Hydrological Summary

for the United Kingdom

September 2025

General

In comparison to the summer months, September was wetter with temperatures nearer average. Rainfall was 132% of average for the UK, with most regions above average. River flows were above normal to exceptionally high in Northern Ireland, Wales and northern and south-west England, whilst below normal to exceptionally low flows were seen in northern and eastern Scotland and south-eastern England. Though soils wetted in all regions, COSMOS-UK sites in south-east England remained drier than normal at month-end. Groundwater levels generally remained below normal across the UK and continued to decline apart from western boreholes where some localised recharge was observed. In most impoundments, stocks rose relative to average and in some cases, stocks increased to above average by month-end (notably so at Northern Command Zone, Daer, Silent Valley). However, reservoirs from north-east Scotland to southern England remained below average at month-end – some substantially so, including East Lothian (its lowest for September in a series from 1988). Despite recent wetter conditions, the impacts of the dry spring/summer persist, with sustained rainfall still needed to fully recover the deficits that have built up since the start of the year. At the end of September, five Environment Agency areas remained in drought and seven catchments in north-east Scotland remained at significant water scarcity; whilst by the 26th, all areas in Wales were in recovery from drought/prolonged dry weather. The latest Hydrological Outlook suggests a continuation of normal to below normal flows and groundwater levels in eastern Scotland and the south and east of England, whilst elsewhere they are likely to be normal to above normal over the next three months.

Rainfall

September was notable for frontal rainfall incursions in the first three weeks, making it wetter than any previous month in 2025, however, some easterly regions remained drier than average. Atlantic frontal systems on the 1st-4th brought heavy rain resulting in landslides in Argyll, and surface water flooding and travel disruption in both southern England and Wales. A brief interlude of high pressure brought warmer and more settled conditions, before a sequence of low pressure and unstable airflows brought heavy rainfall (e.g. 88mm on the 11th at Achnagart, Ross & Comarty), hail and thunderstorms, and were associated with surface water flooding and travel disruption (e.g. 7th-8th in south-west England, 11th in Wales and 17th in Northern Ireland). After a brief spell of high pressure on the 18th/19th, low pressure systems on the 20th brought heavy rain (with daily totals of over 60mm recorded across Wales and northern England). High pressure from the 21st meant the final week was more settled – apart from heavy rain from the 27th, particularly over western Scotland. Above average rainfall at the UK scale masked some regional differences; around three-quarters of average was registered in North East (Scotland), whilst Solway had 1.5 times the average and North West region (England) registered 190%, its fourth wettest September in a series from 1890. For the summer half-year (April-September) less than 70% of average was registered across much of the country, with the North East region (Scotland) recording its third driest April-September in a series from 1890.

River Flows

Away from Northern Ireland, south-west Scotland and north Wales, river flows started September below or near average. Flows generally rose rapidly rose in the first week, substantially so in the south-east of England. In more responsive catchments, flows responded to each wave of rainfall (also reflected in the national outflow series), with most peaking around the 20th when new September peak flow maxima were set on the Cumbrian Derwent, Ribble and Erch (in series of 52 years or more). Thereafter, recessions recommenced in most catchments, ending the month with below average flows. Despite responses to rainfall, the Bervie continued to record daily flow minima (as it has on the majority of days since the spring), with the exception of the 14th-16th. Mean September river flows showed a mixed picture across the country. Record low flows were recorded on the Deveron and Ythan in north-east Scotland (in series from 1975 and 1983, respectively), with exceptionally low flows on the Helsmdale and Stringside (with 25% and 17% of average, respectively – both the second lowest September flows in records of at least 50 years). In contrast, above normal to exceptionally high flows were registered in a band from Cornwall to Northumberland, with some over twice the average, e.g. on the Lune and Welsh Dee – both the second highest September flows in records from 1959 and 1969, respectively. Over the summer half year (April-September), above normal flows were limited to a handful of catchments in the west, with most catchments notably to exceptionally low. Record low flows for this six-month period were registered in north-east Scotland (including the Spey and Scottish Dee, in 72- and 95-year series, respectively). Over the water year (October-September), the impact of the wet winter in 2024/2025 dominates in southern England, whilst in Scotland and the north of England the impact of the prolonged dry weather is more evident, leading to notably to exceptionally low flows.

Soil Moisture and Groundwater

Soils remained drier than average in most regions and were the third driest on record in Highland and Anglian regions (in series from 1961). Groundwater levels in the Chalk continued to decline, though at a slower rate than previous months, with some sites showing signs of plateauing. Levels ranged from the normal range to notably low, with exceptionally low levels at Dalton Holme, Chilgrove House, Compton House and Tilshead. Therfield Rectory remained above normal despite the ongoing decline. Above-average rainfall triggered recharge at Killyglen, increasing levels from notably low to below normal by month-end. Minor recharge occurred in the Jurassic Oolites at Ampney Crucis but levels quickly receded, resulting in a plateau within the notably low range. At New Red Lion, levels continued to decline but remained in the normal range. In the Magnesian Limestone, levels fell but remained above normal at Brick House Farm. Recharge in the Carboniferous Limestone meant levels rose to notably low (from below normal) at Greenfield Garage and to the normal range at Alstonfield and Pant y Lladron (from notably low and record low levels, respectively). Recharge was also observed in the Permo-Triassic sandstones at Newbridge and Annan, while other sites plateaued or declined, remaining in the normal range to above normal. Levels declined at Lime Kiln Way (Upper Greensand), Royalty Observatory (Fell Sandstone), and Easter Lathrisk (Devonian sandstone), though all remained in the normal range to notably low.

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.

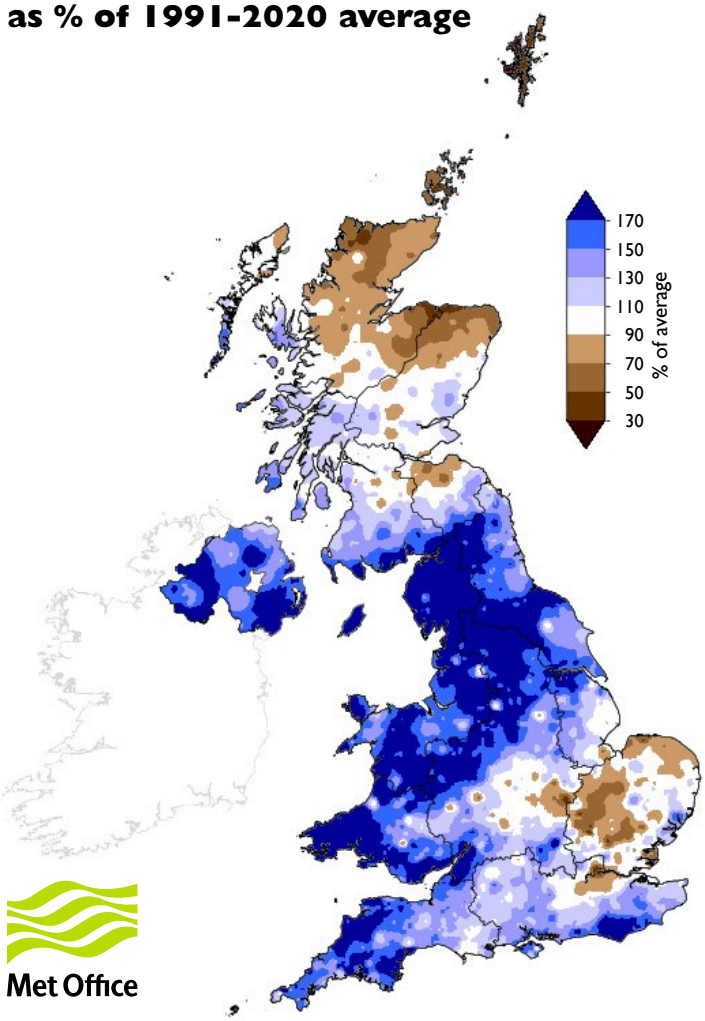
Region	Rainfall	Sep 2025	Jul25 – Sep25	*RP*	Apr25 – Sep25	*RP*	Jan25 – Sep25	*RP*	Oct24 – Sep25	*RP*
United Kingdom	mm	**120**	253		424		629		974	
	%	**132**	95	2-5	87	2-5	80	8-12	84	5-10
England	mm	**102**	192		305		465		717	
	%	**149**	92	2-5	79	5-10	78	8-12	83	5-10
Scotland	mm	**126**	329		565		838		1319	
	%	**102**	95	2-5	91	2-5	79	5-10	84	2-5
Wales	mm	**194**	319		555		816		1287	
	%	**174**	99	2-5	94	2-5	84	2-5	88	2-5
Northern Ireland	mm	**145**	291		537		710		967	
	%	**165**	106	2-5	106	2-5	89	2-5	84	8-12
England & Wales	mm	**115**	210		339		513		795	
	%	**154**	93	2-5	82	5-10	79	8-12	84	5-10
North West	mm	**205**	362		597		790		1177	
	%	**190**	114	2-5	109	2-5	91	2-5	92	2-5
Northumbria	mm	**118**	219		322		449		693	
	%	**163**	96	2-5	77	5-10	71	20-30	76	10-20
Severn-Trent	mm	**96**	168		260		395		643	
	%	**152**	84	2-5	68	10-20	70	15-25	80	5-10
Yorkshire	mm	**125**	216		303		447		677	
	%	**177**	100	2-5	76	5-10	73	10-20	78	10-15
Anglian	mm	**53**	126		196		295		462	
	%	**100**	75	2-5	62	20-30	66	30-50	73	15-25
Thames	mm	**64**	140		214		368		573	
	%	**114**	82	2-5	65	15-25	74	10-15	79	5-10
Southern	mm	**87**	189		273		461		700	
	%	**140**	106	2-5	81	2-5	86	2-5	86	2-5
Wessex	mm	**90**	157		259		472		762	
	%	**135**	78	2-5	68	10-20	78	5-10	84	2-5
South West	mm	**145**	250		495		797		1178	
	%	**165**	94	2-5	101	2-5	97	2-5	94	2-5
Welsh	mm	**183**	304		528		784		1239	
	%	**170**	97	2-5	93	2-5	84	2-5	88	2-5
Highland	mm	**130**	374		644		982		1637	
	%	**88**	97	2-5	92	2-5	78	5-10	89	2-5
North East	mm	**64**	184		310		479		818	
	%	**76**	72	5-10	65	30-50	66	70-100	77	15-25
Tay	mm	**108**	290		478		716		1096	
	%	**106**	95	2-5	86	2-5	76	5-10	79	5-10
Forth	mm	**93**	237		433		629		924	
	%	**99**	82	2-5	84	2-5	73	8-12	74	10-20
Tweed	mm	**93**	227		397		552		813	
	%	**116**	87	2-5	84	2-5	74	10-15	75	10-20
Solway	mm	**179**	392		658		913		1318	
	%	**150**	110	2-5	103	2-5	86	2-5	84	2-5
Clyde	mm	**177**	426		741		1053		1551	
	%	**118**	101	2-5	100	2-5	82	2-5	82	2-5

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

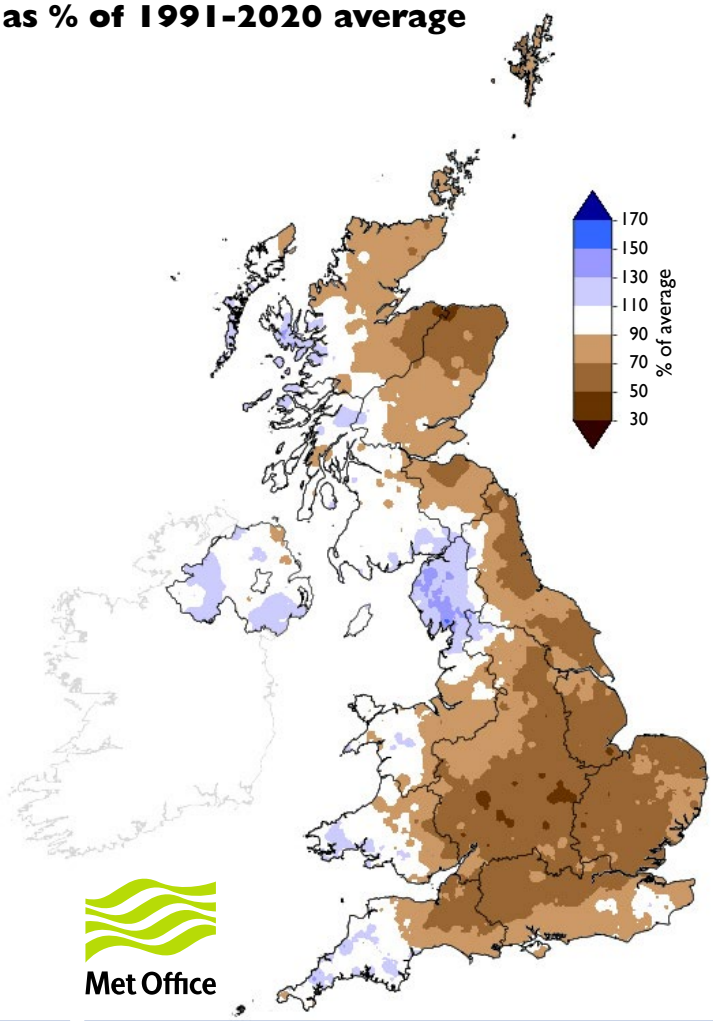
Important note: Figures in the above table may be quoted provided their source is acknowledged. Where appropriate, specific mention must be made of the uncertainties associated with the return period estimates. The RP estimates are based on data provided by the Met Office and reflect climatic variability 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 2025 are provisional. Source: Data from HadUK-Grid dataset at 1km resolution v1.3.1.0.

Rainfall . . . Rainfall . . .

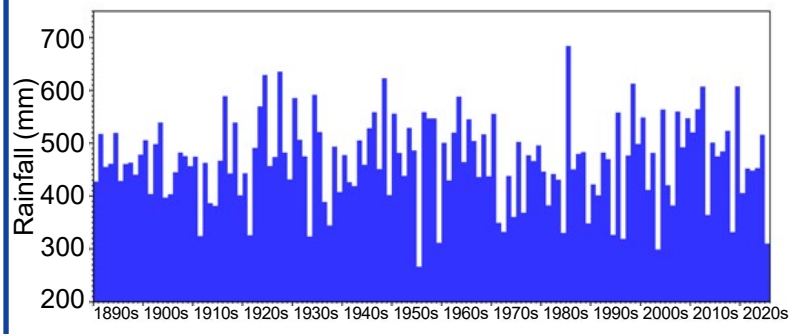
September 2025 rainfall as % of 1991-2020 average



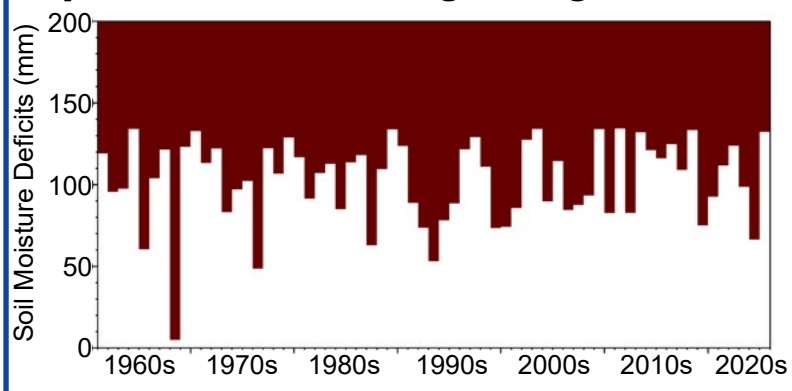
April 2025 - September 2025 rainfall as % of 1991-2020 average



April - September rainfall for North East Scotland



September SMDs for Anglian region



UK Hydrological Outlook

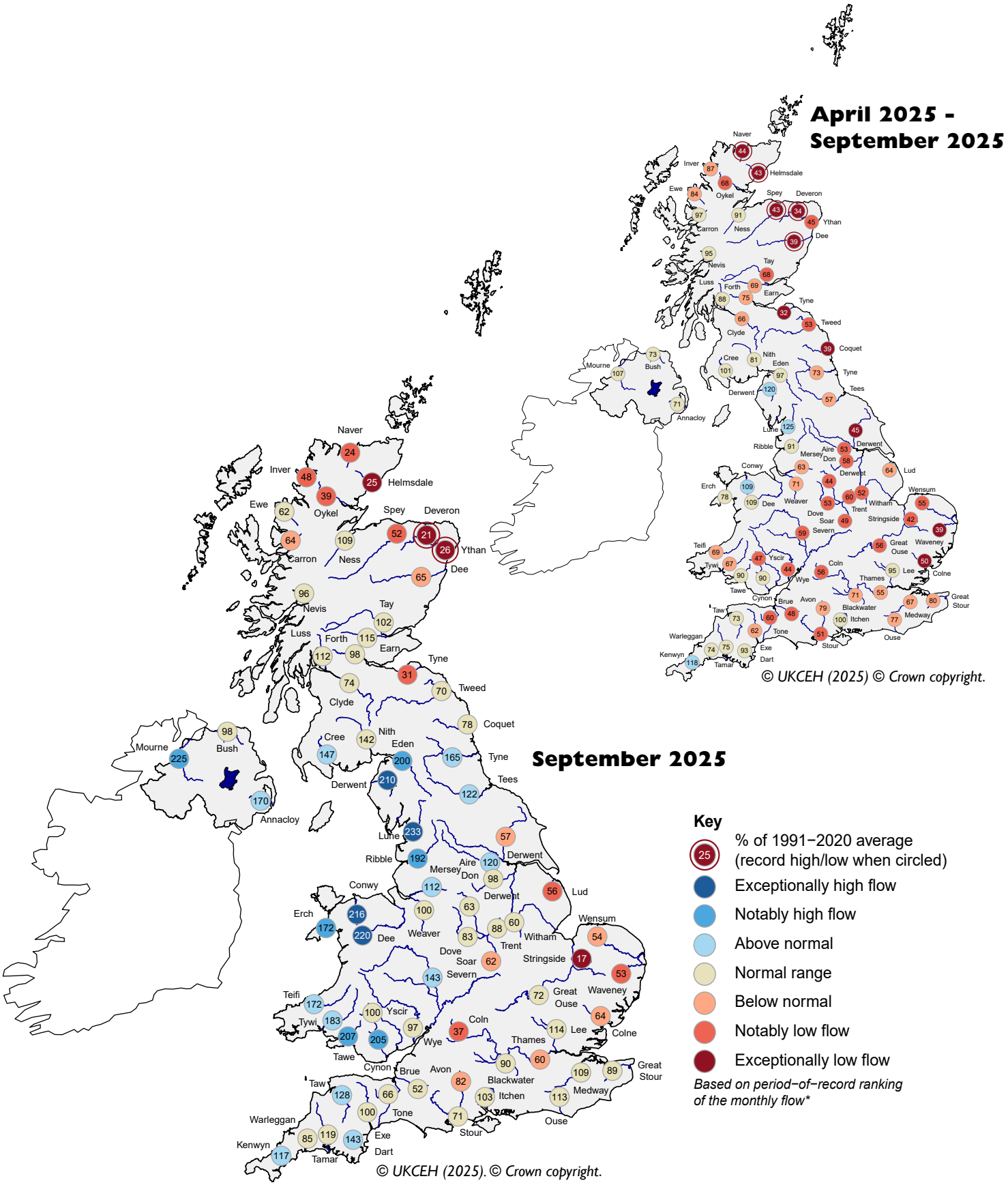
The Hydrological Outlook provides an insight into future hydrological conditions across the UK. Specifically it describes likely trajectories for river flows and groundwater levels on a monthly basis, with particular focus on the next three months.

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

Period: **from October 2025**
Issued: **09.10.2025**
using data to the end of September 2025

High rainfall in central and northern England over September has helped river flows recover, and they are likely to be in the normal to above normal range over the next one and three months. Below normal flows in groundwater-dominated catchments in southern England and north-east Scotland are likely to persist as these areas still require significant additional rainfall to replenish subsurface water stores.

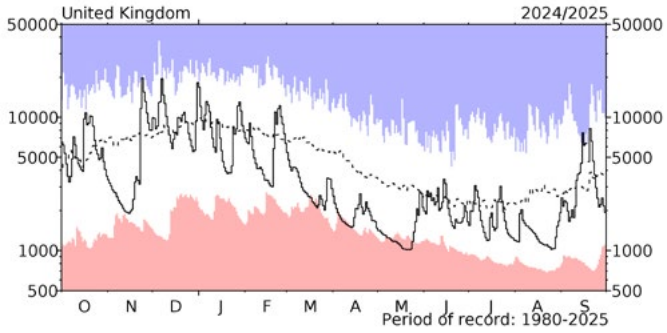
River flow . . . River flow . . .

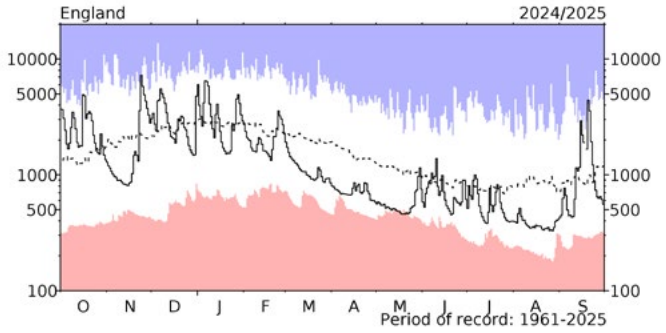


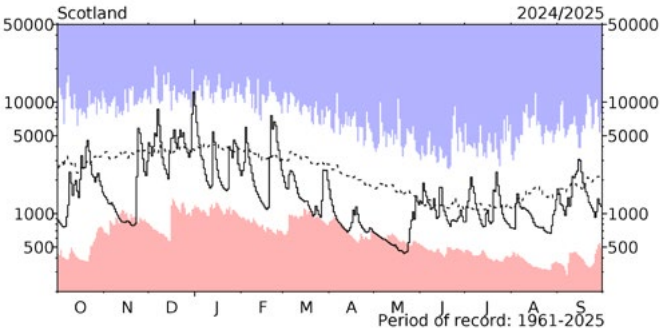
River flows

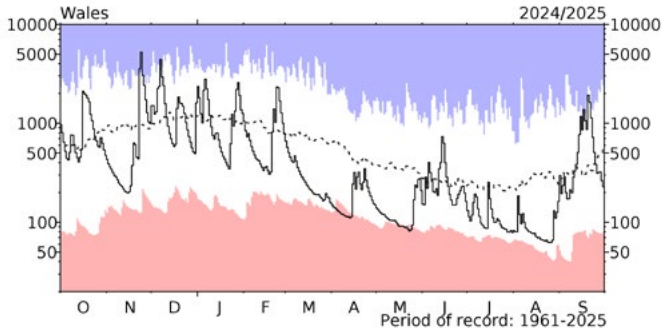
*Comparisons based on percentage flows alone can be misleading. A given percentage flow can represent extreme drought conditions in permeable catchments where flow patterns are relatively stable but be well within the normal range in impermeable catchments where the natural variation in flows is much 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.

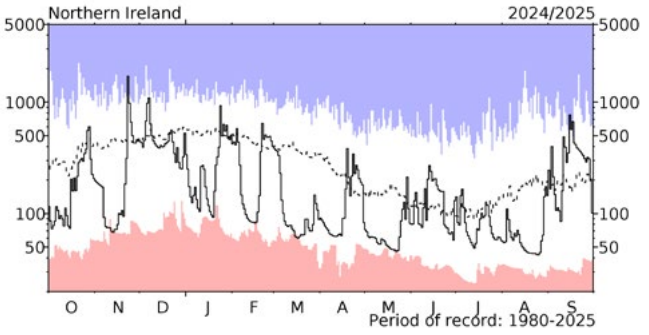
River flow . . . River flow . . .

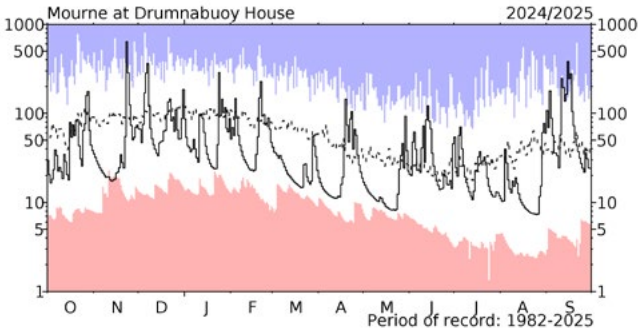


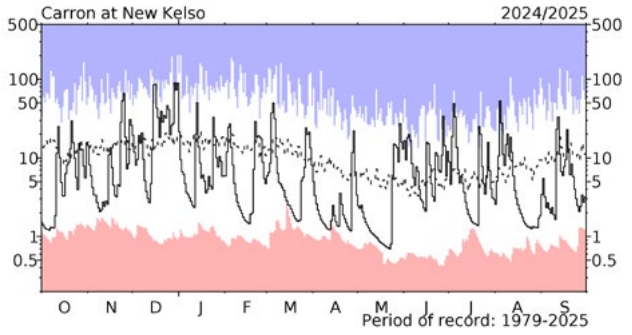


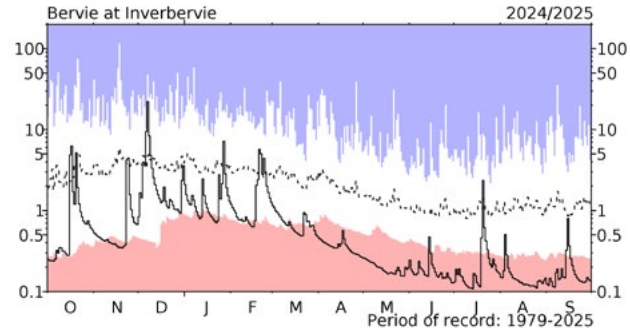


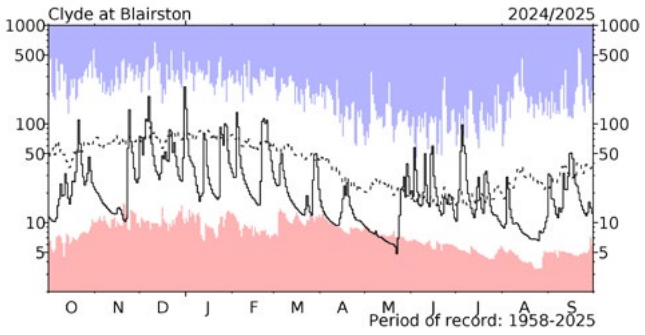


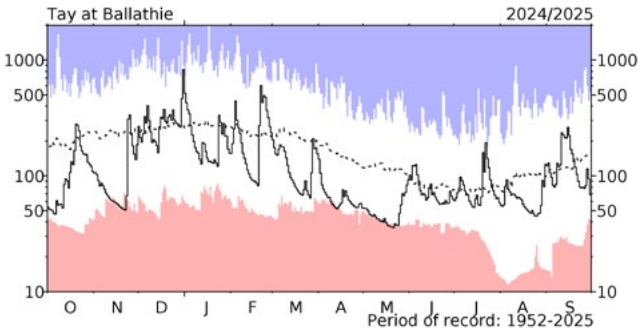








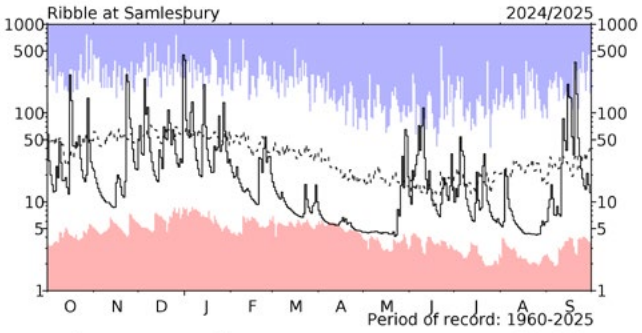


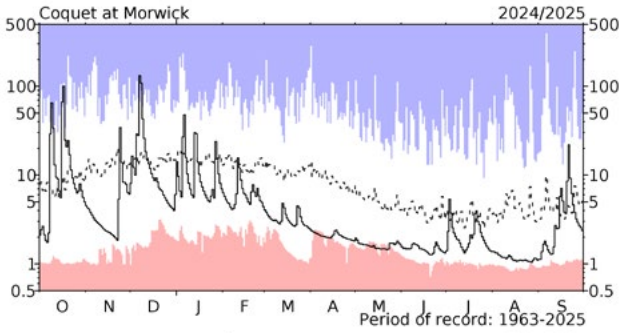


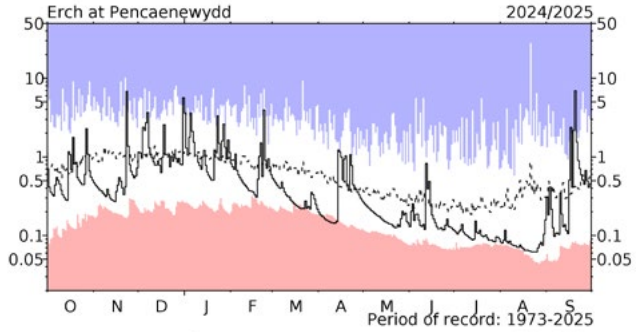
River flow hydrographs

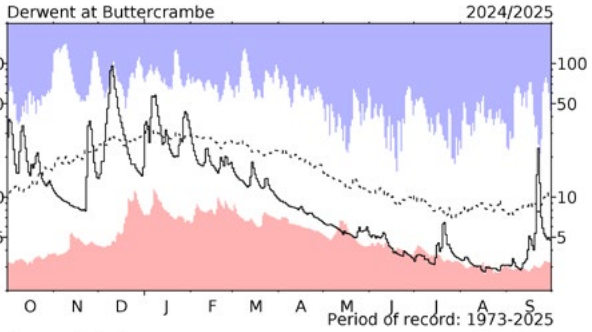
*The river flow hydrographs show the daily mean flows (measured in m^3s^{-1}) together with the maximum and minimum daily flows prior to January 2024 (shown by the shaded areas). Daily flows falling outside the maximum/minimum range are indicated where the bold trace enters the shaded areas. The dashed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

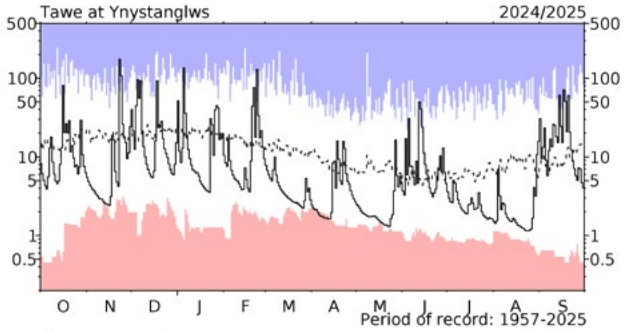
River flow . . . River flow . . .

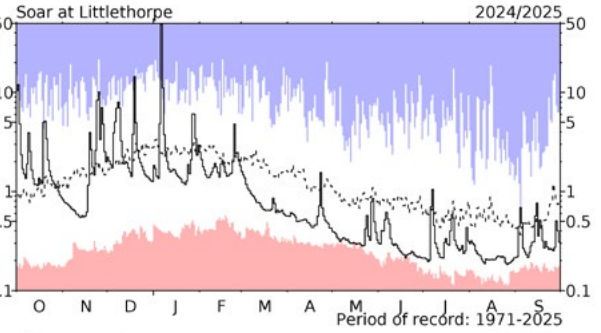


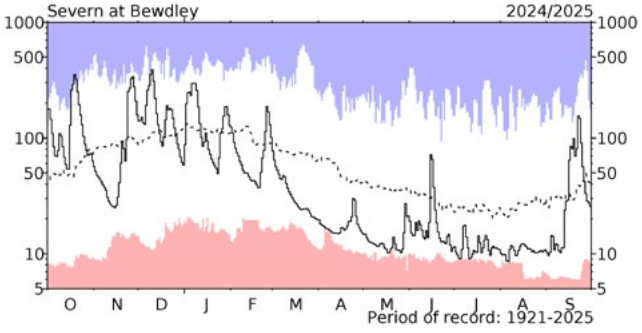


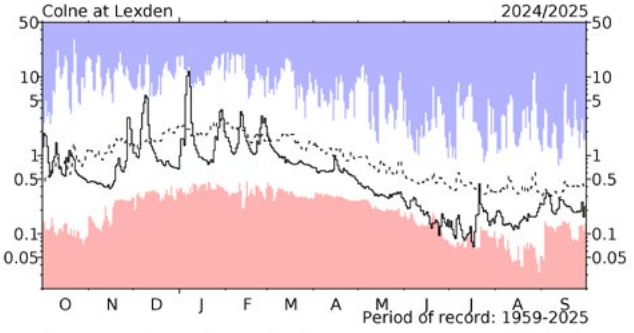


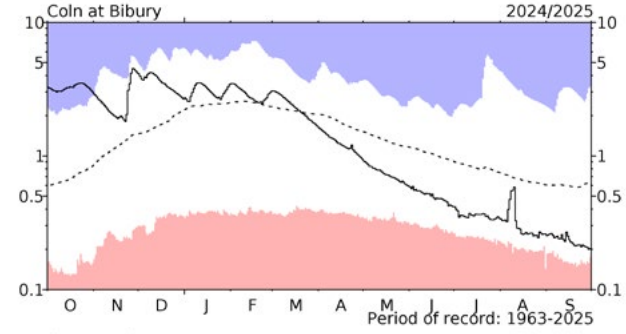


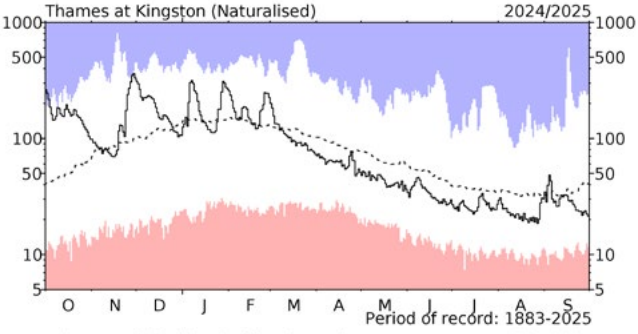


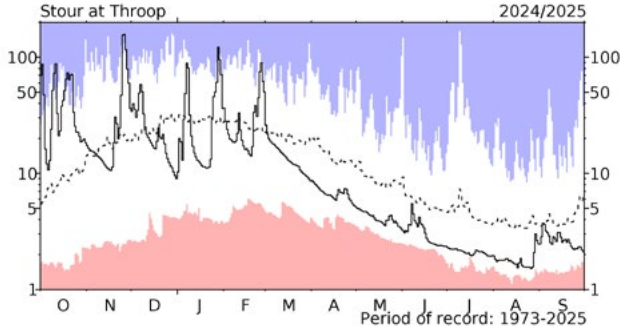


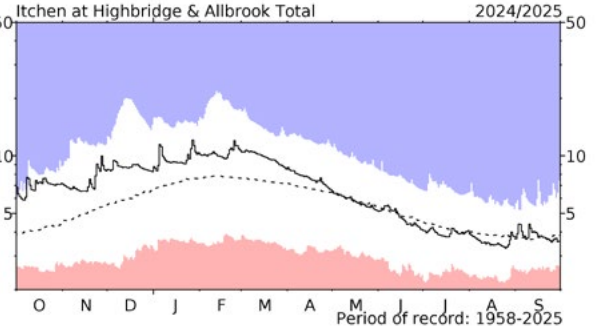




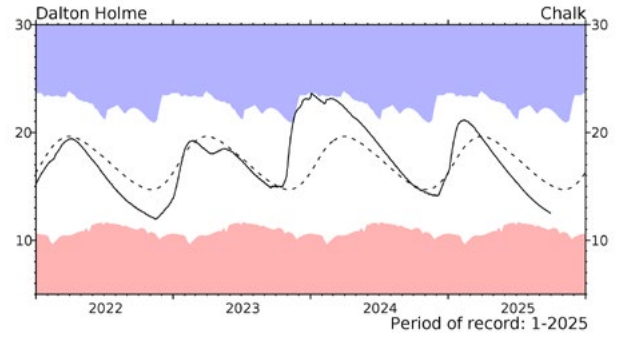


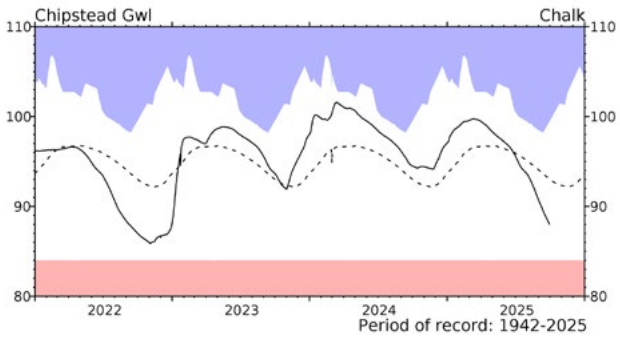


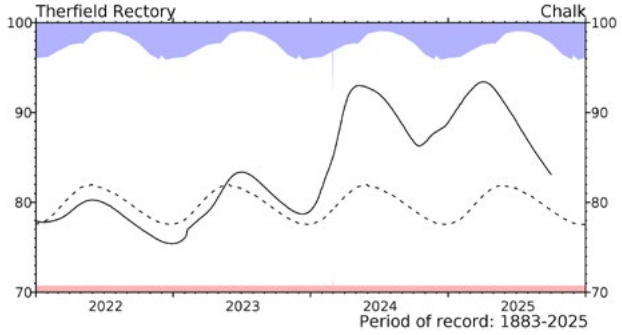


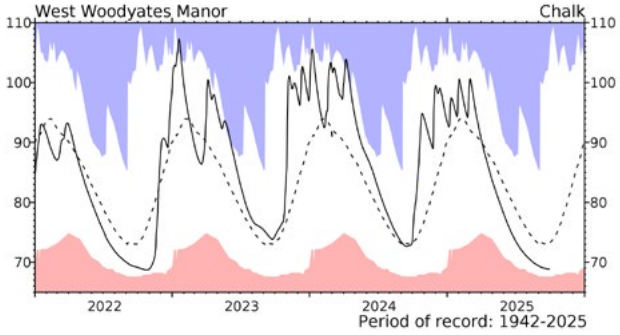


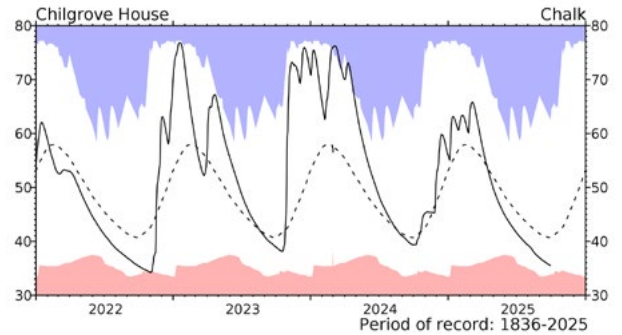
Groundwater…Groundwater

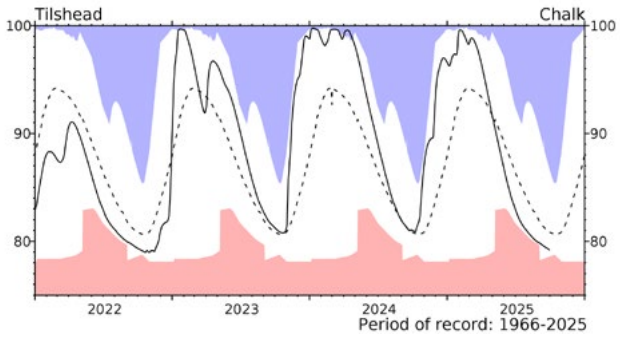


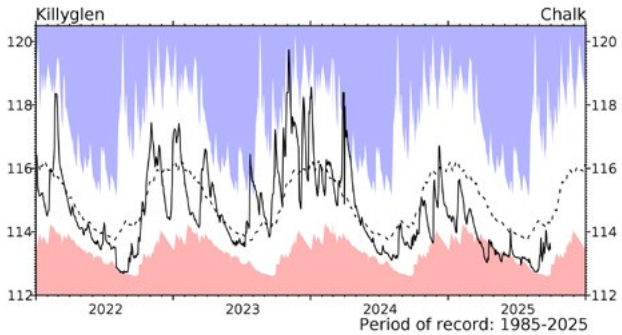


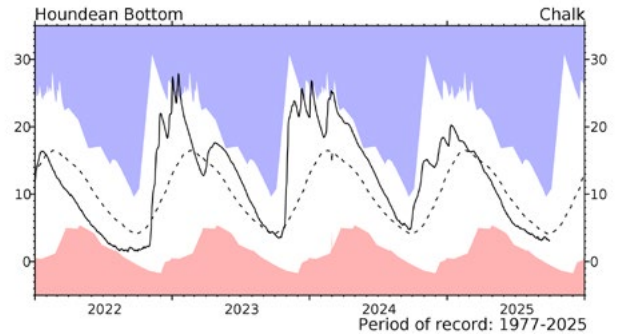


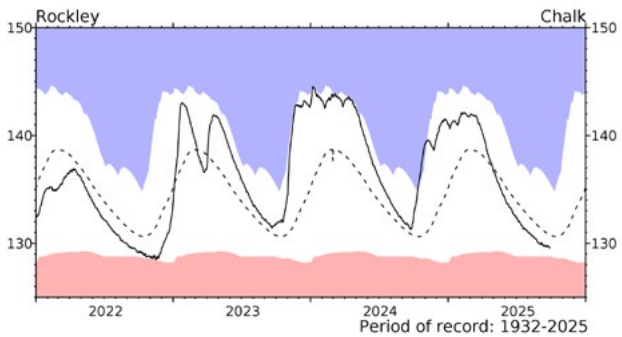


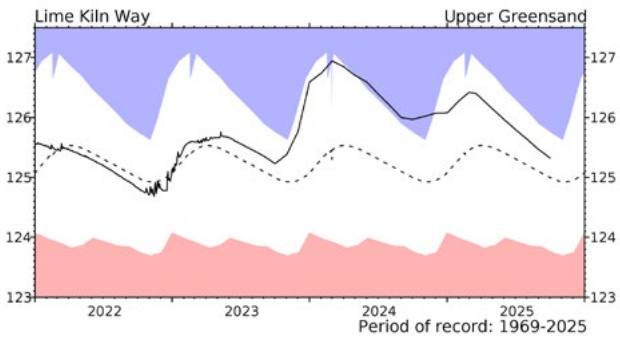






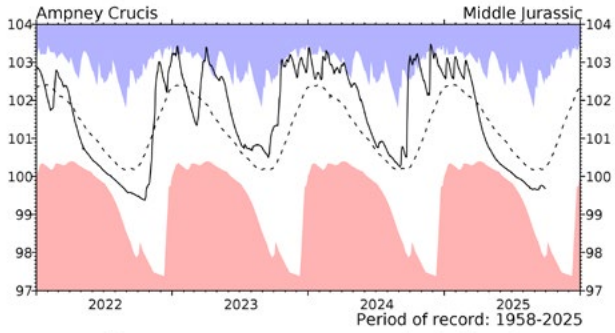


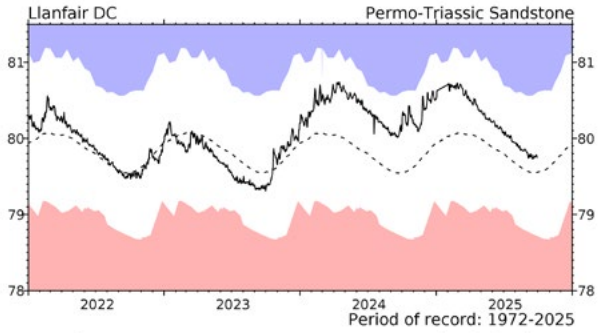


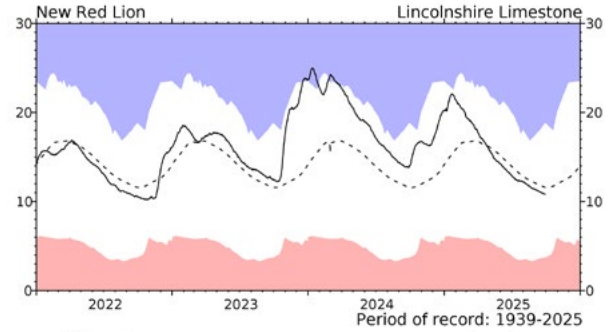


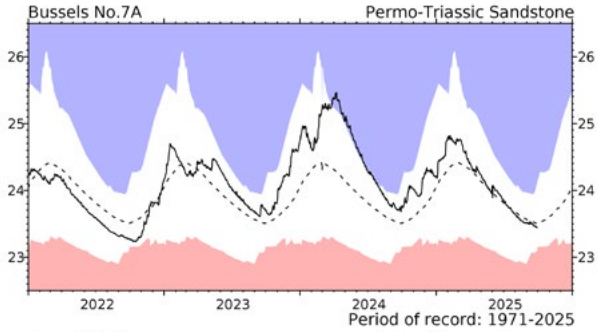
Groundwater levels (measured in metres above ordnance datum) normally rise and fall with the seasons, reaching a peak in the spring following replenishment through the winter (when evaporation losses are low and soil moist). They decline through the summer and early autumn. This seasonal variation is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

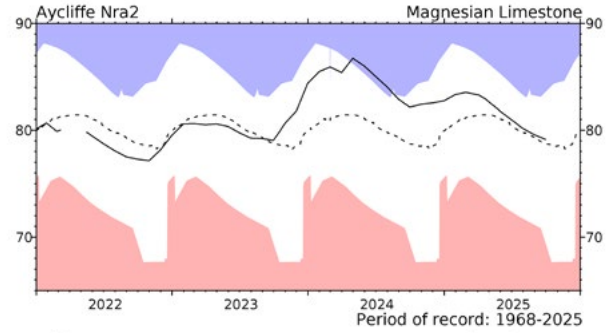
Groundwater … Groundwater

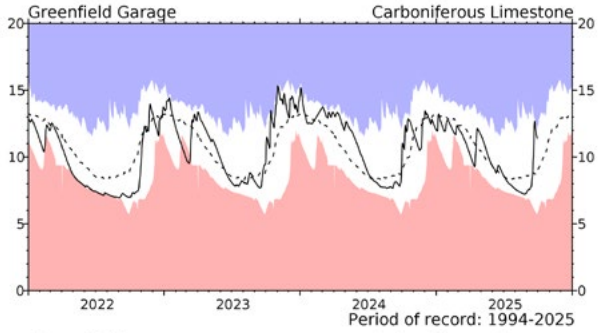


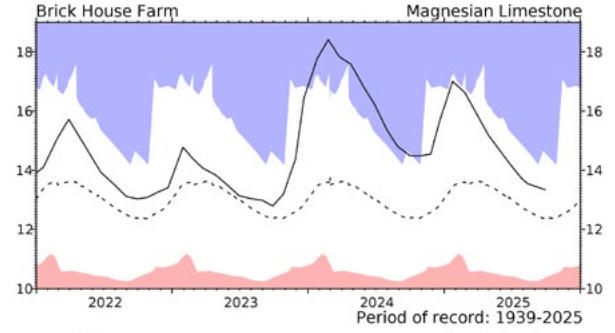


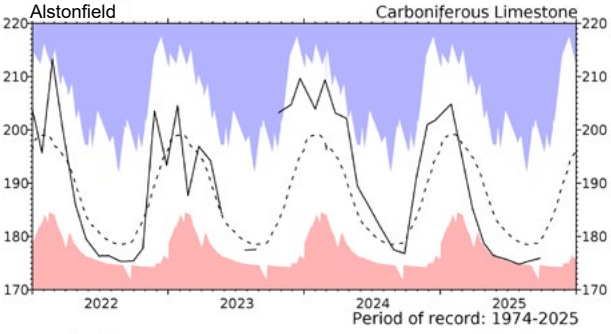


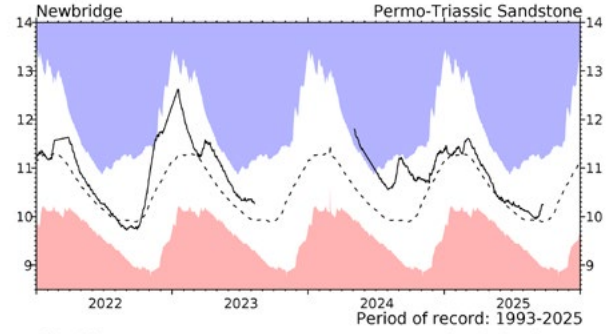


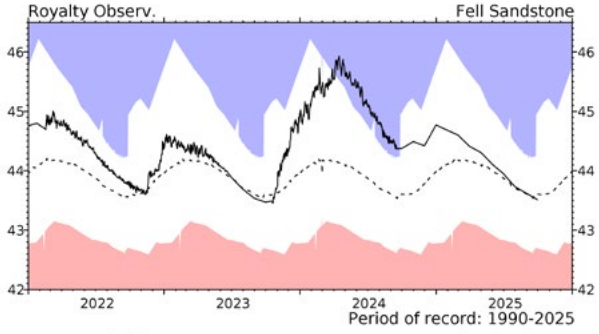


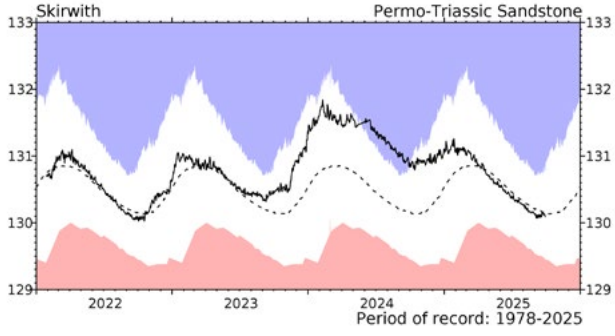


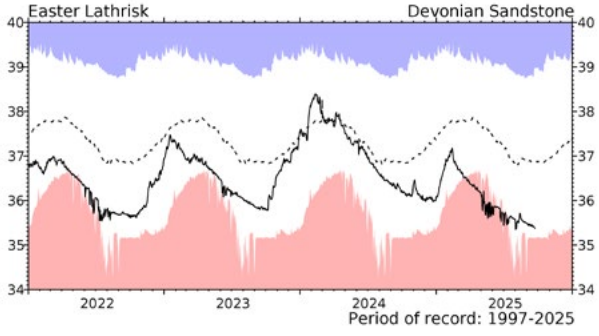










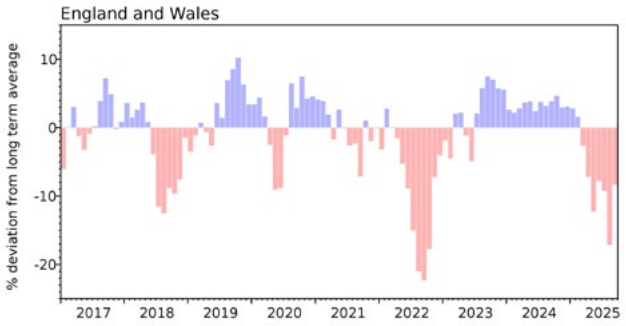


Groundwater levels - September 2025

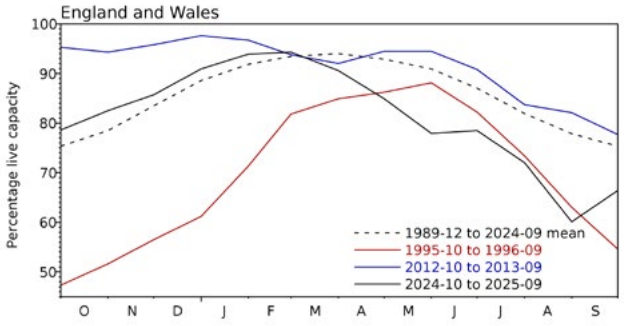
The calculation of ranking has been modified from that used in summaries published prior to October 2012. It is now based on a comparison between the most recent level and levels for the same date during previous years of record. Where appropriate, levels for earlier years may have been interpolated. 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 Jul	2025 Aug	2025 Sep	Sep Anom.	Min Sep	Year* of min	2024 Sep	Diff 25-24
North West	N Command Zone	•	124929	58	43	65	5	13	1995	76	-11
	Vyrnwy		55146	87	75	96	24	26	1995	93	3
Northumbrian	Teesdale	•	87936	68	57	72	0	31	1995	91	-19
	Kielder		(199175)	90	81	85	0	59	1989	80	5
Severn-Trent	Clywedog		49936	86	59	75	1	24	1989	90	-16
	Derwent Valley	•	46692	49	40	50	-13	24	1989	54	-4
Yorkshire	Washburn	•	23373	51	30	36	-31	24	1995	72	-35
	Bradford Supply	•	40942	48	31	50	-17	15	1995	69	-19
Anglian	Grafham		(55490)	80	72	70	-14	46	1997	86	-16
	Rutland		(116580)	80	72	69	-12	61	1995	83	-14
Thames	London	•	202828	82	71	68	-9	53	1997	82	-14
	Farmoor	•	13822	90	82	87	-3	54	2003	88	-1
Southern	Bewl		31000	65	55	48	-15	32	1990	64	-15
	Ardingly		4685	56	34	28	-35	21	2020	60	-32
Wessex	Clatworthy		5662	51	37	31	-25	25	2003	55	-24
	Bristol	•	(38666)	51	39	37	-26	31	1990	62	-25
South West	Colliford		28540	62	48	44	-22	38	2006	67	-23
	Roadford		34500	80	65	60	-8	20	2022	83	-24
	Wimbleball		21320	58	39	32	-32	23	2022	58	-27
	Stithians		4967	73	54	49	-7	19	2022	51	-2
Welsh	Celyn & Brenig	•	131155	72	62	69	-11	39	1989	76	-7
	Brianne		62140	72	63	82	-5	48	1995	100	-18
	Big Five	•	69762	60	47	56	-13	19	1995	70	-14
	Elan Valley	•	99106	55	43	48	-26	31	2022	71	-23
Scotland(E)	Edinburgh/Mid-Lothian	•	97223	78	72	75	-4	43	1998	90	-15
	East Lothian	•	9317	72	63	51	-33	51	2025	89	-38
Scotland(W)	Loch Katrine	•	110326	65	55	68	-8	41	2021	83	-15
	Daer		22494	77	69	93	15	32	1995	84	9
	Loch Thom		10721	82	77	93	11	40	2021	91	2
Northern Ireland	Total+	•	56800	77	68	86	10	29	1995	77	8
	Silent Valley	•	20634	80	68	91	18	27	1995	83	7

( ) figures in parentheses relate to gross storage

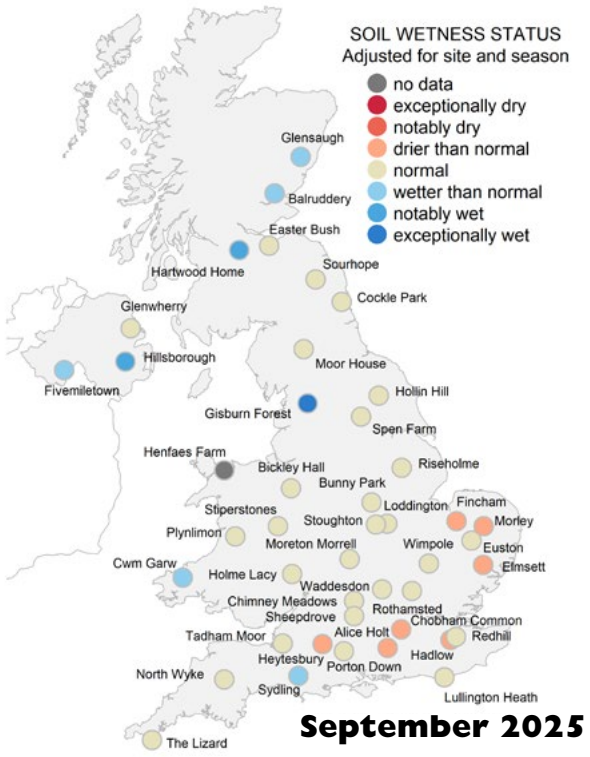
• denotes reservoir groups

*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

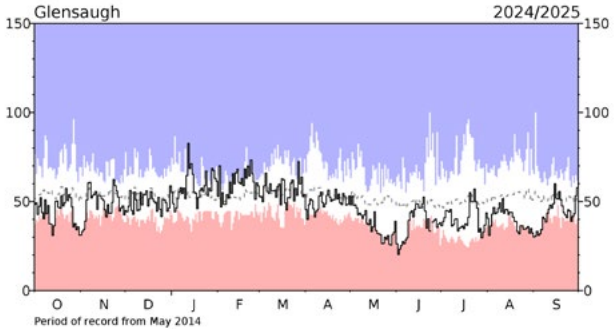


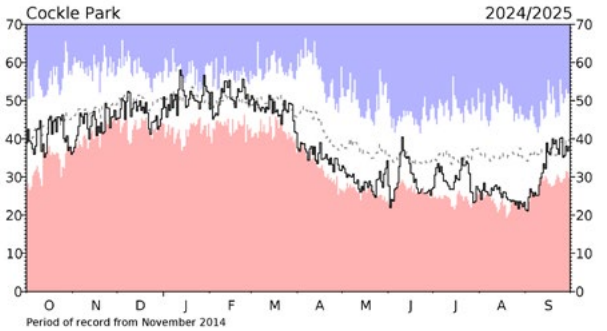
September 2025

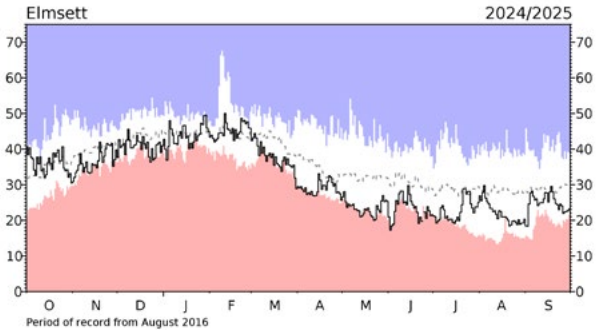
Daily mean soil moisture status at COSMOS-UK sites on the last day of the month 30 September 2025. Soil wetness categories are adjusted for site specific characteristics, i.e. taking account of the possible range of soil wetness at each site, determined through period-of-record data and hindcast modelling.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

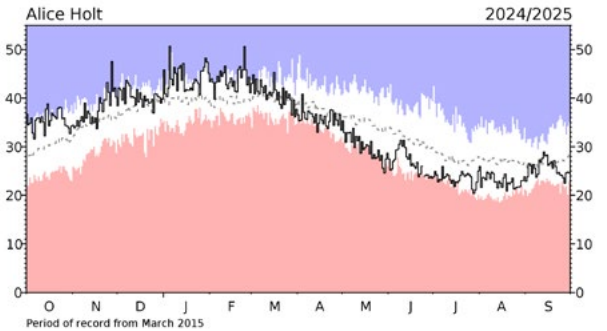
COSMOS-UK sites showed a strong north-south contrast in soil moisture conditions during September. Sites in central and southern such as Alice Holt, Heytesbury and Elmsett remained exceptionally dry, though some sites show soil moisture conditions within the normal range for the time of year (e.g. Bunny Park). The wetter conditions in northern areas brought increased soil moisture, for example in Northern Ireland (e.g. Hillsborough), northern England (e.g. Cockle Park) and Scotland (e.g. Glensaugh). Drier, sunnier conditions late in the month led to partial drying at some sites (e.g. Chimney Meadows, Fincham).

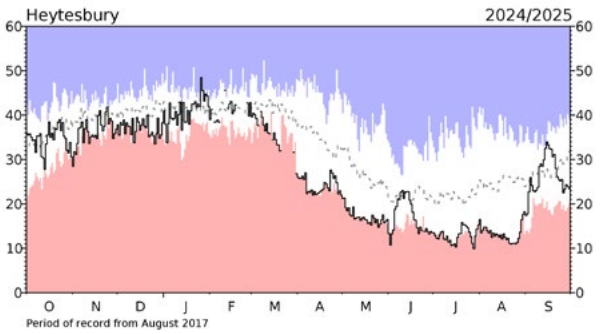
Overall, September's above-average rainfall helped replenish soil moisture in northern and western regions, but southern sites remained notably dry following the summer. Entering October, soils across much of England remain below field capacity, leaving limited reserves for an autumn-recharge.











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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