Hydrological Summary for Great Britain

SEPTEMBER 1994

Rainfall

September was generally cool and wet with weather patterns dominated by the passage of a sequence of active frontal systems until near month-end when high pressure produced a more settled complexion throughout most of Britain. Rainfall was especially abundant in mid-month when fronts associated with an exceptionally intense low pressure cell, centred near Denmark, brought sustained rainfall to eastern and central England. September rainfall totals were below average throughout most of Scotland - central and southern areas were particularly dry - but substantially above average to the south. Some localities in the English lowlands registered more than twice the 1961-90 mean; the east Midlands and parts of East Anglia were especially wet. By contrast, several districts in northern England recorded their fifth successive month with less than average rainfall and a much larger area has been relatively dry since June. Regional rainfall deficiencies over the last five months are very substantial in parts of eastern Scotland and significant in northern England. Rainfall totals are well within the normal range for the year thus far, albeit well above average in most of southern Britain where they are also notably high in timeframes extending back to the summer of 1992.

River Flow

Gentle seasonal recoveries in flow rates could be identified as soil moisture deficits declined over the first two weeks of September. Widespread and heavy rainfall around the 14/15th then produced some short-lived spates but thereafter recessions became re-established and continued into early October. Spate conditions were most notable in the Midlands where the Trent (at Colwick) registered its highest September flow rate for 30 years. Runoff totals for the month were - apart from some Scottish catchments e.g. the Clyde - appreciably above the August figures but showed wide regional differences: below half the average in the Tweed catchment, for instance, but considerably above the average throughout southern Britain. Although, by early October, flows in impervious catchments had returned to the levels which typified the late summer, they remained generally well above those recorded in, for example, 1989, 1990 and 1991. In the South and East runoff in rivers sustained principally from groundwater continued to exceed the monthly mean; in some catchments (e.g. the Mimram) September was the sixteenth such month in sequence. Correspondingly, accumulated runoff totals are outstanding for a number of, mainly Chalk, rivers. Water-year (October-September) runoff has been unprecedented on the Kennet, Mimram, Itchen and for a number of rivers in the South-West also. In the two-year timeframe runoff totals are exceptionally high throughout much of Britain.

Groundwater

The initial brisk reduction in soil moisture deficits stalled over the last two weeks in September and in early October significant deficits remained in most central, eastern and southern areas (SMDs were notably high in parts of eastern Scotland). The very limited aquifer recharge in the autumn is reflected in the groundwater hydrographs: levels continue to fall gently in the eastern Chalk and, elsewhere, only modest inflections in the 1994 recessions can be identified - although minor and isolated recoveries have occurred (e.g. in the Lincolnshire and Carboniferous Limestones). Notwithstanding the relatively steep declines in the water-tables from the early spring, groundwater levels in the Chalk remain healthy, notably so in the eastern Chilterns and East Anglia; 1994 minima are expected to be greatly above the minima registered in 1992. This is true of most of the Permo-Triassic sandstone aquifers also but generalisations are less appropriate: in the South-West, some groundwater levels are close to the monthly maximum but in Dumfries and Galloway the recent fall has left levels approaching the period-of-record minima (in a relatively short series). The length of the 1994/95 recharge season and magnitude of the recovery will, in large part, depend on rainfall over the next six weeks.

General

Runoff and recharge rates in September have picked-up and the decline in reservoir contents has generally been arrested; typically, regional stocks are considerably below the corresponding totals for last year but well above those of 1990. However, the seasonal recovery in river flows and groundwater levels is not yet firmly established. A dry October, in northern Britain particularly, would significantly reduce the window of opportunity for winter aquifer replenishment and make for a less encouraging water resources outlook.

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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13 October 1994

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

		Sep 1993	Oct	Nov	Dec	Jan 1994	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
England and Wales	mm	113	89	74	167	123	82	93	75	61	35	46	93	112
	%	147	105	82	178	140	130	129	125	95	54	74	123	145
NRA REGIONS														
North West	mm	87	51	65	247	159	71	151	151	31	73	67	94	106
	%	76	40	53	199	131	91	159	213	41	90	79	88	92
Northumbrian	mm	109	91	63	136	107	71	82	65	27	39	39	78	73
	%	149	120	73	168	127	120	117	116	44	65	60	97	101
Severn Trent	mm	96	74	67	139	95	71	74	59	55	23	43	48	120
	%	150	116	94	181	136	131	121	107	93	39	81	71	187
Yorkshire	mm	132	62	63	136	116	68	69	61	45	28	52	53	102
	%	194	85	79	164	147	117	101	103	75	47	88	72	150
Anglian	mm	105	90	70	85	73	45	52	52	51	25	41	58	92
	%	214	176	121	155	146	122	111	113	106	49	84	105	187
Thames	mm	103	111	47	105	97	59	49	59	80	25	21	49	79
	%	175	179	72	150	152	131	88	118	143	45	43	84	134
Southern	mm	123	134	63	154	124	64	57	78	91	39	29	65	93
	%	178	168	74	188	155	119	90	147	169	72	60	113	135
Wessex	mm	120	122	63	167	126	100	79	63	90	24	34	67	101
	%	167	154	76	180	145	154	113	119	148	42	65	102	141
South West	mm	168	119	107	263	186	174	124	87	100	32	48	95	124
	%	181	103	86	189	135	172	125	126	139	46	70	113	134
Welsh	mm	118	81	113	275	182	131	177	115	68	57	64	93	140
	%	103	59	80	180	127	135	165	144	83	72	83	92	121
Scotland	mm	76	118	76	234	215	96	249	134	30	110	66	89	102
	%	54	76	50	155	142	94	199	176	35	128	70	76	72
RIVER PURIFICATION BOARDS														
Highland	mm	52	138	67	275	248	74	338	188	39	148	62	95	166
	%	30	70	33	140	132	58	209	207	42	151	58	75	97
North East	mm	84	170	44	115	131	110	105	77	16	56	39	35	84
	%	97	175	44	124	132	169	135	128	23	85	53	40	97
Tay	mm	103	126	77	175	206	117	229	103	22	89	47	56	52
	%	90	97	64	138	143	123	210	166	27	122	61	60	46
Forth	mm	80	107	73	189	161	88	204	83	21	75	55	68	53
	%	73	93	65	172	136	111	217	141	28	109	73	72	48
Tweed	mm	92	135	55	176	141	86	122	71	20	52	42	55	52
	%	103	142	59	189	141	128	154	125	28	80	58	63	58
Solway	mm	102	54	97	269	204	116	191	120	28	79	102	105	78
	%	71	34	67	182	131	115	163	156	33	94	113	88	55
Clyde	mm	75	66	114	306	268	110	301	148	38	141	99	151	84
	%	42	34	63	171	142	93	205	176	42	152	91	113	47

Note: The monthly rainfall figures for the NRA regions for August and September 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 & September 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

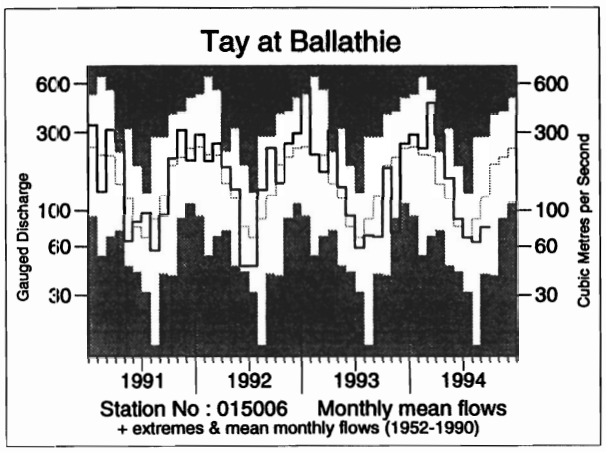
		May94-Sep94		Jan94-Sep94		Oct93-Sep94		Sep92-Sep94	
			Est Return Period, years		Est Return Period, years		Est Return Period, years		Est Return Period, years
England and Wales	mm	347		720		1050		2100	
	% LTA	111	2-5	115	5-10	117	10-15	112	10-15
NRA REGIONS									
North West	mm	371		903		1266		2589	
	% LTA	80	5-10	109	2-5	105	2-5	103	2-5
Northumbrian	mm	257		582		872		1894	
	% LTA	75	5-10	95	2-5	102	2-5	106	2-5
Severn Trent	mm	288		587		867		1742	
	% LTA	95	2-5	108	2-5	115	5-10	111	5-10
Yorkshire	mm	280		594		855		1834	
	% LTA	87	2-5	102	2-5	104	2-5	107	2-5
Anglian	mm	267		489		734		1500	
	% LTA	106	2-5	113	2-5	123	15-25	121	35-50
Thames	mm	254		518		781		1631	
	% LTA	92	2-5	105	2-5	113	5-10	113	5-10
Southern	mm	317		640		991		1920	
	% LTA	112	2-5	120	5-10	127	20-30	118	15-25
Wessex	mm	316		684		1036		2023	
	% LTA	103	2-5	117	5-10	124	10-20	116	10-15
South West	mm	399		970		1459		2883	
	% LTA	103	2-5	122	5-15	124	15-25	118	20-30
Welsh	mm	422		1027		1496		2972	
	% LTA	93	2-5	117	5-10	114	5-10	108	5-10
Scotland	mm	397		1091		1519		3250	
	% LTA	76	10-20	111	5-10	106	2-5	108	5-10
RIVER PURIFICATION BOARDS									
Highland	mm	510		1358		1838		3938	
	% LTA	86	2-5	117	5-10	104	2-5	107	2-5
North East	mm	230		653		982		2091	
	% LTA	60	80-120	95	2-5	101	2-5	103	2-5
Tay	mm	266		921		1299		2863	
	% LTA	60	40-60	108	2-5	106	2-5	111	5-10
Forth	mm	272		808		1177		2532	
	% LTA	64	35-50	105	2-5	106	2-5	109	5-10
Tweed	mm	221		641		1007		2159	
	% LTA	57	70-100	93	2-5	104	2-5	106	2-5
Solway	mm	392		1023		1443		3054	
	% LTA	75	5-10	105	2-5	102	2-5	102	2-5
Clyde	mm	513		1340		1826		3825	
	% LTA	85	2-5	117	5-10	108	2-5	107	2-5

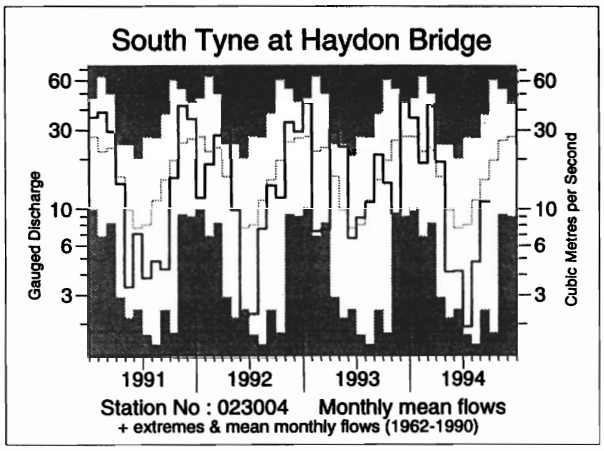
LTA refers to the period 1961-90.

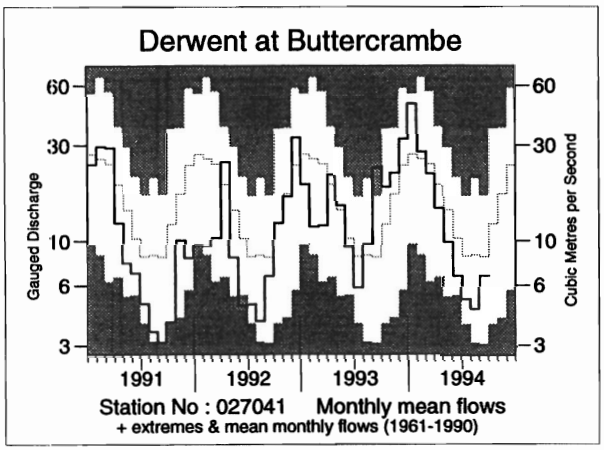
Return period assessments are based on tables provided by the Meteorological Office*. The tables reflect rainfall totals over the period 1911-70 only and the estimate assumes a sensibly stable climate. They assume a start in a specified month; return periods for a start in any month may be expected to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

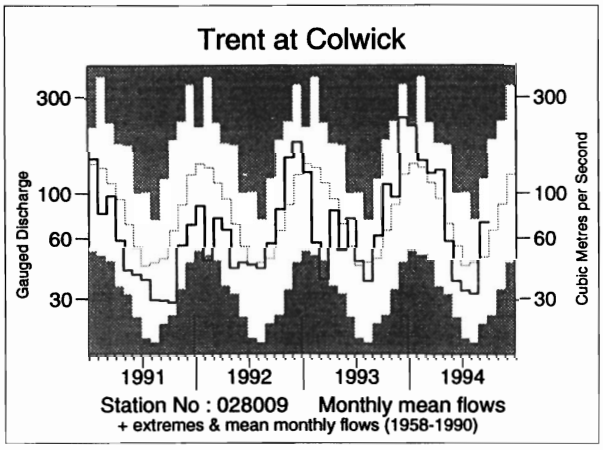
* Tabony, R.C., 1977, The Variability of long duration rainfall over Great Britain, Scientific Paper No. 37, Meteorological Office.

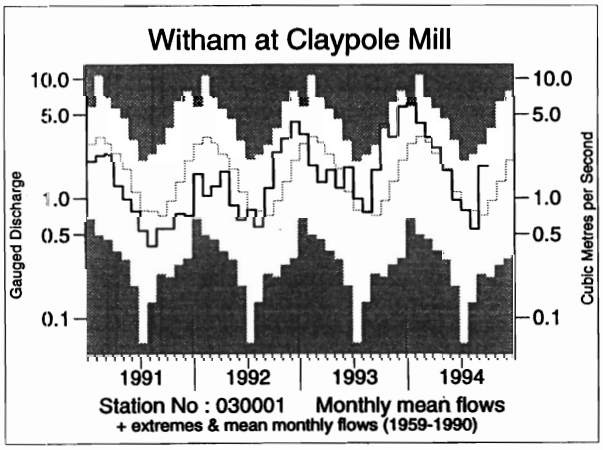
FIGURE 1 MONTHLY RIVER FLOW HYDROGRAPHS

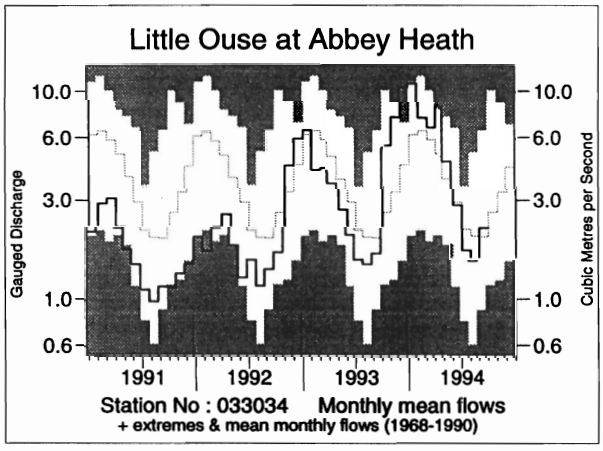


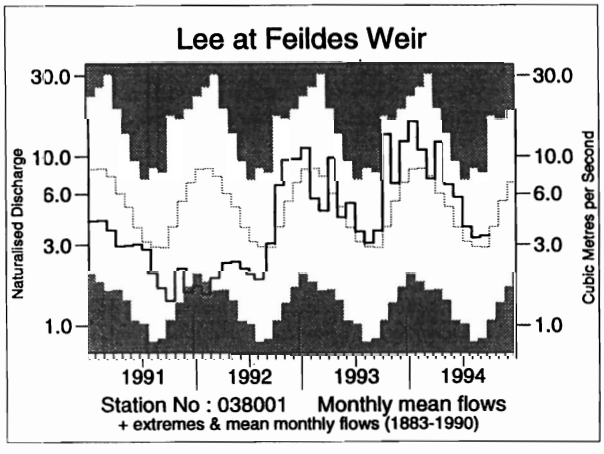


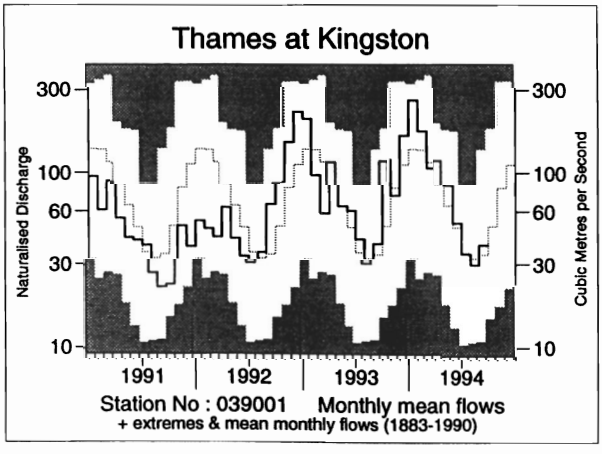


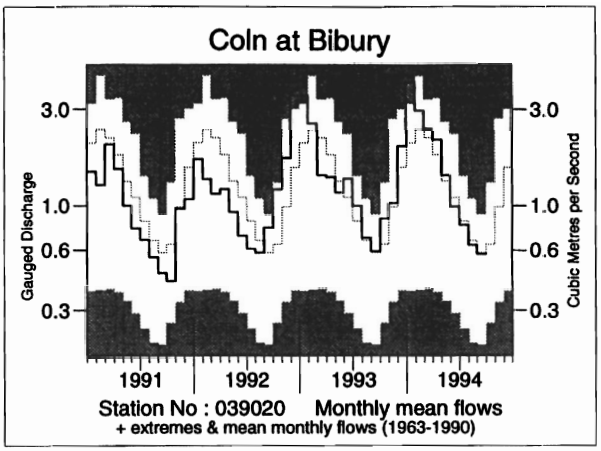


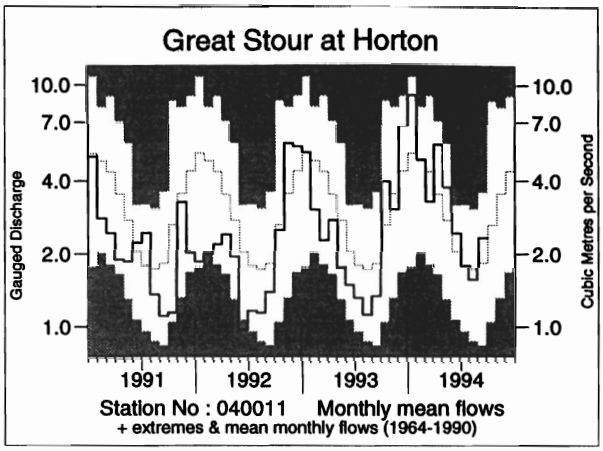


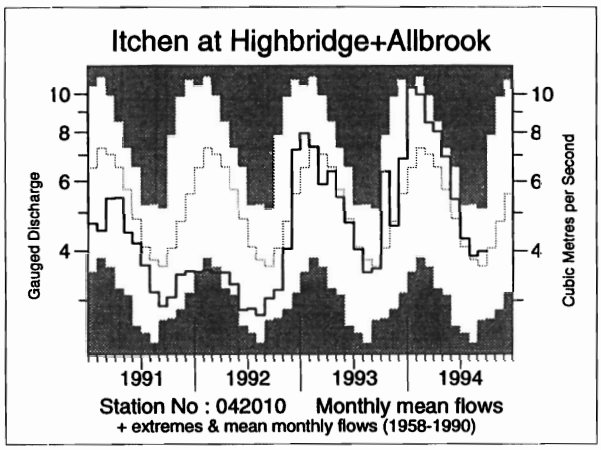


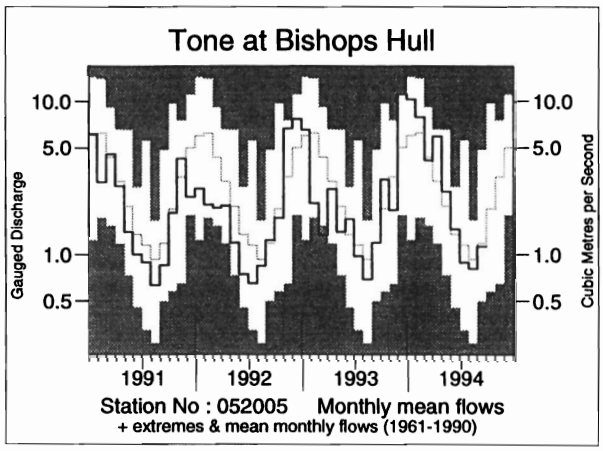


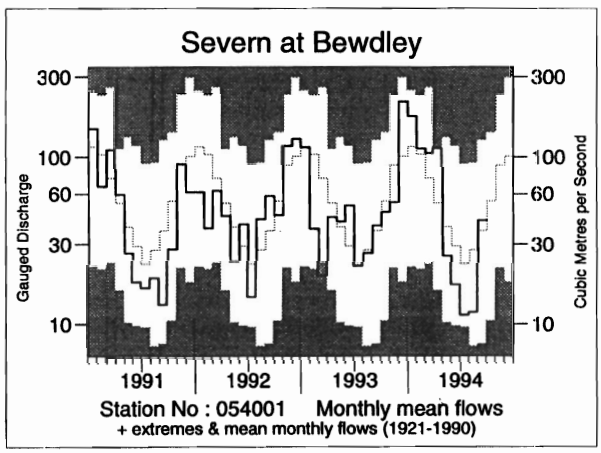


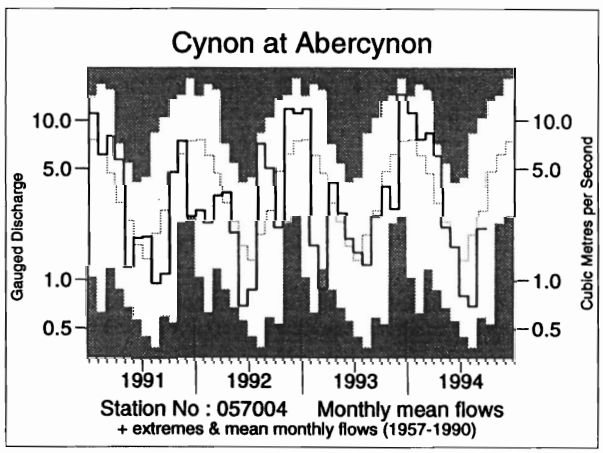

Coln at Bibury
3.0
1.0
0.6
0.3
Gauged Discharge
Cubic Metres per Second
1991
1992
1993
1994
Station No : 039020 Monthly mean flows
+ extremes & mean monthly flows (1963-1990)

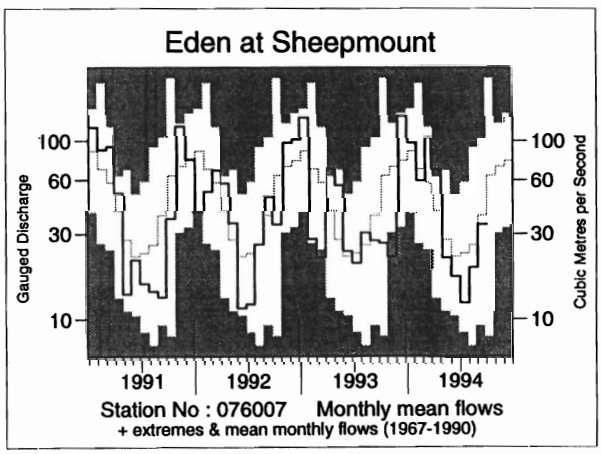

Great Stour at Horton
10.0
7.0
4.0
2.0
1.0
Gauged Discharge
Cubic Metres per Second
1991
1992
1993
1994
Station No : 040011 Monthly mean flows
+ extremes & mean monthly flows (1964-1990)


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


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


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


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


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

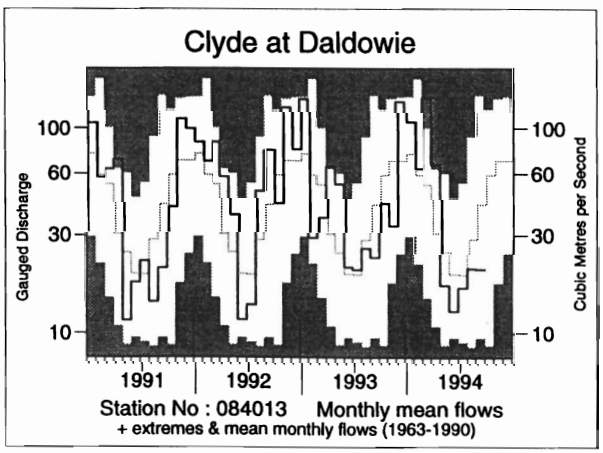

Clyde at Daldowie
100
60
30
10
Gauged Discharge
Cubic Metres per Second
1991
1992
1993
1994
Station No : 084013 Monthly mean flows
+ extremes & mean monthly flows (1963-1990)

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	May 1994	Jun	Jul	Aug	Sep 1994		7/94 to 9/94		1/94 to 9/94		10/93 to 9/94		9/92 to 9/94	
	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	48	24	16	12	29	8	57	2	578	14	862	16	1755	14
Park	78	67	57	38	70	/22	57	/22	108	/22	109	/21	108	/20
Tay at	94	50	40	37	45	12	122	14	995	40	1292	35	2798	37
Ballathie	136	113	99	72	63	/42	76	/42	131	/42	114	/42	119	/40
Tweed at	33	19	17	21	25	9	63	8	590	28	886	31	1836	31
Boleside	79	71	64	55	49	/34	56	/34	117	/34	116	/33	117	/32
Whiteadder Water at	14	9	7	6	6	3	19	1	286	13	478	20	877	15
Hutton Castle	53	52	54	41	41	/26	46	/25	102	/25	121	/25	110	/24
South Tyne at	15	15	7	17	38	11	62	7	501	17	761	14	1642	19
Haydon Bridge	43	56	25	45	76	/31	54	/31	102	/31	101	/31	103	/27
Wharfe at	19	15	9	20	44	21	73	12	513	28	745	24	1502	19
Flint Mill Weir	50	59	34	51	99	/39	66	/39	108	/39	104	/39	101	/37
Derwent at	17	11	9	8	11	10	27	6	241	19	363	25	688	18
Buttercrambe	71	67	63	56	82	/33	66	/33	102	/33	112	/33	104	/31
Trent at	21	13	12	12	25	32	48	18	297	29	455	34	825	26
Colwick	84	69	75	71	148	/36	98	/36	116	/36	128	/36	114	/34
Lud at	33	22	17	14	14	23	45	17	302	23	413	24	617	18
Louth	128	112	113	105	126	/27	117	/26	143	/26	160	/26	121	/25
Witham at	15	8	7	5	16	35	28	30	194	30	313	35	543	33
Claypole Mill	99	87	102	73	257	/36	137	/36	135	/35	168	/35	145	/34
Little Ouse at	18	10	7	6	8	24	21	=15	175	23	264	24	421	22
Abbey Heath	126	101	81	80	114	/27	92	/27	134	/26	155	/26	124	/25
Colne at	10	5	3	3	4	23	10	11	115	26	194	31	351	29
Lexden	112	87	68	70	101	/35	81	/35	118	/35	142	/35	129	/33
Lee at	18	14	10	9	8	82	27	83	175	94	259	100	463	98
Feildes Weir (natr.)	138	152	123	114	117	/109	118	/109	145	/108	158	/108	140	/105
Thames at	23	13	9	8	10	83	27	66	237	95	333	96	662	101
Kingston (natr.)	132	107	98	92	113	/112	101	/112	131	/112	136	/111	132	/110
Coln at	35	24	20	16	14	14	50	18	391	28	487	27	999	27
Bibury	109	93	97	96	98	/31	97	/31	125	/31	124	/31	124	/29
Great Stour at	29	18	14	12	18	26	44	20	265	25	372	23	643	15
Horton	140	120	98	92	131	/30	108	/30	127	/28	128	/27	108	/25
Itchen at	52	39	32	29	29	29	89	24	445	35	577	34	1059	28
Highbridge+Allbrook	124	114	106	104	110	/36	106	/36	126	/36	125	/35	113	/34
Piddle at	43	28	19	16	16	23	51	17	449	30	609	30	1068	25
Baggs Mill	139	122	108	102	104	/31	104	/31	143	/30	150	/30	130	/27
Exe at	34	21	12	11	43	28	65	18	736	38	1139	37	2004	35
Thorverton	90	89	58	37	111	/39	75	/39	141	/38	137	/38	119	/37
Taw at	25	12	6	5	32	27	42	17	619	36	995	35	1779	33
Umberleigh	85	75	37	26	133	/36	73	/36	148	/36	144	/36	126	/34
Tone at	34	19	12	11	15	21	37	16	456	32	672	32	1144	29
Bishops Hull	128	110	78	88	96	/34	88	/34	137	/33	142	/33	120	/32
Severn at	16	10	7	7	25	54	39	31	368	60	561	64	1011	50
Bewdley	68	59	50	42	116	/74	75	/74	122	/73	124	/73	110	/72
Teme at	11	6	2	2	17	23	21	9	274	16	439	23	791	14
Knightsford Bridge	53	42	29	22	195	/25	83	/25	108	/24	121	/24	108	/23
Cynon at	56	40	20	18	52	21	91	10	1007	34	1550	34	3003	29
Abercynon	95	101	60	34	78	/36	60	/36	129	/36	124	/36	116	/32
Dee at	41	65	24	51	126	12	201	7	1297	22	1935	19	3713	14
New Inn	62	113	37	55	96	/26	70	/26	117	/25	108	/25	100	/24
Eden at	26	20	14	23	39	15	76	10	500	17	717	13	1517	15
Sheepmount	80	79	55	76	91	/24	78	/24	111	/24	103	/23	108	/20
Clyde at	24	18	24	29	28	8	81	8	645	28	943	28	1972	28
Daldowie	70	67	87	72	48	/31	66	/31	129	/31	121	/31	121	/29
Carron at	56	183	35	80	186	4	302	2	1741	13	2253	4	5183	5
New Kelso	56	250	30	47	68	/16	56	/16	104	/16	88	/15	95	/14
Ewe at	119	124	66	58	132	6	257	4	1508	19	1929	7	4824	16
Poolewe	120	170	78	52	67	/24	66	/24	110	/24	90	/23	106	/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.

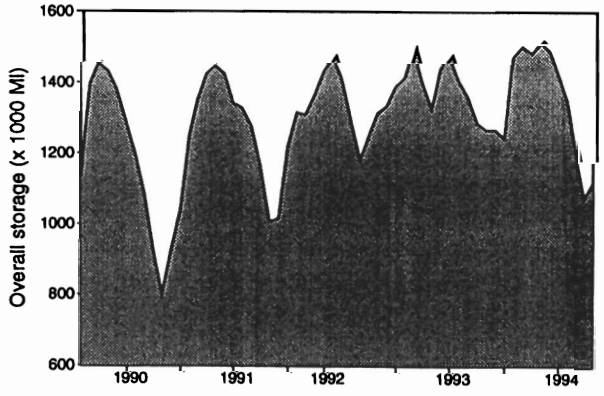
TABLE 4 START-MONTH RESERVOIR STORAGES UP TO OCTOBER 1994

Area	Reservoir (R)/ Group (G)		Capacity● (Ml)	1994 May	June	July	Aug	Sept	Oct	1993 Oct
North West	N.Command Zone[1]	(G)	133375	97	85	73	59	52	55	51
	Vyrnwy	(R)	55146	94	87	79	66	61	69	73
Northumbria	Teesdale[2]	(G)	87936	99	83	72	54	46	51	73
	Kielder	(R)	199175*	93*	92*	93*	89*	92*	89*	84*
Severn-Trent	Clywedog	(R)	44922	96	93	93	77	61	70	87
	Derwent Valley[3]	(G)	39525	97	90	78	60	43	53	84
Yorkshire	Washburn[4]	(G)	22035	94	89	68	53	40	42	67
	Bradford supply[5]	(G)	41407	96	83	66	49	38	48	90
Anglian	Grafham	(R)	58707	96	96	94	88	83	88	95
	Rutland	(R)	130061	96	95	93	89	86	87	86
Thames	London[6]	(G)	207569	89	88	86	83	77	83	86
	Farmoor [7]	(G)	13843	98	98	95	98	96	97	93
Southern	Bewl	(R)	28170	100	100	98	92	88	86	74
	Ardingly	(R)	4685	100	100	100	93	85	82	77
Wessex	Clatworthy	(R)	5364	99	84	85	68	54	48	61
	Bristol W [8]	(G)	38666*	98*	94*	85*	71*	61*	55*	48*
South West	Colliford	(R)	28540	100	96	87	78	68	69	84
	Roadford	(R)	34500	97	92	87	79	67	65	76
	Wimbleball[9]	(R)	21320	99	99	92	77	60	57	74
	Stithians	(R)	5205	96	93	82	69	57	50	93
Welsh	Celyn + Brenig	(G)	131155	99	97	94	78	66	71	92
	Brianne	(R)	62140	100	96	90	81	72	71	91
	Big Five[10]	(G)	69762	97	93	89	70	58	62	80
	Elan Valley[11]	(G)	99106	99	95	91	77	62	67	97
Lothian	Edin./Mid Lothian	(G)	97639	98	93	84	79	73	71	81
	West Lothian	(G)	5613	100	91	77	64	52	45	87
	East Lothian	(G)	10206	99	95	86	76	66	56	85

● 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.

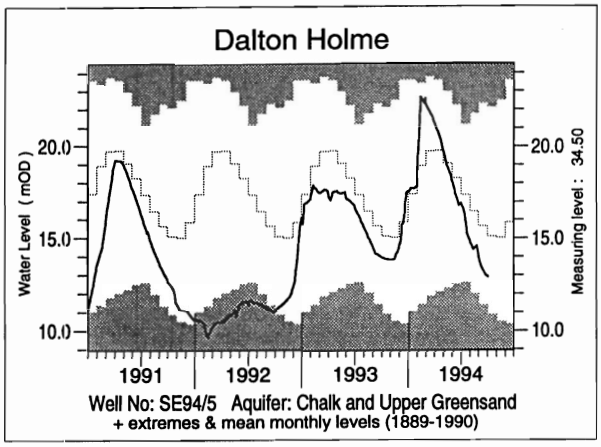
A GUIDE TO THE VARIATION IN OVERALL RESERVOIR STOCKS FOR ENGLAND AND WALES

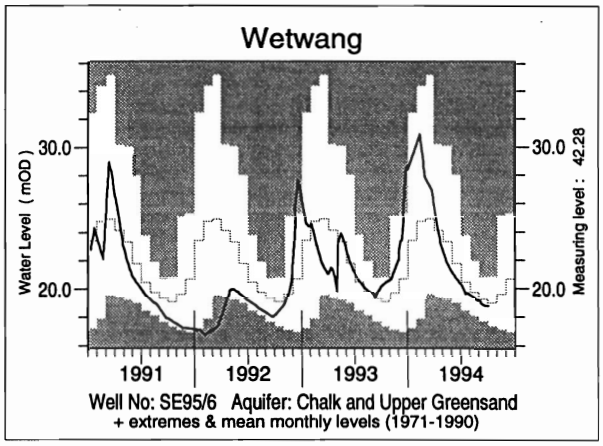


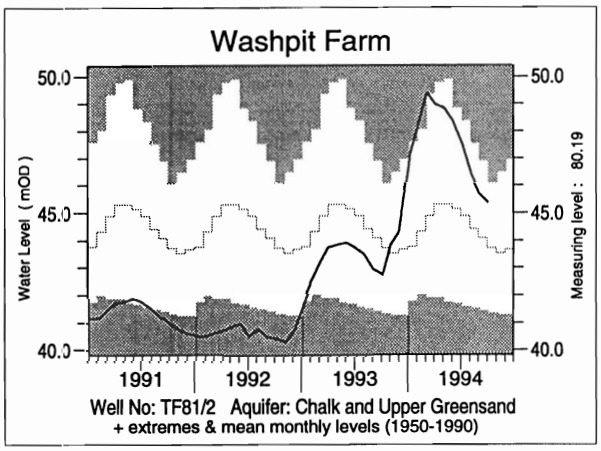
This plot is based on the reservoirs featured in Table 4 only.

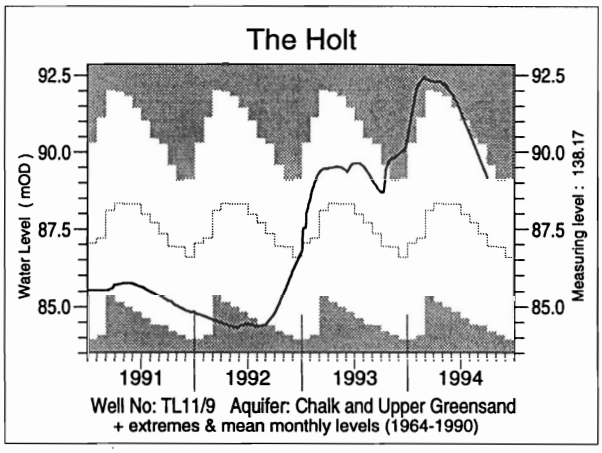
Note: Variations in storage depend on the balance between inputs (from catchment rainfall and any pumping) and outputs (to supply, compensation flow, HEP, amenity). There will be additional losses due to evaporation, especially in the summer months. Operational strategies for making the most efficient 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.

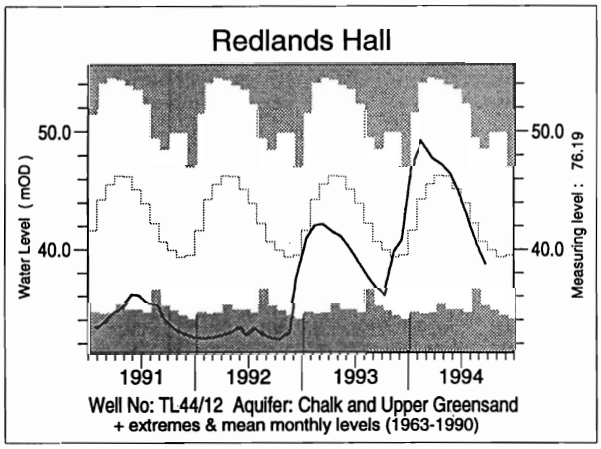
FIGURE 2 GROUNDWATER LEVEL HYDROGRAPHS

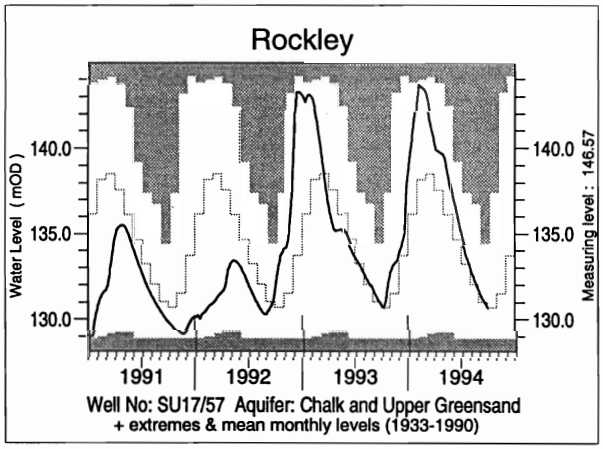


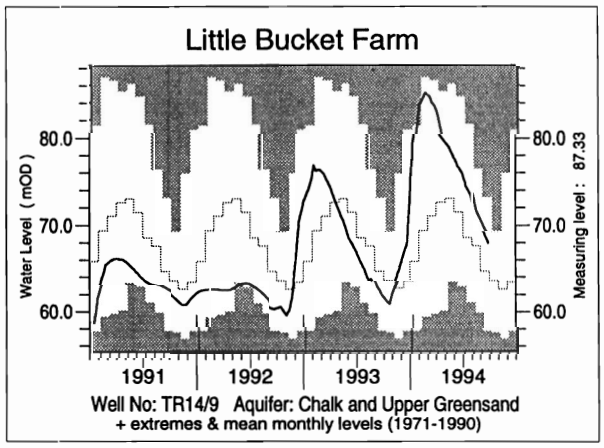


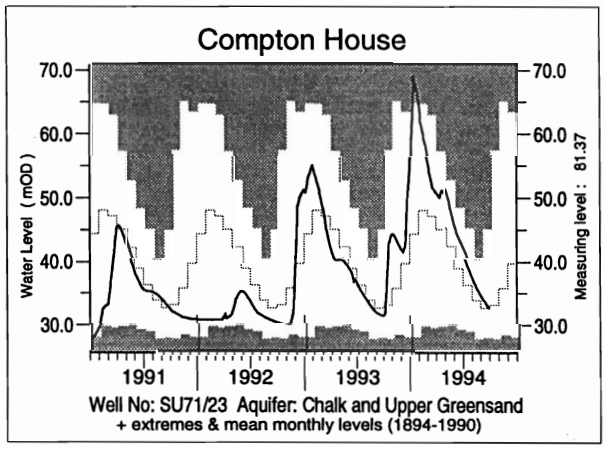


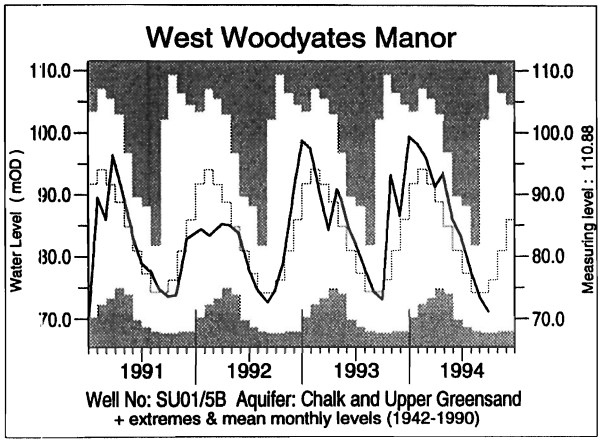


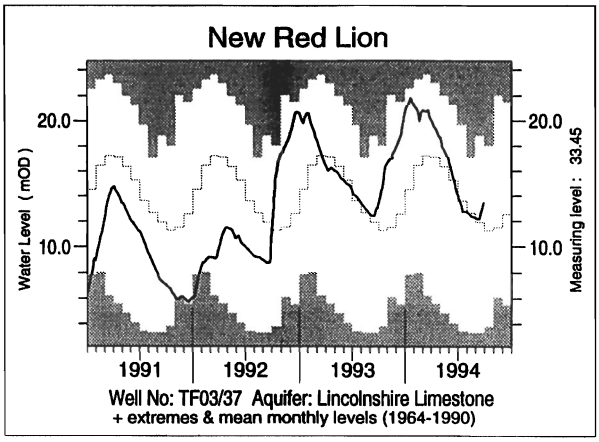


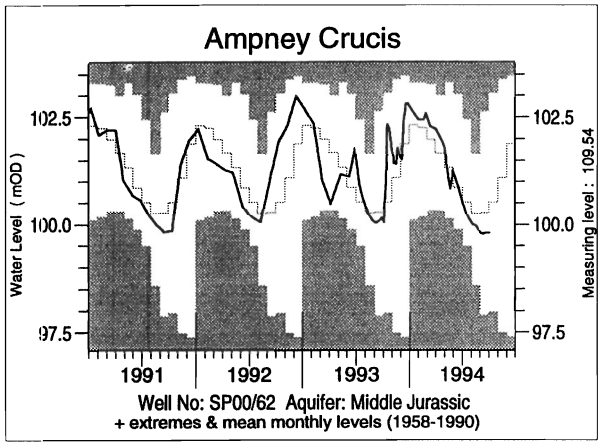


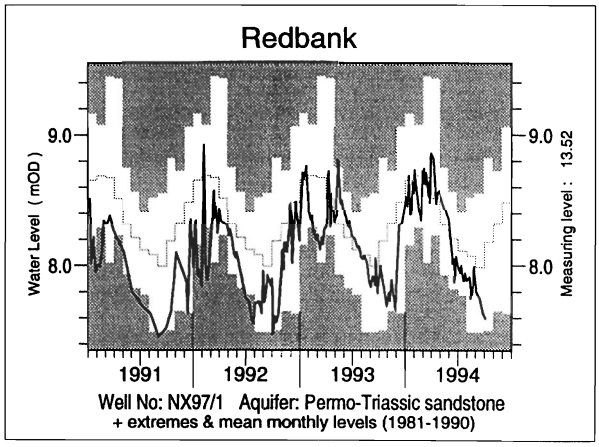


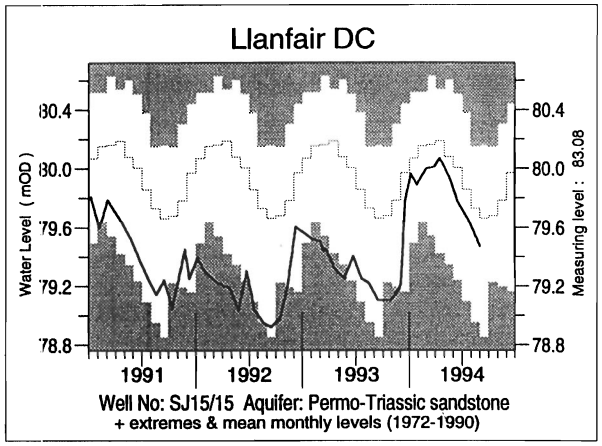


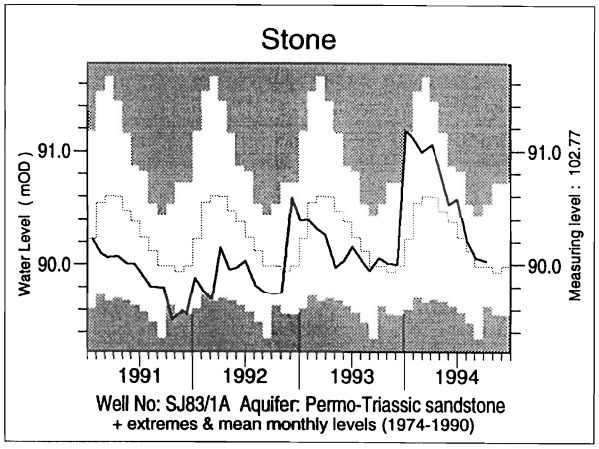

West Woodyates Manor
Water Level (mOD)
110.0
100.0
90.0
80.0
70.0
Measuring level : 110.88
1991
1992
1993
1994
Well No: SU01/5B Aquifer: Chalk and Upper Greensand
+ extremes & mean monthly levels (1942-1990)

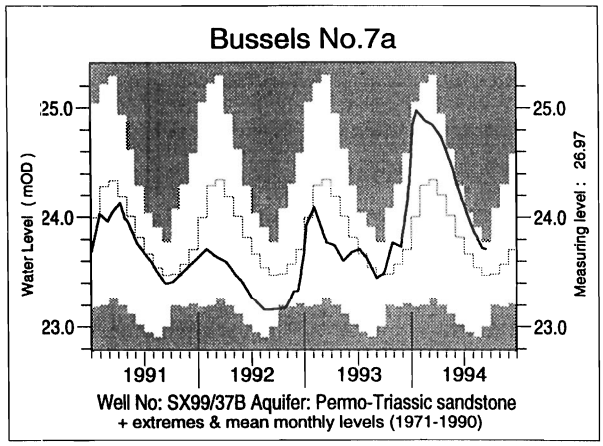

New Red Lion
Water Level (mOD)
20.0
10.0
Measuring level : 33.45
1991
1992
1993
1994
Well No: TF03/37 Aquifer: Lincolnshire Limestone
+ extremes & mean monthly levels (1964-1990)


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)

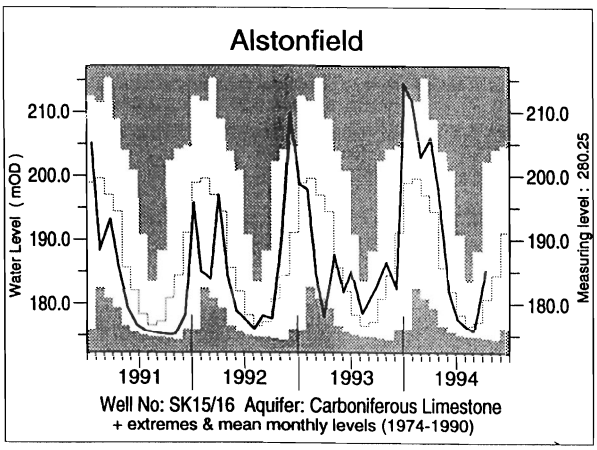

Alstonfield
Water Level (mOD)
210.0
200.0
190.0
180.0
Measuring level : 280.25
1991
1992
1993
1994
Well No: SK15/16 Aquifer: Carboniferous Limestone
+ extremes & mean monthly levels (1974-1990)

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

Site	Aquifer	Records commence	Minimum Sept	Average Sept	Maximum Sept	September 1993		Sept/Oct 1994	
			<1994	<1994	<1994	day	level	day	level
Dalton Holme	C & UGS	1889	10.98	15.62	22.30	20/09	14.08	03/10	12.90
Wetwang	C & UGS	1971	17.61	19.36	20.73	28/09	20.12	03/10	18.78
Washpit Farm	C & UGS	1950	40.47	43.91	46.90	01/09	42.96	03/10	45.37
The Holt	C & UGS	1964	84.34	87.38	90.22	26/09	88.73	02/10	89.12
Therfield Rectory	C & UGS	1883	dry <71.6	80.04	98.51	26/09	77.40	02/10	81.04
Redlands Hall	C & UGS	1964	32.40	40.02	48.49	10/09	36.75	23/09	38.73
Rockley	C & UGS	1933	dry <128.44	131.02	134.38	26/09	130.94	02/10	130.64
Little Bucket Farm	C & UGS	1971	57.64	64.82	73.12	13/09	61.96	27/09	67.93
Farm									
Compton House	C & UGS	1984	27.72	32.90	44.90	29/09	31.45	27/09	32.77
Chilgrove House	C & UGS	1836	33.48	40.81	62.48	29/09	38.31	27/09	40.32
West Dean No.3	C & UGS	1940	1.10	1.46	1.90	24/09	1.59	30/09	1.57
Lime Kiln Way	C & UGS	1969	123.85	124.98	125.63	08/09	124.10	06/10	125.32
Ashton Farm	C & UGS	1974	63.23	65.25	67.07	30/09	65.41	30/09	65.05
West Woodyates Manor	C & UGS	1942	67.67	73.31	102.09	30/09	72.90	30/09	71.10
Killyglen (NI)	C & UGS	1985	113.26	114.81	118.82	26/09	113.68	18/09	113.68
New Red Lion	LLst	1964	3.37	11.63	18.84	27/09	13.06	27/09	13.44
Ampney Crucis	Mid Jur	1958	97.87	100.21	102.60	26/09	100.14	02/10	99.81
Yew Tree Farm	PTS	1973	11.08	13.23	13.75	29/09	13.47	07/09	13.37
Llanfair D.C	PTS	1972	78.85	79.52	80.16	13/09	79.10	15/09	79.47
Morris Dancers	PTS	1969	31.85	32.48	33.58	15/09	31.94	12/09	32.40
Weeford Flats	PTS	1966	dry <88.61	89.98	91.55	no levels		11/10	89.61
Stone	PTS	1974	89.34	90.10	90.44	01/09	89.94	10/10	90.03
Skirwith	PTS	1978	129.75	130.11	130.54	28/09	130.02	29/09	130.11
Redbank	PTS	1981	7.45	7.96	8.55	26/09	7.78	05/10	7.59
Bussels No.7A	PTS	1972	22.99	23.46	23.77	28/09	23.49	14/09	23.71
Rushyford NE	MgLst	1967	64.89	72.35	76.40	30/09	75.85	23/09	76.13
Peggy Ellerton	MgLst	1968	31.10	34.01	36.73	06/09	31.37	23/09	33.08
Alstonfield	CLst	1974	174.56	177.41	188.14	no levels		11/10	185.14

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