and October to December.

* In all cases this refers to the temporal mean rather than the flow-weighted average.

Mersey at Flixton 1989

Harmonised monitoring station number : 01 001
Measuring authority : NRA-NW NGR : 33 (SJ) 742 938

Flow measurement station : 069007 - Ashton Weir
C.A.(km²) : 660.0 NGR : 33 (SJ) 772 936

		1989						Period of record: 1975 - 1988							
Determinand	Units	Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	48	11.8	22.5	19/07	5.0	27/12	10.8	3.0	10.0	19.7	5.6	12.5	16.4	8.8
pH	pH units	49	7.4	7.7	19/07	7.1	04/01	7.3	6.9	7.3	7.6	7.3	7.3	7.3	7.3
Conductivity	μS/cm	49	449	663	04/10	250	12/04	497	284	480	760	470	514	530	463
Suspended solids	mg/l	48	20.6	108.0	26/07	2.0	05/04	38.1	10.0	21.0	114.6	47.9	32.6	28.9	43.7
Dissolved oxygen	mg/l O	48	6.81	11.17	27/12	2.65	30/08	8.1	5.0	8.1	11.3	10.1	7.3	6.3	8.7
BOD (inhibited)	mg/l O	47	5.9	17.0	28/06	2.4	04/10	6.5	3.2	5.6	13.0	6.8	6.8	5.6	6.9
Ammoniacal nitrogen	mg/l N	45	1.586	4.300	24/05	0.180	30/03	2.09	0.43	1.90	4.42	2.13	2.50	1.96	1.68
Nitrite	mg/l N	45	0.321	1.100	24/05	0.040	30/03	0.27	0.05	0.20	0.69	0.09	0.32	0.47	0.17
Nitrate	mg/l N	45	4.74	7.30	13/09	1.78	30/03	3.9	2.0	3.6	6.6	2.9	4.2	4.9	3.5
Chloride	mg/l Cl	45	41.5	80.0	13/12	21.0	12/04	54.1	28.0	52.0	87.7	58.9	53.1	54.6	48.2
Total alkalinity	mg/l $CaCO_3$	37	93.2	147.0	21/06	47.0	27/12	94.3	54.4	95.0	140.0	86.6	101.4	99.0	88.3
Orthophosphate	mg/l P	45	1.753	3.400	04/10	0.300	30/03	1.12	0.18	0.98	2.55	0.64	1.28	1.61	0.90
Silica	mg/l SiO_2	40	8.12	10.14	04/10	2.30	17/05	7.92	5.30	8.10	10.22	7.70	6.96	8.80	8.41
Calcium	mg/l Ca	47	32.6	40.0	10/05	23.0	27/12	32.6	23.7	33.0	39.3	32.6	32.5	33.1	31.6
Magnesium	mg/l Mg	47	7.3	9.1	04/10	4.6	28/06	7.0	4.7	7.0	9.2	6.7	7.1	7.3	6.7

Ribble at Samlesbury 1989

Harmonised monitoring station number : 01 008
Measuring authority : NRA-NW NGR : 34 (SD) 590 305

Flow measurement station : 071001 - Samlesbury
C.A.(km²) : 1145.0 NGR : 34 (SD) 589 304

		1989						Period of record: 1974 - 1988							
Determinand	Units	Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	64	10.9	21.5	20/07	2.0	30/11	9.4	1.0	9.8	17.0	3.9	11.6	15.0	7.7
pH	pH units	62	8.0	9.3	20/07	7.3	13/02	7.7	7.0	7.7	8.6	7.5	7.9	7.9	7.6
Conductivity	μS/cm	62	425	658	22/06	238	18/12	418	234	410	640	418	454	434	363
Suspended solids	mg/l	60	12.2	126.0	30/10	2.0	07/09	19.7	3.0	9.0	68.5	20.4	15.3	17.3	26.7
Dissolved oxygen	mg/l O	62	9.26	11.60	29/11	5.50	10/08	10.3	7.7	10.3	12.9	11.8	9.9	8.9	10.8
BOD (inhibited)	mg/l O	62	2.6	6.9	30/10	1.0	16/03	2.9	1.1	2.5	6.4	2.8	3.3	2.7	2.9
Ammoniacal nitrogen	mg/l N	60 (4)	0.252	1.600	29/11	<0.010	27/04	0.27	0.05	0.15	0.85	0.53	0.18	0.14	0.23
Nitrite	mg/l N	60 (1)	0.104	0.400	31/08	<0.010	23/11	0.08	0.02	0.06	0.20	0.06	0.12	0.09	0.06
Nitrate	mg/l N	60	4.61	15.20	12/06	1.07	13/04	4.1	1.3	3.5	9.7	3.4	5.3	4.7	3.0
Chloride	mg/l Cl	60	33.8	94.0	06/04	18.0	02/11	33.3	14.0	30.0	58.7	39.3	36.0	32.6	25.6
Total alkalinity	mg/l $CaCO_3$	60	122.8	164.0	30/11	42.0	30/10	113.8	65.0	117.0	151.7	108.5	120.3	117.6	107.6
Orthophosphate	mg/l P	60	0.876	2.800	22/06	0.060	18/12	0.40	0.10	0.30	1.05	0.24	0.50	0.54	0.26
Silica	mg/l SiO_2	56 (8)	3.08	12.00	27/04	0.03	08/05	3.26	0.20	3.60	5.80	4.26	1.88	2.75	4.65
Calcium	mg/l Ca	62	48.1	62.6	05/01	33.8	18/12	51.0	34.0	52.0	65.0	51.1	52.8	51.4	50.1
Magnesium	mg/l Mg	61	5.1	7.1	08/06	2.6	18/12	5.2	2.7	5.0	7.9	5.0	5.7	5.3	4.7
Potassium	mg/l K	61	4.9	12.0	16/02	2.2	16/03	3.8	2.0	3.6	6.6	3.4	4.4	4.3	3.3
Sodium	mg/l Na	60	35.5	78.0	22/06	8.8	30/10	29.7	9.5	25.0	64.3	29.6	35.3	33.2	20.6

Eden at Temple Sowerby 1989

Harmonised monitoring station number : 01 017
Measuring authority : NRA-NW NGR : 35 (NY) 604 281

Flow measurement station : 076005 - Temple Sowerby
C.A.(km²) : 616.4 NGR : 35 (NY) 605 283

		1989						Period of record: 1975 - 1988							
Determinand	Units	Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	13	11.1	19.0	13/07	3.5	13/12	10.1	2.6	9.5	18.5	4.4	12.1	15.7	7.6
pH	pH units	13	8.4	9.2	13/07	7.8	12/01	8.0	7.4	8.0	8.7	7.9	8.2	8.2	7.9
Conductivity	μS/cm	13	404	498	13/07	261	18/10	362	225	378	474	331	361	379	346
Suspended solids	mg/l	12 (1)	8.8	44.0	09/03	<1.0	13/07	7.8	1.0	4.0	21.6	7.0	7.8	5.1	10.0
Dissolved oxygen	mg/l O	13	11.55	14.70	15/06	10.10	09/03	11.2	8.8	11.1	13.8	12.4	11.5	10.6	11.0
BOD (inhibited)	mg/l O	13	1.6	2.6	15/06	0.9	13/12	1.8	0.8	1.7	3.3	1.7	1.9	2.1	1.7
Ammoniacal nitrogen	mg/l N	12 (2)	0.054	0.100	13/12	<0.010	18/05	0.07	0.01	0.04	0.20	0.07	0.05	0.06	0.06
Nitrite	mg/l N	12	0.029	0.100	15/06	0.010	16/11	0.03	0.01	0.02	0.06	0.02	0.03	0.02	0.02
Nitrate	mg/l N	12	1.39	2.30	16/11	0.56	13/07	1.3	0.1	1.2	2.8	1.9	1.4	1.0	1.5
Chloride	mg/l Cl	12	19.7	28.0	13/07	14.0	18/10	19.4	10.0	18.0	30.5	19.9	20.2	21.7	15.8
Total alkalinity	mg/l $CaCO_3$	12	150.6	190.0	15/06	21.0	09/02	149.0	85.3	157.0	191.8	145.1	155.1	148.7	150.9
Orthophosphate	mg/l P	12	0.126	0.300	13/12	0.020	09/03	0.15	0.02	0.11	0.42	0.09	0.19	0.21	0.10
Silica	mg/l SiO_2	12	2.82	4.00	09/02	0.18	18/05	2.39	0.38	2.47	4.35	3.10	1.41	2.16	3.03
Calcium	mg/l Ca	12	60.8	69.8	13/12	38.3	18/10	57.1	33.7	58.0	76.9	56.5	57.4	58.3	56.3
Magnesium	mg/l Mg	12	9.9	14.9	15/06	4.8	18/10	9.1	4.1	8.8	14.7	8.4	10.4	10.3	7.8
Potassium	mg/l K	12	3.3	4.9	10/08	1.9	18/10	2.8	1.6	2.5	5.0	2.2	3.0	3.5	2.4
Sodium	mg/l Na	12	11.7	19.6	13/07	6.5	09/03	10.0	5.0	9.0	16.6	9.6	10.7	11.3	7.7

South Tyne at Warden Bridge 1989

Harmonised monitoring station number : 02 021
Measuring authority : NRA-N NGR : 35 (NY) 910 660

Flow measurement station : 023004 - Haydon Bridge
C.A.(km²) : 751.1 NGR : 35 (NY) 856 647

		1989						Period of record: 1975 - 1988							
Determinand	Units	Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	10	10.0	19.5	08/08	0.6	04/12	9.2	2.0	8.2	19.0	3.7	11.1	15.1	6.5
pH	pH units	10	7.9	8.5	16/05	7.0	02/11	7.8	7.3	7.8	8.5	7.7	8.0	7.9	7.7
Conductivity	μS/cm	10	252	416	08/08	120	30/10	256	130	247	410	263	266	273	210
Suspended solids	mg/l	10 (2)	20.7	184.0	30/10	<1.0	08/08	10.2	1.0	4.0	21.3	9.1	12.7	12.0	6.7
Dissolved oxygen	mg/l O	10	11.35	13.90	04/12	8.70	08/08	11.3	9.0	11.3	13.7	12.3	10.9	10.0	11.5
BOD (inhibited)	mg/l O	10	2.2	3.4	30/10	1.4	13/03	1.6	0.5	1.5	3.1	1.5	1.9	1.8	1.5
Ammoniacal nitrogen	mg/l N	10 (7)	0.076	0.500	04/12	<0.010	11/01	0.07	0.01	0.03	0.17	0.07	0.04	0.11	0.04
Nitrite	mg/l N	10 (8)	0.010	0.010	04/12	<0.010	11/01	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.01
Nitrate	mg/l N	10 (1)	0.47	1.60	15/02	<0.01	08/08	0.6	0.1	0.5	1.4	1.0	0.6	0.3	0.6
Chloride	mg/l Cl	10	13.7	24.2	27/06	7.0	02/11	13.3	7.6	13.0	20.0	16.1	13.2	11.6	11.6

Tees at Broken Scar 1989

Harmonised monitoring station number : 02 058
Measuring authority : NRA-N NGR : 45 (NZ) 265 131

Flow measurement station : 025001 - Broken Scar
C.A.(km²) : 818.4 NGR : 45 (NZ) 259 137

Determinand	Units	1989						Period of record: 1975 - 1988							
		Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	9	9.1	17.0	23/08	3.0	12/12	9.2	1.1	8.0	18.9	3.4	11.9	15.3	6.1
pH	pH units	11	7.5	8.3	09/05	7.0	14/02	7.7	6.9	7.7	8.2	7.6	7.7	7.6	7.5
Conductivity	µS/cm	11	158	257	10/10	75	12/12	197	120	185	298	231	209	170	176
Suspended solids	mg/l	11 (1)	34.4	212.0	11/07	<1.0	12/12	12.0	1.0	6.0	49.0	15.2	7.0	10.7	18.8
Dissolved oxygen	mg/l O	11	10.34	12.70	12/12	7.10	10/10	11.0	8.3	11.0	13.4	12.6	10.5	9.3	11.6
BOD (inhibited)	mg/l O	11	2.1	2.8	14/02	1.3	23/08	1.8	0.8	1.7	3.2	1.9	1.8	1.8	1.7
Ammoniacal nitrogen	mg/l N	11 (5)	0.109	0.300	12/09	<0.010	10/01	0.12	0.01	0.06	0.31	0.13	0.10	0.08	0.14
Nitrite	mg/l N	11 (8)	0.015	0.030	12/12	<0.010	10/01	0.02	0.01	0.02	0.04	0.02	0.02	0.02	0.02
Nitrate	mg/l N	11	1.47	6.30	16/11	0.06	12/12	1.3	0.3	1.0	3.0	1.9	1.3	0.7	1.4
Chloride	mg/l Cl	11	16.0	78.0	16/11	7.0	15/03	14.6	6.0	14.0	25.1	19.4	14.4	11.5	15.1
Total alkalinity	mg/l $CaCO_3$	11	53.9	126.0	09/05	24.0	14/02	62.8	34.9	60.0	94.1	64.4	69.3	60.2	59.5
Orthophosphate	mg/l P	10 (4)	0.021	0.038	10/10	<0.010	15/03	0.05	0.01	0.03	0.14	0.04	0.04	0.07	0.05

Trent at Nottingham 1989

Harmonised monitoring station number : 03 007
Measuring authority : NRA-ST NGR 43 (SK) 581 383

Flow measurement station : 028009 - Colwick
C.A.(km²) : 7486.0 NGR : 43 (SK) 620 399

Determinand	Units	1989						Period of record: 1974 - 1988							
		Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	25	12.6	23.0	24/05	6.0	18/03	13.2	6.0	13.0	21.8	7.8	15.3	19.1	11.3
pH	pH units	25	7.9	8.5	18/07	7.6	11/11	7.7	7.3	7.7	8.2	7.6	7.8	7.8	7.6
Conductivity	µS/cm	25	885	1140	11/12	520	11/04	886	607	898	1130	800	904	957	875
Suspended solids	mg/l	26 (1)	28.0	165.0	15/12	<2.0	11/12	25.5	7.4	17.0	75.2	29.6	21.6	20.3	29.1
Dissolved oxygen	mg/l O	24	10.33	12.40	22/05	8.10	17/06	9.7	7.6	9.8	11.7	10.7	9.5	8.8	9.8
BOD (inhibited)	mg/l O	25	4.1	10.0	15/12	2.5	11/12	3.5	1.7	3.4	5.9	3.2	3.8	3.7	3.2
Dissolved organic carbon	mg/l O	24	7.2	9.5	11/11	5.4	07/03	8.5	4.4	6.2	18.9	7.2	8.6	9.2	8.5
Ammoniacal nitrogen	mg/l N	25	0.361	1.500	03/04	0.040	18/07	0.39	0.01	0.30	0.99	0.67	0.29	0.23	0.37
Nitrate	mg/l N	25	8.99	11.50	11/12	5.90	11/04	8.5	6.1	8.5	11.1	8.4	8.7	8.3	8.5
Chloride	mg/l Cl	26	104.0	150.0	19/10	41.0	11/04	98.1	54.5	97.0	146.5	84.9	97.3	115.0	93.7
Total alkalinity	mg/l $CaCO_3$	25	166.0	333.0	30/06	107.0	15/12	159.7	120.0	164.0	188.0	156.8	163.3	162.1	155.5
Orthophosphate	mg/l P	12	1.838	3.300	30/06	0.700	11/04	1.49	0.51	1.46	2.70	0.92	1.55	2.00	1.47
Silica	mg/l SiO_2	12	7.22	12.00	11/12	0.80	22/05	6.98	2.66	7.30	11.08	8.40	4.59	6.55	7.64
Sulphate	mg/l SO_4	14	166.1	220.0	19/10	115.0	03/04	168.4	107.4	166.0	227.9	53.7	74.3	71.7	62.6
Calcium	mg/l Ca	13	96.2	110.0	11/12	78.0	03/04	97.1	70.4	100.0	115.4	95.2	111.4	89.4	92.4
Magnesium	mg/l Mg	13	23.3	27.5	17/06	17.0	11/11	21.0	13.8	21.2	28.0	21.1	21.8	20.3	18.9
Potassium	mg/l K	12	12.4	19.5	18/09	6.7	18/03	9.5	6.5	9.2	14.0	7.4	9.4	11.2	9.8
Sodium	mg/l Na	12	83.3	135.0	19/10	40.0	18/03	70.0	32.7	69.0	115.2	56.3	69.0	81.9	67.3

Derwent at Wilne 1989

Harmonised monitoring station number : 03 011
Measuring authority : NRA-ST NGR : 43 (SK) 452 315

Flow measurement station : 028067 - Church Wilne
C.A.(km²) : 1177.5 NGR : 43 (SK) 438 316

Determinand	Units	1989						Period of record: 1975 - 1988							
		Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	35	13.4	23.0	25/07	4.0	19/12	11.9	3.5	11.0	21.0	6.2	14.0	17.7	9.4
pH	pH units	35	8.0	9.0	03/05	7.7	20/12	7.8	7.4	7.8	8.2	7.7	7.9	7.9	7.7
Conductivity	µS/cm	35	699	970	12/10	330	11/04	657	425	645	948	551	670	771	640
Suspended solids	mg/l	35 (6)	8.7	51.0	11/04	<2.0	03/05	16.3	4.0	9.0	54.9	23.8	10.3	11.4	19.6
Dissolved oxygen	mg/l O	35	9.72	13.60	03/05	4.70	25/07	10.1	7.2	10.2	12.8	11.7	10.0	8.6	10.3
BOD (inhibited)	mg/l O	33	2.8	4.1	22/06	1.7	08/03	2.5	1.0	2.4	4.2	2.3	2.5	2.6	2.6
Dissolved organic carbon	mg/l O	35	5.2	7.2	20/12	2.8	07/03	4.9	2.1	4.1	11.4	3.9	4.9	5.9	5.1
Ammoniacal nitrogen	mg/l N	35 (1)	0.278	0.700	16/02	<0.040	01/06	0.31	0.05	0.25	0.74	0.39	0.30	0.23	0.34
Nitrate	mg/l N	35	5.02	11.90	13/09	3.10	11/04	4.3	3.0	4.3	5.4	4.2	4.2	4.3	4.2
Chloride	mg/l Cl	35	72.2	110.0	08/12	22.0	11/04	66.8	33.8	62.5	114.0	55.0	66.3	84.5	62.8
Total alkalinity	mg/l $CaCO_3$	24	172.4	442.0	21/09	93.0	11/04	154.6	108.1	160.0	190.0	137.4	161.2	169.8	149.7
Orthophosphate	mg/l P	13	0.840	1.500	29/06	0.280	11/04	0.87	0.21	0.82	1.86	0.48	0.88	1.27	0.80
Silica	mg/l SiO_2	12	4.82	8.10	15/11	0.42	15/05	5.15	0.65	5.51	8.65	5.79	3.94	4.36	6.45
Sulphate	mg/l SO_4	12	110.7	175.0	12/10	62.0	08/03	102.7	59.2	97.3	170.0	79.3	9.8	24.8	92.6
Calcium	mg/l Ca	12	73.7	80.0	12/10	61.0	21/02	72.7	54.6	75.0	87.1	67.6	76.7	78.0	67.6
Magnesium	mg/l Mg	12	19.9	32.0	12/10	9.8	08/03	15.5	8.4	15.2	23.0	13.1	17.0	18.3	13.3
Potassium	mg/l K	12	5.9	9.0	12/10	3.4	08/03	5.1	3.0	5.0	6.7	4.6	5.1	5.8	4.8
Sodium	mg/l Na	12	57.8	100.0	12/10	30.0	08/03	46.9	20.1	44.8	76.6	34.2	51.5	63.3	40.3

Teme at Powick 1989

Harmonised monitoring station number : 03 029
Measuring authority : NRA-ST NGR : 32 (SO) 836 525

Flow measurement station : 054029 - Knightsford Br.
C.A.(km²) : 1480.0 NGR : 32 (SO) 735 557

Determinand	Units	1989						Period of record: 1975 - 1988							
		Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	29	10.6	21.0	19/07	3.0	10/10	10.4	2.0	10.0	19.5	5.0	12.6	16.5	7.7
pH	pH units	30	8.1	8.6	19/07	7.7	01/03	8.0	7.4	8.0	8.5	7.8	8.1	8.2	7.8
Conductivity	µS/cm	30	427	530	19/10	299	01/03	411	270	410	520	365	421	441	412
Suspended solids	mg/l	30 (1)	22.0	197.0	10/04	<2.0	17/11	41.2	3.0	13.0	206.0	73.2	39.1	13.7	48.6
Dissolved oxygen	mg/l O	30	10.60	13.40	06/01	6.20	16/11	11.0	8.8	11.0	13.3	12.2	10.7	9.8	11.2
BOD (inhibited)	mg/l O	30 (4)	1.6	4.5	14/12	<0.5	19/04	2.0	0.7	1.6	4.5	1.8	2.2	1.9	1.8
Dissolved organic carbon	mg/l O	25	3.7	9.6	15/06	1.8	27/11	5.1	2.0	3.7	15.6	4.9	5.4	5.2	5.6
Ammoniacal nitrogen	mg/l N	30 (7)	0.102	0.400	29/09	0.020	18/05	0.08	0.01	0.05	0.23	0.10	0.08	0.06	0.07
Nitrate	mg/l N	30	4.31	8.30	14/12	2.10	31/07	4.2	2.2	4.1	6.3	5.3	4.4	3.4	4.1
Chloride	mg/l Cl	30	27.3	68.0	29/09	19.0	10/04	22.5	15.0	22.0	30.0	22.4	21.5	23.9	21.9
Total alkalinity	mg/l $CaCO_3$	29	154.9	204.0	31/07	82.0	16/11	137.8	77.0	140.0	186.2	117.3	147.7	163.8	125.0
Orthophosphate	mg/l P	14	0.215	0.300	10/04	0.080	13/03	0.18	0.03	0.13	0.40	0.12	0.13	0.23	0.27
Silica	mg/l SiO_2	13	5.23	8.80	27/11	0.20	05/05	5.18	0.52	5.61	8.63	6.15	4.34	4.81	7.01
Sulphate	mg/l SO_4	13	41.3	87.0	05/06	21.0	01/03	37.5	23.0	36.0	57.0	35.9	36.5	40.7	35.2
Calcium	mg/l Ca	13	68.5	91.0	31/07	45.0	01/03	58.3	37.2	59.0	74.0	52.6	61.8	66.5	53.0
Magnesium	mg/l Mg	13	12.1	17.1	05/06	6.8	01/03	10.4	5.0	9.8	17.9	8.4	10.4	11.6	9.4
Potassium	mg/l K	13	3.5	5.8	29/09	1.5	10/04	3.1	1.5	3.0	5.0	2.6	3.0	3.9	3.3
Sodium	mg/l Na	13	16.7	23.5	10/10	8.0	10/04	14.2	9.5	13.9	19.0	12.3	14.6	16.3	13.2

Avon at Evesham Road Bridge — 1989

Harmonised monitoring station number : 03 416
Measuring authority : NRA-ST NGR : 42 (SP) 034 431

Flow measurement station : 054002 - Evesham
C.A.(km²) : 2210.0 NGR : 42 (SP) 040 438

Determinand	Units	1989 Samples	Mean	Max.	Date	Min.	Date	Period of record: 1977 - 1988 Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	34	11.5	21.0	18/07	4.0	04/12	11.1	3.0	11.0	20.0	4.9	13.0	16.9	8.8
pH	pH units	32	7.9	8.6	18/05	7.6	20/12	8.0	7.6	7.9	8.7	7.9	8.2	8.0	7.8
Conductivity	μS/cm	32	970	1210	31/07	600	20/12	919	607	933	1157	827	894	1023	936
Suspended solids	mg/l	32	22.5	78.0	10/11	6.0	04/12	28.7	6.3	18.0	90.5	44.8	28.7	17.8	23.3
Dissolved oxygen	mg/l O	34	10.55	12.90	24/11	7.20	07/07	10.5	7.8	10.4	13.2	11.8	10.6	9.0	10.6
BOD (inhibited)	mg/l O	31	2.9	8.0	18/05	1.0	09/10	3.2	1.3	2.8	7.3	2.8	4.5	3.1	2.4
Dissolved organic carbon	mg/l O	26	7.6	10.8	20/12	4.3	04/05	9.2	5.2	7.3	19.9	9.3	9.6	9.5	9.4
Ammoniacal nitrogen	mg/l N	32 (1)	0.230	0.900	30/01	0.010	05/06	0.27	0.01	0.19	0.77	0.51	0.16	0.13	0.28
Nitrate	mg/l N	32	10.93	16.50	15/11	7.10	04/07	10.3	7.4	10.2	13.5	11.1	9.6	9.8	10.8
Chloride	mg/l Cl	32	88.0	138.0	31/07	43.0	10/04	73.2	37.4	72.0	106.0	64.5	64.9	86.7	76.1
Total alkalinity	mg/l $CaCO_3$	29	201.3	248.0	24/11	120.0	20/12	197.2	150.0	200.0	231.1	192.0	200.7	198.3	197.2
Orthophosphate	mg/l P	14	1.809	3.700	28/06	0.290	10/04	1.72	0.49	1.50	3.60	0.99	1.39	2.41	2.00
Silica	mg/l SiO_2	14	11.62	15.00	09/10	6.30	04/05	10.21	3.61	10.75	15.48	9.49	6.61	10.91	12.91
Sulphate	mg/l SO_4	14	182.5	265.0	05/06	91.0	20/12	191.0	95.1	195.0	267.3	66.0	93.3	15.4	97.8
Calcium	mg/l Ca	15	126.1	156.0	31/07	90.0	20/12	119.8	85.7	125.0	140.0	118.3	116.0	123.0	123.1
Magnesium	mg/l Mg	15	32.1	72.0	09/10	15.6	20/12	26.9	15.0	27.0	37.0	24.2	28.1	30.0	27.2
Potassium	mg/l K	14	9.9	15.5	09/10	1.5	10/04	9.5	5.9	9.0	14.5	7.1	8.9	11.8	10.4
Sodium	mg/l Na	14	58.4	106.0	31/07	22.0	20/12	53.3	19.9	51.0	92.0	39.9	51.5	67.5	58.8

Aire at Fleet Weir — 1989

Harmonised monitoring station number : 04 005
Measuring authority : NRA-Y NGR : 44 (SE) 381 285

Flow measurement station : 027080 - Fleet Weir
C.A.(km²) : 865.0 NGR : 44 (SE) 381 295

Determinand	Units	1989 Samples	Mean	Max.	Date	Min.	Date	Period of record: 1975 - 1988 Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Flow	m^3s^{-1}	365	13.50	93.24	24/03	3.787	09/10								
Temperature	°C	39	14.2	21.0	21/07	7.7	15/12	12.4	4.6	12.0	21.0	6.9	14.4	17.7	10.3
pH	pH units	44	7.6	8.0	20/02	6.9	27/07	7.5	7.2	7.5	7.8	7.5	7.4	7.4	7.5
Conductivity	μS/cm	44	737	1160	06/10	353	12/04	676	387	650	1103	671	688	760	613
Suspended solids	mg/l	45 (1)	17.8	69.0	12/04	<1.0	02/02	26.9	8.0	17.0	85.0	31.8	27.2	17.2	32.9
Dissolved oxygen	mg/l O	42 (1)	6.02	13.13	15/12	<0.50	08/08	7.7	2.7	7.9	11.5	10.3	6.7	5.4	8.4
BOD (inhibited)	mg/l O	43	7.7	16.8	10/11	2.8	28/12	7.9	3.9	7.3	14.4	8.0	8.5	7.3	7.8
Ammoniacal nitrogen	mg/l N	44 (3)	1.850	6.500	05/12	<0.040	06/04	2.20	0.46	1.74	5.43	2.19	2.44	2.72	1.91
Nitrite	mg/l N	44 (3)	0.290	1.300	08/08	<0.010	06/10	0.36	0.07	0.29	0.90	0.16	0.44	0.57	0.27
Nitrate	mg/l N	44	5.62	11.40	27/07	1.06	22/11	4.9	2.6	4.7	7.7	4.2	5.2	5.7	4.6
Chloride	mg/l Cl	44	77.3	135.0	06/10	31.8	27/07	81.2	34.6	74.0	157.7	84.9	84.0	91.4	70.2
Total alkalinity	mg/l $CaCO_3$	26	138.5	212.0	27/07	82.0	28/12	121.5	75.0	124.0	159.0	113.7	121.2	130.9	116.3
Orthophosphate	mg/l P	44 (2)	1.849	5.500	25/08	<0.100	28/04	1.41	0.17	1.13	3.46	0.84	1.48	1.97	1.04
Silica	mg/l SiO_2	17	9.39	16.20	06/10	6.28	03/03	7.69	5.01	7.68	10.29	7.81	6.45	8.29	7.92
Sulphate	mg/l SO_4	19	100.3	159.0	06/10	43.0	06/04	111.7	49.3	104.0	200.0	97.6	23.8	28.5	0.3
Calcium	mg/l Ca	37	61.1	77.7	25/08	46.0	06/04	60.4	45.6	60.6	75.9	60.4	61.4	60.8	60.8
Magnesium	mg/l Mg	37	11.6	19.1	04/05	5.9	03/03	13.2	5.4	12.6	20.9	13.1	13.9	15.0	11.3

Derwent at Loftsome Bridge — 1989

Harmonised monitoring station number : 04 014
Measuring authority : NRA-Y NGR : 44 (SE) 707 302

Flow measurement station : 027041 - Buttercrambe
C.A.(km²) : 1586.0 NGR : 44 (SE) 731 587

Determinand	Units	1989 Samples	Mean	Max.	Date	Min.	Date	Period of record: 1975 - 1988 Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	17	12.3	20.0	21/07	4.0	03/03	10.6	3.0	10.0	19.6	5.0	12.5	16.7	7.9
pH	pH units	19	8.0	8.7	21/07	7.4	21/11	7.9	7.5	7.9	8.3	7.8	8.0	7.9	7.8
Conductivity	μS/cm	18	590	678	12/09	503	16/03	513	361	525	605	515	504	518	514
Suspended solids	mg/l	19	8.5	27.0	04/01	4.0	14/08	24.9	3.5	13.4	90.0	38.2	20.6	11.5	32.7
Dissolved oxygen	mg/l O	17	9.68	12.85	03/03	7.43	06/10	10.7	8.8	10.8	12.6	11.8	10.8	9.5	10.7
BOD (inhibited)	mg/l O	19	1.6	3.1	21/07	0.8	03/03	1.6	0.7	1.5	2.9	1.9	1.8	1.3	1.6
Ammoniacal nitrogen	mg/l N	19 (4)	0.101	0.300	21/11	<0.040	06/06	0.11	0.01	0.09	0.25	0.14	0.09	0.09	0.11
Nitrite	mg/l N	18 (1)	0.039	0.100	31/10	<0.010	05/09	0.04	0.02	0.04	0.08	0.04	0.05	0.05	0.05
Nitrate	mg/l N	18	3.58	6.20	04/01	1.24	08/11	4.4	2.6	4.1	7.0	5.4	4.7	3.4	4.3
Chloride	mg/l Cl	19	32.8	39.0	06/10	23.0	21/11	30.4	22.0	30.0	40.6	34.2	29.6	29.6	31.5
Total alkalinity	mg/l $CaCO_3$	18	153.1	171.0	06/06	124.0	08/11	147.9	104.4	153.0	174.0	146.0	153.1	149.9	144.5
Orthophosphate	mg/l P	18 (4)	0.164	0.300	06/10	<0.030	16/03	0.10	0.01	0.09	0.21	0.07	0.08	0.13	0.10
Silica	mg/l SiO_2	17 (2)	6.01	10.90	06/10	<0.10	21/07	6.54	3.60	6.64	9.19	7.34	5.81	6.61	7.01
Sulphate	mg/l SO_4	18	87.1	158.0	06/10	27.3	31/10	78.0	48.4	79.9	97.0	79.8	75.1	78.3	79.8
Calcium	mg/l Ca	16	98.0	111.0	12/09	76.5	05/07	92.1	65.8	91.2	103.0	101.0	90.4	86.1	88.8
Magnesium	mg/l Mg	16	9.8	11.2	12/09	7.7	02/02	10.1	4.6	8.8	19.5	12.4	9.7	8.0	9.5

Nene at Wansford — 1989

Harmonised monitoring station number : 05 511
Measuring authority : NRA-A NGR : 52 (TL) 082 996

Flow measurement station : 032001 - Orton
C.A.(km²) : 1634.3 NGR : 52 (TL) 166 972

Determinand	Units	1989 Samples	Mean	Max.	Date	Min.	Date	Period of record: 1974 - 1988 Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	35	12.9	23.9	24/07	2.5	14/12	11.4	3.0	11.0	21.0	5.2	13.9	17.8	8.2
pH	pH units	36	8.1	8.9	15/05	7.5	25/10	8.1	7.7	8.0	8.8	7.9	8.3	8.2	7.9
Conductivity	μS/cm	23	1009	1280	04/12	808	27/04	931	718	922	1200	907	919	974	965
Suspended solids	mg/l	16	12.0	26.0	18/04	2.5	06/09	21.8	4.0	13.6	67.6	29.4	22.9	14.7	20.2
Dissolved oxygen	mg/l O	36	9.88	13.00	09/05	7.90	01/08	10.6	8.0	10.7	13.1	12.0	10.8	9.3	10.9
BOD (inhibited)	mg/l O	35	2.7	8.8	23/05	1.0	11/09	3.7	1.3	3.0	8.9	3.2	6.0	3.4	2.6
Ammoniacal nitrogen	mg/l N	35 (6)	0.211	0.700	09/10	<0.030	23/05	0.36	0.05	0.19	1.19	0.73	0.18	0.12	0.56
Nitrite	mg/l N	12	0.094	0.300	10/07	0.030	07/08	0.11	0.03	0.10	0.20	0.09	0.12	0.08	0.13
Nitrate	mg/l N	36	8.84	15.70	27/12	4.80	01/08	9.8	5.5	9.3	15.3	12.1	9.3	6.9	10.2
Chloride	mg/l Cl	36	80.1	121.0	25/10	43.2	27/04	72.8	41.0	71.0	109.2	64.6	68.7	82.8	75.0
Total alkalinity	mg/l $CaCO_3$	16	212.5	235.0	11/12	154.0	13/11	208.2	170.0	210.0	235.0	206.9	206.8	209.1	206.7
Silica	mg/l SiO_2	16 (1)	7.94	41.60	15/05	<0.20	09/05	5.58	0.14	6.06	9.21	6.95	2.65	4.47	7.89
Sulphate	mg/l SO_4	15	179.6	215.0	16/10	129.0	18/04	167.4	104.8	166.0	229.9	55.7	63.0	92.8	77.2
Potassium	mg/l K	10	11.3	14.0	30/10	6.3	18/04	10.6	5.3	9.7	21.0	7.8	10.6	12.8	10.9
Sodium	mg/l Na	10	65.0	81.4	31/08	32.4	18/04	52.9	22.1	47.6	100.8	41.9	49.6	62.5	57.2

Bure at Horstead Mill 1989

Harmonised monitoring station number : 05 722
Measuring authority : NRA-A NGR : 63 (TG) 267 198

Flow measurement station : 034003 - Ingworth
C.A.(km^2) : 164.7 NGR : 63 (TG) 192 296

Determinand	Units	1989 Samples	Mean	Max.	Date	Min.	Date	Period of record: 1975 - 1988 Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	31	11.5	21.0	07/08	3.4	04/12	10.8	3.0	10.0	19.2	5.6	12.3	16.7	8.2
pH	pH units	34	8.0	8.5	21/08	7.3	18/09	7.8	7.3	7.8	8.2	7.7	7.8	7.9	7.7
Conductivity	µS/cm	25	774	835	13/11	717	24/07	728	610	730	828	742	702	725	744
Suspended solids	mg/l	25 (1)	3.6	13.5	26/01	0.0	24/07	8.3	1.2	5.2	23.9	25.8	6.4	4.2	6.2
BOD (inhibited)	mg/l O	34 (5)	1.5	3.4	22/05	<1.0	10/07	1.8	0.5	1.7	3.2	1.8	2.2	1.8	1.3
Ammoniacal nitrogen	mg/l N	33 (7)	0.116	1.000	20/11	<0.020		0.15	0.01	0.10	0.51	0.25	0.10	0.09	0.14
Nitrite	mg/l N	16	0.062	0.100	22/05	0.030	21/08	0.07	0.01	0.06	0.20	0.07	0.06	0.10	0.08
Nitrate	mg/l N	33	5.47	7.50	26/01	3.30	24/07	5.9	3.5	5.8	9.0	7.7	5.9	4.6	5.9
Chloride	mg/l Cl	33	60.3	127.0	11/12	25.0	21/02	57.9	47.5	56.0	74.7	60.3	55.6	56.1	60.1
Total alkalinity	mg/l $CaCO_3$	23	207.9	252.0	11/12	180.0	07/02	220.7	177.6	218.0	258.8	223.6	208.2	219.9	240.7
Silica	mg/l SiO_2	20	7.19	11.83	23/10	1.66	24/07	8.07	3.40	8.30	13.06	8.76	5.01	6.85	10.04
Sulphate	mg/l SO_4	23	84.4	111.0	20/11	65.9	21/02	80.0	54.9	79.0	112.0	83.9	82.9	71.8	85.4
Calcium	mg/l Ca	13	117.1	132.0	20/11	106.0	24/07	118.0	90.7	117.0	143.0	119.3	117.2	114.5	121.2
Magnesium	mg/l Mg	13	8.5	11.6	21/02	6.9	24/04	7.3	4.8	7.5	9.3	7.5	7.7	7.1	7.2
Potassium	mg/l K	13	4.4	8.4	25/09	3.2	24/07	4.0	2.4	4.0	5.6	4.2	3.7	3.9	4.5
Sodium	mg/l Na	13	27.6	29.2	24/07	25.7	21/02	30.0	20.0	27.7	48.0	30.3	29.5	29.6	29.9

Stour at Langham 1989

Harmonised monitoring station number : 05 810
Measuring authority : NRA-A NGR : 62 (TM) 026 345

Flow measurement station : 036006 - Langham
C.A.(km^2) : 578.0 NGR : 62 (TM) 020 344

Determinand	Units	1989 Samples	Mean	Max.	Date	Min.	Date	Period of record: 1974 - 1988 Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	48	11.7	21.5	27/07	2.0	30/11	11.2	3.0	11.0	20.0	4.9	13.5	16.9	8.3
pH	pH units	49	8.3	9.0	03/08	7.8	07/12	8.2	7.8	8.2	8.9	8.1	8.4	8.3	8.1
Conductivity	µS/cm	30	871	1011	26/10	716	06/07	906	730	910	1100	927	879	883	946
Suspended solids	mg/l	30 (1)	11.6	122.0	21/12	<0.5	19/10	16.7	3.0	10.0	49.7	19.0	19.8	11.4	15.6
Dissolved oxygen	mg/l O	46	10.77	14.20	16/02	7.40	22/06	10.9	7.5	10.9	14.0	12.3	11.6	9.3	10.5
BOD (inhibited)	mg/l O	48	2.6	7.8	11/05	0.7	19/10	3.1	1.1	2.3	9.6	2.3	5.4	2.6	2.2
Ammoniacal nitrogen	mg/l N	49 (11)	0.088	0.600	06/04	<0.020	12/10	0.13	0.02	0.08	0.38	0.21	0.08	0.08	0.14
Nitrite	mg/l N	15 (2)	0.047	0.100	13/04	<0.004	03/08	0.08	0.02	0.07	0.16	0.08	0.09	0.04	0.09
Nitrate	mg/l N	49	6.33	15.10	28/12	0.50	07/12	8.3	2.1	7.6	16.0	12.5	7.9	4.4	8.8
Chloride	mg/l Cl	48	72.0	293.0	14/12	35.5	06/04	65.6	38.2	64.0	96.8	55.7	61.2	72.8	70.2
Total alkalinity	mg/l $CaCO_3$	21	253.0	285.0	15/05	194.0	21/12	243.3	191.5	250.0	280.0	243.8	242.4	249.4	250.3
Silica	mg/l SiO_2	19	10.57	46.10	15/05	3.70	12/06	7.47	0.20	7.95	13.00	7.51	3.40	8.39	10.27
Sulphate	mg/l SO_4	21	90.7	119.0	18/09	71.6	03/08	100.4	70.0	98.0	140.0	13.7	13.9	97.0	4.9
Calcium	mg/l Ca	11	128.8	145.0	30/03	108.0	17/07	134.2	93.0	139.0	167.5	148.3	134.9	119.7	140.3
Magnesium	mg/l Mg	11	8.3	11.8	18/09	6.2	02/02	9.9	5.0	8.4	22.0	7.8	8.9	9.7	8.9
Potassium	mg/l K	10	8.6	12.7	19/10	5.6	02/02	7.4	3.5	7.2	12.0	5.7	6.9	7.9	9.1
Sodium	mg/l Na	10	47.5	67.0	19/10	31.0	02/02	42.5	20.0	40.0	70.6	32.3	39.7	50.0	49.1

Thames at Teddington Weir 1989

Harmonised monitoring station number : 06 010
Measuring authority : NRA-T NGR : 51 (TQ) 171 714

Flow measurement station : 039001 - Kingston
C.A.(km^2) : 9948.0 NGR : 51 (TQ) 177 698

Determinand	Units	1989 Samples	Mean	Max.	Date	Min.	Date	Period of record: 1974 - 1988 Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	67	18.1	26.0	24/07	5.0	19/01	11.6	4.0	11.5	20.0	5.8	13.8	18.1	9.7
pH	pH units	70	7.7	9.0	18/05	7.1	05/10	8.1	7.6	8.0	8.8	8.0	8.3	8.0	7.8
Suspended solids	mg/l	56	9.3	62.5	05/10	1.5	20/07	22.1	5.0	14.3	76.9	29.2	22.2	13.4	24.4
Dissolved oxygen	mg/l O	69	7.97	11.75	19/01	5.30	12/09	10.2	7.1	10.2	13.2	11.3	10.8	8.6	10.0
BOD (inhibited)	mg/l O	69 (2)	2.4	7.1	16/05	<1.0	15/09	2.9	1.1	2.4	6.7	2.2	4.3	3.0	2.1
Ammoniacal nitrogen	mg/l N	70 (2)	0.422	2.300	15/08	<0.050	16/05	0.32	0.01	0.23	0.89	0.34	0.19	0.38	0.36
Nitrite	mg/l N	9	0.172	0.300	21/11	0.082	16/05	0.11	0.06	0.10	0.20	0.10	0.10	0.11	0.13
Nitrate	mg/l N	70	6.95	9.40	05/12	4.72	16/05	7.4	5.4	7.1	10.3	8.2	6.6	6.6	7.6
Chloride	mg/l Cl	70	58.1	69.0	12/10	39.0	27/04	41.2	30.0	40.0	57.0	39.7	38.4	45.0	42.4
Orthophosphate	mg/l P	62	3.330	4.600	12/10	0.910	09/03	1.30	0.39	1.08	2.72	0.78	1.06	1.99	1.41
Silica	mg/l SiO_2	32	12.91	21.50	05/09	0.30	16/05	10.49	2.90	11.50	14.60	11.03	6.77	11.16	13.23

Lee at Waterhall 1989

Harmonised monitoring station number : 06 101
Measuring authority : NRA-T NGR : 52 (TL) 299 099

Flow measurement station : 038018 - Water Hall
C.A.(km^2) : 150.0 NGR : 52 (TL) 299 099

Determinand	Units	1989 Samples	Mean	Max.	Date	Min.	Date	Period of record: 1975 - 1988 Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	24	11.9	21.5	20/08	4.0	28/02	12.0	4.5	12.0	19.9	6.9	13.6	16.7	9.3
pH	pH units	24	7.9	8.3	01/09	7.3	02/08	8.0	7.6	8.0	8.4	8.0	8.1	8.1	7.8
Conductivity	µS/cm	10	800	974	11/10	545	15/08	808	623	779	1066	885	775	784	814
Suspended solids	mg/l	11	21.0	78.0	25/04	3.0	10/12	15.1	3.0	11.0	42.7	15.9	12.3	13.6	14.9
BOD (inhibited)	mg/l O	24	2.9	5.2	15/08	1.4	04/01	2.7	1.3	2.4	4.6	2.7	3.1	2.2	2.4
Dissolved organic carbon	mg/l O	10	16.0	21.3	25/04	3.5	31/01	13.0	2.6	7.2	55.4	16.0	17.4	6.4	17.1
Ammoniacal nitrogen	mg/l N	24 (4)	0.349	3.900	07/11	<0.050	30/03	0.23	0.05	0.11	0.78	0.37	0.09	0.09	0.32
Nitrite	mg/l N	11	0.191	0.900	07/11	0.068	30/03	0.14	0.05	0.11	0.29	0.11	0.12	0.34	0.18
Nitrate	mg/l N	24	11.96	17.50	10/12	6.03	15/08	11.6	7.7	11.4	16.3	12.7	12.2	12.3	13.7
Chloride	mg/l Cl	24	88.3	132.0	24/05	54.0	15/08	69.4	44.4	67.0	105.0	86.5	65.1	75.6	74.9
Total alkalinity	mg/l $CaCO_3$	10	199.3	241.0	04/01	124.0	15/08	211.0	129.1	223.0	253.9	203.4	217.6	217.5	200.3
Orthophosphate	mg/l P	11	3.546	4.800	04/01	1.820	28/02	2.33	1.10	2.34	3.50	2.10	2.24	2.51	2.47
Sulphate	mg/l SO_4	9	77.4	104.0	11/10	52.0	15/08	79.6	54.3	77.5	112.7	77.8	79.6	77.6	81.5
Calcium	mg/l Ca	10	108.0	138.0	04/01	72.0	15/08	118.8	93.1	118.0	143.0	119.4	120.4	118.1	115.9
Magnesium	mg/l Mg	10	3.9	5.0	25/04	2.4	15/08	4.0	3.1	3.9	4.9	4.2	3.9	3.9	3.9
Potassium	mg/l K	10	10.5	15.5	11/10	7.5	28/02	8.4	5.6	8.0	14.2	7.7	7.1	8.9	9.8
Sodium	mg/l Na	10	74.2	108.2	07/11	42.1	15/08	63.9	35.0	60.7	112.4	63.9	63.5	67.4	58.7

Great Stour at Bretts Bailey Bridge 1989

Harmonised monitoring station number : 07 003
Measuring authority : NRA-S NGR : 61 (TR) 187 603

Flow measurement station : 040011 - Horton
C.A.(km²) : 345.0 NGR : 61 (TR) 116 554

		1989						Period of record: 1974 - 1988							
Determinand	Units	Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	20	13.1	21.0	26/07	5.4	28/11	11.7	4.0	12.0	18.2	7.0	13.4	16.6	10.0
pH	pH units	21	7.9	8.2	30/08	7.7	13/09	7.8	7.3	7.8	8.3	7.7	7.9	7.9	7.7
Conductivity	µS/cm	19	722	830	21/02	640	26/07	684	560	693	784	685	670	673	698
Suspended solids	mg/l	21(1)	5.4	15.0	31/10	<1.0	05/07	12.4	2.0	6.8	44.4	21.0	7.7	6.7	15.8
Dissolved oxygen	mg/l O	20	9.87	12.14	05/06	7.90	26/07	10.7	7.1	10.7	14.9	11.3	10.7	9.1	10.3
BOD (inhibited)	mg/l O	21	2.2	3.8	25/04	1.1	04/09	2.7	1.1	2.5	5.2	3.1	3.0	2.2	2.4
Ammoniacal nitrogen	mg/l N	21	0.128	0.400	13/09	0.020	21/06	0.34	0.02	0.15	1.35	0.55	0.36	0.12	0.40
Nitrite	mg/l N	21	0.069	0.300	13/09	0.030	08/02	0.11	0.03	0.08	0.32	0.10	0.13	0.12	0.14
Nitrate	mg/l N	21	6.56	9.4	28/11	4.20	21/06	5.8	3.9	5.5	8.5	6.6	5.3	4.7	6.2
Chloride	mg/l Cl	20	65.8	83.0	21/02	53.0	29/03	49.5	36.0	48.0	70.0	52.1	46.9	48.2	53.2
Orthophosphate	mg/l P	21	1.719	2.700	30/08	0.080	26/07	0.91	0.32	0.86	1.63	0.63	0.91	1.17	1.00
Silica	mg/l SiO_2	15	6.41	10.00	13/09	1.10	10/05	7.55	2.50	7.90	11.13	8.23	5.10	7.03	10.17

Itchen at Gatersmill 1989

Harmonised monitoring station number : 07 013
Measuring authority : NRA-S NGR : 41 (SU) 434 156

Flow measurement station : 042010 - Highbridge
C.A.(km²) : 360.0 NGR : 41 (SU) 467 213

		1989						Period of record: 1980 - 1988							
Determinand	Units	Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	42	12.9	22.0	26/07	4.2	27/11	10.9	4.4	10.0	18.0	7.3	12.8	15.9	10.1
pH	pH units	43	8.0	8.3	09/10	7.2	18/08	8.1	7.8	8.1	8.4	8.1	8.1	8.2	8.1
Suspended solids	mg/l	42	6.8	51.6	15/03	0.9	05/01	12.5	2.4	8.0	33.7	29.9	10.0	5.1	11.2
Dissolved oxygen	mg/l O	40	10.19	16.26	27/11	6.73	26/07	10.5	8.2	10.6	12.8	10.9	11.0	9.7	10.4
BOD (inhibited)	mg/l O	41(2)	1.7	3.8	12/01	0.8	20/09	2.0	1.0	2.0	3.5	2.2	2.3	1.6	2.0
Dissolved organic carbon	mg/l O	37	6.8	21.6	15/03	2.4	27/11	6.6	4.0	6.2	11.5	6.3	6.2	6.3	7.6
Ammoniacal nitrogen	mg/l N	42(6)	0.109	0.500	09/10	<0.010	19/05	0.11	0.01	0.09	0.28	0.16	0.08	0.06	0.12
Nitrite	mg/l N	43	0.071	0.200	18/07	0.010	07/07	0.05	0.03	0.04	0.10	0.04	0.05	0.05	0.06
Nitrate	mg/l N	41	4.55	6.80	02/06	2.30	30/08	5.2	4.0	5.2	6.1	5.4	5.2	4.7	5.1
Chloride	mg/l Cl	43	22.4	33.2	13/12	17.9	25/05	21.3	17.4	20.8	26.4	21.6	20.5	20.7	22.2
Orthophosphate	mg/l P	43	0.599	0.900	26/09	0.310	07/04	0.38	0.14	0.37	0.71	0.33	0.33	0.42	0.49
Silica	mg/l SiO_2	20	10.78	15.00	17/11	5.10	23/11	10.27	5.41	10.80	12.45	10.48	7.71	11.15	11.79

Stour at Hurn Court School 1989

Harmonised monitoring station number : 08 200
Measuring authority : NRA-W NGR : 40 (SZ) 122 955

Flow measurement station : 043007 - Throop Mill
C.A.(km²) : 1073.0 NGR : 40 (SZ) 113 958

		1989						Period of record: 1975 - 1988							
Determinand	Units	Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	24	11.0	22.5	21/07	3.0	11/12	11.2	4.5	10.7	19.0	6.5	12.6	16.9	8.7
pH	pH units	24	7.9	8.5	06/07	7.2	17/03	8.0	7.4	8.0	8.5	7.9	8.1	8.0	7.8
Suspended solids	mg/l	24	12.0	34.0	17/03	4.0	18/08	15.9	3.0	8.0	57.1	18.2	9.6	10.3	23.0
Dissolved oxygen	mg/l O	23	11.01	14.00	08/05	6.40	18/09	10.3	8.0	10.0	13.2	10.1	11.3	9.5	10.4
BOD (inhibited)	mg/l O	24	3.2	8.6	20/06	1.1	30/01	2.6	1.1	2.1	6.1	2.3	3.6	2.0	2.8
Ammoniacal nitrogen	mg/l N	20	0.121	0.500	21/02	0.020	08/05	0.19	0.02	0.16	0.42	0.23	0.17	0.10	0.22
Nitrite	mg/l N	24	0.078	0.200	11/12	0.040	07/09	0.10	0.03	0.09	0.20	0.06	0.11	0.12	0.09
Nitrate	mg/l N	24	6.70	12.00	07/11	4.36	18/08	5.3	2.6	5.3	8.0	6.2	5.1	4.3	5.8
Chloride	mg/l Cl	24	33.5	47.0	07/11	25.0	03/04	27.2	20.0	27.0	35.0	24.7	25.3	27.4	28.1
Orthophosphate	mg/l P	24	0.595	1.300	07/09	0.200	08/05	0.42	0.10	0.34	0.93	0.25	0.30	0.63	0.48
Silica	mg/l SiO_2	15	2.72	4.40	17/01	0.40	22/05	3.24	0.75	3.26	5.09	3.31	2.46	2.89	4.15
Calcium	mg/l Ca	16	93.0	105.2	08/05	72.0	17/03	97.3	78.4	98.2	112.6	96.2	99.2	94.5	94.0
Magnesium	mg/l Mg	17	4.1	17.1	30/01	2.4	22/05	4.0	2.7	3.8	6.3	3.5	4.5	3.6	4.5
Potassium	mg/l K	17	5.2	9.1	21/02	3.3	22/05	5.1	2.6	5.0	8.5	4.2	4.4	5.2	7.0
Sodium	mg/l Na	17	19.6	30.0	18/08	13.0	31/03	17.1	12.0	16.0	24.3	14.5	16.3	19.5	17.7

Axe at Whitford Road Bridge 1989

Harmonised monitoring station number : 09 001
Measuring authority : NRA-SW NGR : 30 (SY) 262 953

Flow measurement station : 045004 - Whitford
C.A.(km²) : 288.5 NGR : 30 (SY) 262 953

		1989						Period of record: 1974 - 1988							
Determinand	Units	Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	28	12.0	21.0	25/07	2.0	30/11	10.9	3.7	10.2	18.3	5.7	12.2	15.9	8.8
pH	pH units	28	8.1	8.6	17/05	7.3	03/11	7.9	7.4	7.9	8.5	7.8	8.1	8.0	7.8
Conductivity	µS/cm	28	400	454	18/10	301	08/08	385	299	390	451	371	388	412	370
Suspended solids	mg/l	25	11.1	92.0	10/04	2.0	08/12	13.2	2.0	6.0	45.3	17.7	9.5	6.0	24.6
Dissolved oxygen	mg/l O	27	10.66	13.70	17/05	7.40	15/09	10.9	8.4	10.9	13.5	12.1	11.3	9.9	10.7
BOD (inhibited)	mg/l O	28	1.8	6.8	10/04	0.5	08/12	2.1	0.9	1.7	4.5	2.2	2.3	1.7	2.2
Dissolved organic carbon	mg/l O	25	11.9	29.3	23/10	5.6	08/08	13.6	7.5	11.7	26.0	11.9	13.2	12.1	16.7
Ammoniacal nitrogen	mg/l N	28(2)	0.084	0.600	10/04	<0.010	17/05	0.11	0.01	0.06	0.35	0.17	0.08	0.06	0.13
Nitrite	mg/l N	25	0.044	0.100	23/10	0.012	03/10	0.05	0.02	0.04	0.10	0.04	0.06	0.03	0.06
Nitrate	mg/l N	28	4.61	8.80	31/10	2.10	08/08	3.6	2.1	3.3	5.6	4.2	3.3	3.0	4.5
Chloride	mg/l Cl	28	26.4	36.6	23/10	17.8	08/08	23.2	19.0	22.3	29.0	23.8	21.1	23.0	23.8
Total alkalinity	mg/l $CaCO_3$	25	136.5	169.0	25/07	85.0	20/11	135.9	87.7	139.0	167.3	119.4	142.7	154.1	126.0
Orthophosphate	mg/l P	28	0.329	0.600	25/07	0.110	20/11	0.24	0.12	0.23	0.41	0.20	0.24	0.31	0.22
Silica	mg/l SiO_2	25	10.10	16.00	20/11	1.20	17/05	9.36	4.58	9.80	12.70	9.07	7.40	10.11	10.74
Sulphate	mg/l SO_4	25	38.4	49.8	23/10	27.3	08/08	32.7	21.5	33.9	39.2	31.8	31.6	35.0	32.8
Calcium	mg/l Ca	25	65.4	80.7	02/06	43.8	20/11	62.5	42.2	63.0	76.0	57.2	63.0	70.0	58.3
Magnesium	mg/l Mg	25	6.4	7.8	21/04	5.3	30/11	6.0	4.5	6.0	7.5	6.1	6.0	6.1	6.1
Potassium	mg/l K	25	4.0	6.6	31/10	2.0	08/08	4.2	3.1	3.9	6.7	4.1	3.8	4.3	4.7
Sodium	mg/l Na	25	14.2	20.4	18/10	10.7	08/08	12.9	10.2	12.7	16.3	13.1	12.6	13.3	12.6

Tamar at Gunnislake Newbridge — 1989

Harmonised monitoring station number : 09 017
Measuring authority : NRA-SW NGR : 20 (SX) 433 722

Flow measurement station : 047001 - Gunnislake
C.A.(km^2) : 916.9 NGR : 20 (SX) 426 725

		1989						Period of record: 1975 - 1988							
Determinand	Units	Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	21	11.2	27.2	21/08	3.2	06/12	11.4	4.9	11.0	19.0	6.8	12.6	16.0	9.5
pH	pH units	22	7.4	8.9	20/06	6.6	31/01	7.4	6.8	7.4	8.2	7.2	7.5	7.5	7.2
Conductivity	µS/cm	22	194	276	04/08	152	31/01	180	140	179	233	167	183	194	174
Suspended solids	mg/l	22	21.1	176.0	14/12	1.6	21/08	24.9	2.0	6.8	112.4	30.0	12.4	13.7	37.3
Dissolved oxygen	mg/l O	22	10.69	12.70	31/01	8.00	04/08	10.7	8.7	10.7	12.5	11.8	10.5	9.6	10.9
BOD (inhibited)	mg/l O	21	2.3	8.5	14/12	0.6	21/11	2.3	0.8	2.0	5.0	2.2	2.2	2.0	2.4
Dissolved organic carbon	mg/l O	22	10.0	27.2	14/12	5.6	06/04	11.9	5.1	9.9	25.7	9.5	11.7	11.4	13.3
Ammoniacal nitrogen	mg/l N	22 (1)	0.074	0.400	14/12	<0.010	20/06	0.08	0.01	0.05	0.25	0.10	0.06	0.06	0.09
Nitrite	mg/l N	22 (1)	0.030	0.100	14/12	<0.010	05/10	0.02	0.01	0.02	0.06	0.03	0.02	0.02	0.03
Nitrate	mg/l N	22	2.62	4.20	06/11	<0.10	06/12	2.6	1.5	2.5	4.2	3.2	2.6	2.1	2.9
Chloride	mg/l Cl	22	23.7	32.0	14/12	21.0	19/04	22.2	18.0	22.0	28.0	23.2	21.4	22.4	22.8
Total alkalinity	mg/l $CaCO_3$	22	40.5	59.0	04/08	22.0	06/11	36.1	23.0	34.0	52.0	30.1	39.3	41.9	33.4
Orthophosphate	mg/l P	22	0.094	0.200	14/12	0.060	21/11	0.08	0.03	0.07	0.15	0.06	0.08	0.11	0.08
Silica	mg/l SiO_2	22	4.59	6.70	06/12	0.50	20/06	4.86	1.70	5.10	6.80	5.09	3.96	4.69	5.60
Sulphate	mg/l SO_4	22	17.2	26.5	21/08	12.1	20/03	15.8	10.9	15.3	21.0	15.0	16.4	16.5	14.9
Calcium	mg/l Ca	22	18.1	22.2	04/08	16.1	20/03	17.6	13.9	17.4	22.0	16.6	17.3	18.3	16.8
Magnesium	mg/l Mg	22	5.3	6.9	21/08	4.1	23/02	4.8	3.4	4.7	6.5	4.2	4.9	5.4	4.5
Potassium	mg/l K	22	3.3	6.0	21/08	1.7	06/12	3.2	1.9	3.0	5.3	2.7	2.9	3.9	3.4
Sodium	mg/l Na	22	13.8	16.2	20/10	11.7	10/03	12.1	9.4	12.0	15.0	12.1	12.1	12.9	12.0

Exe at Thorverton Road Bridge — 1989

Harmonised monitoring station number : 09 036
Measuring authority : NRA-SW NGR : 21 (SS) 936 016

Flow measurement station : 045001 - Thorverton
C.A.(km^2) : 600.9 NGR : 21 (SS) 936 016

		1989						Period of record: 1974 - 1988							
Determinand	Units	Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	27	10.8	21.0	24/07	3.0	01/12	11.2	4.0	10.5	19.0	6.0	12.4	16.3	9.1
pH	pH units	27	7.5	8.1	15/08	7.1	10/11	7.5	6.9	7.5	8.2	7.3	7.7	7.5	7.4
Conductivity	µS/cm	27	194	247	24/07	128	27/10	170	121	161	244	158	181	186	158
Suspended solids	mg/l	27	14.2	126.0	14/12	2.0	08/12	11.8	2.0	6.0	42.0	15.9	8.8	6.8	12.2
Dissolved oxygen	mg/l O	27	10.43	12.80	24/11	6.60	24/07	11.1	8.8	11.3	13.3	12.4	11.1	9.8	11.4
BOD (inhibited)	mg/l O	27	1.9	6.1	14/12	0.7	08/12	1.7	0.8	1.6	3.4	1.7	2.1	1.5	1.5
Dissolved organic carbon	mg/l O	27	7.4	19.5	14/12	3.5	01/12	7.7	4.0	7.2	13.7	6.1	8.0	8.3	7.4
Ammoniacal nitrogen	mg/l N	27	0.070	0.300	13/12	0.010	09/10	0.07	0.01	0.05	0.17	0.08	0.07	0.05	0.05
Nitrite	mg/l N	27	0.024	0.047	14/12	0.011	03/10	0.03	0.01	0.02	0.06	0.02	0.04	0.03	0.02
Nitrate	mg/l N	27	2.52	4.60	14/12	1.40	27/10	2.4	1.4	2.3	3.5	2.8	2.5	2.0	2.4
Chloride	mg/l Cl	27	19.6	28.4	12/12	14.6	27/04	17.8	13.0	17.0	27.0	17.3	17.6	19.0	16.2
Total alkalinity	mg/l $CaCO_3$	27	43.1	64.0	26/06	21.0	10/11	40.6	24.0	38.0	66.0	33.6	45.6	47.3	36.0
Orthophosphate	mg/l P	27	0.146	0.300	24/07	0.040	10/11	0.12	0.03	0.08	0.31	0.06	0.12	0.18	0.08
Silica	mg/l SiO_2	27	3.85	5.40	14/12	1.20	03/08	3.99	1.60	4.20	5.30	4.46	3.09	3.65	4.66
Sulphate	mg/l SO_4	27	19.6	33.4	03/10	11.0	27/04	12.9	9.2	12.2	18.8	12.3	13.5	13.9	12.6
Calcium	mg/l Ca	27	17.8	23.2	26/06	11.3	27/10	16.8	11.7	16.0	24.9	15.8	18.3	17.7	14.9
Magnesium	mg/l Mg	27	4.2	5.4	26/06	2.9	10/11	4.1	2.9	4.0	5.5	3.8	4.5	4.4	3.7
Potassium	mg/l K	27	2.3	4.3	14/12	1.4	27/10	2.1	1.3	1.9	3.6	1.8	2.1	2.4	1.9
Sodium	mg/l Na	27	14.3	25.1	03/10	8.1	10/11	10.4	7.1	9.3	18.2	9.3	10.8	12.7	9.5

Dee at Overton — 1989

Harmonised monitoring station number : 10 002
Measuring authority : NRA-WEL NGR : 33 (SJ) 354 427

Flow measurement station : 067015 - Manley Hall
C.A.(km^2) : 1019.3 NGR : 33 (SJ) 348 415

		1989						Period of record: 1974 - 1988							
Determinand	Units	Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	12	10.6	17.6	11/07	4.4	05/12	10.0	3.0	9.7	17.5	4.7	11.7	15.2	7.7
pH	pH units	12	7.4	7.9	09/05	6.7	13/01	7.2	6.5	7.2	7.8	7.2	7.3	7.3	7.1
Conductivity	µS/cm	12	184	267	05/12	101	12/04	172	98	163	270	159	215	171	139
Suspended solids	mg/l	12 (1)	10.8	57.0	12/04	<1.0	06/10	8.9	1.0	3.1	36.6	11.4	5.7	7.1	11.4
Dissolved oxygen	mg/l O	12	10.62	13.20	05/12	9.25	11/07	11.1	9.1	11.1	13.3	12.6	10.8	9.8	11.7
BOD (inhibited)	mg/l O	12	1.1	1.8	12/04	0.6	13/01	1.2	0.5	1.1	2.6	1.2	1.5	1.2	1.1
Ammoniacal nitrogen	mg/l N	12 (3)	0.071	0.300	06/10	0.010	06/09	0.05	0.01	0.03	0.13	0.07	0.05	0.04	0.06
Nitrite	mg/l N	12 (1)	0.021	0.037	11/07	0.008	02/11	0.02	0.01	0.01	0.05	0.02	0.03	0.02	0.02
Chloride	mg/l Cl	12	27.1	46.6	05/12	14.4	12/04	19.3	10.2	18.0	32.0	19.8	23.2	20.4	15.4
Orthophosphate	mg/l P	12 (5)	0.062	0.100	05/12	0.030	02/11	0.05	0.01	0.05	0.14	0.05	0.06	0.07	0.06

Taf at Clog-y-fran Bridge — 1989

Harmonised monitoring station number : 10 027
Measuring authority : NRA-WEL NGR : 22 (SN) 238 161

Flow measurement station : 060003 - Clog-y-fran
C.A.(km^2) : 217.3 NGR : 22 (SN) 238 160

		1989						Period of record: 1975 - 1988							
Determinand	Units	Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	10	10.6	18.0	14/07	3.0	16/12	10.4	4.0	10.1	17.5	6.3	12.0	14.6	8.6
pH	pH units	10	7.6	8.1	21/11	6.9	15/03	7.4	6.9	7.3	7.9	7.2	7.5	7.5	7.2
Conductivity	µS/cm	10	192	270	02/10	134	15/03	164	114	155	239	144	173	193	146
Suspended solids	mg/l	10	8.6	20.0	15/03	5.0	16/12	15.9	1.0	7.0	62.0	27.3	8.7	11.0	21.3
Dissolved oxygen	mg/l O	10	10.10	12.50	16/12	8.40	21/08	10.3	7.3	10.5	12.7	10.9	10.6	9.3	10.5
BOD (inhibited)	mg/l O	10 (1)	1.3	2.2	14/04	<0.2	21/11	1.8	0.8	1.6	4.0	2.0	2.0	1.6	1.5
Ammoniacal nitrogen	mg/l N	10	0.098	0.200	02/10	0.040	14/04	0.11	0.02	0.08	0.34	0.18	0.13	0.07	0.11
Nitrite	mg/l N	10	0.039	0.100	02/10	0.018	15/03	0.03	0.01	0.03	0.07	0.03	0.03	0.04	0.03
Orthophosphate	mg/l P	9 (1)	0.186	0.400	21/08	<0.050	21/11	0.12	0.03	0.08	0.36	0.07	0.16	0.20	0.06

Carron at A890 Road Bridge — 1989

Harmonised monitoring station number : 11 009
Measuring authority : HRPB NGR : 18 (NG) 938 425

Flow measurement station : 093001 - New Kelso
C.A.(km²) : 137.8 NGR : 18 (NG) 942 429

Determinand	Units	1989 Samples	Mean	Max.	Date	Min.	Date	Period of record: 1979 - 1988 Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	12	8.1	15.9	07/07	2.7	11/12	8.5	2.3	8.5	15.2	3.6	11.7	12.9	7.1
pH	pH units	12	6.6	7.3	07/07	6.1	03/03	6.7	5.8	6.7	7.4	6.6	6.7	6.7	6.5
Conductivity	µS/cm	12	46	67	03/03	31	17/10	44	27	42	65	49	47	41	38
Suspended solids	mg/l	12 (1)	1.3	2.9	11/01	0.5	03/03	1.5	0.3	1.0	4.6	1.8	1.2	1.3	1.6
Dissolved oxygen	mg/l O	12	11.27	13.21	11/12	9.65	04/08	11.3	9.8	11.3	13.0	12.6	10.9	10.2	11.4
BOD (inhibited)	mg/l O	12	1.1	2.4	03/03	0.4	06/06	0.8	0.3	0.8	1.4	0.8	0.7	0.8	1.0
Ammoniacal nitrogen	mg/l N	12 (1)	0.005	0.009	07/07	0.002	04/08	0.01	0.00	0.01	0.03	0.01	0.01	0.01	0.01
Nitrite	mg/l N	12 (2)	0.001	0.002	06/06	<0.001	02/05	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Nitrate	mg/l N	12	0.05	0.10	11/12	0.03	08/11	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Chloride	mg/l Cl	12	11.0	19.7	03/03	6.6	17/10	10.4	5.5	9.5	18.3	13.7	10.4	8.1	9.2
Total alkalinity	mg/l $CaCO_3$	12	3.0	5.7	07/07	0.4	11/01	6.3	1.8	5.0	15.0	5.9	7.0	6.5	5.9
Orthophosphate	mg/l P	12 (8)	0.004	0.005	02/05	0.002	06/06	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Sulphate	mg/l SO_4	11	1.1	2.8	20/02	0.3	07/07	2.5	0.3	2.5	5.8	2.8	2.4	2.1	2.6
Calcium	mg/l Ca	11	2.0	2.7	11/12	1.3	11/01	1.8	0.6	1.5	4.2	1.4	2.8	1.9	1.4
Magnesium	mg/l Mg	11	1.0	1.5	03/03	0.6	04/08	1.5	0.4	0.9	3.5	1.4	1.0	2.5	1.0
Potassium	mg/l K	11	0.4	0.5	03/03	0.3	26/09	0.3	0.2	0.3	0.6	0.3	0.4	0.3	0.3
Sodium	mg/l Na	11	5.5	8.5	03/03	3.9	17/10	4.4	2.9	4.2	8.4	4.6	5.4	4.0	4.0

Spey at Fochabers — 1989

Harmonised monitoring station number : 12 002
Measuring authority : NERPB NGR : 38 (NJ) 341 596

Flow measurement station : 008006 - Boat o Brig
C.A.(km²) : 2861.2 NGR : 38 (NJ) 318 518

Determinand	Units	1989 Samples	Mean	Max.	Date	Min.	Date	Period of record: 1975 - 1988 Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	10	8.3	14.5	17/08	3.0	21/02	9.9	2.0	10.0	18.0	3.3	10.0	15.0	6.2
pH	pH units	10	7.3	7.7	17/08	6.8	18/01	7.2	6.4	7.2	7.8	6.9	7.2	7.4	7.0
Conductivity	µS/cm	10	79	96	29/11	44	18/01	75	50	75	105	81	70	84	70
Suspended solids	mg/l	10	5.3	25.0	18/01	1.0	29/11	4.0	0.1	2.0	18.0	2.7	4.0	3.7	4.1
Dissolved oxygen	mg/l O	10	12.35	13.92	29/11	11.20	04/09	11.2	9.2	11.2	13.5	12.7	11.0	9.8	11.7
BOD (inhibited)	mg/l O	10	0.8	1.6	17/08	0.2	22/02	0.9	0.4	0.9	1.4	0.9	1.0	0.9	0.9
Ammoniacal nitrogen	mg/l N	10	0.025	0.100	22/02	0.003	04/04	0.04	0.00	0.03	0.12	0.02	0.04	0.04	0.03
Nitrite	mg/l N	10	0.004	0.009	18/01	0.001	22/03	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Nitrate	mg/l N	10	0.25	0.30	29/11	0.13	08/06	0.3	0.2	0.3	0.7	0.5	0.3	0.3	0.3
Chloride	mg/l Cl	10	9.5	12.0	22/02	6.0	18/01	10.3	6.0	10.0	15.4	12.3	10.0	10.7	9.2
Total alkalinity	mg/l $CaCO_3$	10	18.8	25.0	08/06	8.0	18/01	25.9	15.0	25.0	40.0	24.5	24.6	29.9	26.9
Orthophosphate	mg/l P	10	0.011	0.036	18/01	0.001	08/06	0.03	0.00	0.01	0.09	0.02	0.02	0.04	0.02
Silica	mg/l SiO_2	9	5.58	7.79	29/11	4.49	08/06	5.64	3.45	5.86	7.23	5.47	4.60	5.67	5.98

Almond at Craigiehall — 1989

Harmonised monitoring station number : 14 008
Measuring authority : FRPB NGR : 36 (NT) 165 752

Flow measurement station : 019001 - Craigiehall
C.A.(km²) : 369.0 NGR : 36 (NT) 165 752

Determinand	Units	1989 Samples	Mean	Max.	Date	Min.	Date	Period of record: 1975 - 1988 Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	12	11.5	21.0	05/07	5.0	10/01	9.6	2.0	9.5	17.5	4.0	11.8	14.6	7.3
pH	pH units	12	7.8	8.5	15/05	7.2	14/02	7.5	7.0	7.6	8.0	7.4	7.7	7.5	7.5
Conductivity	µS/cm	12	665	850	12/06	372	14/02	596	307	580	880	522	693	649	509
Suspended solids	mg/l	12	11.9	40.0	14/02	2.0	05/07	23.2	2.4	11.0	79.0	35.4	10.5	14.8	29.0
BOD (inhibited)	mg/l O	11	3.0	5.3	12/09	1.6	07/04	3.3	1.6	2.8	6.8	3.3	3.8	3.0	3.1
Ammoniacal nitrogen	mg/l N	11	1.095	3.500	06/12	0.320	01/08	1.20	0.22	0.94	3.00	1.29	1.57	1.16	0.83
Nitrite	mg/l N	11 (1)	0.399	0.770	05/07	<0.010	10/01	0.26	0.04	0.14	0.86	0.14	0.31	0.43	0.14
Nitrate	mg/l N	12	4.25	6.40	06/12	2.00	14/03	3.7	2.1	3.6	5.5	3.6	4.1	3.7	3.6
Chloride	mg/l Cl	12	68.1	103.0	06/12	45.0	14/02	62.9	25.7	60.0	103.3	64.0	70.4	68.5	48.3
Total alkalinity	mg/l $CaCO_3$	12	117.8	152.0	15/05	76.0	14/02	120.9	53.4	120.0	190.0	102.0	141.6	133.1	103.0
Orthophosphate	mg/l P	12	1.147	2.100	10/10	0.140	14/02	0.72	0.10	0.45	2.05	0.26	0.93	1.23	0.37
Silica	mg/l SiO_2	12	5.48	8.70	14/11	0.10	15/05	6.12	0.80	6.70	9.68	7.75	4.08	4.39	8.13
Sulphate	mg/l SO_4	12	131.5	176.0	01/08	60.0	10/01	130.8	51.6	130.5	206.1	14.3	36.3	43.0	14.5
Calcium	mg/l Ca	12	60.7	95.0	12/06	34.1	10/10	68.6	38.6	61.9	151.3	68.2	76.6	63.8	63.4
Magnesium	mg/l Mg	12	19.7	28.0	12/06	9.6	14/02	25.6	11.3	24.5	43.4	22.4	29.4	29.1	22.6
Potassium	mg/l K	12	6.5	9.9	01/08	3.6	14/02	6.9	3.6	5.9	12.5	5.1	8.5	8.9	5.7
Sodium	mg/l Na	12	52.8	85.0	01/08	28.0	14/02	49.5	20.1	46.6	87.8	44.0	56.7	63.3	39.8

Tweed at Norham — 1989

Harmonised monitoring station number : 15 001
Measuring authority : TWRPB NGR : 36 (NT) 898 477

Flow measurement station : 021009 - Norham
C.A.(km²) : 4390.0 NGR : 36 (NT) 898 477

Determinand	Units	1989 Samples	Mean	Max.	Date	Min.	Date	Period of record: 1975 - 1988 Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	12	11.4	22.5	06/07	1.5	06/12	9.9	2.5	9.5	20.0	4.1	13.4	15.9	6.4
pH	pH units	12	8.3	9.5	03/08	7.4	09/03	8.0	7.1	7.9	9.3	7.6	8.3	8.4	7.7
Conductivity	µS/cm	12	226	273	28/06	155	14/02	237	165	227	326	261	229	219	238
Suspended solids	mg/l	12	6.3	29.0	14/02	1.0	06/12	10.2	1.7	5.0	32.3	16.2	5.5	7.8	11.1
Dissolved oxygen	mg/l O	12	12.46	17.20	03/08	9.00	17/10	11.6	9.1	11.5	14.9	12.1	11.6	11.3	11.5
BOD (inhibited)	mg/l O	12	2.2	3.3	03/08	0.9	17/10	2.3	1.0	2.2	4.2	2.3	2.5	2.5	2.0
Ammoniacal nitrogen	mg/l N	12	0.063	0.100	20/04	0.020	16/11	0.09	0.03	0.09	0.16	0.11	0.08	0.08	0.10
Nitrite	mg/l N	12	0.016	0.030	03/08	0.010	06/12	0.02	0.01	0.02	0.05	0.02	0.02	0.02	0.02
Nitrate	mg/l N	12	1.29	1.70	16/01	0.70	07/09	1.9	0.8	1.8	3.4	2.6	1.8	1.1	1.9
Chloride	mg/l Cl	12	13.9	19.0	11/05	10.0	16/01	16.2	10.4	16.0	23.1	18.0	16.5	15.8	15.1
Orthophosphate	mg/l P	12	0.060	0.100	06/07	0.010	07/09	0.15	0.03	0.08	0.48	0.16	0.14	0.17	0.17

Dee at Glenlochar 1989

Harmonised monitoring station number : 16 005
Measuring authority : SRPB NGR : 25 (NX) 733 642

Flow measurement station : 080002 - Glenlochar
C.A.(km²) : 809.0 NGR : 25 (NX) 733 641

Determinand	Units	1989						Period of record: 1975 - 1988							
		Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	12	10.2	19.0	03/07	1.0	01/12	10.0	1.6	9.0	20.0	3.5	11.4	16.6	8.4
pH	pH units	12	6.7	7.1	01/08	6.4	01/11	6.7	6.1	6.7	7.4	6.6	6.7	6.9	6.6
Conductivity	µS/cm	12	57	67	02/10	46	03/04	59	39	54	87	55	59	69	61
Suspended solids	mg/l	12	1.7	4.0	01/08	1.0	01/11	3.6	1.0	2.0	9.9	5.5	4.0	2.5	2.9
Dissolved oxygen	mg/l O	12	11.52	12.90	01/12	10.10	03/07	10.9	8.7	10.8	13.2	12.5	11.1	9.4	10.6
BOD (inhibited)	mg/l O	12	1.9	3.0	02/05	1.1	03/04	2.0	1.0	1.9	3.3	2.1	1.9	1.8	1.8
Ammoniacal nitrogen	mg/l N	12	0.046	0.100	01/06	0.010	01/11	0.06	0.01	0.04	0.16	0.06	0.06	0.07	0.05
Nitrate	mg/l N	11	0.29	0.60	03/03	0.04	03/07	0.3	0.1	0.3	0.8	0.5	0.4	0.2	0.3
Chloride	mg/l Cl	12	10.4	13.3	03/03	7.8	04/01	8.8	5.0	8.5	13.8	9.5	9.3	8.7	8.1
Total alkalinity	mg/l $CaCO_3$	12	5.5	8.9	01/12	3.3	03/03	6.7	3.1	6.0	10.3	5.1	6.0	10.8	6.0
Orthophosphate	mg/l P	12	0.007	0.018	04/01	0.002	03/07	0.01	0.00	0.01	0.04	0.01	0.02	0.03	0.01
Silica	mg/l SiO_2	12	1.79	3.10	01/12	0.30	01/08	2.41	0.43	2.35	4.59	3.55	1.74	1.41	3.06
Sulphate	mg/l SO_4	10	5.7	9.3	01/09	4.2	03/04	5.9	1.9	5.6	11.1	5.8	5.5	5.6	6.6
Calcium	mg/l Ca	12	4.1	7.0	03/04	3.0	01/06	3.8	2.4	3.3	6.0	3.4	3.5	5.0	3.7
Magnesium	mg/l Mg	12	1.6	2.0	02/10	1.4	02/05	1.4	0.7	1.4	2.2	1.4	1.5	1.5	1.4
Potassium	mg/l K	11	0.6	0.8	03/03	0.5	01/12	0.5	0.3	0.5	0.8	0.5	0.5	0.5	0.5
Sodium	mg/l Na	11	6.3	7.9	01/02	5.4	02/05	4.4	3.4	4.2	6.2	4.7	5.1	4.3	3.9

Leven at Renton Footbridge 1989

Harmonised monitoring station number : 17 005
Measuring authority : CRPB NGR : 26 (NS) 389 783

Flow measurement station : 085001 - Linnbrane
C.A.(km²) : 784.3 NGR : 26 (NS) 394 803

Determinand	Units	1989						Period of record: 1975 - 1988							
		Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	10	11.5	22.0	20/06	6.0	21/03	9.3	2.0	9.0	17.1	3.6	10.8	15.1	8.0
pH	pH units	10	7.1	7.5	15/05	7.0	17/10	7.1	6.7	7.1	7.5	7.0	7.2	7.1	7.0
Suspended solids	mg/l	10	3.9	11.0	21/03	1.0	20/01	5.0	1.0	4.0	13.0	7.1	4.1	4.1	4.8
Dissolved oxygen	mg/l O	10	10.88	12.00	26/04	9.50	20/06	11.0	9.2	11.0	12.7	12.3	11.3	9.6	10.7
BOD (inhibited)	mg/l O	10	1.9	3.2	26/04	1.1	24/08	1.8	0.8	1.8	2.9	2.3	2.0	1.4	1.6
Ammoniacal nitrogen	mg/l N	10 (2)	0.030	0.100	24/08	<0.020	20/01	0.05	0.01	0.02	0.23	0.05	0.05	0.05	0.05
Nitrite	mg/l N	10 (4)	0.010	0.010	15/05	<0.010	20/01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
Nitrate	mg/l N	10	0.34	0.50	07/11	0.20	17/10	0.3	0.1	0.3	0.5	0.4	0.3	0.2	0.3
Chloride	mg/l Cl	9	9.9	14.0	21/03	7.0	20/01	10.0	6.0	9.0	18.1	10.6	10.2	10.0	9.0
Total alkalinity	mg/l $CaCO_3$	10	14.4	18.0	17/10	12.0	21/03	16.5	10.0	16.0	23.0	15.2	16.7	17.2	16.9
Orthophosphate	mg/l P	8 (3)	0.014	0.000	07/11	<0.010	15/05	0.02	0.00	0.01	0.05	0.02	0.02	0.02	0.02

Ballinderry at Ballinderry Bridge 1989

DOE Northern Ireland station number : 03/07/Q001
Measuring authority : DOEN NGR : *23 (IH) 927 798*

Flow measurement station : 203012 - Ballinderry Br.
C.A.(km²) : 419.5 NGR : *23 (IH) 926 799*

Determinand	Units	1989						Period of record: 1974 - 1988							
		Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	21	10.3	18.0	01/08	4.5	28/02	9.8	3.0	10.0	17.0	4.8	12.2	14.8	8.0
pH	pH units	23	7.9	8.8	02/06	7.3	10/11	7.7	7.3	7.7	8.2	7.6	7.9	7.8	7.6
Conductivity	µS/cm	23	319	471	30/08	179	28/02	303	215	302	375	278	321	327	290
Suspended solids	mg/l	23	8.0	32.0	13/01	3.0	03/07	9.5	2.0	6.0	32.0	12.6	7.3	6.9	10.9
Dissolved oxygen	mg/l O	23	11.00	15.60	04/12	8.30	30/08	9.8	6.7	9.8	12.5	11.1	9.4	8.4	10.2
BOD (inhibited)	mg/l O	23	2.6	4.9	16/06	1.1	04/12	2.4	1.0	2.0	4.2	2.5	2.6	2.2	2.2
Ammoniacal nitrogen	mg/l N	23	0.210	0.780	30/01	0.040	02/06	0.26	0.04	0.20	0.49	0.32	0.29	0.17	0.23
Nitrite	mg/l N	23	0.073	0.510	26/10	0.020	28/02	0.05	0.02	0.04	0.12	0.03	0.05	0.06	0.04
Chloride	mg/l Cl	23	20.0	27.0	12/10	16.0	30/01	18.5	11.0	18.0	26.0	18.9	18.8	18.8	17.4
Orthophosphate	mg/l P	23	0.260	0.560	12/10	0.070	13/02	0.23	0.06	0.20	0.42	0.16	0.21	0.33	0.20

Lagan at Shaws Bridge 1989

DOE Northern Ireland station number : 03/07/Q002
Measuring authority : DOEN NGR : *33 (IJ) 325 690*

Flow measurement station : 205004 - Newforge
C.A.(km²) : 490.4 NGR : *33 (IJ) 329 693*

Determinand	Units	1989						Period of record: 1973 - 1988							
		Samples	Mean	Max.	Date	Min.	Date	Mean	Percentiles 5%	50%	95%	Quarterly averages J-M	A-J	J-S	O-D
Temperature	°C	23	11.4	22.0	24/07	4.0	04/12	10.3	4.0	10.5	16.5	5.1	12.7	15.1	7.8
pH	pH units	23	7.7	8.1	22/08	7.3	03/11	7.6	7.2	7.6	8.0	7.6	7.6	7.5	7.5
Conductivity	µS/cm	23	483	774	23/06	212	12/04	414	275	385	600	366	444	475	366
Suspended solids	mg/l	23	11.4	47.0	07/03	3.0	20/09	14.3	2.0	7.0	46.0	18.3	7.8	9.9	21.2
Dissolved oxygen	mg/l O	23	9.63	13.70	29/03	3.90	05/10	9.2	3.0	9.5	12.8	11.8	8.7	6.1	10.3
BOD (inhibited)	mg/l O	23	2.7	6.4	19/10	1.0	22/08	3.6	1.4	3.0	7.5	3.3	4.0	3.7	3.4
Ammoniacal nitrogen	mg/l N	23	0.490	1.400	11/12	0.040	06/09	1.04	0.17	0.67	2.88	0.79	0.93	1.55	0.87
Nitrite	mg/l N	23	0.233	0.840	23/06	0.020	07/03	0.19	0.02	0.10	0.50	0.10	0.22	0.36	0.08
Chloride	mg/l Cl	23	52.5	110.0	26/04	20.0	06/02	38.8	21.0	35.0	62.0	36.0	44.1	42.4	32.6
Orthophosphate	mg/l P	23	1.443	4.150	06/09	0.090	07/03	0.78	0.13	0.55	1.72	0.34	1.15	1.11	0.57

DIRECTORY OF MEASURING AUTHORITIES

The enactment of the Water Act 1989 facilitated the creation of ten Water Services PLCs to take over the former Water Authorities' responsibilities for water supply and sewerage and for the setting up of a new body, the National Rivers Authority, to operate their regulatory and river management functions. Responsibility for most hydrometric activities has passed to the NRA. As part of the necessary restructuring prior to this major water industry reorganisation, 'shadow' regional NRA Units were established in each Water Authority. The Units began operating as fully independent units within each Water Authority on the 1st April 1989 and, formally, became regional divisions of the National Rivers Authority on the 1st September 1989.

	Address	Code
National Rivers Authority	30–34 Albert Embankment, London SE1 7TL Tel: 071–820–0101	NRA

NRA Regional Headquarters

Anglian	Kingfisher House, Goldhay Way, Orton Goldhay, Peterborough PE2 0ZR	NRA-A
Northumbria	Eldon House, Regent Centre, Gosforth, Newcastle-upon-Tyne NE3 3UD	NRA-N
North West	Richard Fairclough House, PO Box 12, Knutsford Rd, Latchford, Warrington WA4 1HG	NRA-NW
Severn-Trent	Sapphire East, 550 Streetsbrook Road, Solihull B91 1QT	NRA-ST
Southern	Guildbourne House, Chatsworth Road, Worthing, West Sussex BN11 1LD	NRA-S
South West	Manley House, Kestrel Way, Sowton Industrial Estate, Exeter EX2 7LQ	NRA-SW
Thames	Kings Meadow House, Kings Meadow Road, Reading RG1 8DQ	NRA-T
Welsh	Rivers House/Plas-yr-Afon, St Mellons Business Park, St Mellons, Cardiff CF3 0EG	NRA-WEL
Wessex	Rivers House, East Quay, Bridgwater, Somerset TA6 4YS	NRA-W
Yorkshire	21 Park Square South, Leeds LS1 2QG	NRA-Y

Water Services PLCs

Anglian Water	Ambury Road, Huntingdon PE18 6NZ	AW
Northumbrian Water	PO Box 4, Regent Centre, Gosforth, Newcastle-upon-Tyne NE3 3PX	NW

North West Water	Dawson House, Liverpool Road, Great Sankey, Warrington WA5 3LW	NWW
SevernTrent Water	2297 Coventry Road, Birmingham B26 3PU	STW
Southern Water	Southern House, Yeoman Road, Durrington, Worthing, West Sussex BN13 3NX	SW
South West Water	Peninsula House, Rydon Lane, Exeter EX2 7HR	SWW
Thames Water	Nugent House, Vastern Road, Reading RG1 8DB	TW
Welsh Water	Plas-y-Ffynnon, Cambrian Way, Brecon, Powys LD3 7HP	WELW
Wessex Water	Wessex House, Passage Street, Bristol BS2 0JQ	WW
Yorkshire Water	West Riding House, 67 Albion Street, Leeds LS1 5AA	YW

River Purification Boards

Clyde River Purification Board	Rivers House, Murray Road, East Kilbride, Glasgow G75 0LA	CRPB
Forth River Purification Board	Herriot Watt Research Park, Avenue North, Riccarton, Edinburgh EH14 4AP	FRPB
Highland River Purification Board	Strathpeffer Road, Dingwall IV15 9QY	HRPB
North East River Purification Board	Greyhope House, Greyhope Road, Torry, Aberdeen AB1 3RD	NERPB
Solway River Purification Board	Rivers House, Irongray Road, Dumfries DG2 0JE	SRPB
Tay River Purification Board	1, South Street, Perth PH2 8NJ	TRPB
Tweed River Purification Board	Burnbrae, Mossilee Road, Galashiels TD1 1NF	TWRP

Other measuring authorities

Borders Regional Council (Directorate of Water and Drainage Services)	West Grove, Waverley Road, Melrose TD6 9SJ	BRWD
Corby (Northants) and District Water Company	Geddington Road, Corby, Northants NN18 8ES	CDWC
Department of the Environment for Northern Ireland	Water Service, Northland House, 3 Frederick Street, Belfast BT1 2NS	DOEN
	Environmental Protection Division, Calvert House, 23 Castle Place, Belfast BT1 1FY	

Dumfries and Galloway Regional Council (Department of Water and Sewerage)	Marchmount House, Dumfries DG1 1PW	DGRW
Essex Water Company	Hall Street, Chelmsford, Essex CM2 OHH	EWC
Geological Survey of Northern Ireland	20 College Gardens, Belfast BT9 6BS	GSNI
Grampian Regional Council (Water Services Department)	Woodhill House, Westburn Road, Aberdeen AB9 2LU	GRWD
Highland Regional Council (Water Department)	Regional Buildings, Glenurquhart Road, Inverness IV3 5NX	HRCW
Institute of Hydrology	Maclean Building, Crowmarsh Gifford, Wallingford, Oxfordshire OX10 8BB	IH
Lothian Regional Council (Department of Water and Drainage)	6 Cockburn Street, Edinburgh EH1 1NZ	LRWD
Newcastle and Gateshead Water Company	PO Box 10, Allendale Road, Newcastle-upon-Tyne NE6 2SW	NGWC
Scottish Electric PLC	16 Rothesay Terrace, Edinburgh EH3 7SE	SE
Strathclyde Regional Council (Water Department)	419 Balmore Road, Glasgow G22 6NU	SRCW
Tayside Regional Council (Water Services Department)	Bullion House, Invergowrie, Dundee DD2 5BB	TRWS

PUBLICATIONS - in the Hydrological data UK series

Title	*Published*	*Price* (inclusive of second class postage within the UK) *Loose Leaf*	*Bound*
Yearbooks:			
Yearbook 1981	1985	£10	£12
Yearbook 1982	1985	£10	£12
Yearbook 1983	1986	out of print	
Yearbook 1984	1986	out of print	
Yearbook 1985	1987	£12	£15
Yearbook 1986	1988	£12	£15
Yearbook 1987	1989	£12	£15
Yearbook 1988	1989	£12	£15
Yearbook 1989	1990	£15	£18
Reports:			
Hydrometric Register and Statistics 1981-5[1]	1988	£12	£15
The 1984 Drought[2]	1985		£12

Concessionary rates apply to the purchase of two or more of the pre-1988 Yearbooks.

The Yearbooks are available as bound volumes or as sets of pre-punched sheets for insertion in a ring binder designed to hold the five yearbooks in each publication cycle together with the five-yearly catalogue of summary statistics. The ring binder to hold the Yearbooks for 1986-90 may be purchased for £5.

All the Hydrological data UK publications and the ring binder may be obtained from:-

Institute of Hydrology
Maclean Building
Crowmarsh Gifford
WALLINGFORD
OXFORDSHIRE OX10 8BB

Telephone: Wallingford (0491) 38800

Enquiries or comments regarding the series, or individual publications are welcomed and should be directed to the Surface Water Archive Office at the above address.

1. Hydrometric Register and Statistics 1981-5

This reference volume includes maps, tables and statistics for over 800 river basins and 150 representative observation boreholes throughout the United Kingdom. The principal objective of the publication is to assist data users in the selection of monitoring sites for particular investigations and to allow more effective interpretation of analyses based upon the raw data. To this end, concise gauging station and catchment descriptions are given for the featured flow measurement stations - particular emphasis is placed on hydrometric performance, especially in the high and low flow ranges, and on the net effect of artificial influences on the natural flow regime.

Summary hydrometric statistics, for each of the years 1981-5, are provided alongside the corresponding long term averages, or extremes, to allow the recent variability in surface and groundwater resources to be considered in a suitable historical context.

2. The 1984 Drought

This first, occasional report in the Hydrological data UK series concerns the 1984 drought. The report documents the drought in a water resources framework and its development, duration and severity are examined with particular reference to regional variations in intensity. Assessments are made of the likely frequency of occurrence of the drought and its magnitude is considered both in the perspective provided by historical records of rainfall and runoff, and in the context of the recent somewhat erratic climatic behaviour.

ABBREVIATIONS

Note: The following abbreviations do not purport to represent any standardised usage; they have been developed for use in the Hydrological data UK series of publications only. Where space constraints have required alternative forms of these conventional abbreviations to be used, the meaning should be evident from the context.

AOD	Above Ordnance Datum
Bk	Beck
Blk	Black
Br	Bridge
Brk or B	Brook
Brn	Burn
Ch	Channel
C/m	Current meter(ing)
Com	Common
Dk	Dike
Dr or D	Drain
D/s	Downstream
DWF	Dry weather flow
E	East
Frm	Farm
G/s	Gauging station
Gw	Groundwater
HEP	Hydro-electric power
Ho	House
Hosp	Hospital
L	Loch or lake
Lb	Left hand river bank (looking downstream)
Ln	Lane
Lst	Limestone
Ltl	Little
MAF	Mean annual flood
Mkt	Market
Ml/d	Megalitres per day
Mnr	Manor
N	North
Ntch	Notch
NW	North-West
O/f	Outfall or outflow
ORS	Old Red Sandstone
Pk	Park
Pop	Population
POR	Period of record
PS	Pumping station
Pt	Point
PWS	Public water supply
Rb	Right hand river bank (looking downstream)
R/c	Racecourse
RCS	Regional communications system
Rd	Road
Res	Reservoir
Rh	Right hand
S	South
SAGS	Stour Augmentation Groundwater Scheme
Sch	School
S-D	Stage-discharge relation
SDD	Scottish Development Department
SE	South-East
Sl	Sluice
Sp	Spring
St	Stream
STW	Sewage treatment works
SW	South-West
TS	Transfer scheme
US	Ultrasonic gauging station
U/s	Upstream
W	West
W'course	Watercourse
Wd	Wood
Wht	White
Wr	Weir
WRW	Water reclamation works
Wtr	Water
WTW	Water treatment works

Natural
Environment
Research
Council