Hydrological Summary

for the United Kingdom

April 2025

General

April was dry and warm overall, although with rain in some western parts. It was the third warmest April for the UK in a series from 1884, with particularly high temperatures in England and Wales towards the end of the month (e.g. 26.9°C on the 30th recorded at Treknow, Cornwall). Rainfall was just over half of the April average for the UK, with some places receiving less than a fifth of average. Many rivers registered notably or exceptionally low monthly mean flows, several with minima for April. In most regions of the UK, soils at the end of April were drier than at the end of March, and many COSMOS-UK sites registered drier than normal to exceptionally dry soils. There were wildfires in south-west Scotland, Northern Ireland and Wales, and increased concerns about the impacts on agriculture, with an early start to the irrigation season. Groundwater levels generally continued to decline, with most levels in the normal range to below normal. Reservoir stocks for England and Wales were below average at 85% of capacity. Away from Northern Ireland and south-west England, some impoundments were considerably below average at month-end (e.g. Northern Command Zone, Celyn & Brenig and Daer). Without appreciable late spring rainfall, summer will most likely commence with widely depressed river flows, with potential for environmental impacts and pressure on water resources (some water companies are already starting to ask customers to use water wisely). The start of May has been extremely dry across the UK, and the current Hydrological Outlook suggests that below normal or lower flows will persist into the summer in many areas.

Rainfall

April was exceptionally dry except for some western parts. High pressure dominated the first fortnight, which was warm and almost entirely dry across the UK. Atlantic low pressure brought heavy rain on the 14th and most notably, in the south-west on the 15th (e.g. 83mm at Otterham Station, Cornwall). Unsettled conditions continued, bringing rain on the 16th, 18th and 22nd, chiefly, but not exclusively in the west. From the 27th, southerly airflows brought high temperatures, initially to the south, and from the 29th across England and Wales. Total April rainfall for the UK was 56% of average, and although above average in Northern Ireland and the south-west, there was less than 30% of average across large swathes of the north and east. Whilst most regions in Scotland and England received less than half of their average April rainfall (Northumbrian and Yorkshire less than a fifth, the former the second driest of any month for the region since August 1947), Wales and Northern Ireland saw more moderate totals, and south-west England was a wet outlier (144% of average). The two-month rainfall totals were below average for all regions making it the driest March-April for the UK since 1974 (49% of average). Although six-month deficits were moderated by rainfall in the south, some regions, including many in the north-east, saw the driest November-April in 50 years or more (e.g. Forth, Solway and Yorkshire), with Tweed and Northumbrian regions the third driest in series from 1890.

River Flows

River flows began April below average, except in the south-east where they continued to be sustained by groundwater, and receded, with responses to rainfall mid-month in the west. New daily minima were sustained on widespread rivers, in some catchments across the whole of the first fortnight (e.g. the Bervie, Taw and Yscir). Flows then rose sharply in the west and south-west, peaking above average between the 15th and 22nd (e.g. the Kenwyn registered its second highest April peak flow on record on the 18th, in a series from 1969). Thereafter flows receded, again establishing new daily minima on rivers in Scotland and north-east England (e.g. the Spey, Tweed, and Yorkshire Ouse in series of 60 years or more). April monthly mean flows were below normal to exceptionally low across much of Great Britain. Record low April mean flows were registered for some rivers in eastern Scotland and northern England, including in large catchments like the Spey, Tweed, Aire and Mersey (in series of 48 years or more). Flows in many catchments were half the April average or less, with some less than a quarter of average (e.g. the Oykel, Coquet and Yscir). In Northern Ireland and south-west England, flows were generally in the normal range, and some groundwater-dominated catchments in the south-east remained in the normal range or above. The spatial extent of low flows is reflected in the average April outflow series from Great Britain, which were the third lowest on record (after 1974 and 2003, in a series from 1961). For spring so far, many more catchments across Scotland and northern England registered exceptionally low and record low average March-April flows (e.g. Scottish Dee, English Tyne and Welsh Dee, all in series of at least 55 years), with many a third or less of the average for this period. Flow deficits in Scotland and the north of England can be traced back at least to the autumn.

Soil Moisture and Groundwater

Soils dried considerably in April across much of the UK. Wessex region registered the third driest April soils on record (in a series from 1961). Average March-April soil moisture deficits for Great Britain were the third highest (i.e. driest) and were in the five highest for many regions of England in series from 1961. Groundwater levels in the Chalk generally decreased throughout April. In the north, levels were generally within the normal range to below normal, whereas around Hertfordshire levels were in the normal range to notably high. At Killyglen, levels continued decreasing, before increasing slightly. In the Jurassic Limestone, levels at Ampney Crucis decreased to below normal. In the Magnesian Limestone levels decreased, with Aycliffe transitioning to normal conditions. In south Wales, levels in the Carboniferous Limestone increased, Pant y Lladron rose to below normal. At Alstonfield, levels continued to decrease. In the Permo-Triassic Sandstones levels fell slightly but remained exceptionally high at Weir Farm and fell to above normal at Llanfair D.C. At Bussels No.7a and Skirwith, levels decreased but remained in the normal range. Upper Greensand levels at Lime Kiln Way continued to fall but remained notably high. In the Fell Sandstone at Royal Observatory, levels decreased slightly but remained in the normal range. At Easter Lathrisk in the Devonian Sandstone, levels continued falling to a record low for April.

National Hydrological Monitoring Programme | UK Centre for Ecology & Hydrology | BGS British Geological Survey

Rainfall . . . Rainfall . . .

Met Office

Rainfall accumulations and return period estimates

Percentages are from the 1991-2020 average.

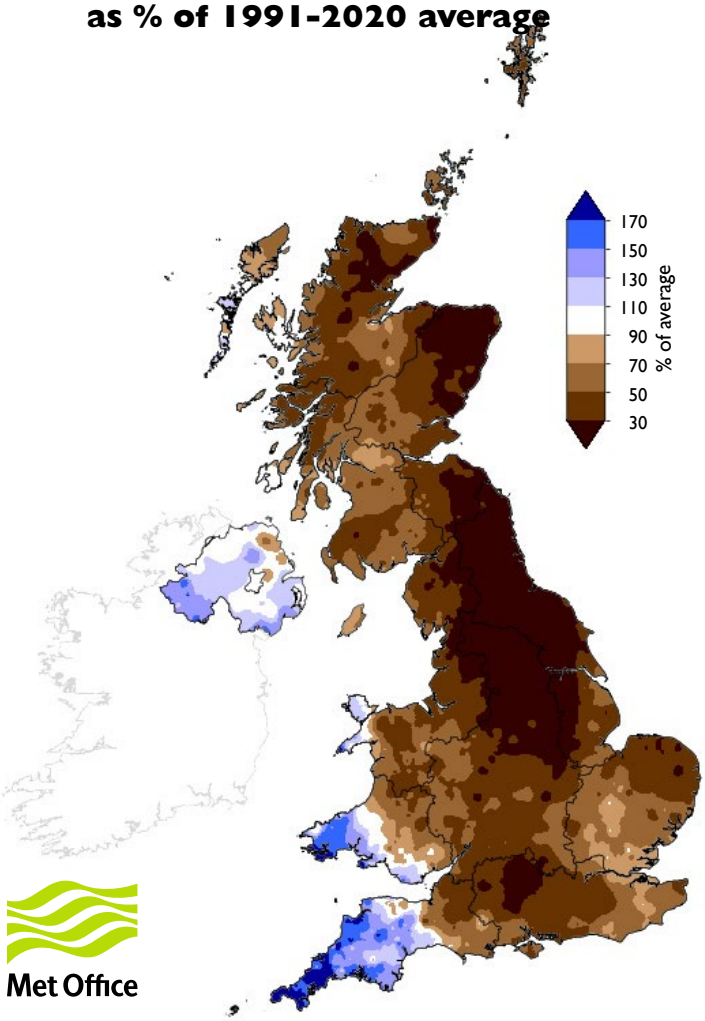
Region	Rainfall	Apr 2025	Mar25 – Apr25	RP	Jan25 – Apr25	RP	Nov24 – Apr25	RP	May24 – Apr25	RP
United Kingdom	mm	**40**	77		246		469		1010	
	%	**56**	49	30-50	66	10-20	75	5-10	87	2-5
England	mm	**28**	43		188		346		814	
	%	**50**	38	30-50	71	5-10	78	5-10	94	2-5
Scotland	mm	**45**	124		317		633		1289	
	%	**48**	57	10-20	59	15-25	73	5-10	82	5-10
Wales	mm	**70**	94		331		653		1269	
	%	**80**	49	10-20	71	5-10	81	2-5	87	2-5
Northern Ireland	mm	**85**	112		259		429		894	
	%	**114**	69	5-10	70	8-12	70	15-25	78	30-50
England & Wales	mm	**34**	50		208		388		876	
	%	**56**	40	25-40	71	5-10	78	5-10	93	2-5
North West	mm	**24**	55		216		474		1157	
	%	**33**	34	>100	55	30-50	71	8-12	91	2-5
Northumbria	mm	**9**	37		136		265		741	
	%	**15**	30	>100	49	60-90	57	50-80	82	5-10
Severn-Trent	mm	**22**	36		158		323		770	
	%	**40**	33	30-50	66	10-15	81	2-5	96	2-5
Yorkshire	mm	**11**	36		155		313		738	
	%	**19**	31	50-80	58	20-35	71	10-15	85	2-5
Anglian	mm	**20**	27		119		226		572	
	%	**48**	33	30-50	67	10-15	77	5-10	91	2-5
Thames	mm	**23**	29		178		309		757	
	%	**45**	30	25-40	80	2-5	83	2-5	105	2-5
Southern	mm	**28**	35		216		355		788	
	%	**53**	34	20-30	85	2-5	80	2-5	97	2-5
Wessex	mm	**33**	41		245		404		950	
	%	**54**	34	20-30	86	2-5	82	2-5	105	2-5
South West	mm	**112**	126		414		642		1207	
	%	**144**	75	2-5	100	2-5	91	2-5	96	2-5
Welsh	mm	**69**	92		324		632		1239	
	%	**81**	50	10-20	73	5-10	82	2-5	89	2-5
Highland	mm	**50**	160		387		861		1605	
	%	**46**	60	5-10	59	8-12	81	2-5	87	2-5
North East	mm	**22**	69		190		401		885	
	%	**31**	48	40-60	59	50-80	75	10-20	84	8-12
Tay	mm	**36**	96		274		500		1020	
	%	**44**	51	15-25	58	10-20	65	15-25	74	25-40
Forth	mm	**38**	90		233		408		952	
	%	**53**	54	10-20	57	10-20	61	15-25	77	8-12
Tweed	mm	**23**	53		178		310		844	
	%	**35**	36	70-100	52	30-50	54	80-120	78	8-12
Solway	mm	**45**	96		300		530		1242	
	%	**49**	45	15-25	58	10-20	62	20-30	79	5-10
Clyde	mm	**61**	151		373		701		1467	
	%	**57**	58	5-10	58	8-12	66	8-12	78	5-10

% = percentage of 1991-2020 average *RP = Return period*

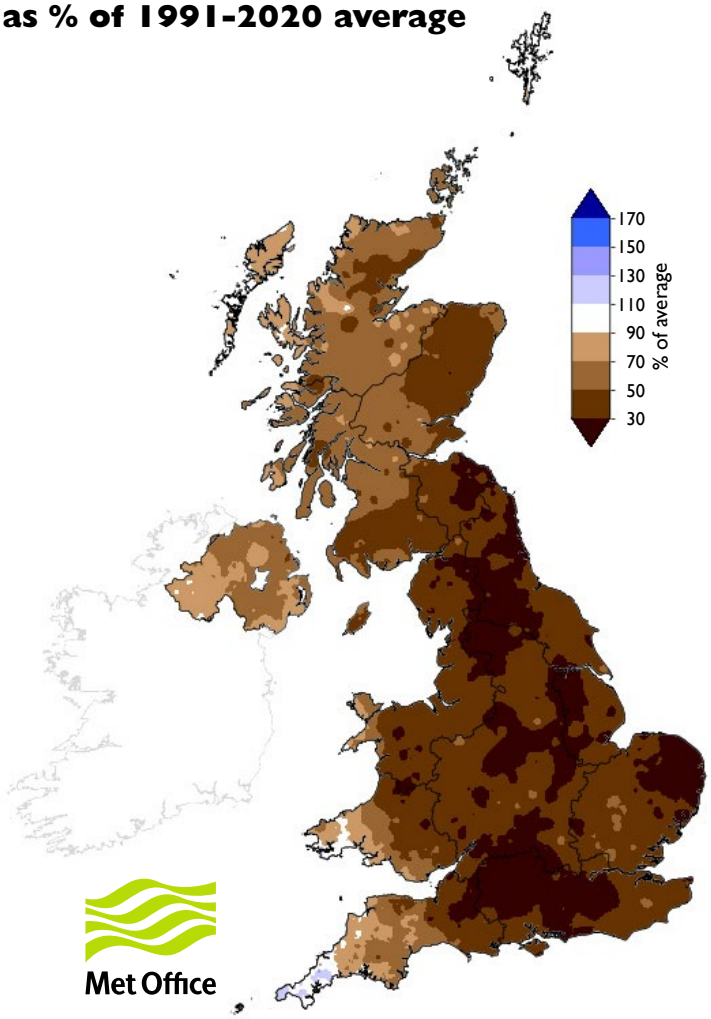
Important note: Figures in the above table may be quoted provided their source is acknowledged. Where appropriate, specific mention must be made of the uncertainties associated with the return period estimates. The RP estimates are based on data provided by the Met Office and reflect climatic variability since 1890; they also assume a stable climate. The quoted RPs relate to the specific timespans only; for the same timespans, but beginning in any month the RPs would be substantially shorter. The timespans featured do not purport to represent the critical periods for any particular water resource management zone. For hydrological or water resources assessments of drought severity, river flows and/or groundwater levels normally provide a better guide than return periods based on regional rainfall totals. Note that precipitation totals in winter months may be underestimated due to snowfall undercatch. All monthly rainfall totals since January 2023 are provisional. Source: Data from HadUK-Grid dataset at 1km resolution v1.2.0.0.

Rainfall . . . Rainfall . . .

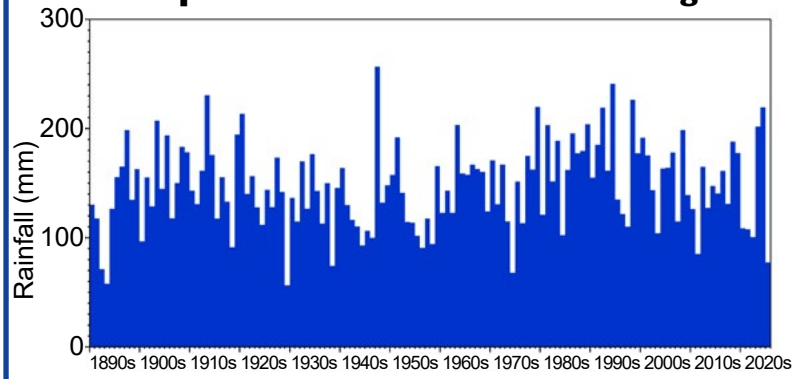
April 2025 rainfall
as % of 1991-2020 average



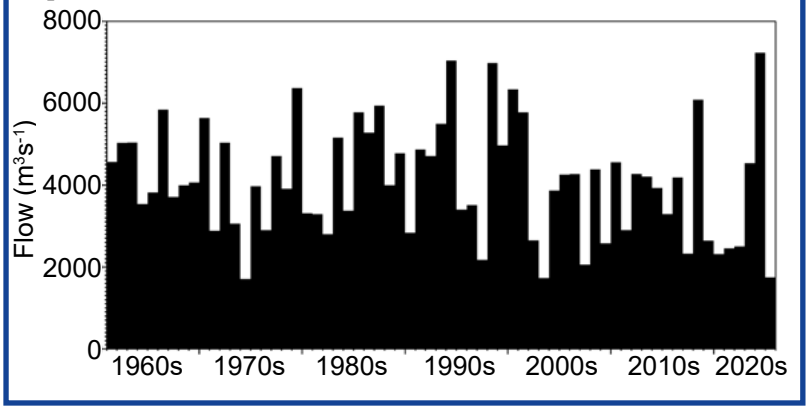
March 2025 - April 2025 rainfall
as % of 1991-2020 average



March - April rainfall for the United Kingdom



April mean outflows for Great Britain



UK Hydrological Outlook

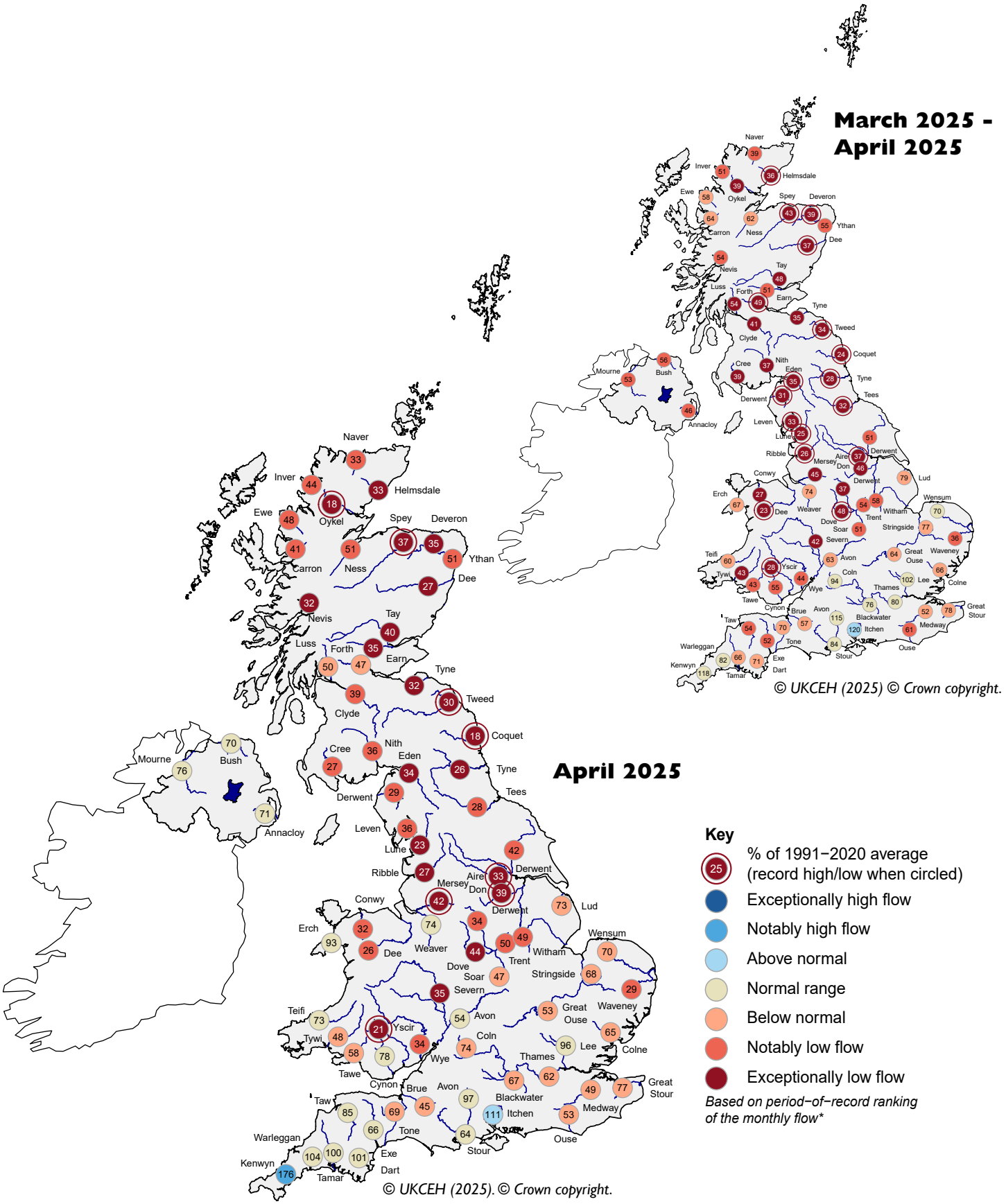
The Hydrological Outlook provides an insight into future hydrological conditions across the UK. Specifically it describes likely trajectories for river flows and groundwater levels on a monthly basis, with particular focus on the next three months.

The complete version of the Hydrological Outlook UK can be found at: www.hydoutuk.net/latest-outlook/

Period: **from May 2025**
Issued: **14.05.2025**
using data to the end of April 2025

The outlook for May is for below normal river flows across most of the UK, except southern Wales and south-west England, where flows are likely to be normal. Groundwater levels are expected to continue to decline in most areas, although above normal levels are likely to persist in parts of the southern chalk. Over the period May-July, river flows in most areas are likely to continue to be below normal, with the potential for current low to exceptionally low flows to persist in some catchments. Flows in western Scotland and Northern Ireland are likely to be normal.

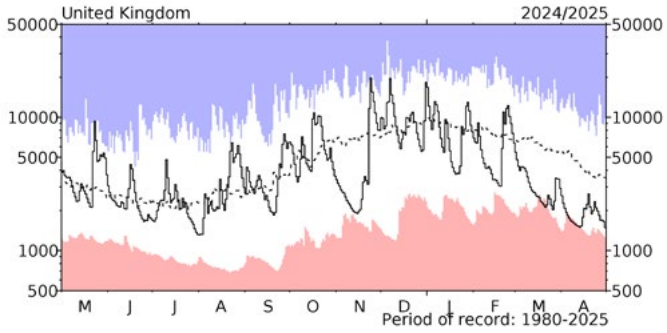
River flow . . . River flow . . .

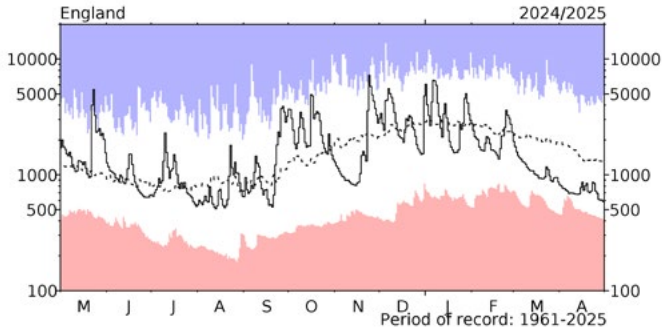


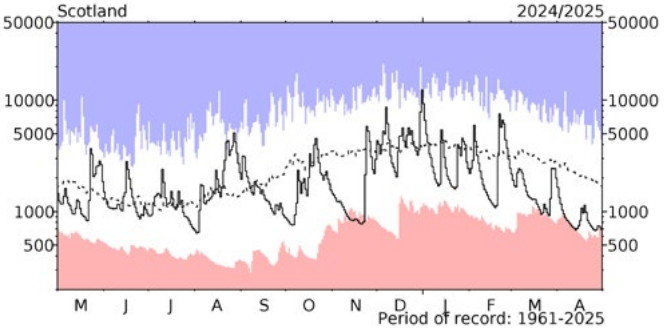
River flows

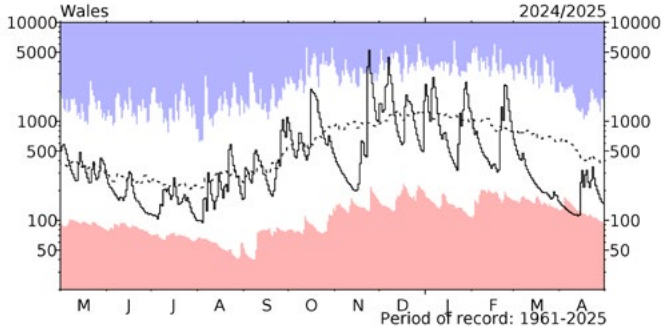
*Comparisons based on percentage flows alone can be misleading. A given percentage flow can represent extreme drought conditions in permeable catchments where flow patterns are relatively stable but be well within the normal range in impermeable catchments where the natural variation in flows is much greater. The categories of the spots are based on the full period-of-record data whereas the percentages are based on the 1991-2020 averaging period for consistency between rainfall and river flows. Percentages may be omitted where flows are under review.

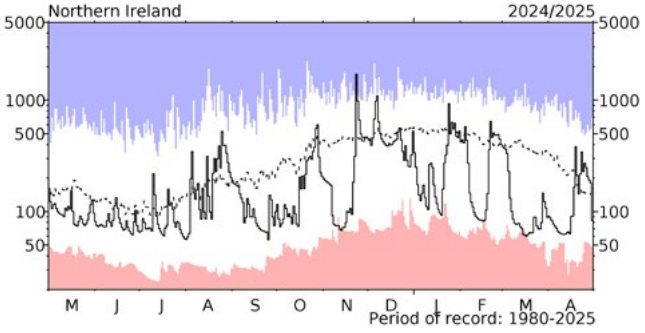
River flow . . . River flow . . .

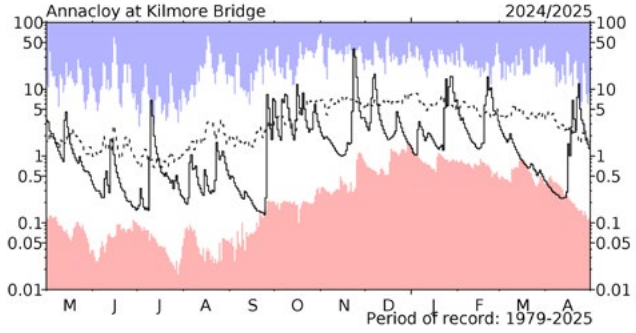


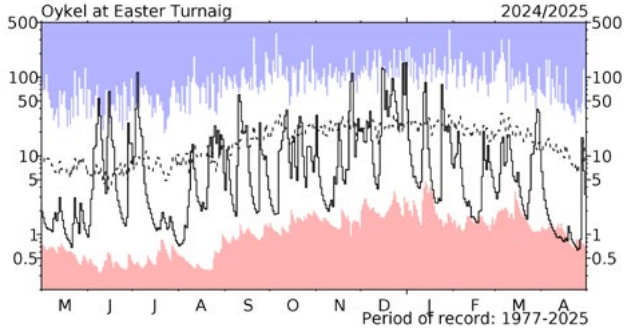


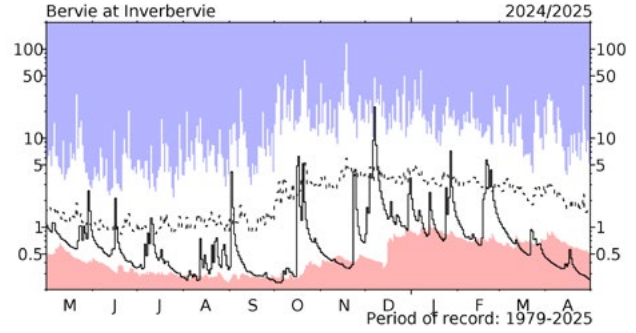


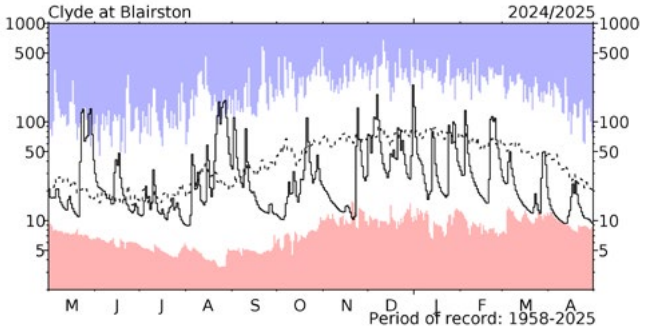


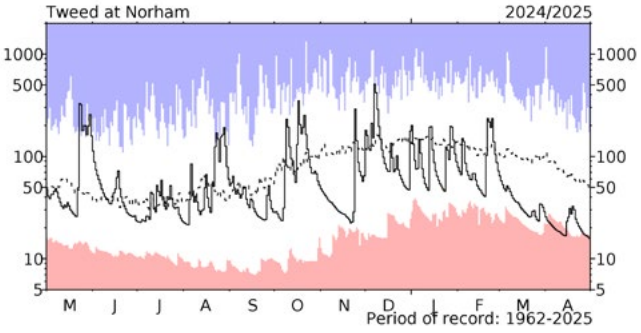








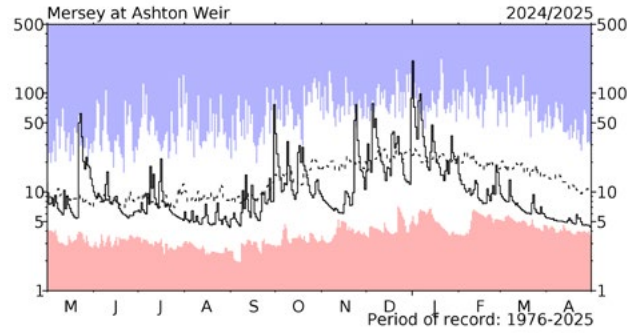


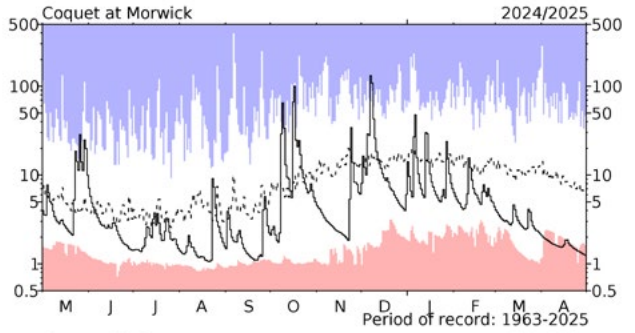


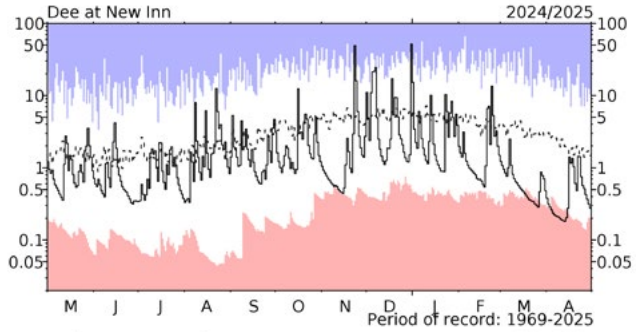
River flow hydrographs

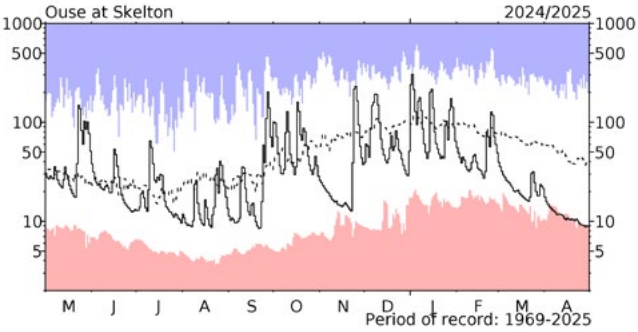
*The river flow hydrographs show the daily mean flows (measured in m^3s^{-1}) together with the maximum and minimum daily flows prior to January 2024 (shown by the shaded areas). Daily flows falling outside the maximum/minimum range are indicated where the bold trace enters the shaded areas. The dashed line represents the period-of-record average daily flow.

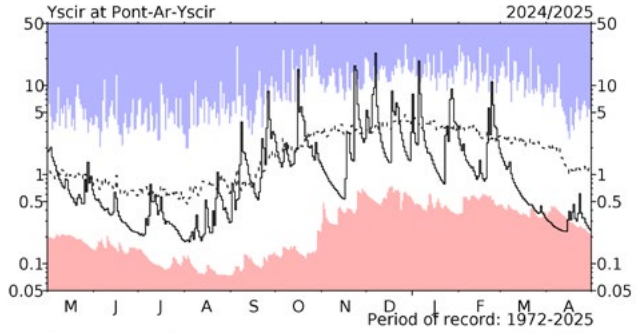
River flow . . . River flow . . .

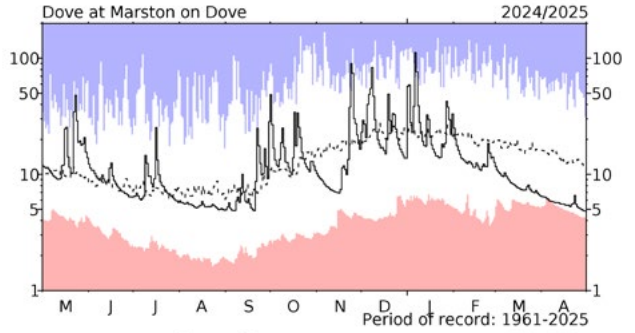


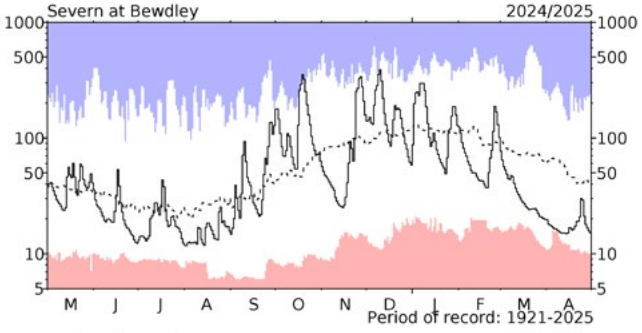


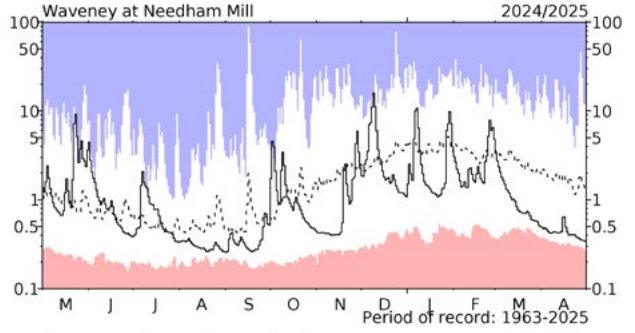


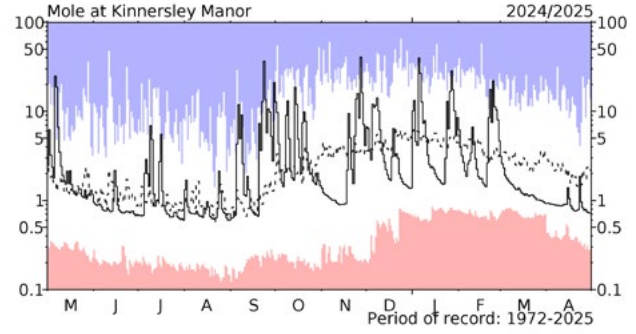


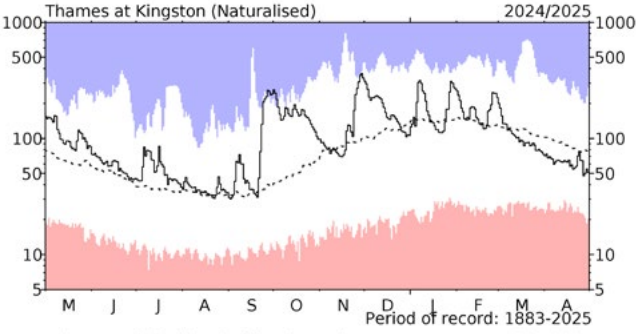


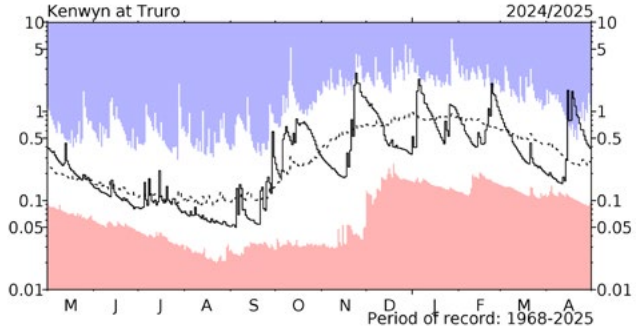


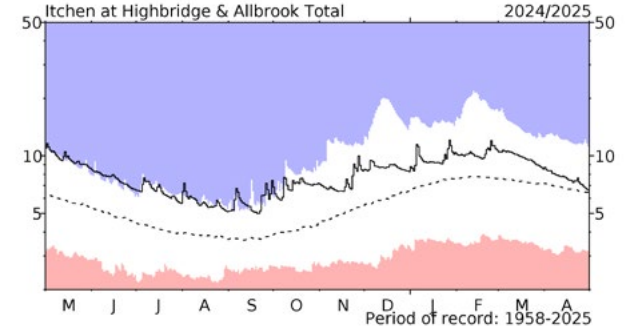




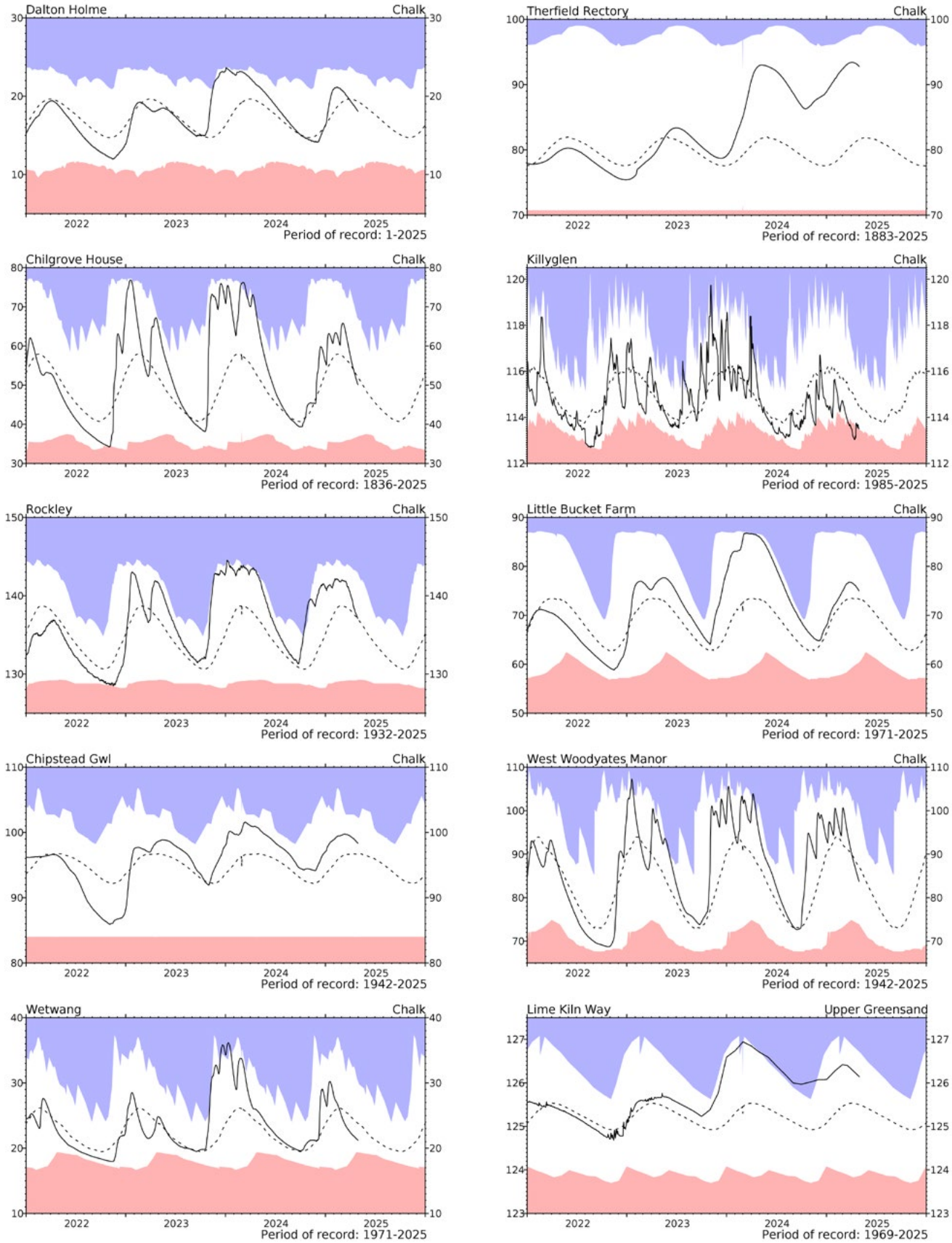






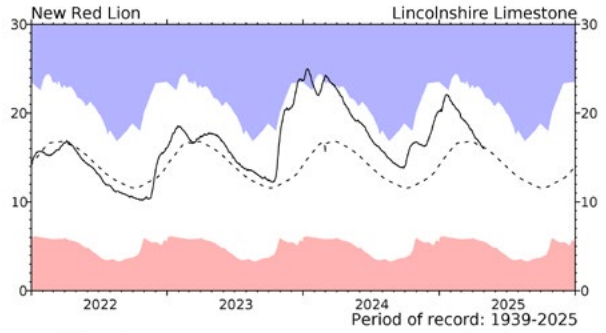


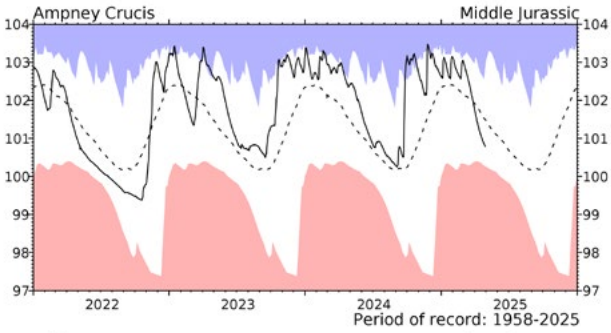
Groundwater…Groundwater

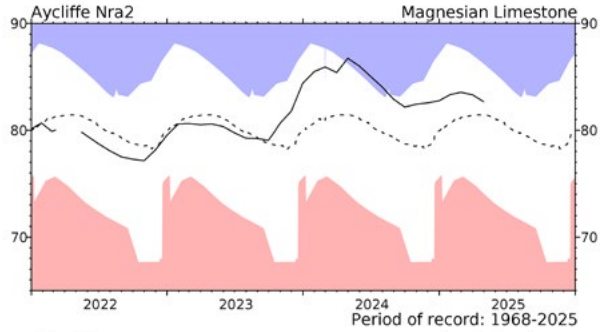


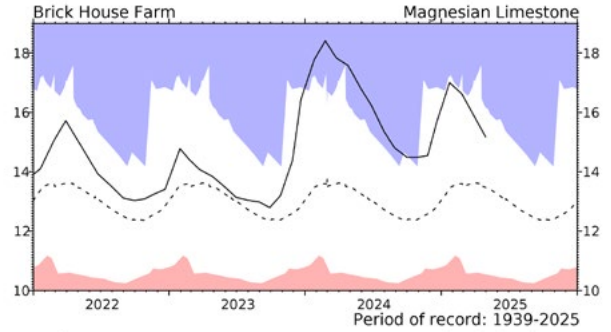
Groundwater levels (measured in metres above ordnance datum) normally rise and fall with the seasons, reaching a peak in the spring following replenishment through the winter (when evaporation losses are low and soil moist). They decline through the summer and early autumn. This seasonal variation is much reduced when the aquifer is confined below overlying impermeable strata. The monthly mean and the highest and lowest levels recorded for each month are calculated with data from the start of the record to the end of 2021. Note that most groundwater levels are not measured continuously and, for some index wells, the greater frequency of contemporary measurements may, in itself, contribute to an increased range of variation.

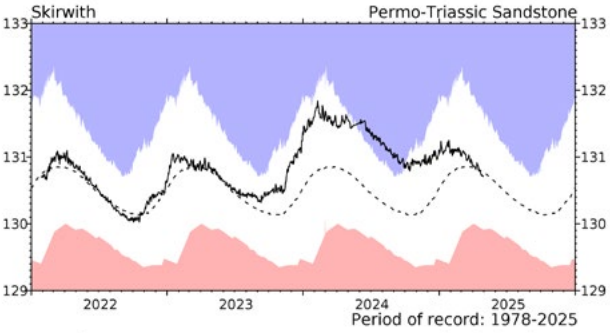
Groundwater … Groundwater

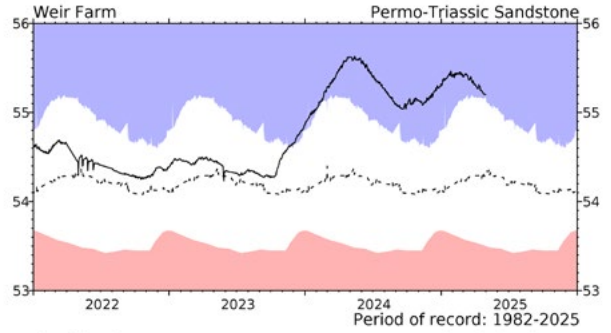


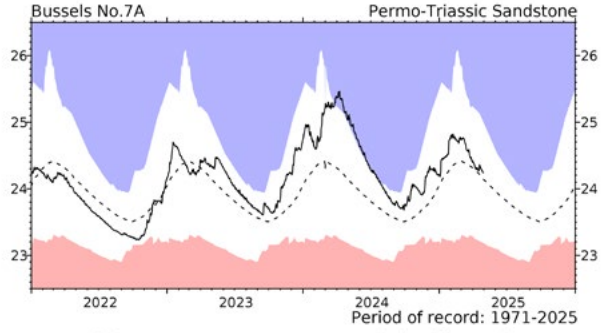


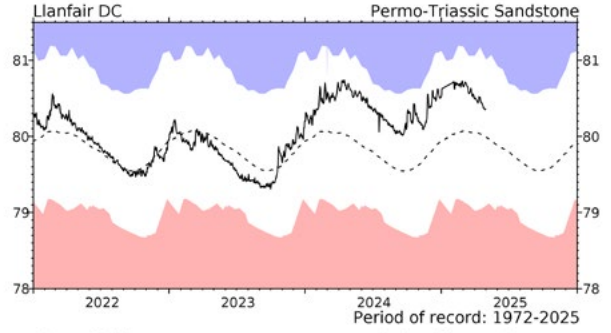


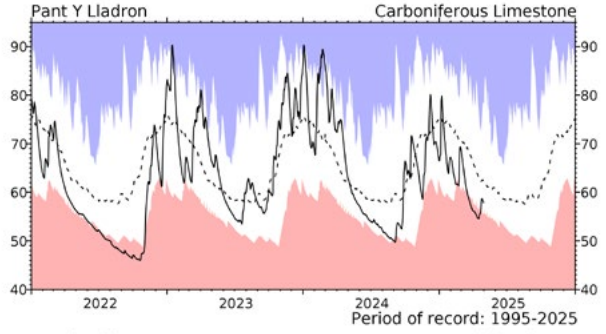


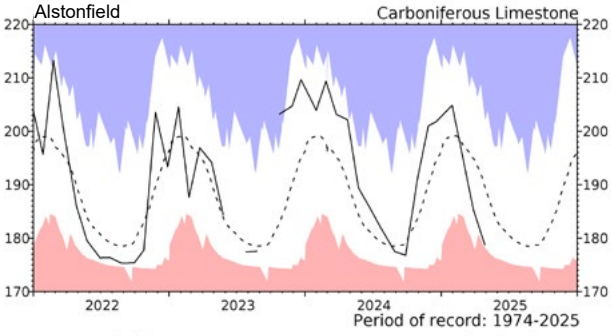


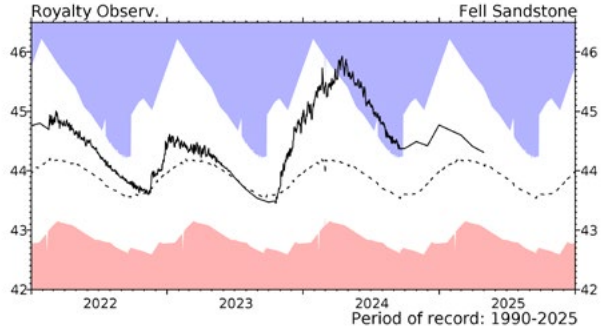


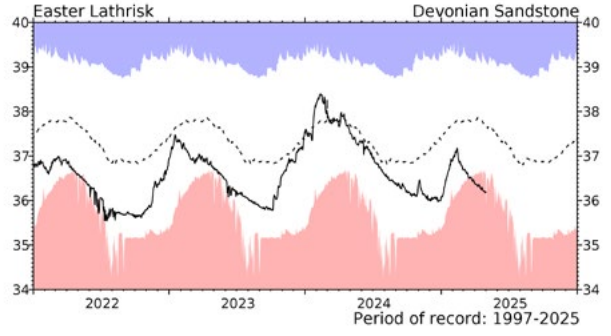


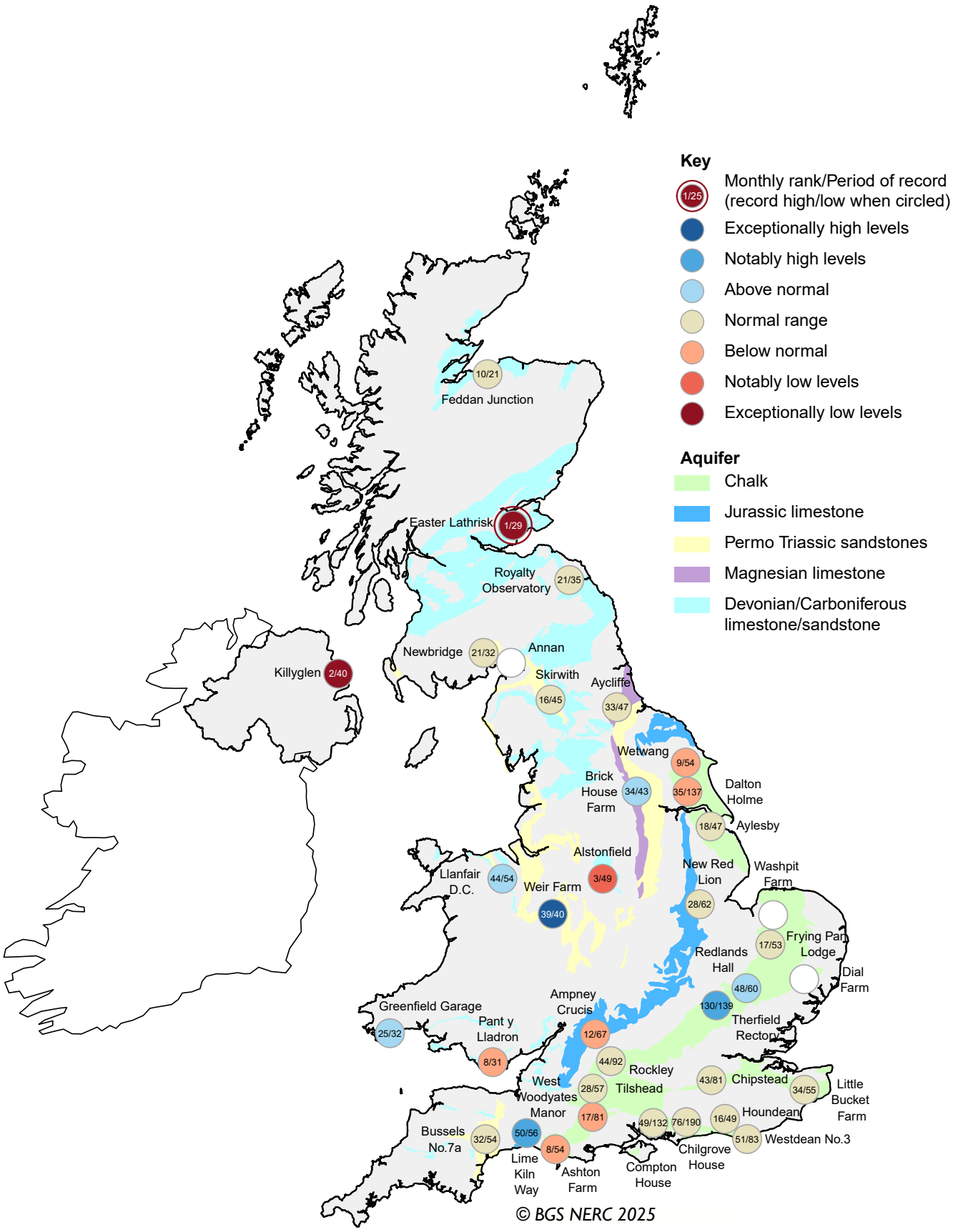










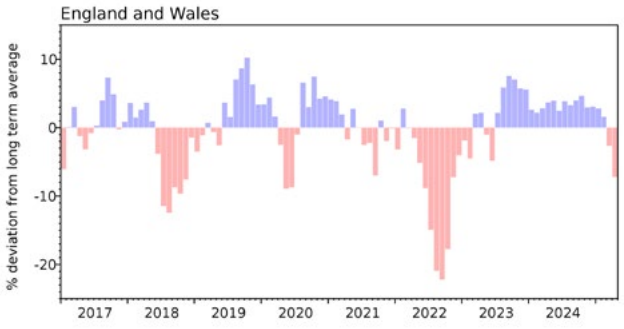


Groundwater levels - April 2025

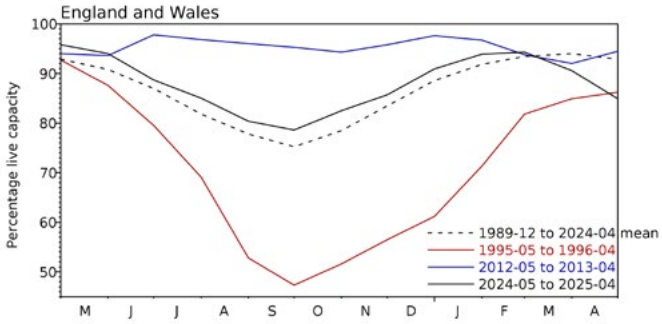
The calculation of ranking has been modified from that used in summaries published prior to October 2012. It is now based on a comparison between the most recent level and levels for the same date during previous years of record. Where appropriate, levels for earlier years may have been interpolated. The rankings are designed as a qualitative indicator, and ranks at extreme levels, and when levels are changing rapidly, need to be interpreted with caution.

Reservoirs . . . Reservoirs . . .

Guide to the variation in overall reservoir stocks for England and Wales



Comparison between overall reservoir stocks for England and Wales in recent years



Percentage live capacity of selected reservoirs at end of month

Area	Reservoir		Capacity (Ml)	2025 Feb	2025 Mar	2025 Apr	Apr Anom.	Min Apr	Year* of min	2024 Apr	Diff 25-24
North West	N Command Zone	•	124929	93	80	62	-25	62	2025	94	-32
	Vyrnwy		55146	100	96	91	-3	70	1996	100	-10
Northumbrian	Teesdale	•	87936	96	87	76	-15	73	2020	98	-22
	Kielder		(199175)	89	87	84	-6	84	2025	93	-8
Severn-Trent	Clywedog		49936	95	93	96	-1	85	1988	99	-2
	Derwent Valley	•	46692	94	86	76	-16	54	1996	97	-21
Yorkshire	Washburn	•	23373	95	87	80	-9	76	1996	97	-17
	Bradford Supply	•	40942	98	86	71	-19	60	1996	97	-26
Anglian	Grafham		(55490)	95	95	95	1	73	1997	90	5
	Rutland		(116580)	93	95	91	-1	72	1997	98	-6
Thames	London	•	202828	94	94	95	0	86	1990	96	-1
	Farmoor	•	13822	88	99	97	0	81	2000	96	2
Southern	Bewl		31000	91	94	89	-1	60	2012	100	-11
	Ardingly		4685	100	100	98	0	69	2012	100	-2
Wessex	Clatworthy		5662	100	93	86	-7	81	1990	98	-12
	Bristol	•	(38666)	100	97	89	-4	83	2011	95	-5
South West	Colliford		28540	89	87	86	-2	56	1997	100	-14
	Roadford		34500	100	97	96	10	41	1996	99	-3
	Wimbleball		21320	100	97	93	-2	79	1992	100	-7
	Stithians		4967	100	98	100	8	65	1992	100	0
Welsh	Celyn & Brenig	•	131155	87	86	80	-17	75	1996	89	-8
	Brianne		62140	100	95	90	-7	86	1997	100	-10
	Big Five	•	69762	100	94	85	-8	85	2025	99	-14
	Elan Valley	•	99106	100	92	81	-15	81	2025	99	-18
Scotland(E)	Edinburgh/Mid-Lothian	•	97223	95	91	86	-8	62	1998	98	-12
	East Lothian	•	9317	100	95	88	-11	88	2025	100	-12
Scotland(W)	Loch Katrine	•	110326	100	91	84	-7	80	2010	97	-13
	Daer		22494	92	86	79	-13	78	2013	83	-4
	Loch Thom		10721	100	93	87	-6	72	2021	99	-12
Northern Ireland	Total+	•	56800	93	87	93	4	77	2007	94	-1
	Silent Valley	•	20634	99	91	100	14	58	2000	96	5

( ) figures in parentheses relate to gross storage

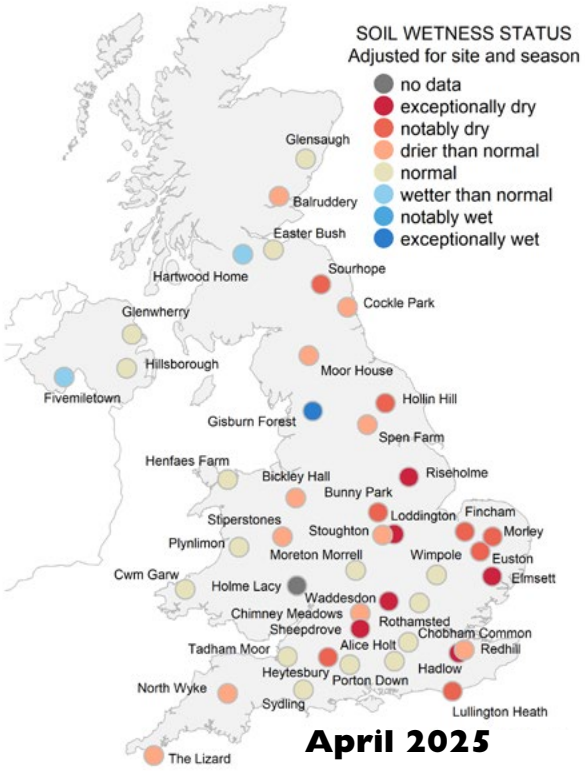
• denotes reservoir groups

*last occurrence

+ excludes Lough Neagh

Details of the individual reservoirs in each of the groupings listed above are available on request. The percentages given in the Average and Minimum storage columns relate to the 1988-2012 period except for West of Scotland and Northern Ireland where data commence in the mid-1990s. In some gravity-fed reservoirs (e.g. Clywedog) stocks are kept below capacity during the winter to provide scope for flood attenuation purposes. Monthly figures may be artificially low due to routine maintenance or turbidity effects in feeder rivers.

Soil Moisture . . . Soil Moisture

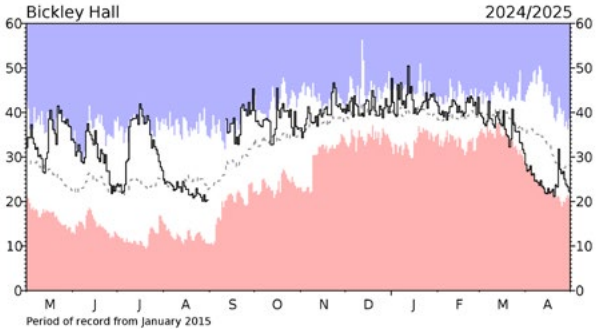


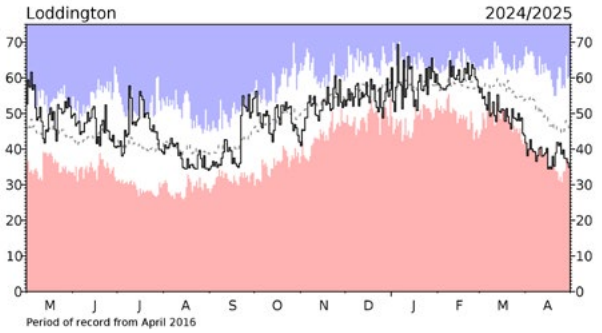
April 2025

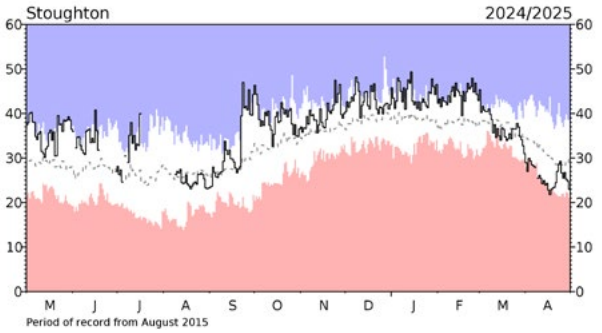
Daily mean soil moisture status at COSMOS-UK sites on the last day of the month 30 April 2025. Soil wetness categories are adjusted for site specific characteristics, i.e. taking account of the possible range of soil wetness at each site, determined through period-of-record data and hindcast modelling. Where no data are available on the last day of the month, these are shown by grey dots.

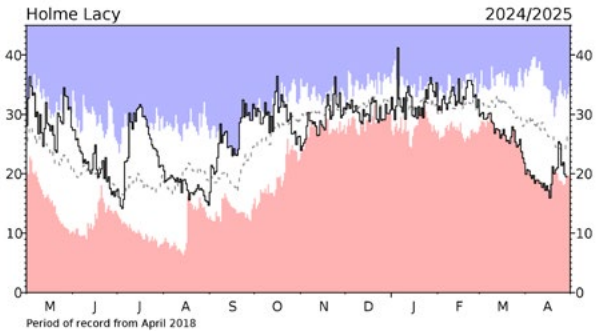
April soil moisture levels were exceptionally low compared with long-term averages across many COSMOS-UK sites, continuing the drying trend from the previous month. Eleven sites across the network, predominantly in the south and east of England, recorded their lowest average April soil moisture on record: Bickley Hall, Euston, Glenwherry, Holme Lacy, Heytesbury, Loddington, Porton Down, Riseholme, Sheepdrove, Stoughton and Waddesdon. The rain in the latter half of April helped some sites in western areas to recharge soil moisture to more normal conditions by the end of the month, e.g. Glenwherry, Hillsborough, Cwm Garw.

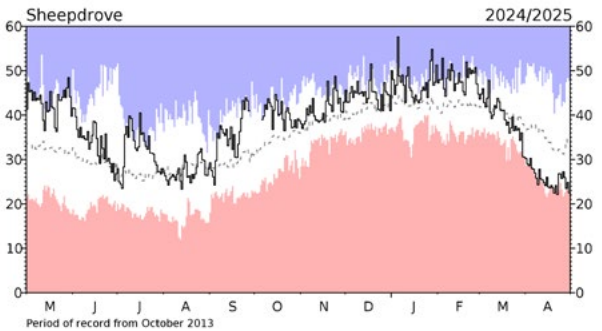
Overall, the limited rainfall and warm temperatures pushed many COSMOS-UK sites into drier conditions than usual for this time of year, with soil moisture levels at some sites resembling conditions typically seen in the summer.











Soil moisture data

These data are from UKCEH's COSMOS-UK network. The time series graphs show volumetric water content as a percentage in black together with the maximum and minimum daily values for the period-of-record of the sites. The dashed line represents the period-of-record mean VWC. For more information visit cosmos.ceh.ac.uk.

NHMP

The National Hydrological Monitoring Programme (NHMP) was started in 1988 and is undertaken jointly by the UK Centre for Ecology & Hydrology (UKCEH) and the British Geological Survey (BGS). The NHMP aims to provide an authoritative voice on hydrological conditions throughout the UK, to place them in a historical context and, over time, identify and interpret any emerging hydrological trends. Hydrological analysis and interpretation within the Programme is based on the data holdings of the National River Flow Archive (NRFA; maintained by UKCEH) and National Groundwater Level Archive (NGLA; maintained by BGS), including rainfall, river flows, borehole levels, and reservoir stocks.

The Hydrological Summary is supported by the Natural Environment Research Council award number NE/Y006208/1 as part of the NC-UK programme delivering National Capability.

Data Sources

The NHMP depends on the active cooperation of many data suppliers. This cooperation is gratefully acknowledged. A location map of all sites used in the Hydrological Summary can be found on the NHMP website. River flow and groundwater level data are provided by the Environment Agency (EA), Natural Resources Wales - Cyfoeth Naturiol Cymru (NRW), the Scottish Environment Protection Agency (SEPA) and, for Northern Ireland, the Department for Infrastructure - Rivers and the Northern Ireland Environment Agency. In all cases the data are subject to revision following validation (high flow and low flow data in particular may be subject to significant revision).

Details of reservoir stocks are provided by the Water Service Companies, the EA, Scottish Water and Northern Ireland Water.

The Hydrological Summary and other NHMP outputs may also refer to and/or map soil moisture data for the UK. These data are provided by the Meteorological Office Rainfall and Evaporation Calculation System (MORECS). MORECS provides estimates of monthly soil moisture deficit in the form of averages over 40 x 40 km grid squares over Great Britain and Northern Ireland. The monthly time series of data extends back to 1961.

Rainfall data are provided by the Met Office. To allow better spatial differentiation the rainfall data for Britain are presented for the regional divisions of the precursor organisations of the EA, NRW and SEPA. The areal rainfall figures have been produced by the Met Office National Climate Information Centre (NCIC), and are based on the HadUK-Grid 1km resolution gridded data from rain gauges. The majority of the full rain gauge network across the UK is operated by the EA, NRW, SEPA and Northern Ireland Water; supplementary rain gauges are operated by the Met Office. The Met Office NCIC monthly rainfall series extend back to 1836 and form the official source of UK areal rainfall statistics which have been adopted by the NHMP. The gridding technique used is described in Hollis, 2019 available at https://doi.org/10.1002/gdj3.78

Long-term averages are based on the period 1991-2020 and are derived from the monthly areal series.

The regional figures for the current month in the hydrological summaries are based on a limited rain gauge network so these (and the associated return periods) should be regarded as a guide only.

The monthly rainfall figures are provided by the Met Office NCIC and are Crown Copyright and may not be passed on to, or published by, any unauthorised person or organisation. These are provisional totals calculated from a sub set of Met Office registered gauges and will be subject to change once data from the complete network of Met Office registered gauges has been quality assured and gridded within the annual process of updating the HadUK-Grid dataset.

For further details on rainfall or MORECS data, please contact the Met Office:

Tel: 0370 900 0100
Email: enquiries@metoffice.gov.uk

Enquiries

Enquiries should be directed to the NHMP:

Tel: 01491 692599
Email: nhmp@ceh.ac.uk

A full catalogue of past Hydrological Summaries can be accessed and downloaded at:

http://nrfa.ceh.ac.uk/monthly-hydrological-summary-uk

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