HYDROLOGICAL SUMMARY FOR ENGLAND AND WALES
MAY 1989

Data for this review have been provided, principally, by the Water Authorities and the Meteorological Office.

A proportion of the data featured is of a provisional nature and subject to later revision.

Summary

May was a remarkably dry and warm month in most parts of England and Wales. Water demand increased substantially and local distribution problems were experienced in some areas, particularly the South-East. However runoff and infiltration rates are normally modest in May and the notably dry conditions were not associated with any serious deterioration in the water resources situation. Apart from a few areas where drought conditions persist - in particular Kent where the situation is exacerbated by water supply problems - river flows and groundwater levels are generally below average but within the normal range for the time of year.

Review

High pressure dominated weather conditions over England and Wales throughout virtually all of May and rainfall in many areas was negligible. Based on provisional data, May 1989 registers as the driest this century for England and Wales. Many regions recorded less than a quarter of their average rainfall and some localities, especially in the South-East, had less than 5 mm; total rainfall in central London barely reached 1 mm - an unprecedented amount over a 300 year period. However, thundery activity was common in the third week of May and heavy rainfall brought flooding to a few localities; great spatial variability was a characteristic of the late-May rainfall.

The impact of the exceptionally dry May on the longer term rainfall deficiencies is shown in Table 1. Accumulated rainfall totals for the periods October 1988 - May 1989 and April 1988 - May 1989 point to significant rather than notable rainfall deficits in most regions. Some important local variations are masked by the regional rainfall figures. Parts of the Chalk outcrop in east Yorkshire and Lincolnshire, for instance, have received little more than 70 per cent of average rainfall since last September. A substantial long term deficiency persists in the Southern Water area where, particularly in Kent, a hydrological drought of significant magnitude may still be recognised. Even in the South-East however, rainfall over the last eight months has been very much more abundant than in 1975/76; accumulated rainfall totals for the Thames and Southern Water areas both exceeded those recorded during the Great Drought by about 150 mm.

At the end of May a northerly airstream brought cool and unsettled conditions to much of England and Wales. By June 8th many areas, especially in central and southern England, had recorded more than 50 per cent of their average June rainfall.

Soil Moisture Deficits, which were negligible at the end of April, increased extremely rapidly through May and, although some stabilisation occurred over the period May 23-June 6, SMDs were generally above average, notably so in the West, approaching mid-June.

The response of river flows to the exceptionally low May rainfall was heavily influenced by the natural storage characteristics of individual catchments. Runoff rates exhibited only a modest decline in high baseflow rivers but steep recessions characterised rivers draining impervious catchments. Mean flows in May were, generally, below average but substantially above historical drought discharge rates except in Kent and east Yorkshire where the River Derwent closely approached its lowest May runoff total in a 16-year record. In the South-East, baseflows remain generally below average but, apart from a few rivers in Kent, not remarkably so and the river flow outlook is more reassuring than, say, in 1965, 73 or 76. In some lowland catchments May runoff was the lowest, for May, since the Great Drought but examination of the full flow records (assuming a stable climate) indicate that, generally, such discharge rates may be expected once every 5-10 years on average. The current runoff deficiency appears rather more prominent in the context of the last 13 years when, gererally, rainfall - especially winter rainfall - has been considerably above the long term average.

Accumulated runoff totals (see Table 2) confirm the relatively modest nature of the drought in most catchments.

Infiltration was minimal in May throughout much of the English lowlands but since, on average, May recharge is very limited anyway, the impact of the dry spell from late April, on groundwater resources was rather marginal in most areas. Except in some deep wells, groundwater levels were in recession throughout England and Wales by the end of May. Principally as a consequence of the recharge in March and April, many boreholes - notwithstanding the very low groundwater levels registered through the winter of 1988/89 - recorded late-May/early-June levels only a little below the average for the beginning of summer. Some deep Chalk wells, including Dalton Holme in Yorkshire, were still rising - albeit modestly and, often, from a low base - through May. However, the virtual absence of any further recharge to aquifer units in parts of Kent and along the south coast has left groundwater levels well below average and, in a few cases, approaching levels recorded during May 1976. Groundwater levels in parts of the Permo-Triassic aquifer in Devon are also reportedly on a par with those for May 1976 but interpretation of these data is complicated by the increased abstraction rates now obtaining.

IH/BGS

12/6/89

TABLE 1 1988/9 RAINFALL IN MM AND AS A PERCENTAGE OF THE 1941-70 AVERAGE

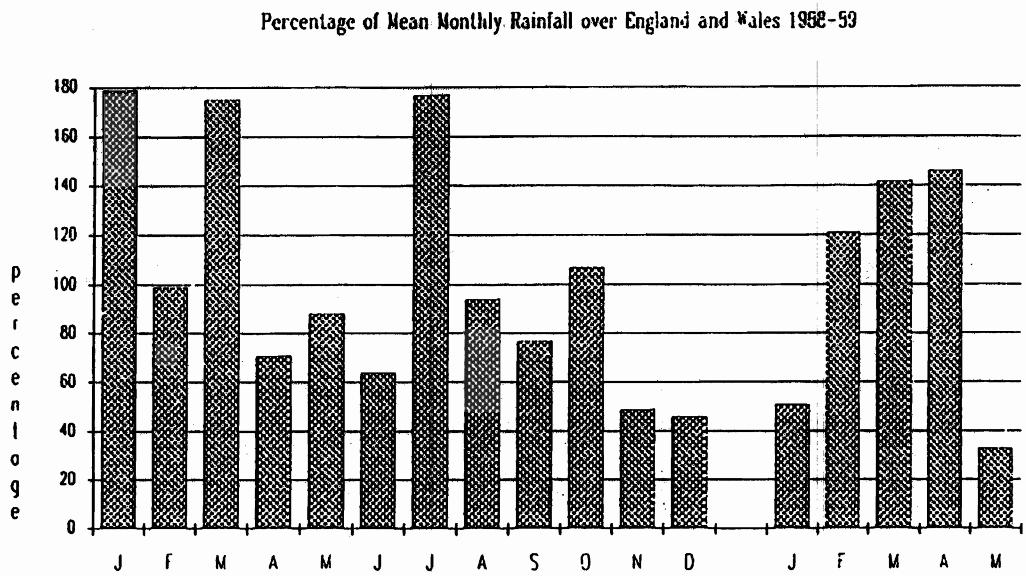
		Oct 1988	Nov	Dec	Jan	Feb	Mar 1989	Apr	May	Oct-May	Approx Return* Period	Apr 88-May 89	Approx Return* Period
England and Wales	mm	89	48	41	44	78	84	85	22	491	5-10	907	5-10
	%	107	49	46	51	121	142	146	33	81		87	
WATER AUTHORITIES													
North West	mm	120	67	86	68	123	113	92	33	703	<5	1304	<5
	%	102	55	72	61	151	157	120	40	90		95	
Northumbria	mm	101	73	38	32	70	55	49	25	441	10	871	5-10
	%	135	78	51	40	106	105	89	38	79		87	
Severn Trent	mm	62	38	34	35	65	69	87	23	413	5-10	781	5
	%	95	48	49	51	122	132	168	35	82		88	
Yorkshire	mm	90	54	38	24	64	63	79	24	435	5-10	825	5-10
	%	130	61	51	31	100	118	140	40	80		87	
Anglia	mm	52	36	22	31	34	48	74	14	312	5-10	604	5-10
	%	100	58	42	59	81	121	186	30	80		87	
Thames	mm	66	28	16	31	60	65	77	14	358	5-10	673	5-10
	%	103	38	24	50	129	141	167	25	78		83	
Southern	mm	84	32	20	29	62	75	81	11	394	10-20	671	20-30
	%	108	34	25	38	109	144	169	20	73		75	
Wessex	mm	101	34	22	44	89	87	74	25	475	5-10	831	5-10
	%	123	35	24	52	151	149	137	36	80		84	
South West	mm	144	55	56	65	135	115	92	18	680	5-10	1191	5
	%	127	41	41	50	151	137	130	21	81		88	
Welsh	mm	125	67	65	80	140	151	89	23	739	5-10	1360	5
	%	97	47	45	59	146	174	103	25	81		90	

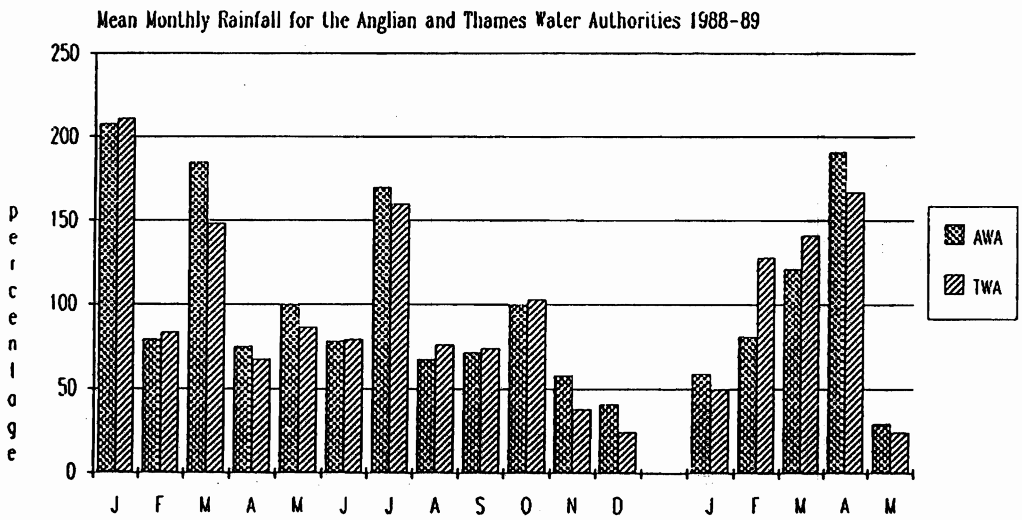
Note: December to May rainfalls are based upon MORECS figures supplied by the Meterological Office.
*The return periods have been estimated from data provided by the Meteorological Office.

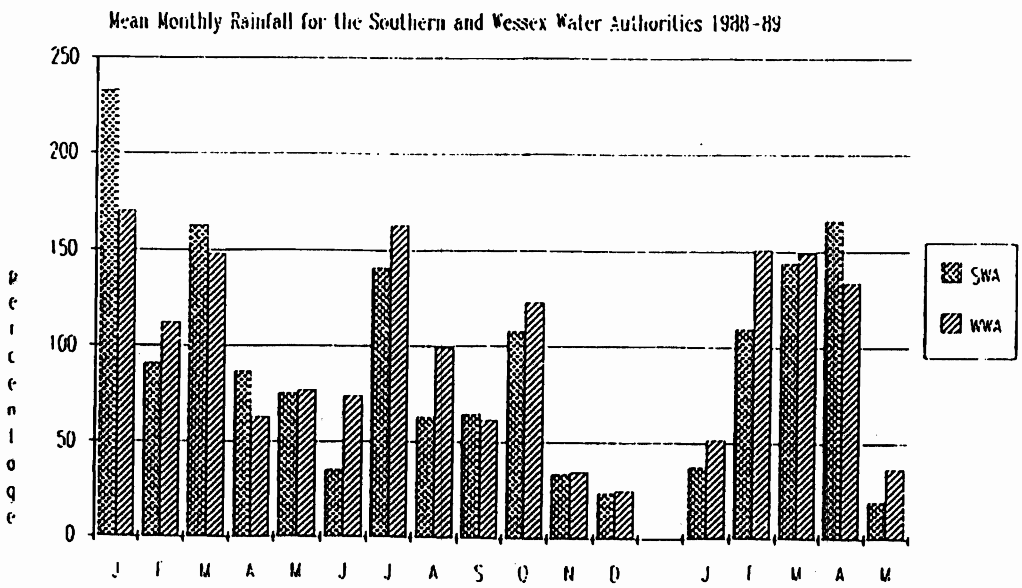
TABLE 2 CATCHMENT RUNOFF IN MM AND AS A PERCENTAGE OF LTA

River/Station Name		Oct 1988	Nov	Dec	Jan 1989	Feb	Mar	Apr	May	Oct '88- May '89	Rank/No. of Years	Oct '75- May '76
Wharfe at Flint Ml	mm	80	65	81	42	64	95	71	15	513	1/13	638
	%	125	80	84	43	84	127	131	39	57		78
Derwent at B'crambe	mm	22	21	29	17	17	22	29	13	170	2/16	151
	%	92	81	67	33	39	49	85	52	58		51
Trent at Colwick	mm	23	17	29	21	26	42	57	18	233	8/31	124
	%	96	55	64	41	59	105	178	69	80		42
Lud at Louth	mm	14	13	17	15	12	16	17	15	119	4/21	56
	%	117	87	85	48	33	42	50	54	55		26
Witham at Claypole	mm	5	5	9	8	8	12	31	14	92	5/30	34
	%	56	42	47	31	28	46	148	92	59		22
Ouse at Bedford	mm	11	9	18	13	23	37	46	13	170	25/56	34
	%	110	45	64	36	85	119	242	101	88		18
Colne at Lexden	mm	9	8	11	13	14	23	20	6	98	10/30	40
	%	100	62	65	59	74	128	154	75	80		33
Thames at Kingston	mm	14	12	15	13	19	36	26	13	148	28/106	73
(nat)	%	108	57	50	35	59	116	118	76	72		35
Kennet at Theale	mm	18	14	16	16	19	31	29	22	165	4/27	87
	%	113	70	59	46	32	82	94	78	72		38
Coln at Bibury	mm	15	15	18	15	19	48	44	30	204	4/26	72
	%	88	60	44	30	56	91	102	89	64		23
Ouse at Gold Bridge	mm	13	10	11	8	12	44	37	11	146	2/27	135
	%	43	20	20	13	25	98	109	40	42		38
Test at Broadlands	mm	20	20	20	20	20	31	27	27	185	3/31	137
	%	87	80	67	51	40	79	79	89	73		54
Itchen at Highbrdge	mm	27	27	27	26	25	41	40	36	249	3/31	227
	%	87	77	63	53	46	79	85	83	71		65
Stour at Throop	mm	25	13	20	19	28	57	39	15	216	2/16	104
	%	109	38	59	31	49	110	115	63	62		30
Tone at Bishops H	mm	42	20	26	25	54	80	40	19	306	5/28	144
	%	156	45	38	31	72	138	102	66	73		35
Severn at Bewdley	mm	41	22	36	27	45	77	48	12	308	15/68	168
	%	121	41	57	38	64	167	177	50	81		44
Yscir at Pont'yscir	mm	91	39	66	92	130	182	72	18	690	2/16	462
	%	98	28	43	64	123	160	120	41	80		54
Dee at Manley Hall	mm	107	60	94	75	88	183	98	28	733	19/51	469
	%	120	115	69	56	84	194	158	61	94		60
Lune at Caton	mm	129	68	168	256	167	191	82	20	1081	23/25	679
	%	71	42	86	174	192	193	106	37	124		78

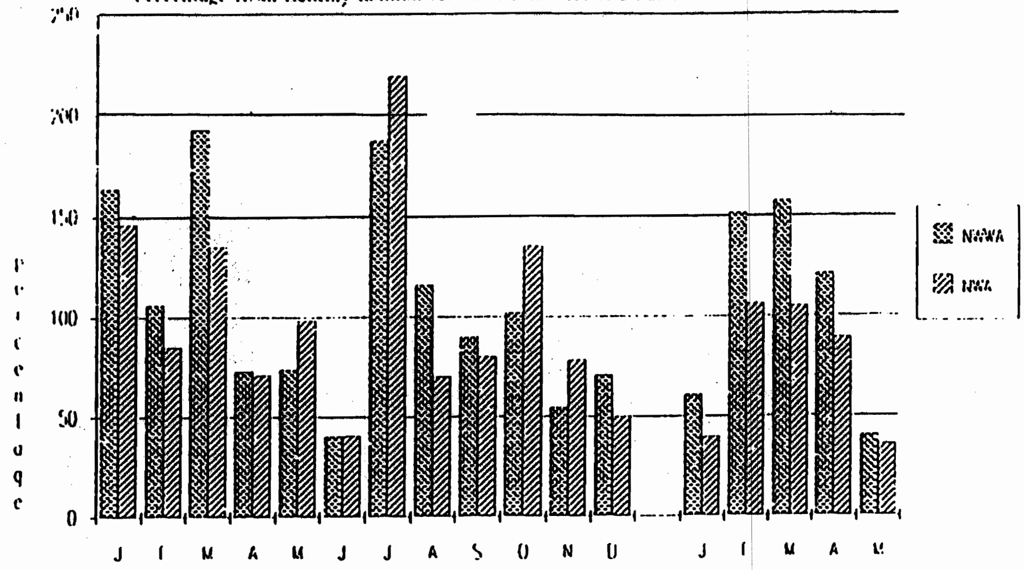
FIGURE 1 MONTHLY RAINFALL - JANUARY 1988 TO MAY 1989



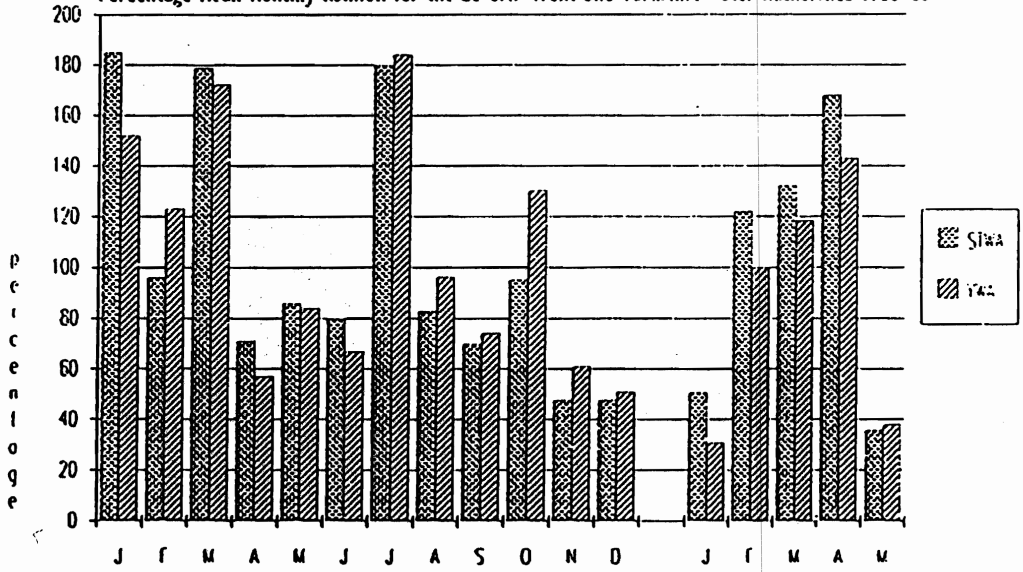




Percentage Mean Monthly Rainfall for the North West and Northumbrian Water Authorities 1988 89



Percentage Mean Monthly Rainfall for the Severn-Trent and Yorkshire Water Authorities 1985-89



Mean Monthly Rainfall for the South West and Welsh Water Authorities 1988-89

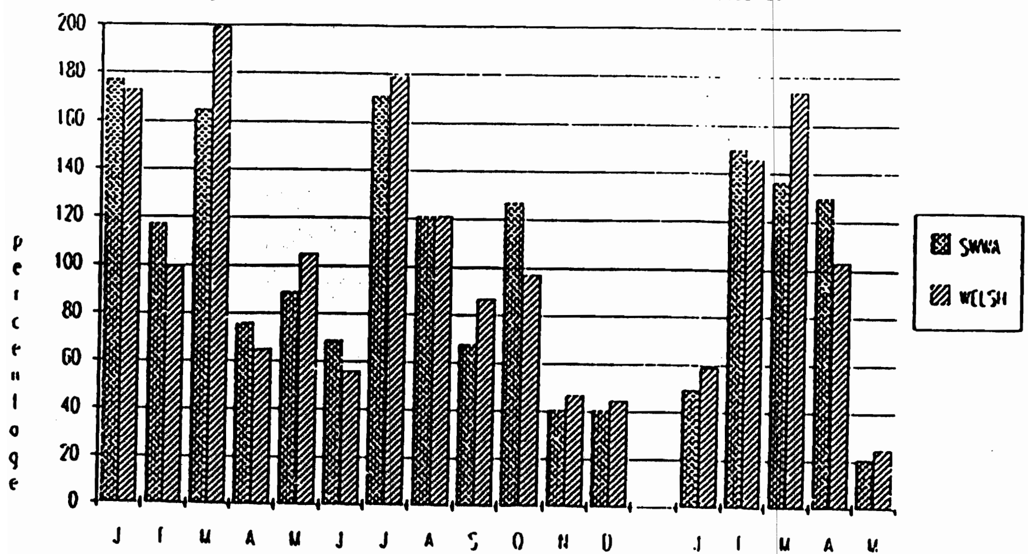


FIGURE 2 MONTHLY HYDROGRAPHS

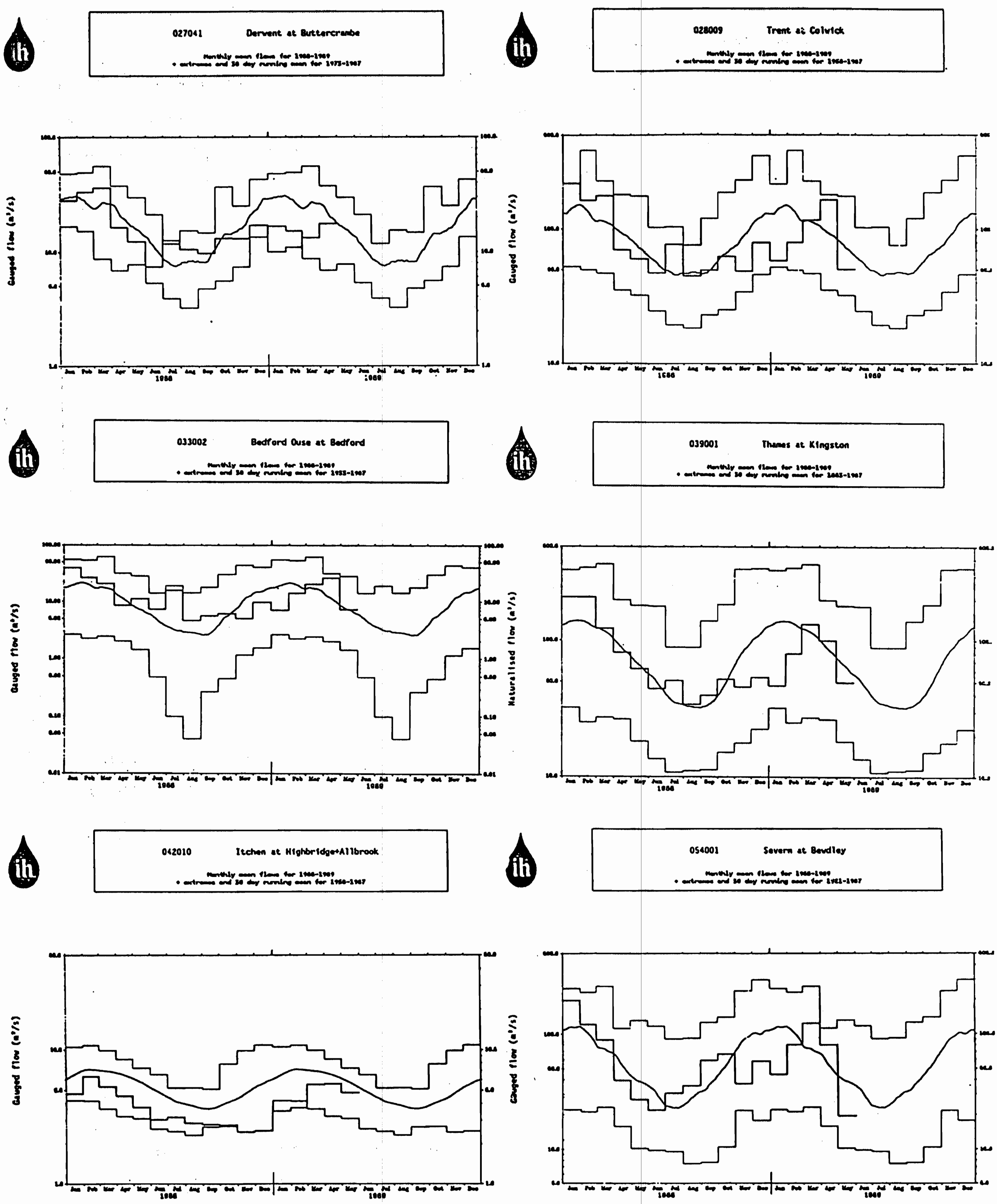
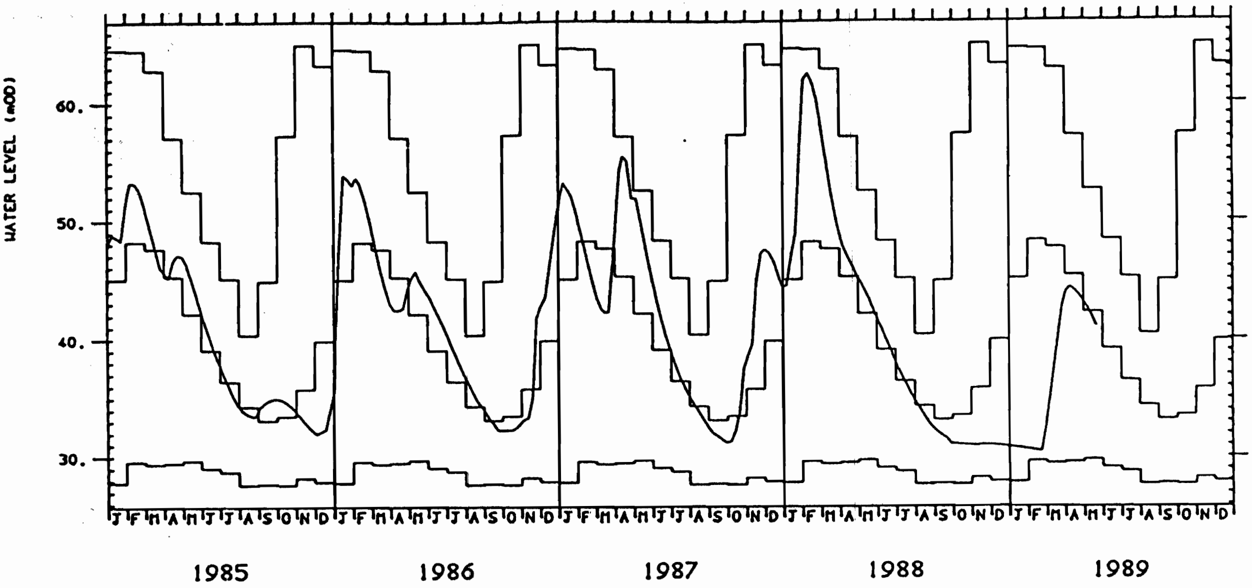


FIGURE 3 GROUNDWATER OBSERVATION WELL HYDROGRAPHS

Site name: COMPTON HOUSE

National grid reference: SU 7755 1490 Well number: SU71/23

Aquifer: CHALK AND UPPER GREENSAND Measuring level: 81.37



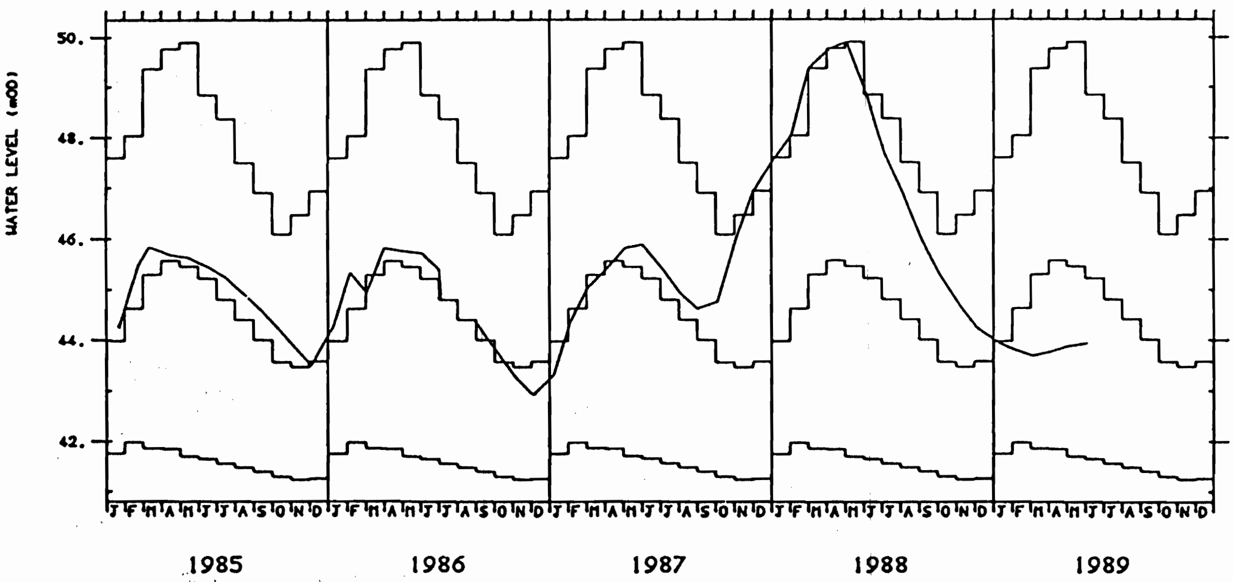
Max, Min and Mean values calculated from years 1894 TO 1988

A break in the data line indicates a recording interval of greater than 8 weeks

Site name: WASHPIT FARM

National grid reference: TF 8138 1960 Well number: TF81/2

Aquifer: CHALK AND UPPER GREENSAND Measuring level: 80.20



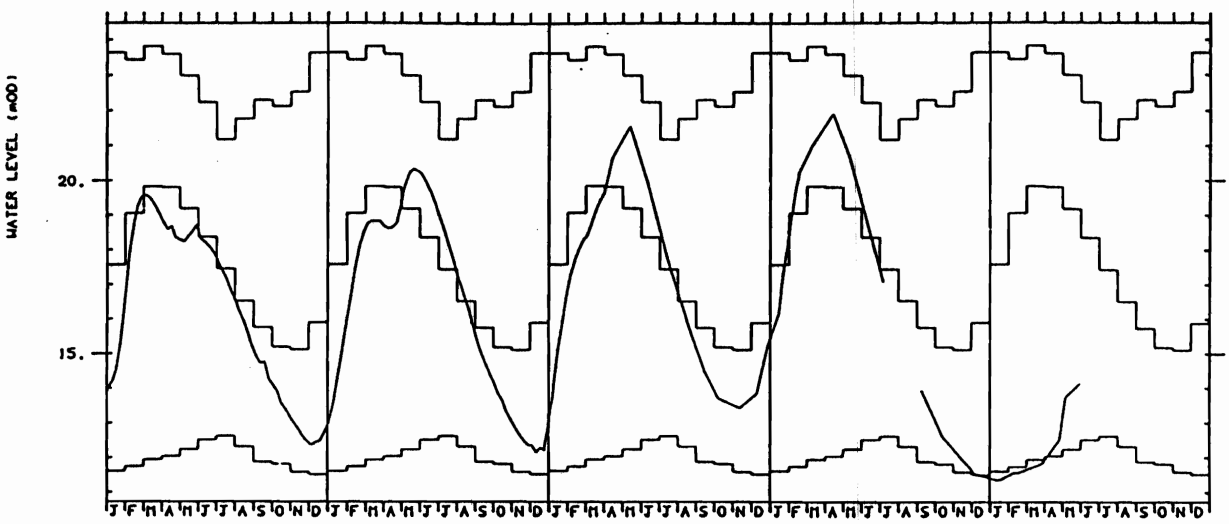
Max, Min and Mean values calculated from years 1950 TO 1988

A break in the data line indicates a recording interval of greater than 8 weeks

Site name: DALTON HOLME

National grid reference: SE 9651 4530 — Well number: SE94/5

Aquifer: CHALK AND UPPER GREENSAND — Measuring level: 33.50



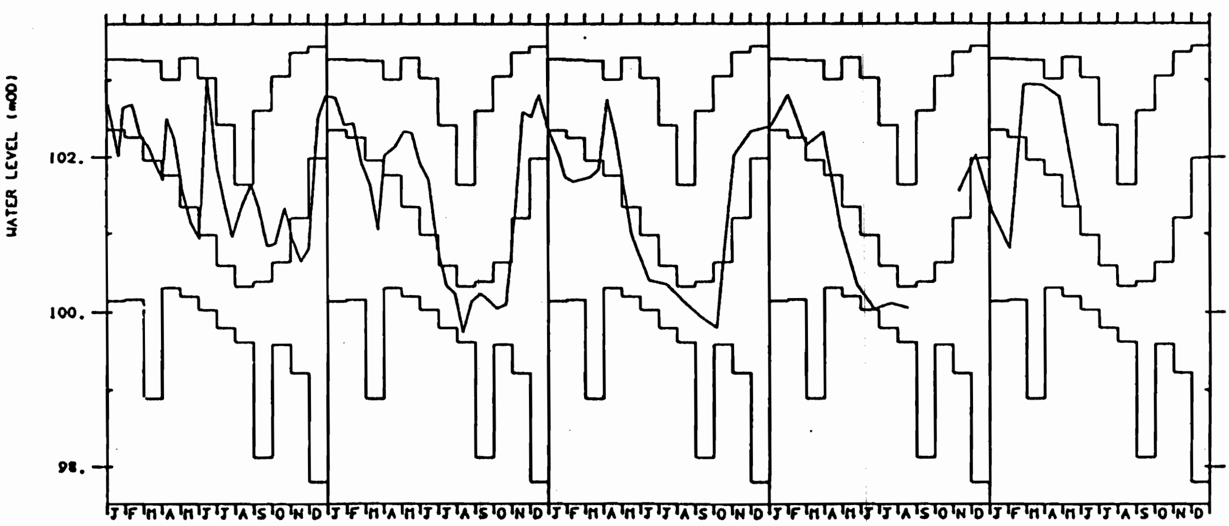
Max, Min and Mean values calculated from years 1889 TO 1988

A break in the data line indicates a recording interval of greater than 8 weeks

Site name: AMPNEY CRUCIS

National grid reference: SP 0595 0190 — Well number: SP00/62

Aquifer: MIDDLE JURASSIC — Measuring level: 109.70



Max, Min and Mean values calculated from years 1958 TO 1988

A break in the data line indicates a recording interval of greater than 8 weeks