

Hydrological Summary

for the United Kingdom

General

May was sunny, warm and largely dry. The mean temperature was 1.3°C above the long-term average (the fifth warmest in a record from 1884) and, despite downpours in the last week, the May rainfall was 72% of the long-term average for the UK. May rounds off an exceptional spring, with sustained warmth and rainfall deficits that have, in turn, led to extremely dry soils. Extensive wildfires were reported (e.g. across western areas on the 5th-9th) and there were wider impacts on agriculture and terrestrial ecosystems. Average river flows for spring were the lowest on record for many rivers across northern and western Britain, with localised environmental impacts (e.g. fish rescues and algal blooms) as well as reported impacts on navigation. Groundwater levels for May were in the normal range or below normal across southern and eastern areas but exceptionally low in some northern and western boreholes. In much of northern Britain, the dry spring adds to longer-term rainfall deficiencies, and these are reflected in the end-of-May reservoir stocks. Combined stocks for England & Wales were the lowest on record (a series from 1990) while stocks were more than 20% below average in some impoundments (e.g. Derwent Valley, Bradford Supply, Celyn & Brenig, Elan Valley) and 33% below average for the Northern Command Zone. Drought status was declared in north-west England on the 29th, with many other regions on alert ('prolonged dry weather' in England and Wales; 'moderate scarcity' in Scotland). The late May rainfall and a wet start to June has brought some respite. Nevertheless, summer begins with depleted river flows, groundwater levels and reservoir stocks. This heightens the risk of further dry weather impacts, particularly as climbing evaporation rates limit the effectiveness of rainfall through summer. The latest Hydrological Outlook indicates that below normal or lower river flows and groundwater levels are likely to persist through summer across large parts of the country, although there is high uncertainty in seasonal forecasts at this time of year.

Rainfall

Aside from a few frontal incursions in Scotland in the opening days, early May saw a continuation of the blocked anticyclonic conditions that have characterised most of spring. Many areas of the country receiving no appreciable rainfall through the first three weeks. On the 11th/12th, thunderstorms in southern and central areas led to some localised surface water flooding. From the 23rd, low pressure took over, with frontal systems bringing strong winds and rain during the 24th-29th, particularly to upland areas (with widespread daily totals of over 70mm in Cumbria on several days), although most areas further south saw only very modest rainfall. The late rainfall pushed May totals closer to average in northern areas, with Scotland and Northern Ireland receiving 90% and 77% of average, respectively. England (57%) and Wales (59%) saw much lower totals and it was particularly dry in the south, notably the Thames (36%) and Southern (38%) regions. Spring (March-May) rainfall deficits were remarkable. It was the fourth driest spring for the UK and the second driest for England (after 1893), and the driest spring on record for the Northumbria region – all in series from 1890. The preceding winter was relatively dry in parts of northern Britain, leading to notably low 6-month accumulations (e.g. the second driest December-May for Northumbria and the fourth for the Tweed region in series from 1890), while parts of Scotland have seen exceptionally low accumulations since the start of autumn.

River Flows

Across most of the country, rivers receded steeply through much of May, continuing recessions established in early spring and only interrupted in some western areas during the wetter interlude in late April. The more unsettled conditions of the final ten days triggered only very modest recoveries in northern and western catchments. Correspondingly, while May average river flows in northwest Britain and the far south of England were in the normal range or moderately below, elsewhere flows were mostly notably or exceptionally low, with new minimum May average flows across northern and eastern Scotland (in records of at least 45 years; including the Scottish Dee, a long record from 1929). New May minima were also established in the Aire, Waveney and Yscir, in records from 1972 or earlier. Similarly, for spring, exceptionally low flows were

registered across northern England and most of Scotland (except the western Highlands) as well as in south Wales. Across these areas, over twenty index rivers set new spring minima. Elsewhere, spring flows were also typically below normal or notably low, except for some more permeable catchments in southern England. The spring outflows were the lowest on record for Scotland, the second lowest for England (after the exceptional drought year of 1976) and Northern Ireland, and the third lowest for Wales (after 1984 and 2011) in series from 1961 (except Northern Ireland that commenced 1981). As with the rainfall, deficits in flow can be traced back to the start of autumn or earlier across northern Britain.

Soil Moisture and Groundwater

The warm and dry conditions resulted in further drying of soils, with more than half of the COSMOS-UK sites recording their lowest average soil moisture levels for May (in records from 2013 or later). Similarly, end-of-May MORECS soil moisture deficits (SMDs) were exceptional across central, southern and eastern England – the highest (Southern) or second highest (North East England, Thames) for some regions in records from 1961. Correspondingly, groundwater levels in the Chalk of southern England generally decreased throughout May and remained in the normal range or below (with notably low levels in east Yorkshire/Lincolnshire) although some areas of the Chilterns remained above normal. In east Yorkshire and Lincolnshire, levels were mostly below normal or notably low. At Killyglen, levels remained exceptionally low. In the Jurassic Limestone, levels gradually decreased, with Ampney Crucis remaining below normal. Levels in the Magnesian Limestone gradually decreased, but Aycliffe remained in the normal range. In south Wales, levels in the Carboniferous Limestone decreased, with Pant y Lladron registering a new May minimum. At Alstonfield, levels continued to fall and were exceptionally low. Levels in the Permo-Triassic Sandstones fell slightly but remained exceptionally high at Weir Farm and above normal at Llanfair D.C.. At Bussels No. 7a, levels decreased but remained in the normal range, whilst levels at Skirwith decreased to below normal. In the Fell Sandstone at Royal Observatory, levels remained within the normal range. A new May minimum was registered at Easter Lathrisk in the Devonian Sandstone.

May 2025



National Hydrological
Monitoring Programme



UK Centre for
Ecology & Hydrology



British
Geological
Survey

Rainfall . . . Rainfall . . .



Rainfall accumulations and return period estimates

Percentages are from the 1991-2020 average.

Region	Rainfall	May 2025	Mar25 – May25		Dec24 – May25		Sep24 – May25		Jun24 – May25	
			RP		RP		RP		RP	
United Kingdom	mm	51	128		436		737		978	
	%	72	56	80-120	76	5-10	81	5-10	85	5-10
England	mm	33	76		303		603		762	
	%	57	44	>100	74	8-12	91	2-5	88	2-5
Scotland	mm	80	204		629		913		1286	
	%	90	66	8-12	79	2-5	73	10-20	82	5-10
Wales	mm	52	146		570		985		1226	
	%	59	52	30-50	78	2-5	85	2-5	84	2-5
Northern Ireland	mm	57	169		399		638		904	
	%	77	72	5-10	71	15-25	72	20-35	78	20-30
England & Wales	mm	35	85		340		655		826	
	%	58	46	>100	75	5-10	90	2-5	88	2-5
North West	mm	70	125		459		800		1103	
	%	93	53	50-80	75	5-10	81	5-10	87	2-5
Northumbria	mm	36	73		262		496		680	
	%	64	41	>>100	62	30-50	73	10-20	75	15-25
Severn-Trent	mm	33	69		282		589		725	
	%	56	41	>100	75	5-10	98	2-5	91	2-5
Yorkshire	mm	36	72		298		539		692	
	%	65	42	>100	73	8-12	83	2-5	80	5-10
Anglian	mm	24	51		199		408		526	
	%	51	40	50-80	71	10-20	89	2-5	84	2-5
Thames	mm	20	49		246		568		701	
	%	36	32	70-100	71	5-10	102	2-5	97	2-5
Southern	mm	20	54		291		615		742	
	%	38	35	50-80	73	5-10	95	2-5	91	2-5
Wessex	mm	25	67		324		729		879	
	%	43	37	80-120	73	5-10	102	2-5	97	2-5
South West	mm	40	165		535		967		1160	
	%	56	69	5-10	85	2-5	97	2-5	93	2-5
Welsh	mm	48	140		548		964		1193	
	%	57	52	30-50	79	2-5	87	2-5	85	2-5
Highland	mm	90	249		831		1192		1634	
	%	85	67	5-10	85	2-5	79	2-5	88	2-5
North East	mm	46	115		401		613		863	
	%	68	55	80-120	82	5-10	76	15-25	81	10-20
Tay	mm	70	166		512		719		1001	
	%	84	61	10-20	73	5-10	65	40-60	72	40-60
Forth	mm	68	158		431		624		891	
	%	93	66	8-12	70	5-10	65	20-35	72	15-25
Tweed	mm	52	105		323		525		768	
	%	80	50	>100	62	30-50	63	40-60	71	25-40
Solway	mm	88	184		546		806		1216	
	%	99	61	10-20	70	5-10	65	30-50	78	5-10
Clyde	mm	113	264		726		1016		1485	
	%	111	73	2-5	75	2-5	67	15-25	79	5-10

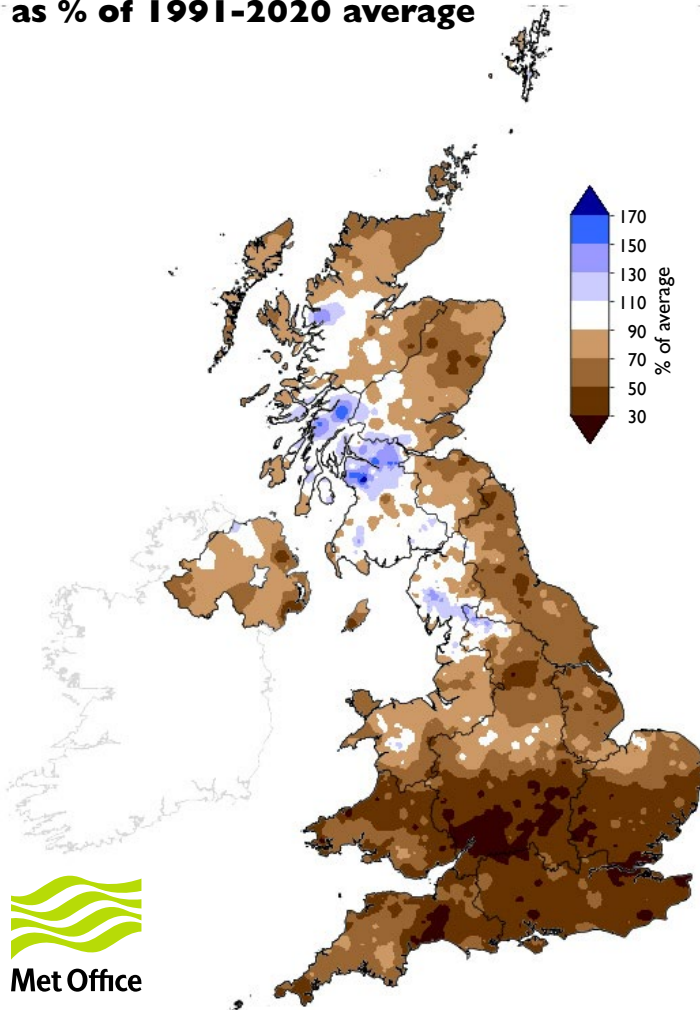
% = percentage of 1991-2020 average

RP = Return period

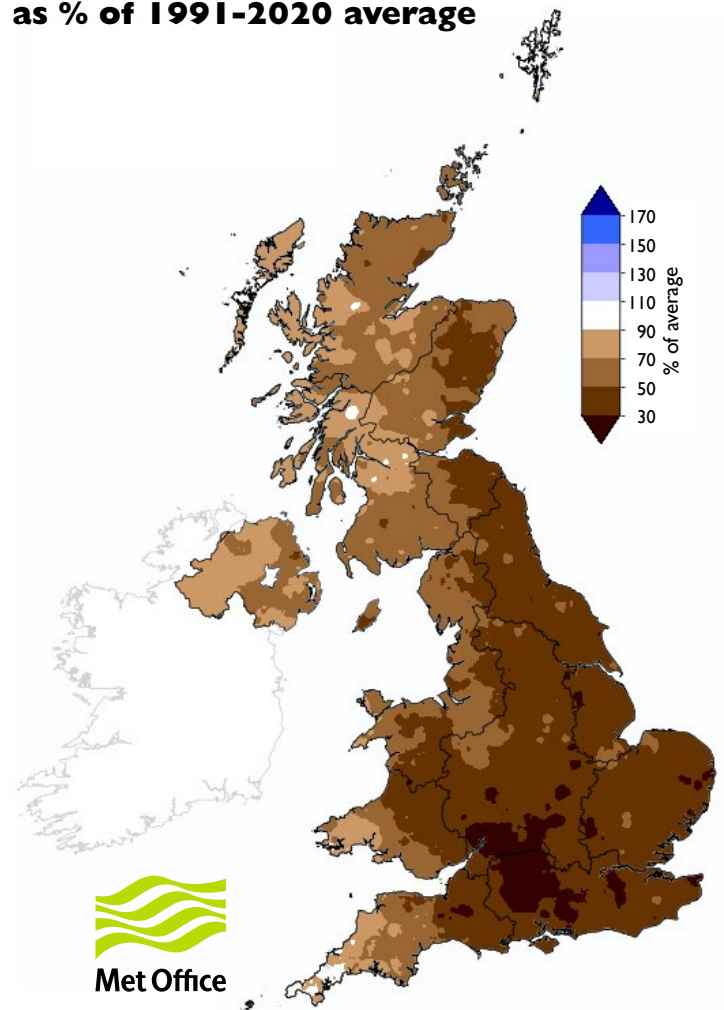
Important note: Figures in the above table may be quoted provided their source is acknowledged. Where appropriate, specific mention must be made of the uncertainties associated with the return period estimates. The RP estimates are based on data provided by the Met Office and reflect climatic variability 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 . . .

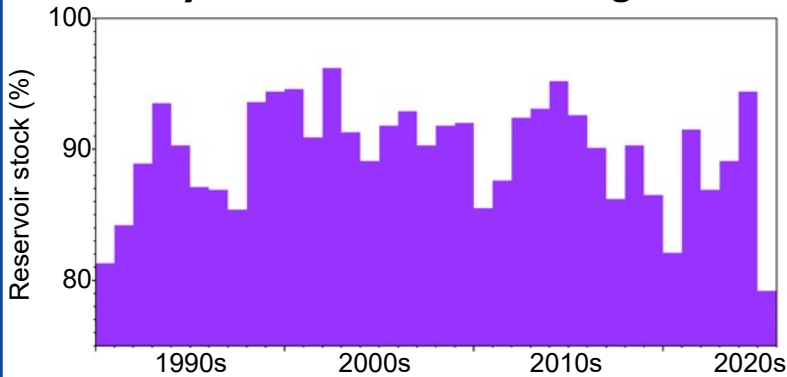
**May 2025 rainfall
as % of 1991-2020 average**



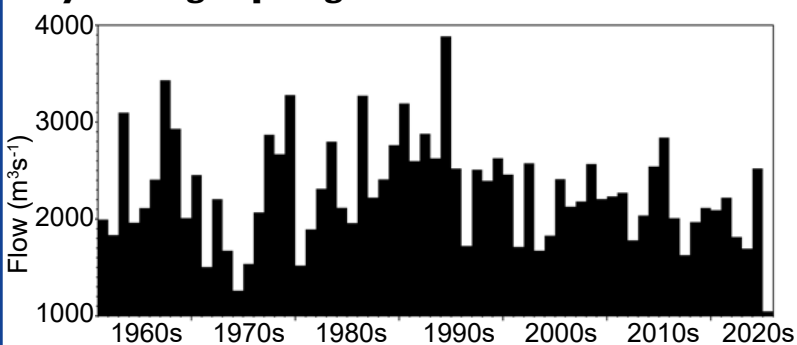
**March 2025 - May 2025 rainfall
as % of 1991-2020 average**



End of May reservoir stocks for England



May average spring outflows for Scotland



**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/

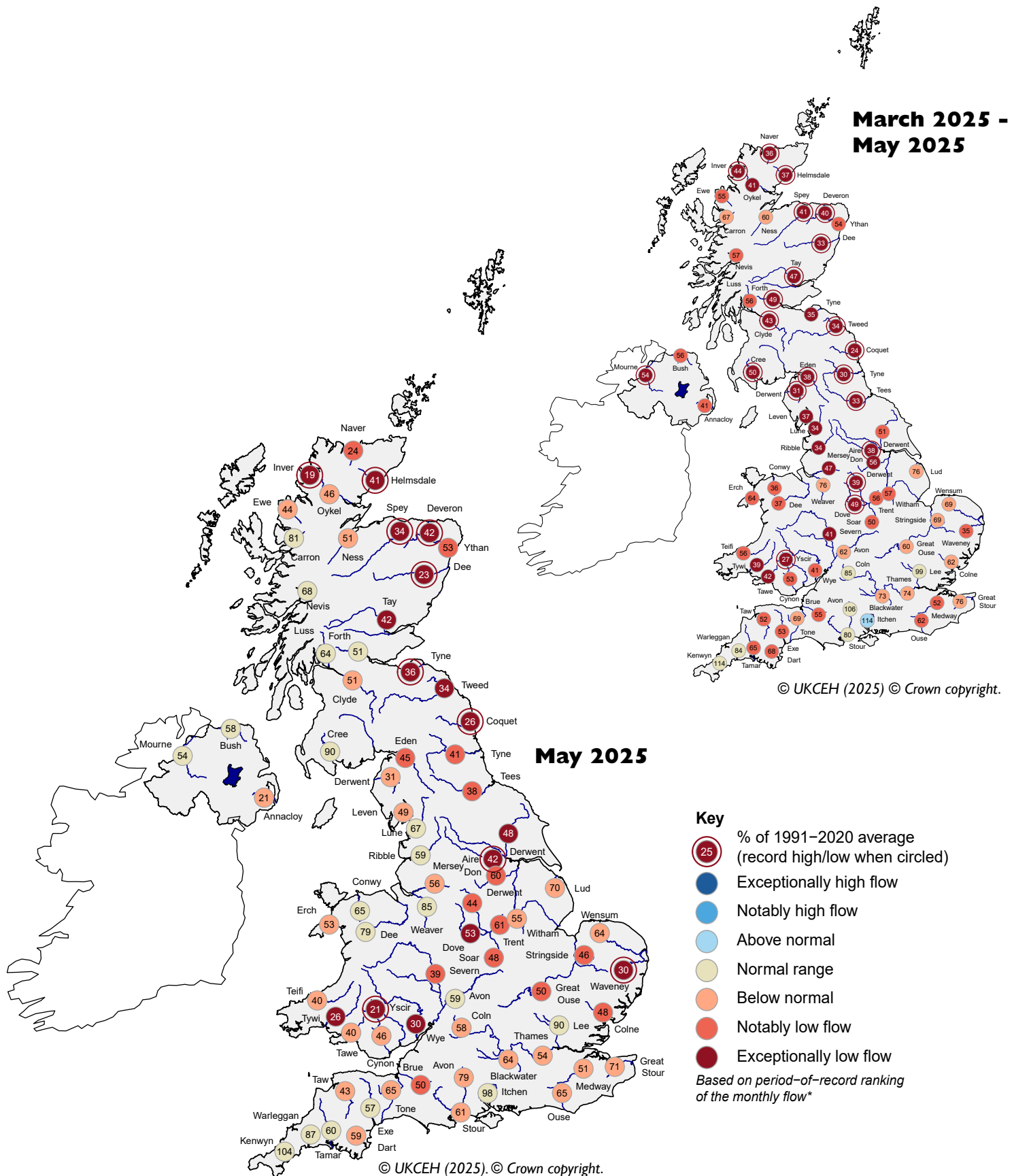
Period: from June 2025

Issued: 11.06.2025

using data to the end of May 2025

The river flow outlook for June is for below normal to low flows in eastern, central and southern areas, with notably or exceptionally low flows likely to persist in some catchments. In contrast, the outlook is for normal to above normal flows in northwestern areas. The June-August outlook suggests a similar contrast, but between normal flows in the northwest and below normal flows elsewhere. For groundwater, the outlook for both June and June-August is for normal to below normal levels across the country.

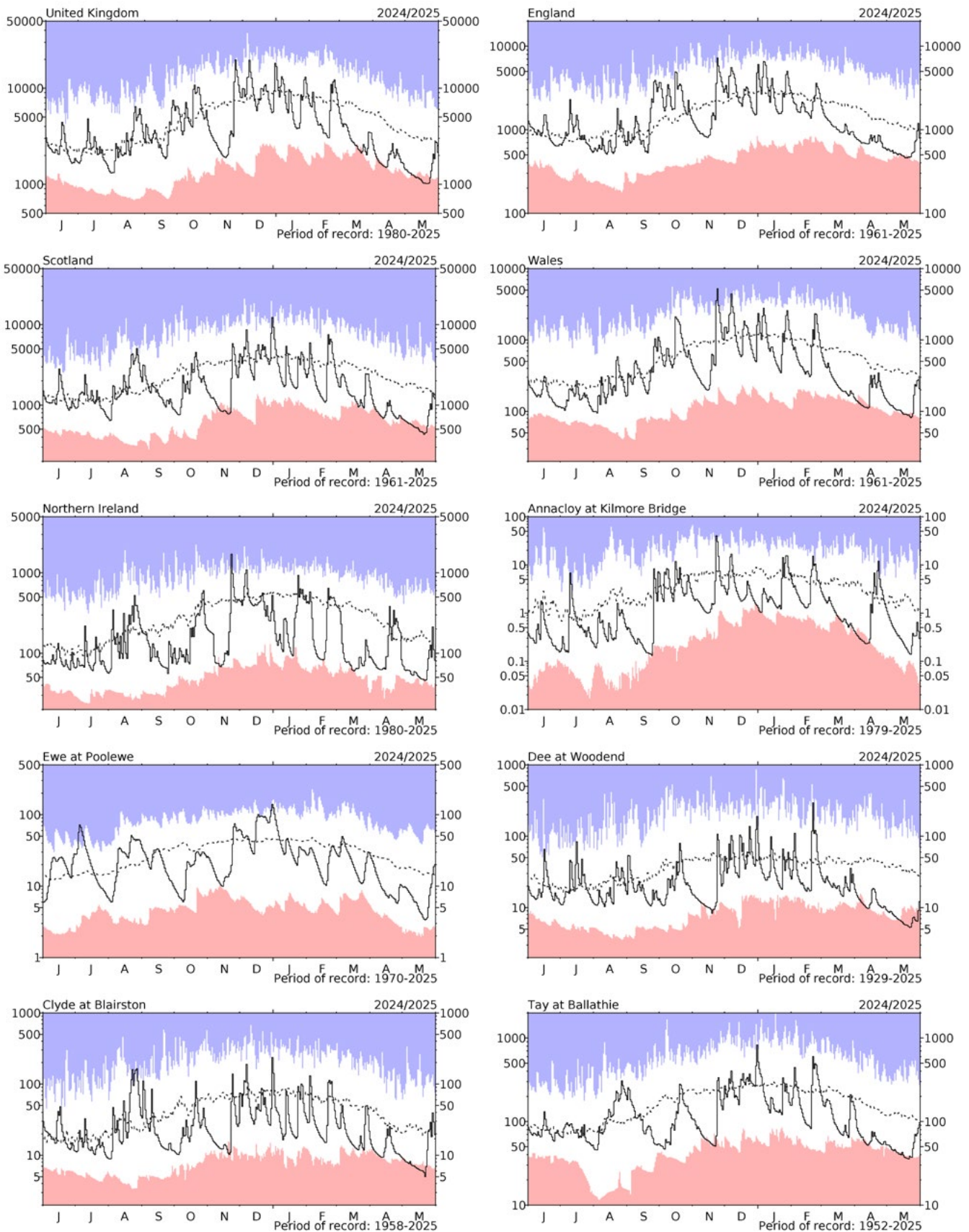
River flow . . . River flow . . .



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.

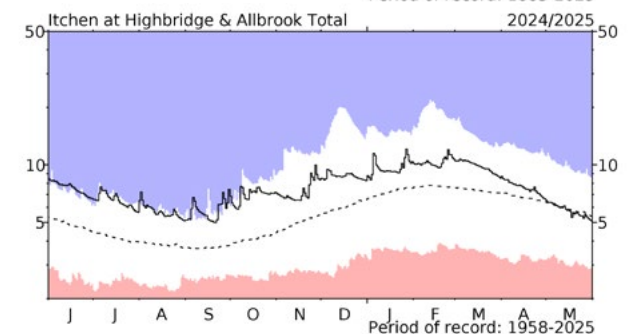
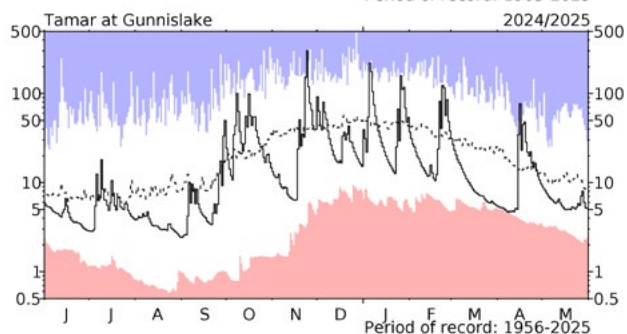
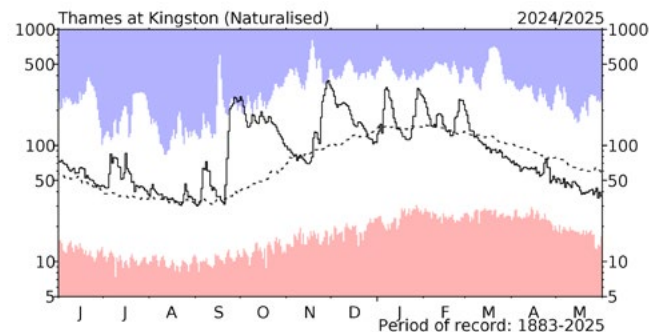
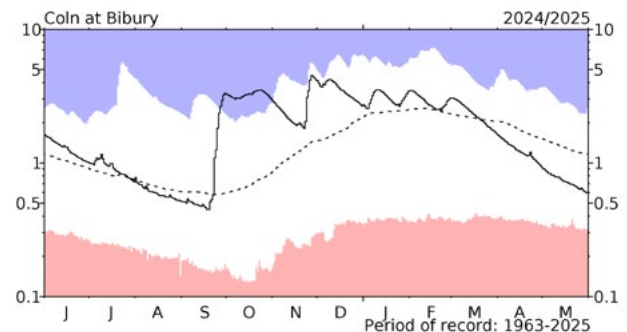
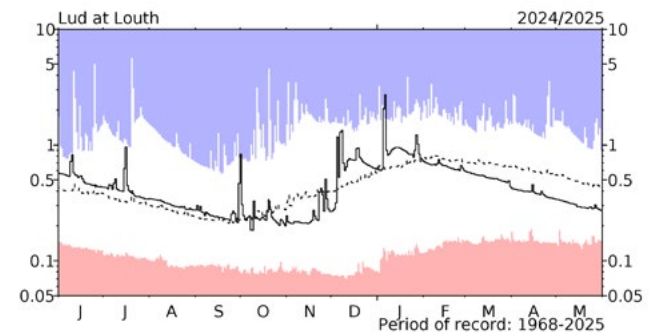
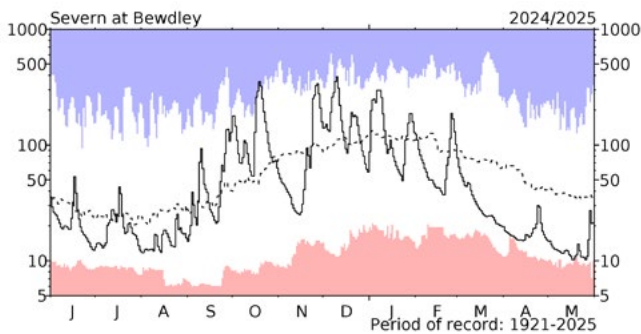
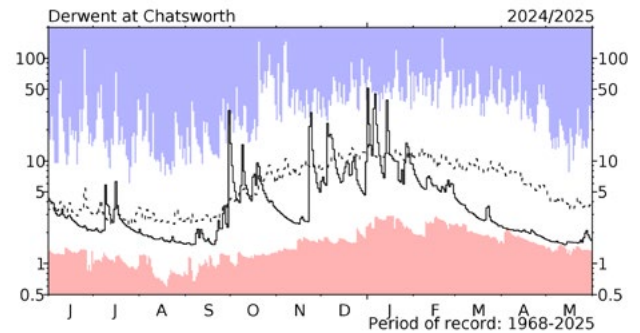
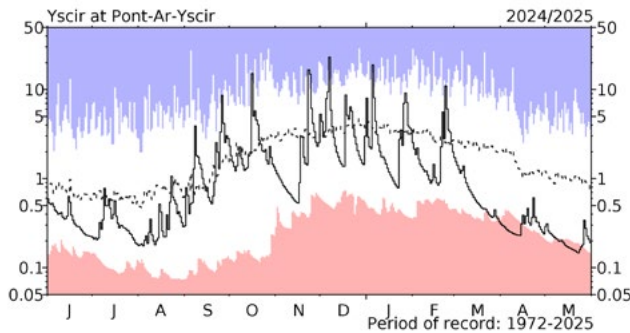
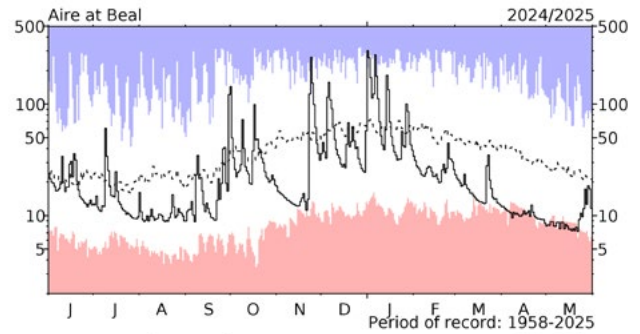
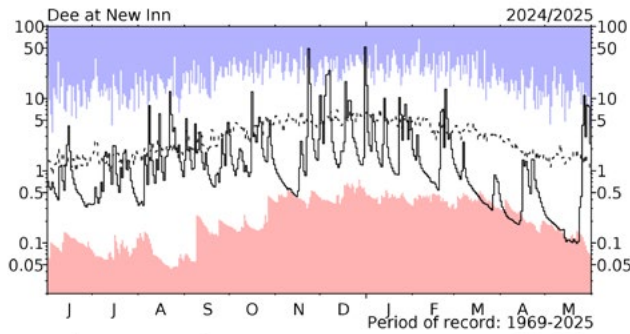
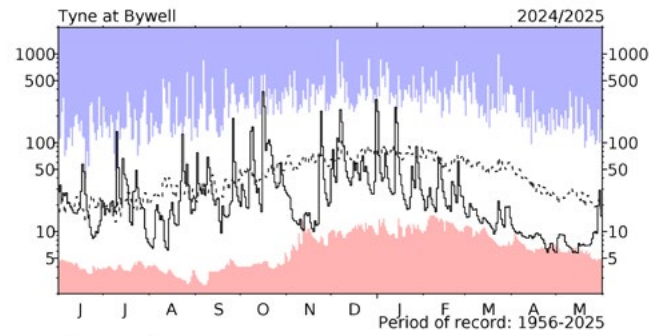
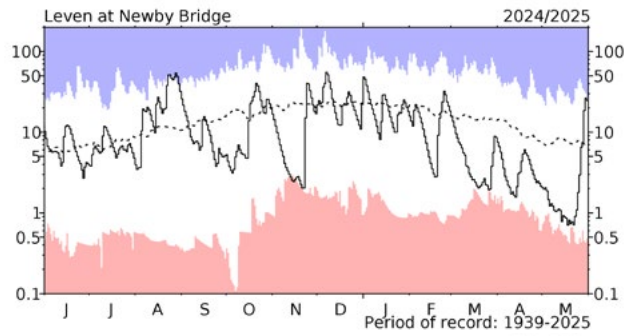
River flow . . . River flow . . .



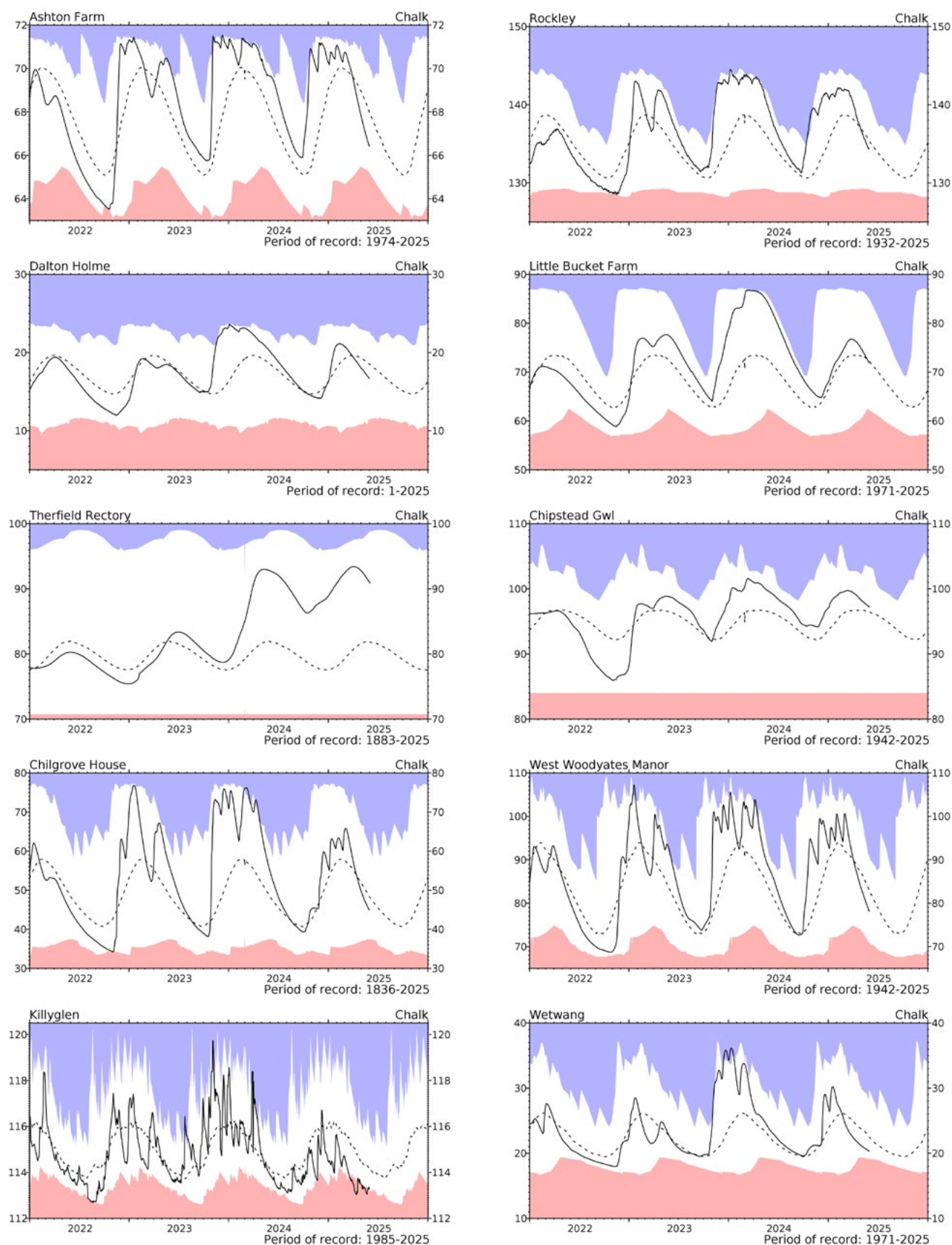
River flow hydrographs

*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 . . .

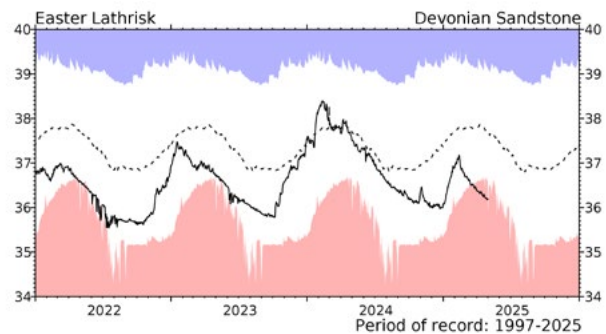
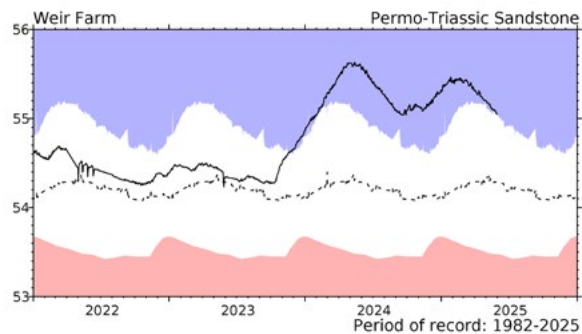
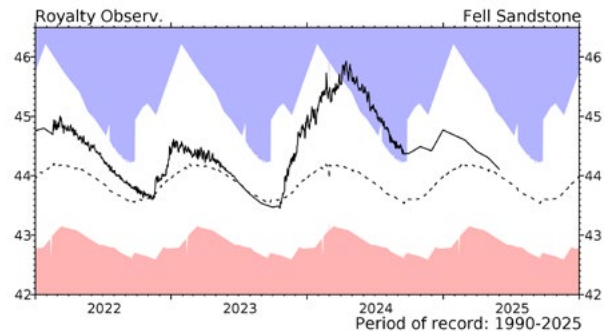
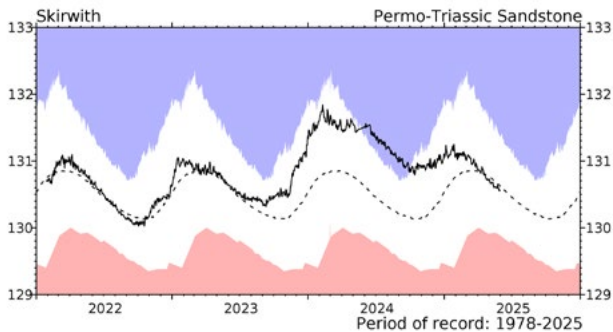
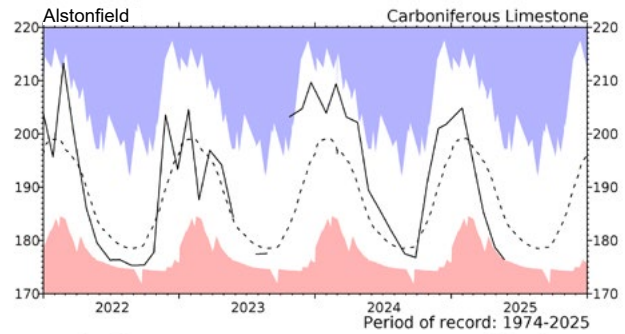
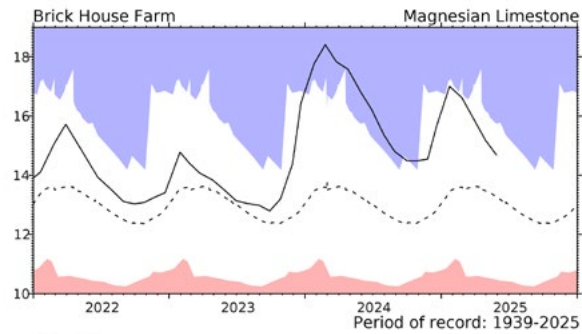
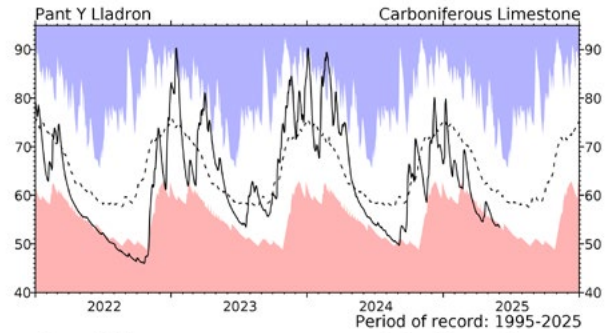
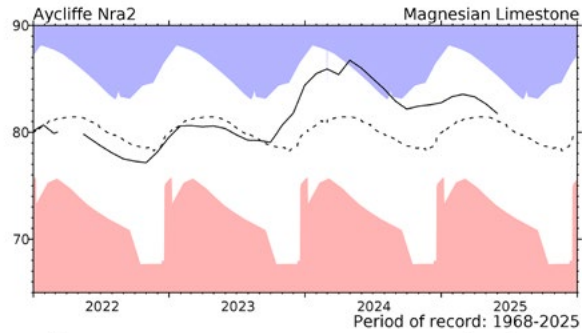
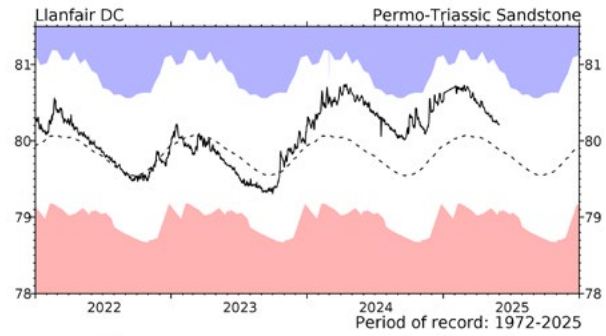
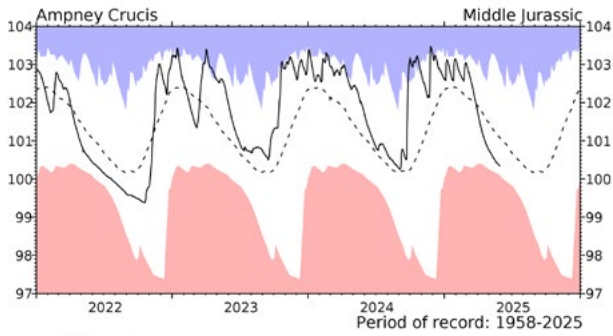
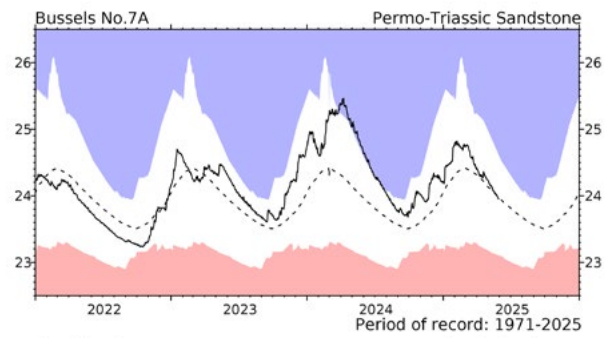
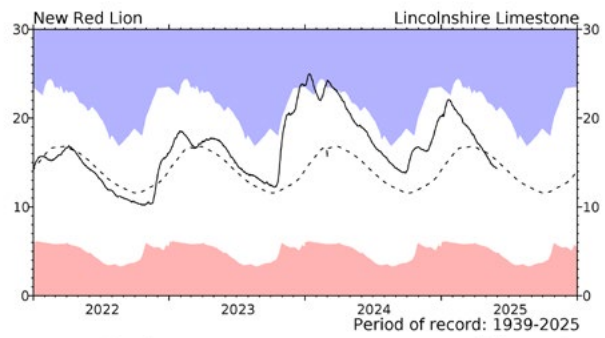


Groundwater... Groundwater

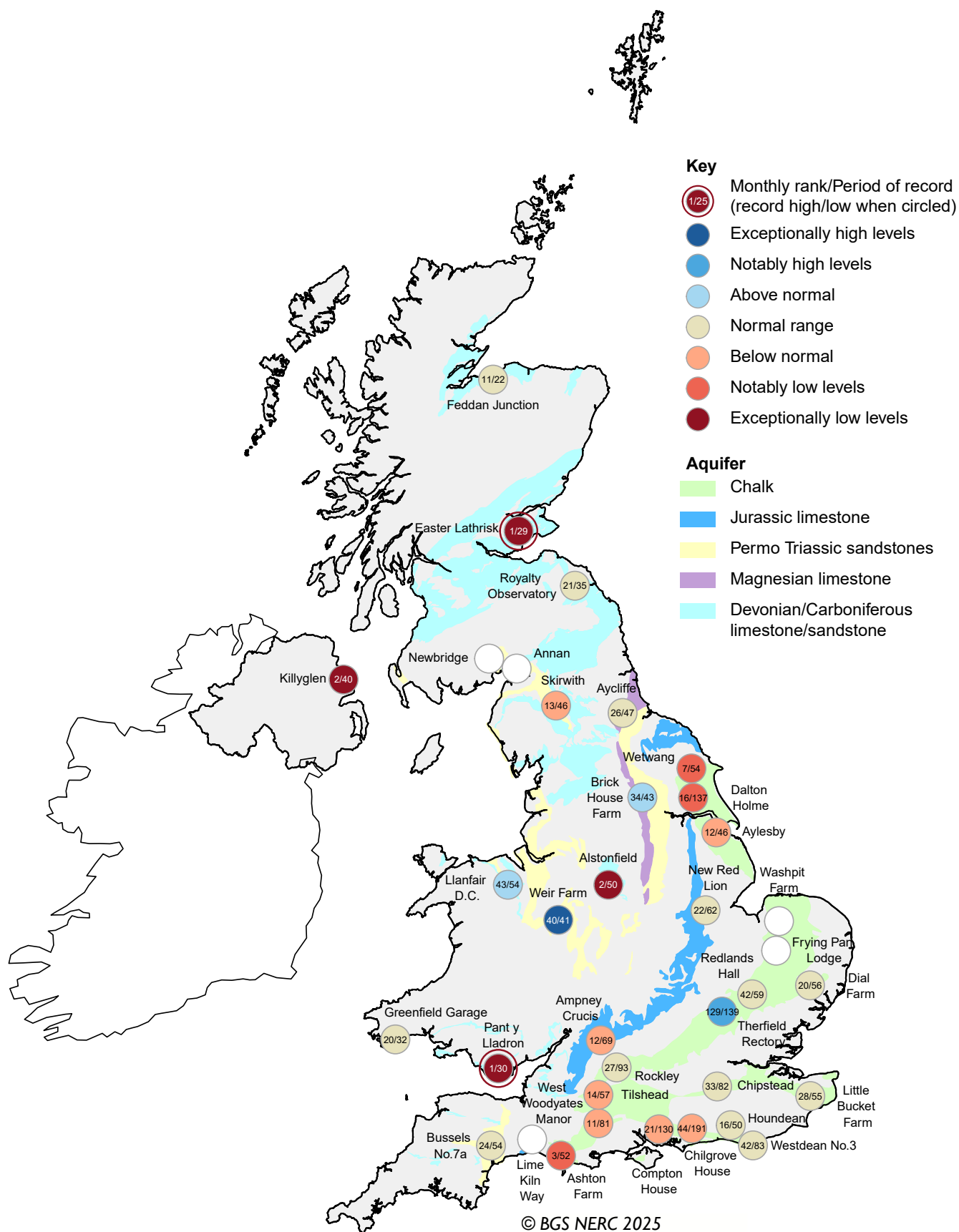


Groundwater levels (measured in metres above ordnance datum) normally rise and fall with the seasons, reaching a peak in the spring following replenishment through the winter (when evaporation losses are low and soil moist). They decline through the summer and early autumn. This seasonal variation is 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... Groundwater

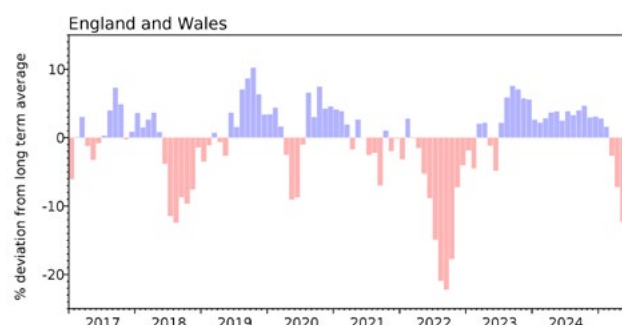


Groundwater levels - May 2025

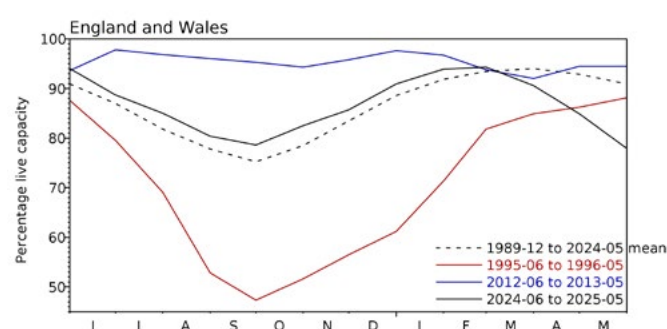
The calculation of ranking has been modified from that used in summaries published prior to October 2012. It is now based on a comparison between the most recent level and levels for the same date during previous years of record. Where appropriate, levels for earlier years may have been interpolated. 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 Mar	2025 Apr	2025 May	May Anom.	Min May	Year* of min	2024 May	Diff 25-24
North West	N Command Zone	• 124929	80	62	47	-33	47	2025	80	-33
	Vyrnwy	• 55146	96	91	83	-7	69	1984	92	-10
Northumbrian	Teesdale	• 87936	87	76	69	-16	62	2020	99	-30
	Kielder	(199175)	87	84	81	-11	81	2025	95	-14
Severn-Trent	Clywedog	• 49936	93	96	93	-4	83	1989	99	-6
	Derwent Valley	• 46692	86	76	65	-21	56	1996	94	-29
Yorkshire	Washburn	• 23373	87	80	67	-20	67	2025	96	-29
	Bradford Supply	• 40942	86	71	56	-29	56	2025	95	-39
Anglian	Grafham	(55490)	95	95	91	-3	72	1997	95	-4
	Rutland	(116580)	95	91	89	-3	75	1997	94	-5
Thames	London	• 202828	94	95	93	-1	83	1990	98	-5
	Farmoor	• 13822	99	97	99	2	90	2002	98	1
Southern	Bewl	• 31000	94	89	82	-6	57	1990	94	-12
	Ardingly	• 4685	100	98	89	-10	88	2022	99	-10
Wessex	Clatworthy	• 5662	93	86	76	-11	67	1990	97	-21
	Bristol	(38666)	97	89	78	-11	70	1990	93	-15
South West	Colliford	• 28540	87	86	79	-6	52	1997	100	-21
	Roadford	• 34500	97	96	90	7	48	1996	98	-8
	Wimbleball	• 21320	97	93	83	-9	74	2011	99	-17
	Stithians	• 4967	98	100	94	6	66	1990	100	-7
Welsh	Celyn & Brenig	• 131155	86	80	72	-24	72	2025	88	-15
	Brianne	• 62140	95	90	81	-14	76	2022	100	-19
	Big Five	• 69762	94	85	75	-14	70	1990	93	-18
	Elan Valley	• 99106	92	81	70	-23	70	2025	95	-25
Scotland(E)	Edinburgh/Mid-Lothian	• 97223	91	86	80	-11	52	1998	97	-17
	East Lothian	• 9317	95	88	79	-18	79	2025	100	-21
Scotland(W)	Loch Katrine	• 110326	91	84	72	-15	66	2001	89	-17
	Daer	• 22494	86	79	73	-15	69	2020	85	-12
	Loch Thom	• 10721	93	87	79	-11	70	2020	97	-18
Northern	Total†	• 56800	87	93	82	-4	69	2008	87	-6
Ireland	Silent Valley	• 20634	91	100	87	5	56	2000	89	-1

() figures in parentheses relate to gross storage

• denotes reservoir groups

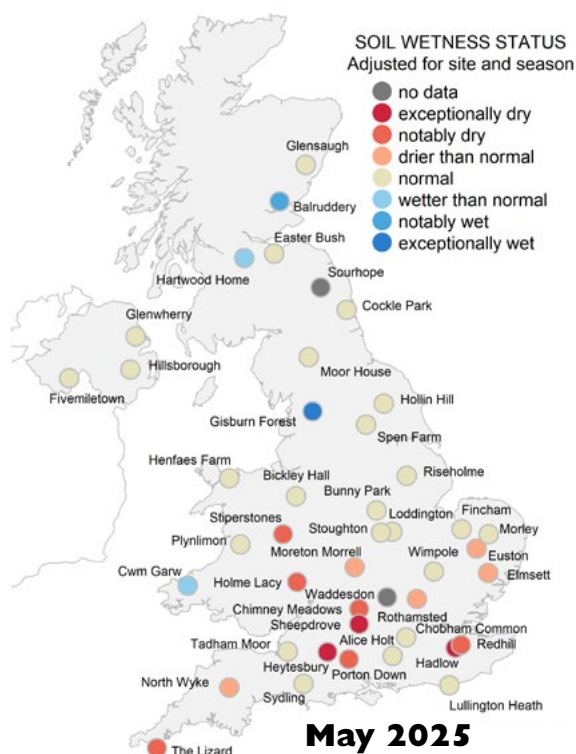
*last occurrence

† 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.

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Soil Moisture . . . Soil Moisture



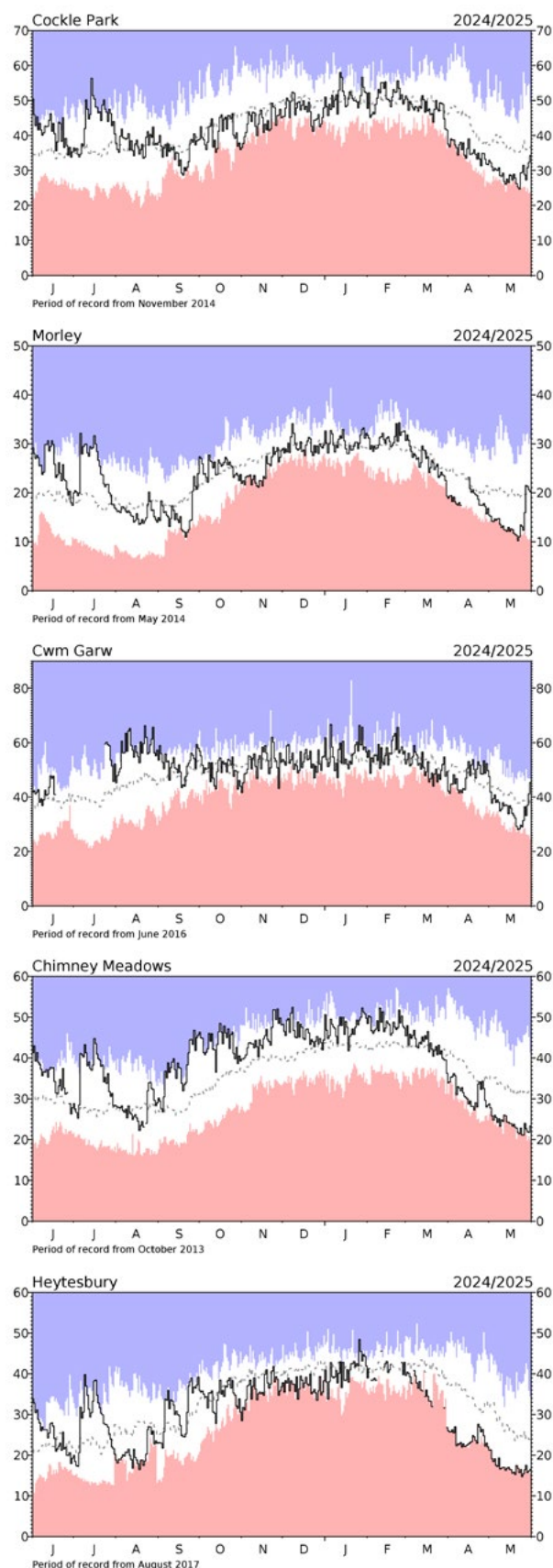
Daily mean soil moisture status at COSMOS-UK sites on the last day of the month 31 May 2025. Soil wetness categories are adjusted for site specific characteristics, i.e. taking account of the possible range of soil wetness at each site, determined through period-of-record data and hindcast modelling. Where no data are available on the last day of the month, these are shown by grey dots.

Soil moisture levels remained low across much of the COSMOS-UK network during May. More than half of the COSMOS-UK sites recorded their lowest average soil moisture levels for May on record. By the end of the month, soil moisture levels remained well below field capacity for most of the UK. The rain towards the end of the month helped some sites recover to their normal range for the time of year (e.g., Bickley Hall, Cwm Garw, Cockle Park, Easter Bush, Morley). However, a significant number of sites, particularly in Southern England, remain much drier than usual (e.g. Chimney Meadows, Sheepdrove, Heytesbury).

Overall, most COSMOS-UK sites remain drier than usual, though the rain towards the end of the month helped some sites recover soil moisture conditions to within their expected range for May.

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.

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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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