Hydrological Summary for Great Britain

AUGUST 1994

Rainfall

The July heatwave gave way to much cooler, more unsettled, conditions in August but temperatures and sunshine amounts were generally close to the monthly average. Countrywide, the rainfall in August was a little above the 1961-90 mean but much of northern Britain was relatively dry. Large areas registered their fourth successive month with below average rainfall, parts of eastern Scotland and some districts to the east of the Pennines have been especially dry. Provisional data suggest that the NERPB area experienced its lowest May-August rainfall total for at least 50 years. In England, August rainfall totals displayed large spatial varaibility (limiting the precision of the regional rainfall estimates) and some very notable catches were reported for individual raingauges. On the 3rd a 30 mm deluge in 15 minutes at Wallington Hall (Northumbria) produced exceptional local runoff conditions in the headwaters of the Wansbeck. Thunderstorms on the 10/11th produced more than the monthly rainfall average in some localities in the South-East causing localised flooding and, in London especially, massive transport disruption. The month ended with a remarkable overnight storm centred along the Norfolk-Suffolk border. Several raingauges recorded over 100 mm and an initial appraisal of a 144.2 mm rain-day total (31st Aug/1st September) for Ditchingham ranks it as the highest in the English Lowlands since the Hampstead storm of August 1975. Severe surface flooding occurred in Beccles and Bungay but the overall hydrological impact was limited. Regional rainfall totals for the summer are, mostly, significantly below average - notably so in parts of central and southern England which missed the thunderstorms. However, accumulations for the year thus far, and in the 12-month timeframe, are well within the normal range.

River Flow

In most catchments recessions have been sustained with only minor interruptions since the early spring although some recoveries greatly moderated by dry soil conditions, were evident in early September. Notably low flows were registered in eastern Scotland by mid-month - the Dee recorded its lowest daily flow for a decade on the 22nd. Many small burns have remained dry through the late summer but in the Highland headwaters snowmelt continued to provide a small but useful runoff contribution. Monthly runoff totals were generally less than half the long term average in many impervious catchments in England and Wales but still appreciably greater than the depressed late summer flows which characterised much of the 1988-92 period. Flows in most English lowland rivers remain well within the normal range and above average in many reliant principally on groundwater (examples include the Itchen and Lud). The importance of the baseflow component is well illustrated on the Mimram where summer runoff was the third highest in a 40-year series despite the driest June-August since 1976. By contrast, a new minimum summer runoff total was established on the Whiteadder (in a 25-year series). More generally summer flows have been modestly depressed but well above historical minima. For the year thus far, runoff totals remain above average for all index catchments, and unprecedented for a few south-western catchments.

Groundwater

Soil moisture deficits declined appreciably towards month end but were still generally above the late summer average, notably so in north-eastern Scotland. Positive anomalies of 20-30 mm characterised the majority of aquifer outcrop areas in England. Thus, as is usual in August, there was little or no recharge over the month and gentle recessions continued in almost all index wells. A few isolated but very modest recoveries could be identified in western Permo-Triassic outcrops and the characteristically sluggish post-drought recovery continues in most of the confined aquifer. In some parts of the Chalk e.g. Yorkshire, the fall in water-tables since the spring has been relatively steep and the overall decline since the early spring exceeds 35 metres in parts of the southern Chalk. Nonetheless, levels in all major aquifers remain well within the normal range and overall groundwater resources close to the early autumn average.

General

Steep decreases in reservoir stocks, especially in the Severn-Trent and Yorkshire regions, signalled a measure of water resources stress in August. However, in most areas the sustained rainfall over last winter has provided more than an adequate buffer to resist the impact of the recent rainfall deficiency.

Institute of Hydrology

British Geological Survey

Data for this report have been provided principally by the regional divisions of the National Rivers Authority* in England and Wales, the River Purification Boards in Scotland and by the Meteorological Office. Reservoir contents information has been supplied by the Water Services Companies, the NRA or, in Scotland, the Lothians Regional Council. The most recent areal rainfall figures are derived from a restricted network of raingauges and a proportion of the river flow data is of a provisional nature.

A map (Figure 3) is provided to assist in the location of the principal monitoring sites.

Financial support towards the production of the Hydrological Summaries is given by the Department of the Environment and the National Rivers Authority.

The Hydrological Summaries are available on annual subscription at a current cost of £48 per year - enquiries should be directed to the National Water Archive Office at the address below. No charge is made to those organisations providing data for the Summaries.

* For reasons of consistency and to provide greater spatial discrimination, the original ten regional divisions of the NRA have been retained for use in the Hydrological Summaries.

MORECS

Most of the recent monthly regional rainfall data featured in the Hydrological Summaries are MORECS assessments. MORECS is the generic name for The Meteorological Office services involving the calculation of evaporation and soil moisture routinely for Great Britain. Products include a weekly issue of maps and tables of potential and actual evaporation, soil moisture deficits, effective rainfall and the hydrometeorological variables used to calculate them. The data are used to provide values for 40 km squares - or larger areas - and various sets of maps and tables are available according to user requirements. Options include a day-by-day retrospective calculation of soil moisture at any of 4000 rain-gauge sites.

Further information about MORECS services may be obtained from: The Meteorological Office, Sutton House, London Road, Bracknell, RG12 2SY

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TABLE 1 1993/94 RAINFALL AS A PERCENTAGE OF THE 1961-90 AVERAGE

		Aug 1993	Sep	Oct	Nov	Dec	Jan 1994	Feb	Mar	Apr	May	Jun	Jul	Aug
England and Wales	mm	55	113	89	74	167	123	82	93	75	61	35	46	93
	%	72	147	105	82	178	140	130	129	125	95	54	74	123
NRA REGIONS														
North West	mm	80	87	51	65	247	159	71	151	151	31	73	67	94
	%	75	76	40	53	199	131	91	159	213	41	90	79	88
Northumbria	mm	77	109	91	63	135	107	71	82	65	27	39	39	78
	%	95	149	120	73	167	127	120	117	116	44	65	60	97
Severn-Trent	mm	43	95	75	67	139	95	71	74	59	55	23	43	48
	%	64	148	117	94	181	136	131	121	107	93	39	81	71
Yorkshire	mm	78	132	62	63	136	116	68	69	61	45	28	52	53
	%	105	194	85	79	164	147	117	101	103	75	47	88	72
Anglian	mm	45	105	90	70	86	73	45	52	52	51	25	41	58
	%	82	214	176	121	156	146	122	111	113	106	49	84	105
Thames	mm	33	103	111	57	105	97	59	49	59	80	25	21	49
	%	57	175	179	88	150	152	131	88	118	143	45	43	84
Southern	mm	37	123	133	62	154	124	64	57	78	91	39	29	65
	%	65	178	166	73	188	155	119	90	147	169	72	60	113
Wessex	mm	36	120	122	63	167	126	100	79	63	90	24	34	67
	%	55	167	154	76	180	145	154	113	119	148	42	65	102
South West	mm	39	168	119	107	263	186	174	124	87	100	32	48	95
	%	46	181	103	86	189	135	172	125	126	139	46	70	113
Welsh	mm	75	118	81	113	275	182	131	177	115	68	57	64	93
	%	74	103	59	80	180	127	135	165	144	83	72	83	92
Scotland	mm	74	76	118	76	234	215	96	249	134	30	110	66	89
	%	63	54	76	50	155	142	94	199	176	35	128	70	76
RIVER PURIFICATION BOARDS														
Highland	mm	85	52	139	68	275	248	74	338	188	39	148	62	95
	%	67	30	70	33	140	132	58	209	207	42	151	58	75
North-East	mm	69	84	170	44	115	131	110	105	77	16	56	39	35
	%	79	97	175	44	124	132	169	135	128	23	85	53	40
Tay	mm	58	103	126	77	176	206	117	229	103	22	89	47	56
	%	62	90	97	64	139	143	123	210	166	27	122	61	60
Forth	mm	51	78	109	73	189	161	88	204	83	21	75	55	68
	%	54	71	95	65	172	136	111	217	141	28	109	73	72
Tweed	mm	53	92	135	55	177	141	86	122	71	20	52	42	55
	%	60	103	142	59	190	141	128	154	125	28	80	58	63
Solway	mm	65	102	54	97	269	204	116	191	120	28	79	102	105
	%	55	71	34	67	182	131	115	163	156	33	94	113	88
Clyde	mm	89	74	67	113	306	268	110	301	148	38	141	99	151
	%	66	41	35	63	171	142	93	205	176	42	152	91	113

Note: The monthly rainfall figures for the NRA regions for August correspond to the MORECS areal assessments derived by the Meteorological Office. In northern England these initial assessments may have a particularly wide error band associated with them. The figures for the RPB regions for August 1994 were derived by IH in collaboration with the RPBs. The provisional figures for England and Wales and for Scotland are derived using a different raingauge network. Regional areal rainfall figures are regularly updated (normally one or two months in arrears) using figures derived from a far denser raingauge network.

TABLE 2 RAINFALL RETURN PERIOD ESTIMATES

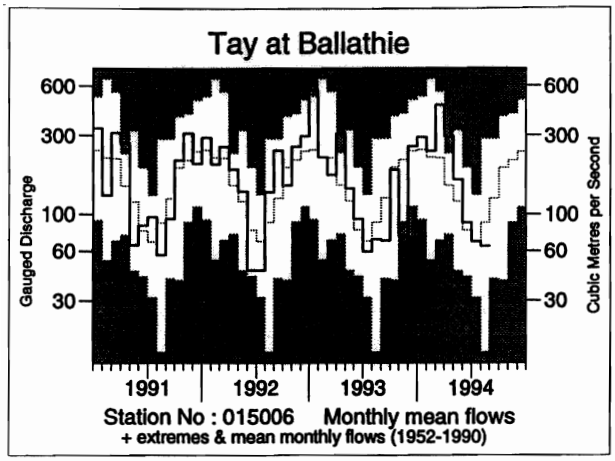
		May94-Aug94	Est Return Period, years	Jan94-Aug94	Est Return Period, years	Sept93-Aug94	Est Return Period, years	Sept92-Aug94	Est Return Period, years
England and Wales	mm	235		608		1051		1990	
	% LTA	88	2-5	111	2-5	117	5-15	111	5-10
NRA REGIONS									
North West	mm	265		797		1247		2482	
	% LTA	76	5-10	112	2-5	104	2-5	103	2-5
Northumbria	mm	183		508		906		1818	
	% LTA	68	10-15	95	2-5	106	2-5	107	2-5
Severn-Trent	mm	169		468		844		1623	
	% LTA	71	5-10	98	2-5	112	2-5	108	2-5
Yorkshire	mm	178		492		885		1733	
	% LTA	71	5-10	95	2-5	108	2-5	106	2-5
Anglian	mm	175		397		748		1409	
	% LTA	86	2-5	104	2-5	126	20-30	118	20-30
Thames	mm	175		439		815		1563	
	% LTA	80	2-5	101	2-5	118	5-10	113	5-10
Southern	mm	224		547		1019		1827	
	% LTA	105	2-5	118	5-10	131	30-50	117	10-20
Wessex	mm	215		583		1055		1924	
	% LTA	91	2-5	114	2-5	126	15-25	115	5-15
South West	mm	275		846		1503		2760	
	% LTA	93	2-5	121	5-10	128	30-40	118	15-25
Welsh	mm	282		887		1474		2831	
	% LTA	83	2-5	116	5-10	112	5-10	108	2-5
Scotland	mm	295		989		1493		3143	
	% LTA	77	5-10	118	10-15	104	2-5	109	5-10
RIVER PURIFICATION BOARDS									
Highland	mm	344		1192		1726		3777	
	% LTA	81	5-10	120	10-20	98	2-5	107	5-10
North-East	mm	146		569		982		2005	
	% LTA	50	>200	95	2-5	101	2-5	103	2-5
Tay	mm	214		869		1351		2812	
	% LTA	65	10-20	118	5-10	110	2-5	114	10-20
Forth	mm	219		755		1204		2480	
	% LTA	70	10-20	114	5-10	109	2-5	112	5-15
Tweed	mm	169		589		1048		2108	
	% LTA	57	40-60	98	2-5	108	2-5	109	5-10
Solway	mm	314		945		1467		2976	
	% LTA	83	2-5	114	5-10	103	2-5	105	2-5
Clyde	mm	429		1256		1816		3740	
	% LTA	101	2-5	130	40-60	107	2-5	110	5-10

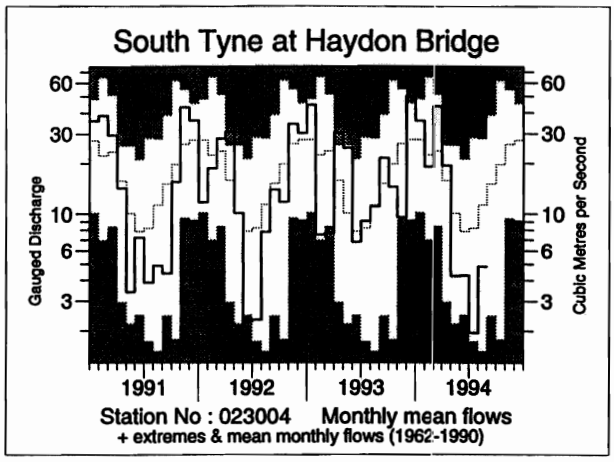
LTA refers to the period 1961-90.

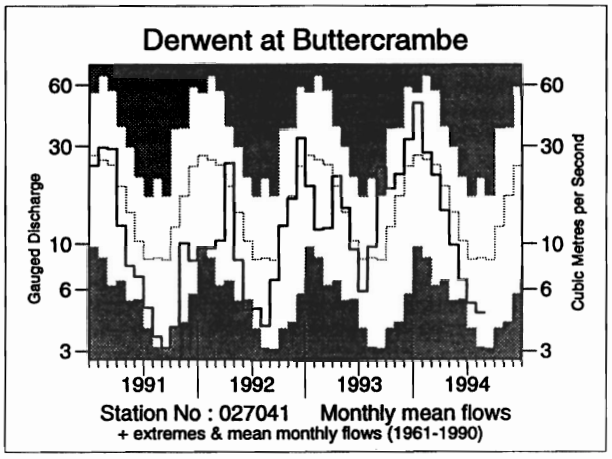
Return period assessments are based on tables provided by the Meteorological Office*. The tables reflect rainfall totals over the period 1911-70 only and the estimate assumes a sensibly stable climate. They assume a start in a specified month; return periods for a start in any month may be expected to be an order of magnitude less - for the longest durations the return period estimates converge. "Wet" return periods underlined.

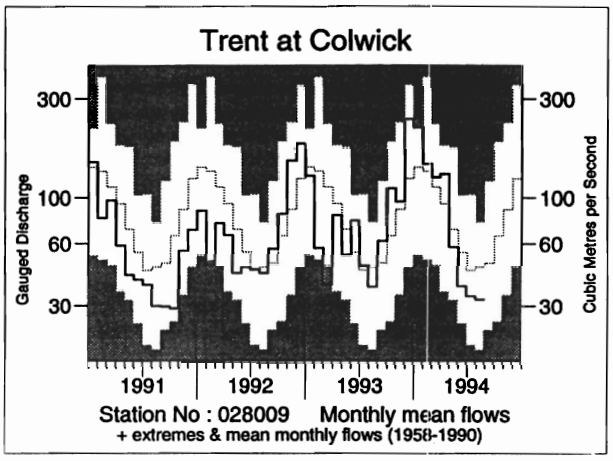
* Tabony, R.C., 1977, The Variability of long duration rainfall over Great Britain, Scientific Paper No. 37, Meteorological Office.

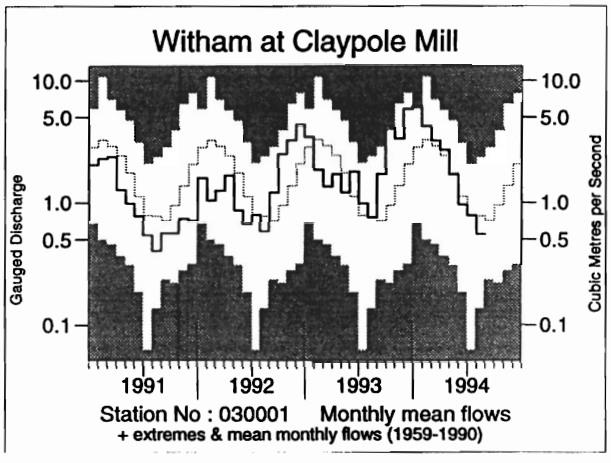
FIGURE 1 MONTHLY RIVER FLOW HYDROGRAPHS

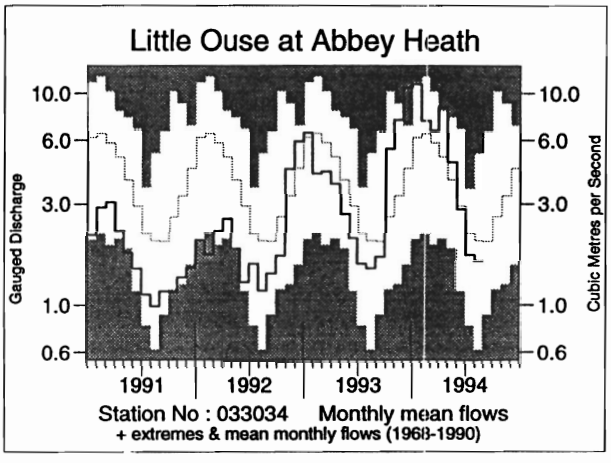


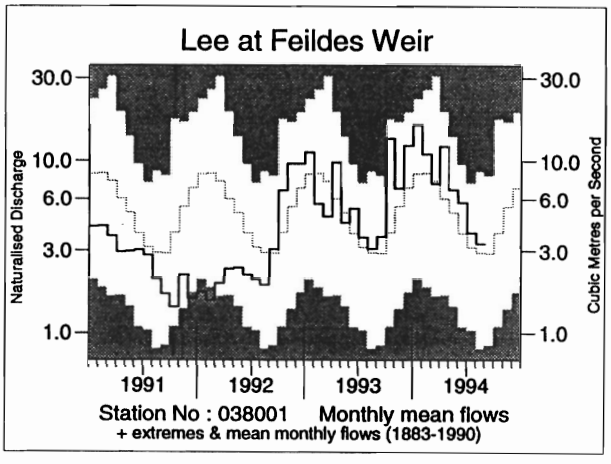


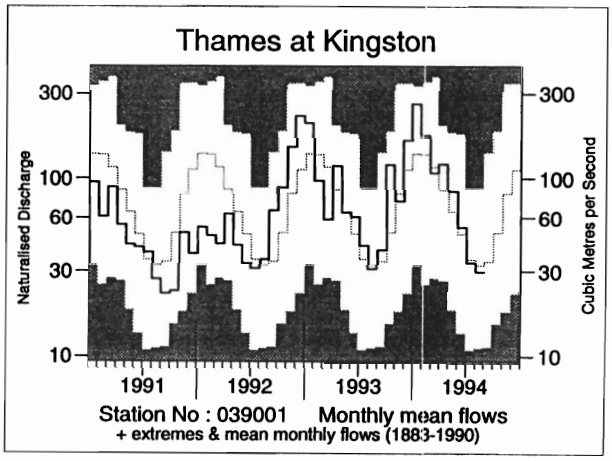


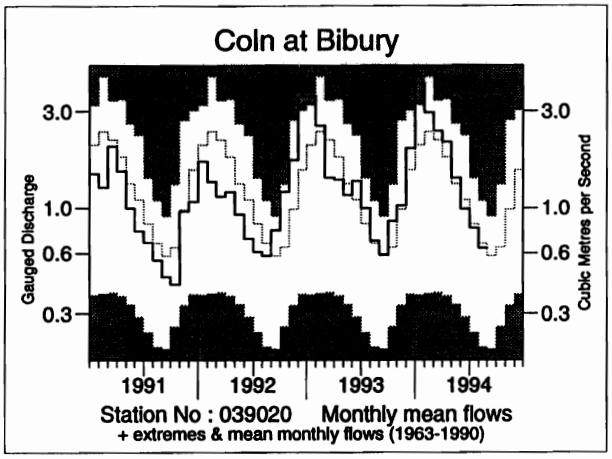


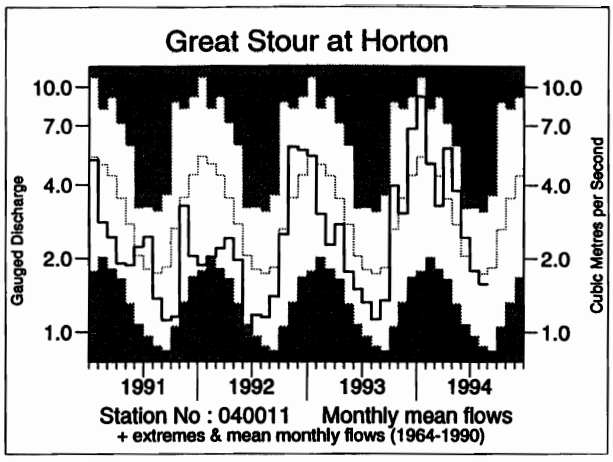


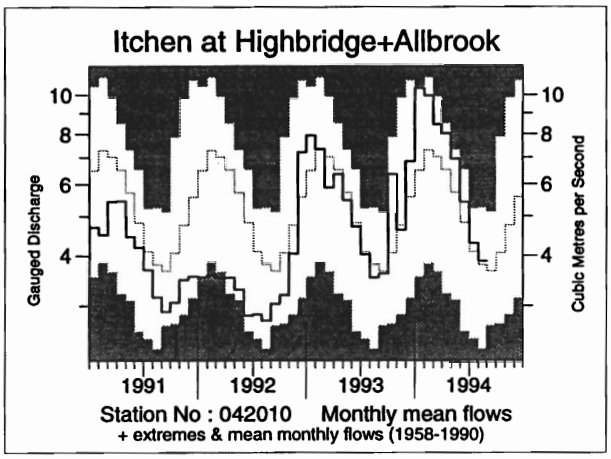


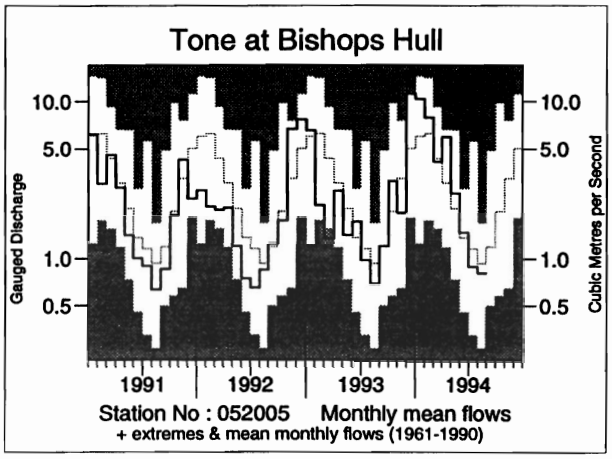


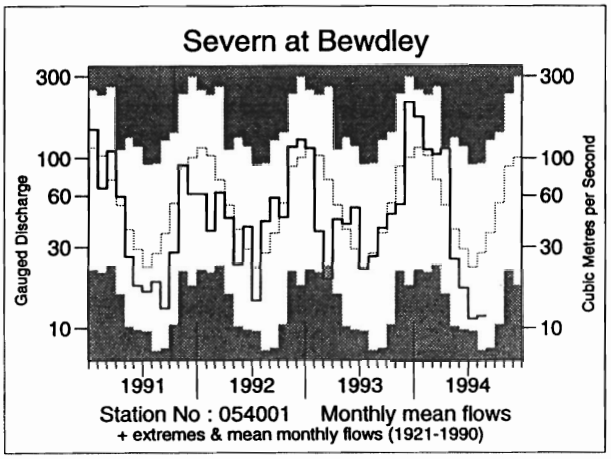


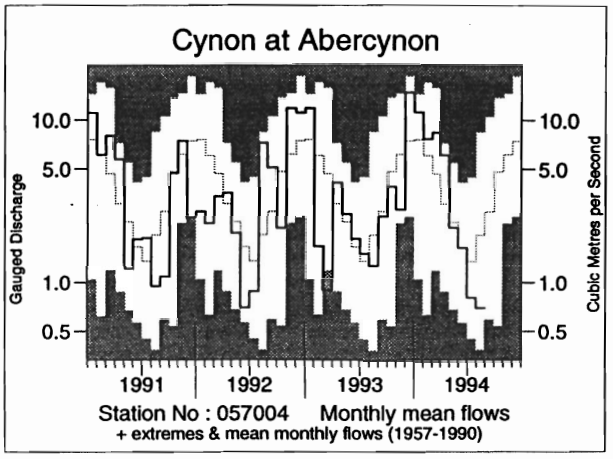

Coln at Bibury
Gauged Discharge
Cubic Metres per Second
3.0
1.0
0.6
0.3
1991
1992
1993
1994
Station No : 039020 Monthly mean flows
+ extremes & mean monthly flows (1963-1990)

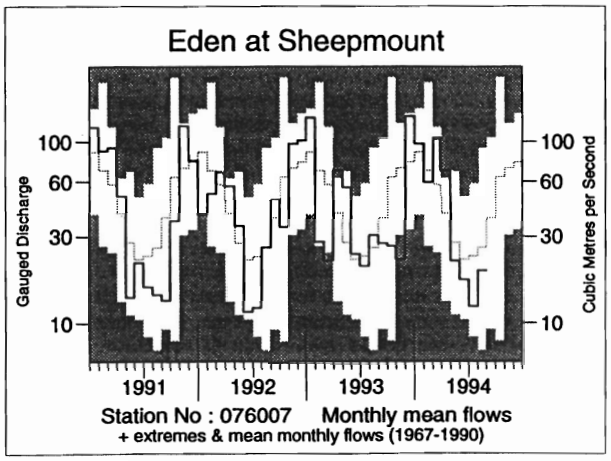

Great Stour at Horton
Gauged Discharge
Cubic Metres per Second
10.0
7.0
4.0
2.0
1.0
1991
1992
1993
1994
Station No : 040011 Monthly mean flows
+ extremes & mean monthly flows (1964-1990)


Itchen at Highbridge+Allbrook
Gauged Discharge
Cubic Metres per Second
10
8
6
4
1991
1992
1993
1994
Station No : 042010 Monthly mean flows
+ extremes & mean monthly flows (1958-1990)


Tone at Bishops Hull
Gauged Discharge
Cubic Metres per Second
10.0
5.0
1.0
0.5
1991
1992
1993
1994
Station No : 052005 Monthly mean flows
+ extremes & mean monthly flows (1961-1990)


Severn at Bewdley
Gauged Discharge
Cubic Metres per Second
300
100
60
30
10
1991
1992
1993
1994
Station No : 054001 Monthly mean flows
+ extremes & mean monthly flows (1921-1990)


Cynon at Abercynon
Gauged Discharge
Cubic Metres per Second
10.0
5.0
1.0
0.5
1991
1992
1993
1994
Station No : 057004 Monthly mean flows
+ extremes & mean monthly flows (1957-1990)


Eden at Sheepmount
Gauged Discharge
Cubic Metres per Second
100
60
30
10
1991
1992
1993
1994
Station No : 076007 Monthly mean flows
+ extremes & mean monthly flows (1967-1990)

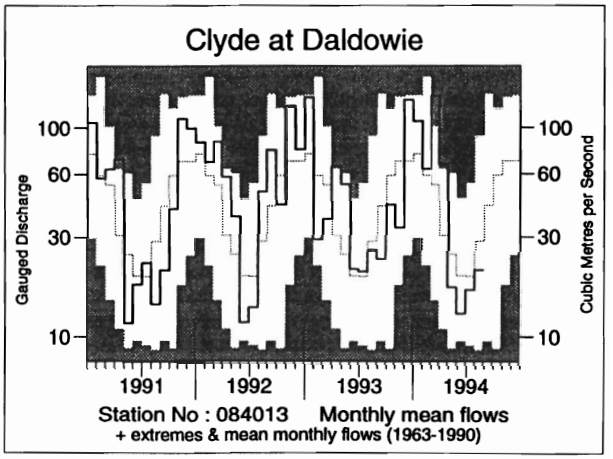

Clyde at Daldowie
Gauged Discharge
Cubic Metres per Second
100
60
30
10
1991
1992
1993
1994
Station No : 084013 Monthly mean flows
+ extremes & mean monthly flows (1963-1990)

TABLE 3 RUNOFF AS MM. AND AS A PERCENTAGE OF THE PERIOD OF RECORD AVERAGE WITH SELECTED PERIODS RANKED IN THE RECORD

River/ Station name	Apr 1994	May	Jun	Jul	Aug 1994		6/94 to 8/94		1/94 to 8/94		9/93 to 8/94		9/92 to 8/94	
	mm %LT	mm %LT	mm %LT	mm %LT	mm %LT	rank /yrs	mm %LT	rank /yrs	mm %LT	rank /yrs	mm %LT	rank /yrs	mm %LT	rank /yrs
Dee at Park	96 123	48 78	24 67	16 57	12 38	5 /22	52 56	3 /22	549 111	15 /22	888 112	17 /21	1727 109	14 /20
Tay at Ballathie	166 194	94 136	50 113	40 99	37 72	15 /42	127 94	18 /42	950 138	41 /42	1287 113	36 /41	2753 121	39 /40
Tweed at Boleside	81 151	33 79	19 71	17 64	21 55	15 /34	57 63	6 /34	565 125	33 /34	893 117	30 /33	1811 119	32 /32
Whiteadder Water at Hutton Castle	26 67	14 53	9 52	7 54	6 41	4 /25	22 50	1 /25	279 106	15 /25	484 123	20 /25	870 111	15 /24
South Tyne at Haydon Bridge	67 120	15 43	15 56	7 25	17 45	9 /31	39 43	3 /31	463 105	17 /31	796 104	18 /29	1603 104	17 /27
Wharfe at Flint Mill Weir	73 134	19 50	15 59	9 34	20 51	12 /39	44 49	4 /39	470 109	27 /39	781 109	25 /38	1458 101	20 /37
Derwent at Buttercrambe	24 76	17 71	11 67	9 63	8 56	7 /33	27 63	7 /33	230 104	19 /33	390 120	26 /32	677 104	18 /31
Trent at Colwick	45 141	21 84	13 69	12 75	12 71	7 /36	37 72	6 /36	272 114	27 /36	452 127	33 /35	801 113	23 /34
Lud at Louth	38 123	33 128	22 112	17 113	14 105	15 /27	53 111	16 /26	288 144	23 /26	411 159	24 /26	603 120	18 /25
Witham at Claypole Mill	23 114	15 99	8 87	7 102	5 73	14 /36	20 87	17 /36	178 130	26 /35	312 168	33 /35	527 143	33 /34
Little Ouse at Abbey Heath	32 180	18 126	10 101	7 81	6 83	14 /27	23 91	13 /27	167 135	23 /26	263 153	24 /26	413 124	22 /25
Colne at Lexden	22 167	10 112	5 87	3 68	3 70	10 /35	10 77	7 /35	111 119	27 35	195 142	30 /34	347 129	29 /33
Lee at Feildes Weir (natr.)	30 203	18 138	14 152	10 123	9 114	77 /109	33 130	87 /109	167 146	95 /108	259 159	98 /107	454 140	98 /105
Thames at Kingston (natr.)	31 140	23 132	14 109	9 95	8 91	54 /112	31 100	62 /112	227 132	95 /112	333 136	96 /111	652 133	101 /110
Coln at Bibury	51 121	35 109	24 93	20 97	16 96	17 /31	60 95	18 /31	377 126	28 /31	487 124	27 /30	985 124	27 /29
Great Stour at Horton	43 166	29 140	18 120	14 98	12 92	12 /30	44 104	15 /29	247 127	25 /28	365 125	23 /27	625 108	15 /25
Itchen at Highbridge+Allbrook	58 126	52 124	39 114	32 106	29 104	22 /36	100 108	26 /36	417 127	35 /36	574 125	33 /35	1031 113	29 /34
Piddle at Baggs Mill	59 140	43 139	28 122	19 108	16 102	17 /31	63 112	22 /31	433 145	30 /30	612 151	29 /29	1052 130	25 /27
Exe at Thorverton	133 238	34 90	21 89	12 58	11 37	7 /39	44 60	7 /39	693 142	38 /38	1137 137	37 /38	1962 119	34 /37
Taw at Umberleigh	112 256	25 85	12 75	6 37	5 26	6 /36	22 44	9 /36	588 149	36 /36	1002 144	34 /35	1747 126	33 /34
Tone at Bishops Hull	77 201	34 128	19 110	12 78	11 88	11 /34	41 93	15 /34	442 139	32 /33	673 143	32 /33	1129 120	29 /32
Severn at Bewdley	67 213	16 68	10 59	7 50	7 42	11 /74	25 51	6 /74	343 123	64 /73	559 124	63 /73	986 110	49 /72
Teme at Knightsford Bridge	47 142	11 53	6 42	2 29	2 22	2 /25	10 33	2 /25	257 105	16 /24	432 119	22 /24	774 107	13 /23
Cynon at Abercynon	150 194	56 95	40 101	20 60	18 34	8 /36	78 63	8 /36	955 134	35 /36	1559 123	32 /34	2951 117	30 /32
Dee at New Inn	195 183	41 62	65 113	24 37	51 55	10 /26	140 64	7 /25	1171 120	22 /25	1891 105	15 /25	3587 100	14 /24
Eden at Sheepmount	79 168	26 80	20 79	14 55	23 76	14 /24	57 71	7 /24	461 112	19 /24	709 103	11 /22	1478 108	15 /20
Clyde at Daldowie	91 203	24 70	18 67	24 87	29 72	14 /31	70 76	10 /31	617 139	30 /31	947 120	28 /30	1944 124	29 /29
Carron at New Kelso	300 213	56 56	183 250	35 30	80 47	2 /16	299 82	5 /16	1555 109	12 /16	2100 82	2 /15	4997 96	6 /14
Ewe at Poolewe	264 190	119 120	124 170	66 78	58 52	3 /24	249 90	10 /24	1376 116	19 /24	1838 85	6 /23	4692 108	17 /22

Notes:
(i) Values based on gauged flow data unless flagged (natr.), when naturalised data have been used.
(ii) Values are ranked so that lowest runoff is rank 1.
(iii) %LT means percentage of long term average from the start of the record to 1992. For the long periods (at the right of this table), the end date for the long term is 1993.

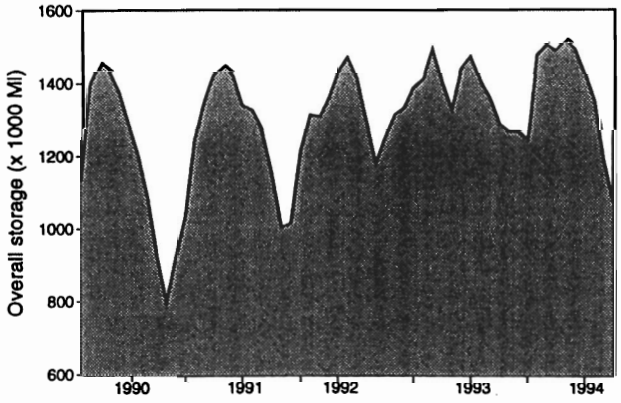
TABLE 4 START-MONTH RESERVOIR STORAGES UP TO SEPTEMBER 1994

Area	Reservoir (R)/ Group (G)		Capacity● (Ml)	1994 Apr	May	June	July	Aug	Sept	1993 Sept
North West	N.Command Zone[1]	(G)	133375	100	97	85	73	59	52	58
	Vyrnwy	(R)	55146	100	94	87	79	66	61	79
Northumbria	Teesdale[2]	(G)	87936	100	99	83	72	54	46	66
	Kielder	(R)	199175*	96*	93*	92*	93*	89*	92*	87*
Severn-Trent	Clywedog	(R)	44922	99	96	93	93	77	61	92
	Derwent Valley[3]	(G)	39525	100	97	90	78	60	43	76
Yorkshire	Washburn[4]	(G)	22035	100	94	89	68	53	40	63
	Bradford supply[5]	(G)	41407	98	96	83	66	49	38	74
Anglian	Grafham	(R)	58707	91	96	96	94	88	83	95
	Rutland	(R)	130061	96	96	95	93	89	86	90
Thames	London[6]	(G)	207569	89	89	88	86	83	77	87
	Farmoor [7]	(G)	13843	98	98	98	95	98	96	98
Southern	Bewl	(R)	28170	100	100	100	98	92	88	78
	Ardingly	(R)	4685	100	100	100	100	93	85	80
Wessex	Clatworthy	(R)	5364	100	99	84	85	68	54	72
	Bristol W [8]	(G)	38666*	99*	98*	94*	85*	71*	61*	60*
South West	Colliford	(R)	28540	100	100	96	87	78	68	81
	Roadford	(R)	34500	100	97	92	87	79	67	74
	Wimbleball[9]	(R)	21320	100	99	99	92	77	60	76
	Stithians	(R)	5205	100	96	93	82	69	57	85
Welsh	Celyn + Brenig	(G)	131155	100	99	97	94	78	66	94
	Brianne	(R)	62140	100	100	96	90	81	72	92
	Big Five[10]	(G)	69762	100	97	93	89	70	58	78
	Elan Valley[11]	(G)	99106	100	99	95	91	77	62	97
Lothian	Edin./Mid Lothian	(G)	97639	99	98	93	84	79	73	83
	West Lothian	(G)	5613	99	100	91	77	64	52	81
	East Lothian	(G)	10206	98	99	95	86	76	66	81

● Live or usable capacity (unless indicated otherwise) * Gross storage/percentage of gross storage

1. Includes Haweswater, Thirlmere, Stocks and Barnacre.
2. Cow Green, Selset, Grassholme, Balderhead, Blackton and Hury.
3. Howden, Derwent and Ladybower.
4. Swinsty, Fewston, Thruscross and Eccup.
5. The Nidd/Barden group (Scar House, Angram, Upper Barden,Lower Barden and Chelker) plus Grimwith.
6. Lower Thames (includes Queen Mother, Wraysbury, Queen Mary, King George VI and Queen Elizabeth II) and Lee Valley (includes King George and William Girling) groups -pumped storages.
7. Farmoor 1 and 2 - pumped storages.
8. Blagdon, Chew Valley and others.
9. Shared between South West (river regulation for abstraction) and Wessex (direct supply).
10. Usk, Talybont, Llandegfedd (pumped stroage), Taf Fechan, Taf Fawr.
11. Claerwen, Caban Coch, Pen y Garreg and Craig Goch.

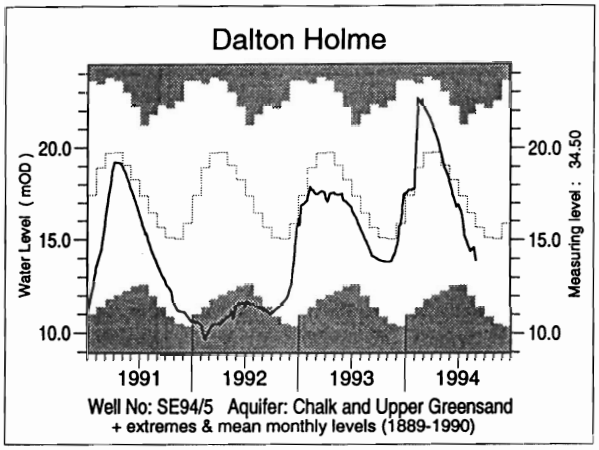
A GUIDE TO THE VARIATION IN OVERALL RESERVOIR STOCKS FOR ENGLAND AND WALES

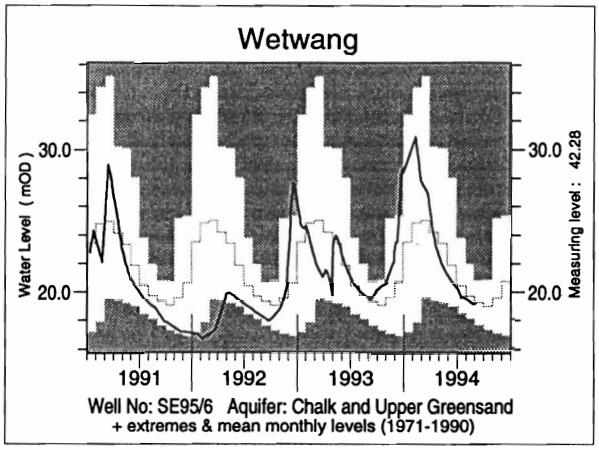


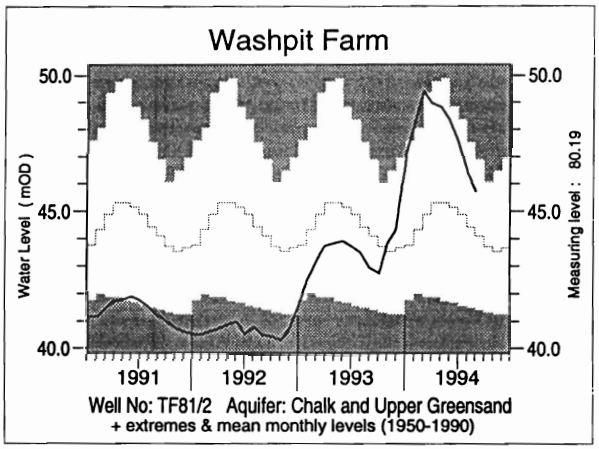
This plot is based on the reservoirs featured in Table 4 only.

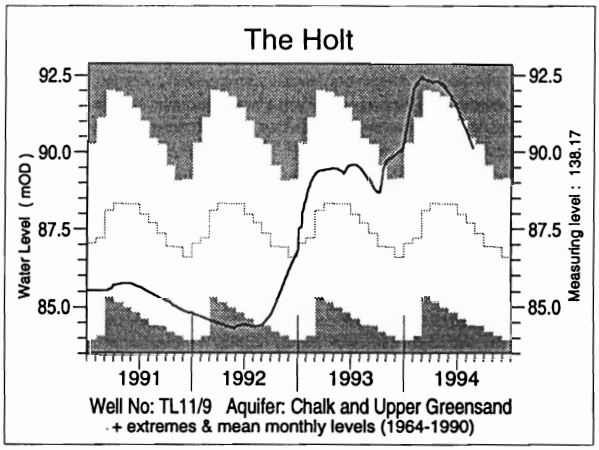
Note: Variations in storage depend on the balance between inputs (from catchment rainfall and any pumping) and outputs (to supply, compensation flow, HEP, amenity). There will be additional losses due to evaporation, especially in the summer months. Operational strategies for making the most efficient use of water stocks will further affect reservoir storages. Table 4 provides a link between the hydrological conditions described elsewhere in the report and the water resources situation.

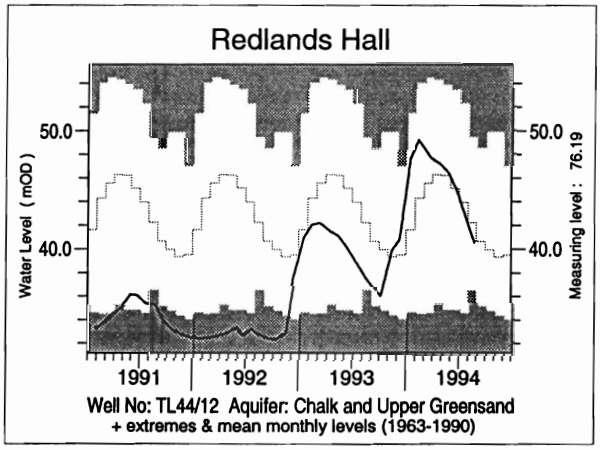
FIGURE 2 GROUNDWATER LEVEL HYDROGRAPHS

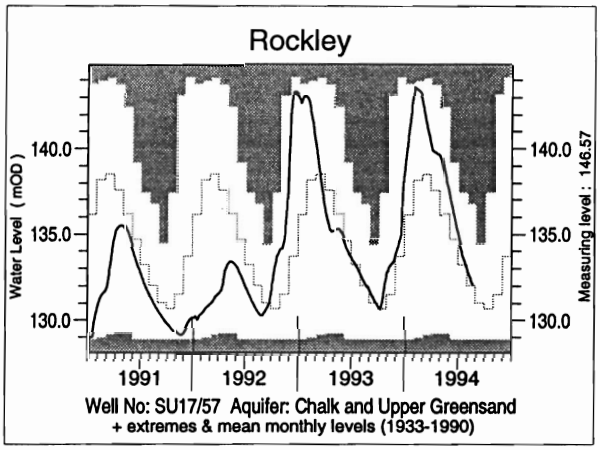


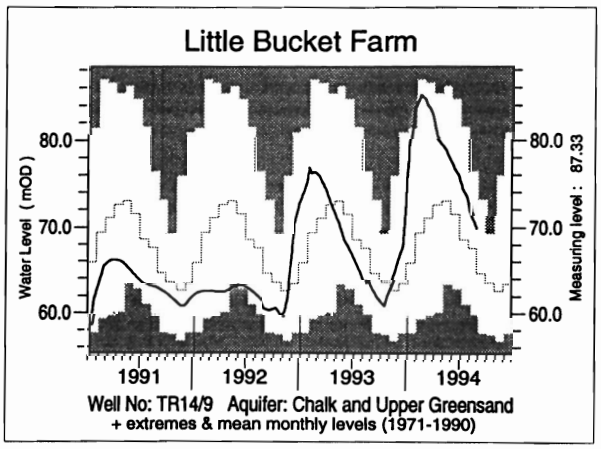


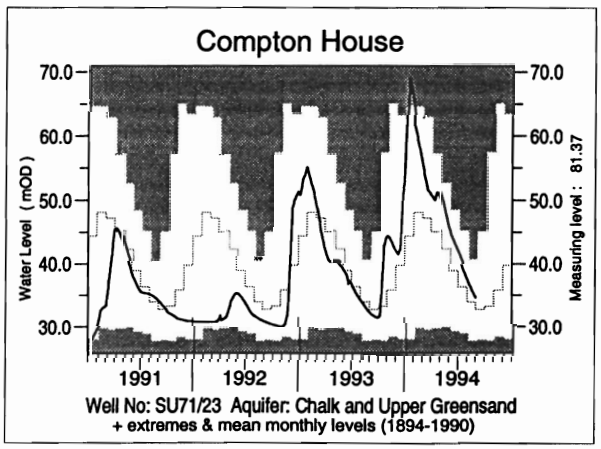


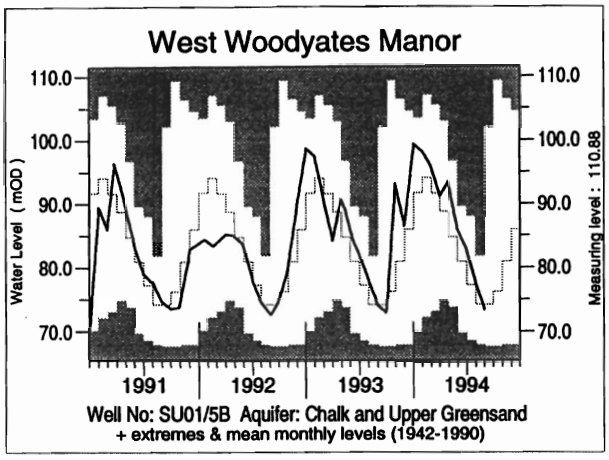


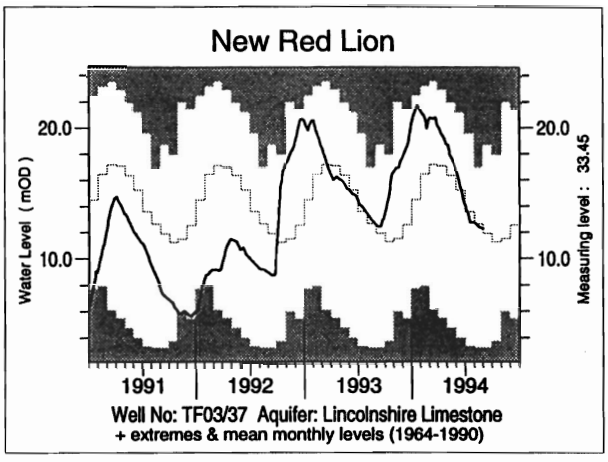


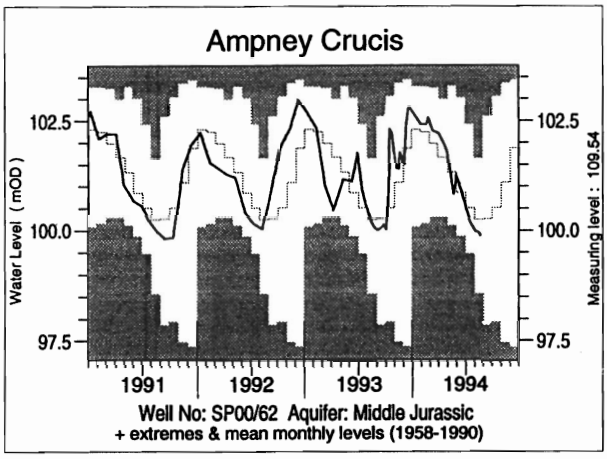


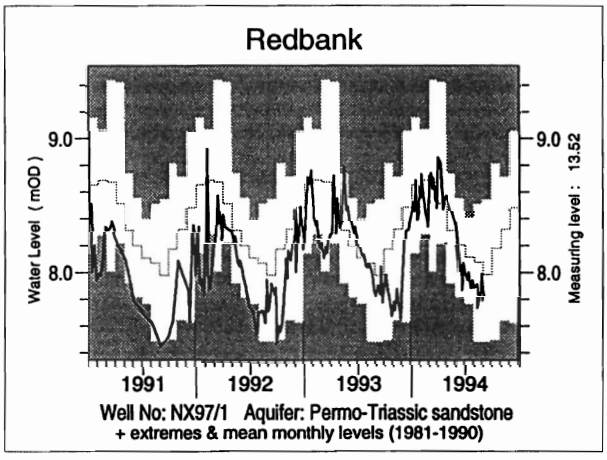


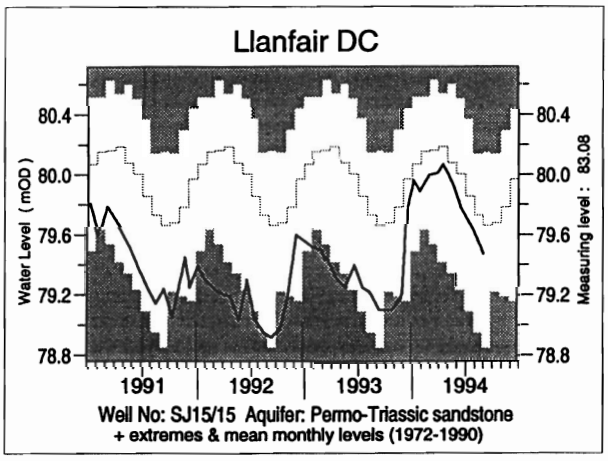


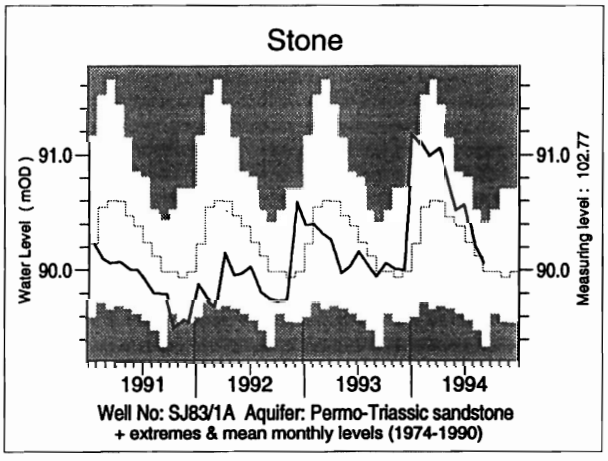

West Woodyates Manor
Water Level (mOD)
110.0
100.0
90.0
80.0
70.0
Measuring level : 110.88
1991
1992
1993
1994
Well No: SU01/5B Aquifer: Chalk and Upper Greensand
+ extremes & mean monthly levels (1942-1990)

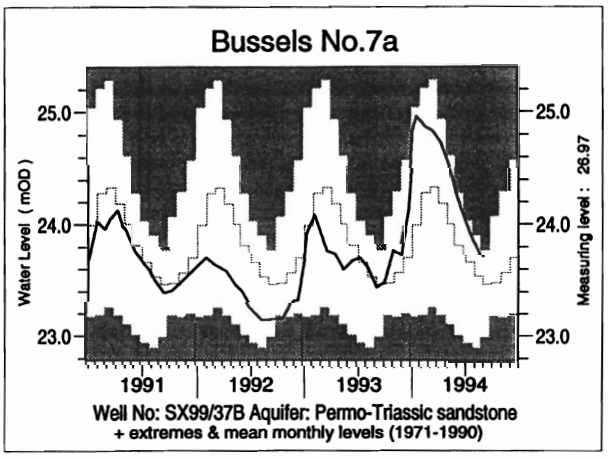

New Red Lion
Water Level (mOD)
20.0
10.0
Measuring level : 33.45
1991
1992
1993
1994
Well No: TF03/37 Aquifer: Lincolnshire Limestone
+ extremes & mean monthly levels (1964-1990)


Ampney Crucis
Water Level (mOD)
102.5
100.0
97.5
Measuring level : 109.54
1991
1992
1993
1994
Well No: SP00/62 Aquifer: Middle Jurassic
+ extremes & mean monthly levels (1958-1990)


Redbank
Water Level (mOD)
9.0
8.0
Measuring level : 13.52
1991
1992
1993
1994
Well No: NX97/1 Aquifer: Permo-Triassic sandstone
+ extremes & mean monthly levels (1981-1990)


Llanfair DC
Water Level (mOD)
80.4
80.0
79.6
79.2
78.8
Measuring level : 83.08
1991
1992
1993
1994
Well No: SJ15/15 Aquifer: Permo-Triassic sandstone
+ extremes & mean monthly levels (1972-1990)


Stone
Water Level (mOD)
91.0
90.0
Measuring level : 102.77
1991
1992
1993
1994
Well No: SJ83/1A Aquifer: Permo-Triassic sandstone
+ extremes & mean monthly levels (1974-1990)


Bussels No.7a
Water Level (mOD)
25.0
24.0
23.0
Measuring level : 26.97
1991
1992
1993
1994
Well No: SX99/37B Aquifer: Permo-Triassic sandstone
+ extremes & mean monthly levels (1971-1990)

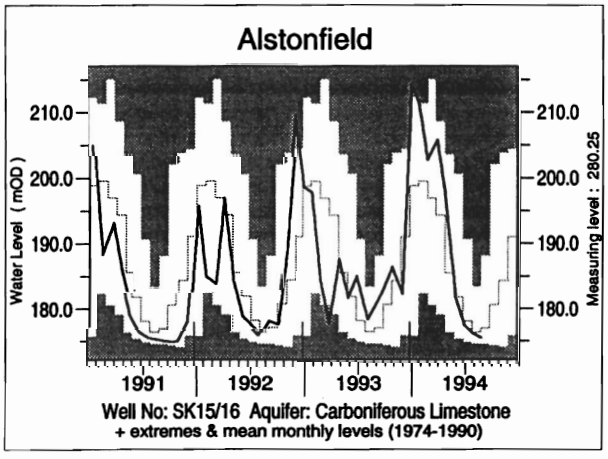

Alstonfield
Water Level (mOD)
210.0
200.0
190.0
180.0
Measuring level : 280.25
1991
1992
1993
1994
Well No: SK15/16 Aquifer: Carboniferous Limestone
+ extremes & mean monthly levels (1974-1990)

TABLE 5 A COMPARISON OF AUGUST GROUNDWATER LEVELS: 1993 AND 1994

Site	Aquifer	Records commence	Minimum August <1994	Average August <1994	Maximum August <1994	August 1993 day	August 1993 level	Aug/Sept 1994 day	Aug/Sept 1994 level
Dalton Holme	C & UGS	1889	11.28	16.42	21.77	30/08	14.58	01/09	13.89
Wetwang	C & UGS	1971	18.02	19.82	21.84	30/08	19.56	01/09	19.21
Washpit Farm	C & UGS	1950	40.77	44.33	47.50	02/08	43.49	01/09	45.72
The Holt	C & UGS	1964	84.32	87.67	90.40	29/08	89.10	22/08	90.08
Therfield Rectory	C & UGS	1883	dry <71.6	81.00	98.97	30/08	78.24	01/09	82.59
Redlands Hall	C & UGS	1964	32.73	41.39	49.47	13/08	37.69	23/08	40.51
Rockley	C & UGS	1933	dry <128.94	131.97	136.70	29/08	131.88	22/08	132.05
Little Bucket Farm Farm	C & UGS	1971	59.75	67.07	76.35	31/08	62.72	31/08	69.91
Compton House	C & UGS	1984	27.65	38.78	40.39	24/08	32.62	31/08	34.67
Chilgrove House	C & UGS	1836	33.68	41.67	67.06	24/08	40.73	31/08	42.32
West Dean No.3	C & UGS	1940	1.01	1.45	1.98	27/08	1.43	26/08	1.68
Lime Kiln Way	C & UGS	1969	123.86	125.06	125.78	11/08	124.11	06/09	125.44
Ashton Farm	C & UGS	1974	63.80	65.78	68.17	31/08	65.36	31/08	65.70
West Woodyates Manor	C & UGS	1942	67.95	74.03	81.67	31/08	74.15	31/08	73.40
Killyglen (NI)	C & UGS	1985	113.23	114.11	117.46	31/08	113.53	24/08	114.92
New Red Lion	LLst	1964	3.29	12.39	17.08	31/08	12.56	30/08	12.28
Ampney Crucis	Mid Jur	1958	98.58	100.24	101.64	29/08	100.05	22/08	99.88
Yew Tree Farm	PTS	1973	10.23	13.16	13.61	10/08	13.47	07/09	13.37
Llanfair D.C	PTS	1972	78.95	79.60	80.15	13/08	79.22	31/08	79.47
Morris Dancers	PTS	1969	31.87	32.48	33.52	10/08	31.91	16/08	32.41
Weeford Flats	PTS	1966	dry <88.61	90.00	91.59	05/08	89.01	31/08	89.64
Stone	PTS	1974	89.48	90.10	90.54	06/08	90.03	02/09	90.06
Skirwith	PTS	1978	129.66	130.16	130.48	20/08	130.11	12/09	130.24
Redbank	PTS	1981	7.49	7.95	8.52	29/08	7.86	02/09	7.80
Bussels No.7A	PTS	1972	22.90	23.54	23.91	04/08	23.61	01/09	23.72
Rushyford NE	MgLst	1967	64.98	72.41	76.49	26/08	75.63	26/08	76.31
Peggy Ellerton	MgLst	1968	31.17	34.04	36.68	05/08	31.61	23/08	33.27
Alstonfield	CLst	1974	174.70	176.98	183.39	09/08	178.34	02/09	175.54

groundwater levels are in metres above Ordnance Datum

C & UGS	Chalk and Upper Greensand	Mid Jur	Middle Jurassic limestones
LLst	Lincolnshire Limestone	MgLst	Magnesian Limestone
PTS	Permo-Triassic sandstones	CLst	Carboniferous Limestone

Note: Table 5 has been redesigned to include both monthly minimum and monthly maximum levels.

FIGURE 3 LOCATION MAP OF GAUGING STATIONS AND GROUNDWATER INDEX WELLS