Monthly water situation report: North-west England

1 Summary – September 2025

Rainfall for north-west England during September was classed as exceptionally high, having received 190% of the long-term average (LTA). Cumbria and Lancashire experienced its fourth wettest September on record since 1871. In response to this, soil moisture deficit (SMD) showed significant recharge with all hydrological areas across Cumbria and Lancashire (CLA) and Greater Manchester, Merseyside and Cheshire (GMMC) reaching lower than average SMD values by the end of the month. Mean river flows were classed as between normal and exceptionally high. The highest river flows were seen in Cumbria and the northern part of Lancashire, with many sites classed as exceptionally high. Total reservoir stocks for north-west England showed some recovery, reaching 65% by the end of the month, however this was still lower than average for this time of year.

1.1 Rainfall

Rainfall for north-west England during September was classed as exceptionally high, receiving 190% of the LTA. CLA received 198% of the LTA which was classed as exceptionally high, the area's fourth wettest September since 1871. GMMC received 178% of the LTA which was also classed as exceptionally high.

All individual hydrological areas were similarly classed as exceptionally high, except for the Esk in Dumfries which was classed as notably high.

Looking at the past 6 months, Cumbria and the northern part of Lancashire have generally been wetter, with rainfall totals ranging from above normal to exceptionally high for this period. Comparatively, the southern part of Lancashire and GMMC have been drier, with normal to below normal rainfall totals. This is more notable in the Mersey and Irwell catchment which has only seen 85% of the LTA over this period, reflecting the prolonged dry weather earlier this year.

1.2 Soil moisture deficit and recharge

Soil moisture deficit across the north-west saw a marked recovery during September, with SMD 25mm to 6mm lower than the LTA in all areas by the end of the month. This indicated significant recharge, particularly in Lancashire and GMMC, where SMD was conversely up to 75mm higher than the LTA in August. Generally for September, SMD was lower in Cumbria and the northern part of Lancashire (reflecting the higher rainfall totals received here in the last 6 months), with values increasing towards the south through GMMC into Cheshire.

1.3 River flows

River flows also saw recovery during September, with flows ranging between normal and exceptionally high. Flows were higher in Cumbria and the northern part of Lancashire, with many sites seeing exceptionally high flows in excess of 200% of the LTA. River flows were slightly lower in GMMC, ranging between normal and above normal. However, this was still a marked improvement compared to the end of August where many sites were classed as exceptionally low. Higher river flows for September reflected the exceptionally high rainfall totals received this month.

Please note that data for Newby Bridge on the River Leven in Cumbria was unavailable for September due to temporary eel pass works at the station.

1.4 Groundwater levels

In September, most groundwater sites within the principle permo-triassic sandstone aquifer ranged from normal to exceptionally high. One site, within a superficial aquifer at Victoria Road in GMMC, remained below normal.

In general, dry weather during the spring and early summer limited recharge and resulted in groundwater levels falling earlier in the year than would typically be expected. However, there is now some evidence of groundwater recovery, with levels increasing at a few sites. An example of this is Great Musgrave in the River Eden catchment in Cumbria, which increased from notably low to normal levels.

1.5 Reservoir stocks

Total reservoir stocks for north-west England saw some recovery during September, increasing from 49% at the end of August to 65% at the end of September. However, this is still lower than average for this time of year (72%), and lower than last year when stocks were 75%.

Total combined stocks in Haweswater and Thirlmere increased from 44% at the end of August to 60% by the end of September. This is slightly lower than average for this time of year (63%) and lower than last year when stocks were 74%.

Haweswater itself improved from 43% at the end of August to 58% at the end of September (see Figure 1).

Although recovering, the Stockport and Rivington supply districts in GMMC and Lancashire remained particularly low at 41% and 38% respectively.

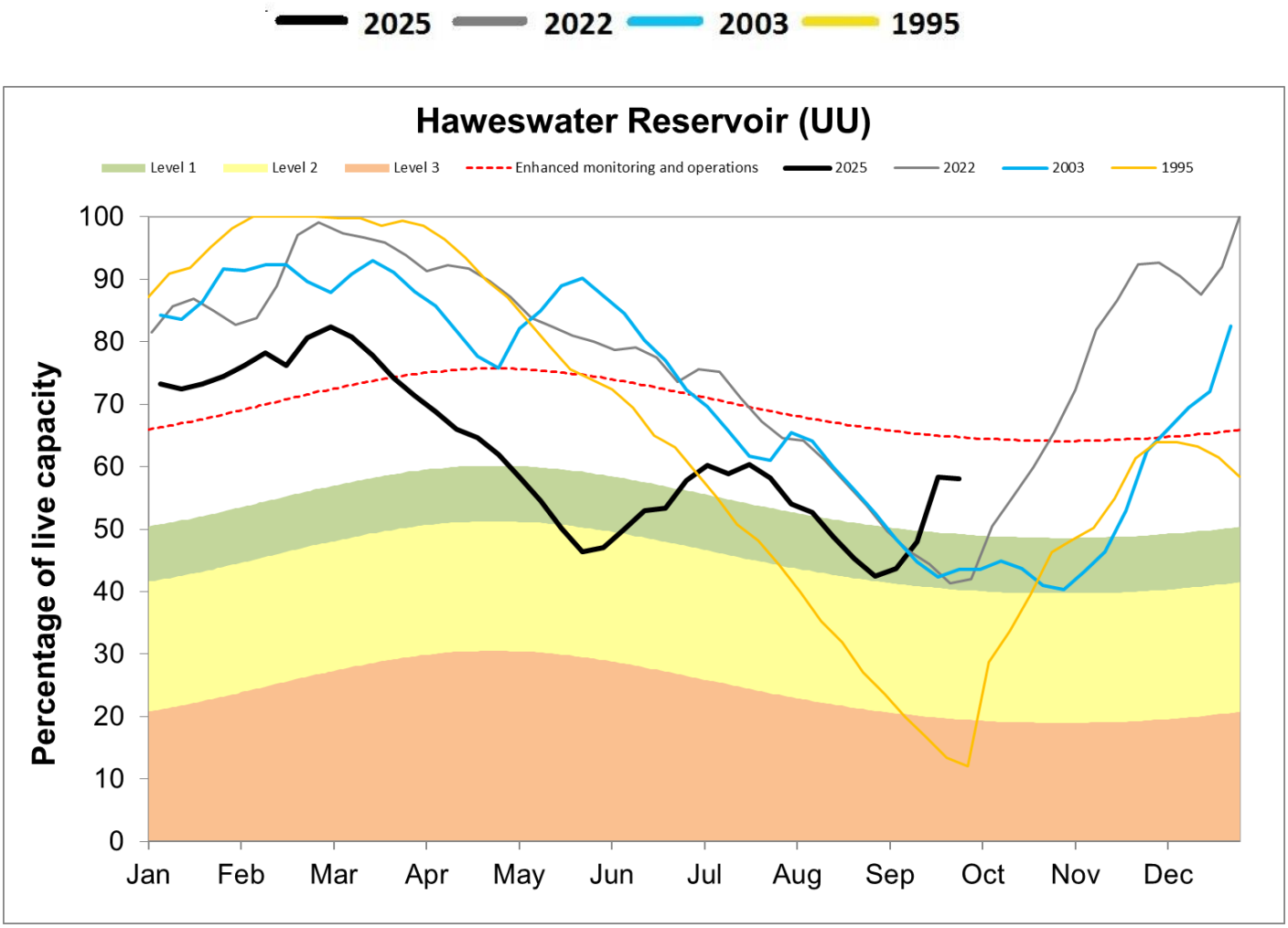
Reservoirs kept low for maintenance works included parts of the:

- Lakes supply district – Dubbs
- Ribble supply district – Alston No. 2, Spade Mill No. 1, Spade Mill No. 2, Ogden (Barley) Lower, Ogden (Barley) Upper
- Rivington supply district – Anglezarke, High Bullough
- Longdendale supply district – Audenshaw No. 1, Torside
- Stockport supply district - Ridegate
- Pennines West supply district – Cragg, Dingle
- Pennines East supply district - Kitcliffe

1.6 Water abstraction restrictions and environmental impacts

During September, two water abstraction licences in CLA were issued with stop notices, however these have since been resumed. There were no reported environmental incidents related to prolonged dry weather in either GMMC or CLA.

Figure 1: Storage in Haweswater Reservoir, including the drought levels for the reservoir and storage for the current year (2025) and representative years: 1995, 2003 and 2022 (*Source: United Utilities* (UU)).

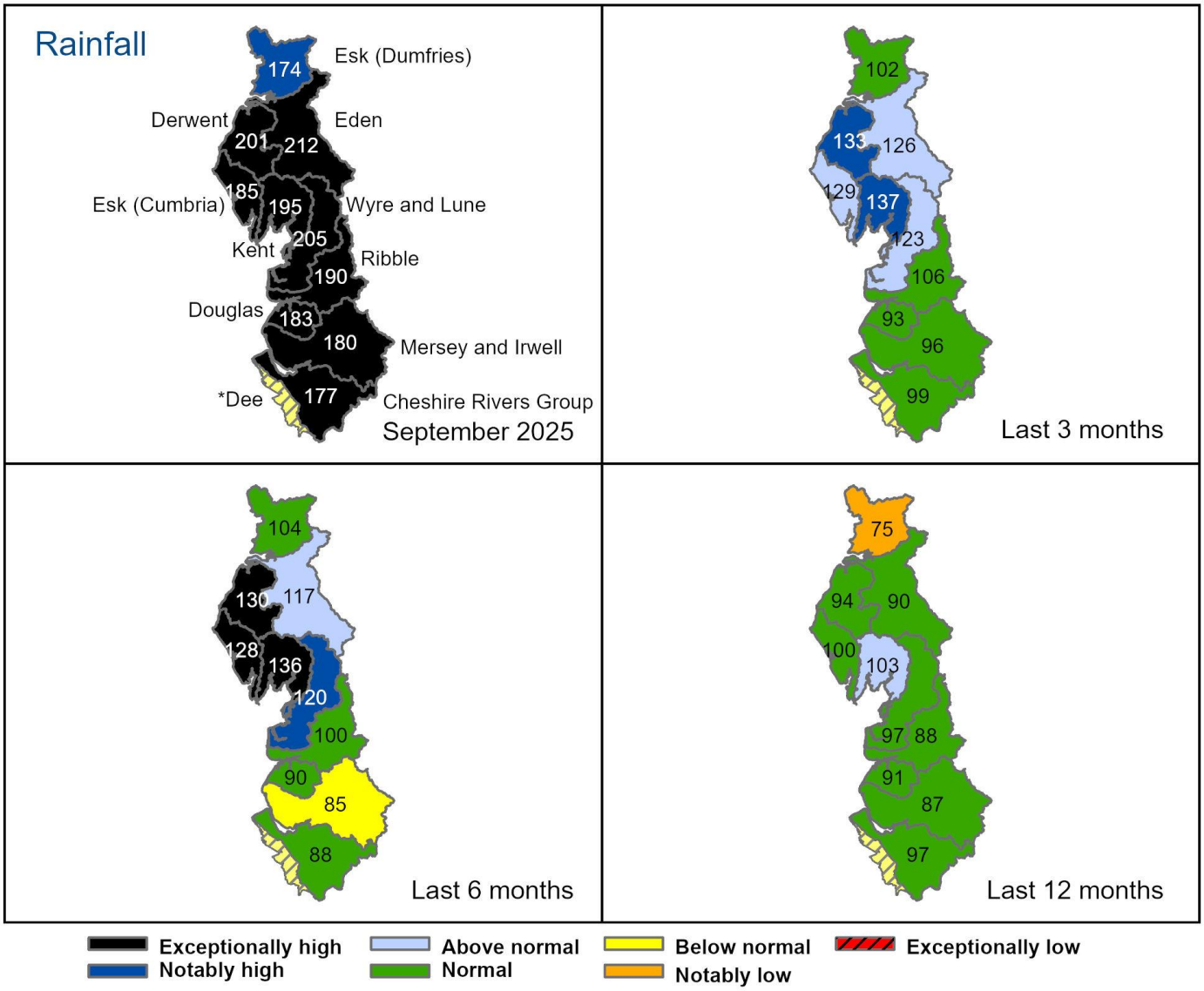


Author: Cumbria and Lancashire Hydrology Team, hydrology.CMBLNC@environment-agency.gov.uk

2 Rainfall

2.1 Rainfall map

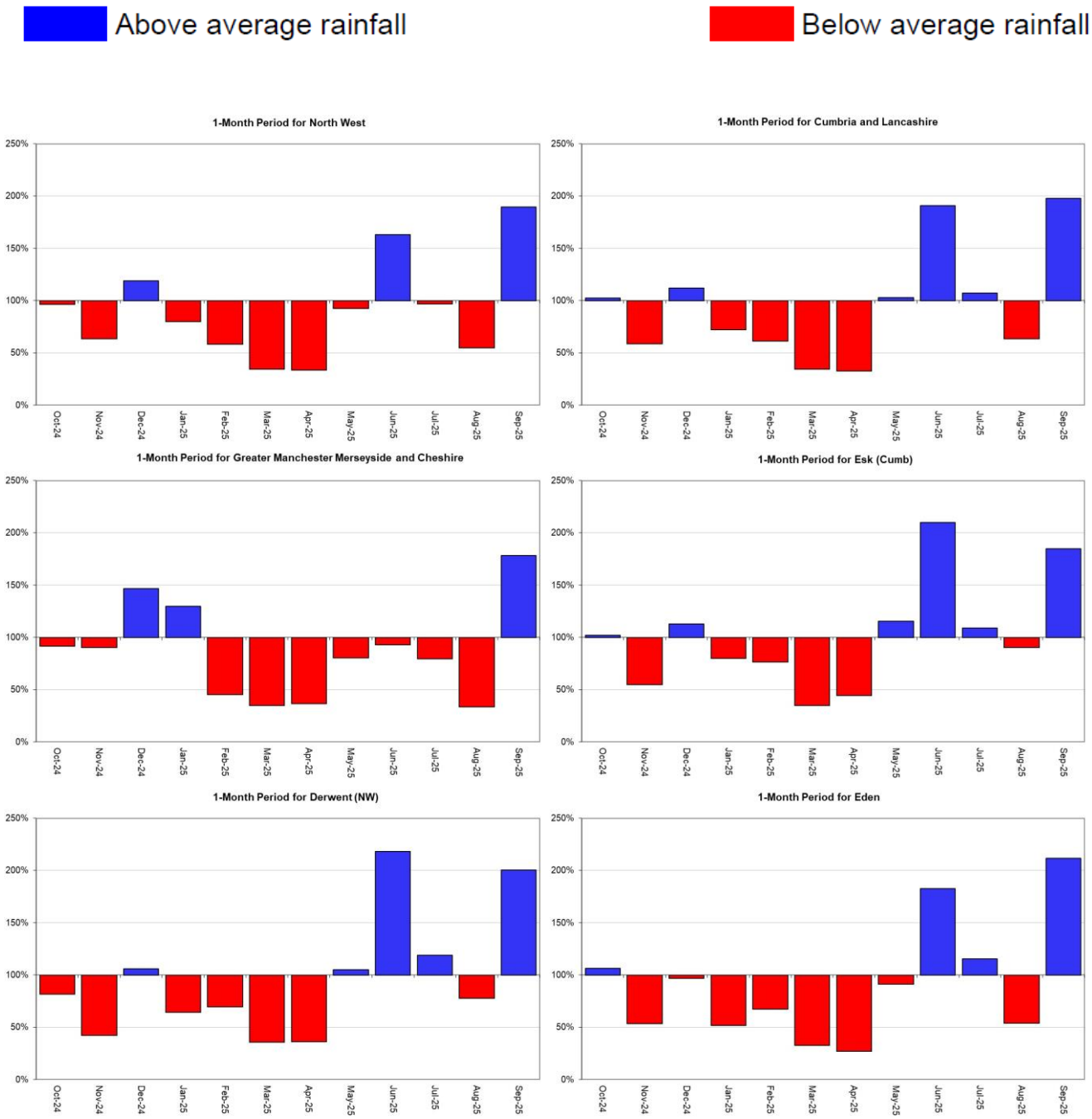
Figure 2.1: Total rainfall (as a percentage of the 1991 to 2020 long term average) for hydrological areas for the current month (up to 30 September 2025), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.

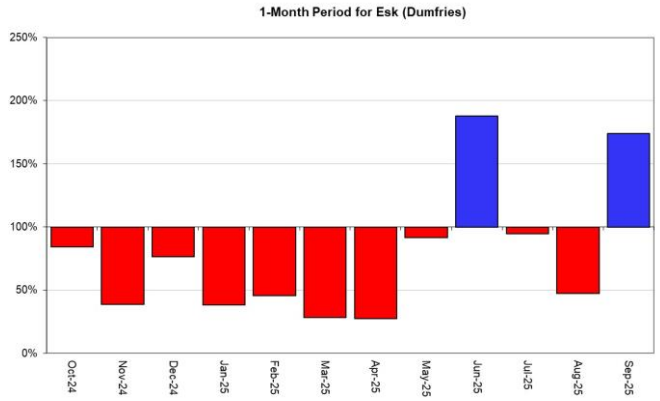


Rainfall data since October 2023, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, AC0000807064, 2025). Rainfall data prior to October 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived from registered rain gauges (Source: Met Office. Crown copyright, 2025). *Dee catchment is operationally managed by Natural Resources Wales.

2.2 Rainfall charts

Figure 2.2: Monthly rainfall totals for the past 12 months expressed as a percentage of the 1991 to 2020 long term average for north-west England and its hydrological areas.




1-Month Period for Esk (Dumfries)
250%
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100%
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Oct-24
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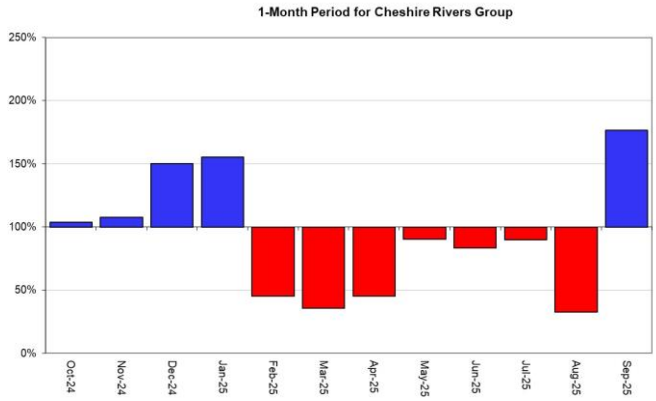
1-Month Period for Cheshire Rivers Group
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200%
150%
100%
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Dec-24
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Feb-25
Mar-25
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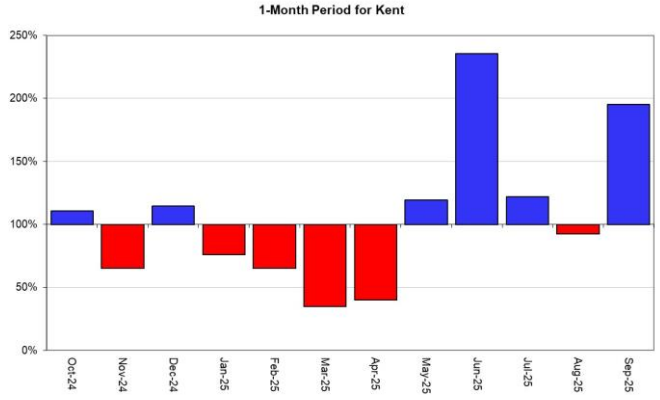
1-Month Period for Kent
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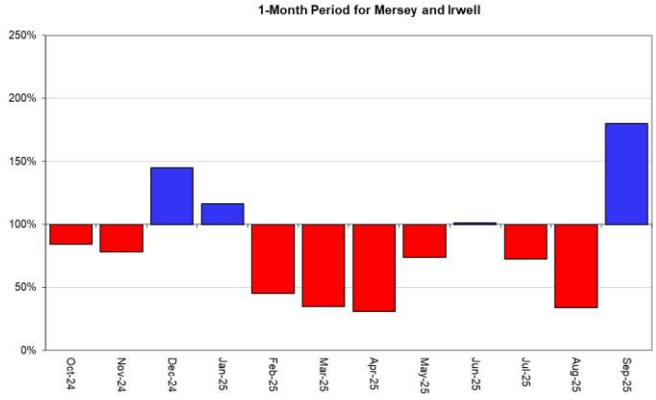
1-Month Period for Mersey and Irwell
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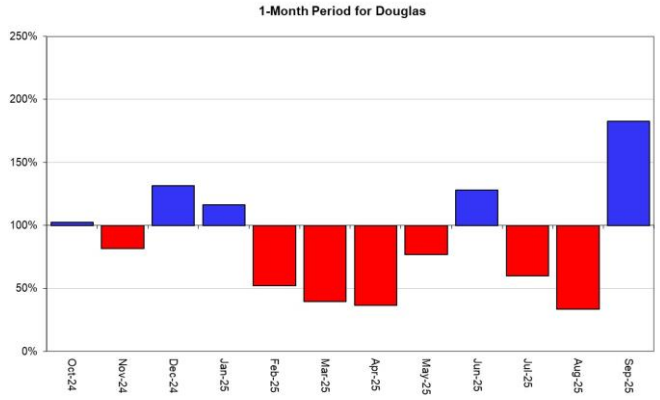
1-Month Period for Douglas
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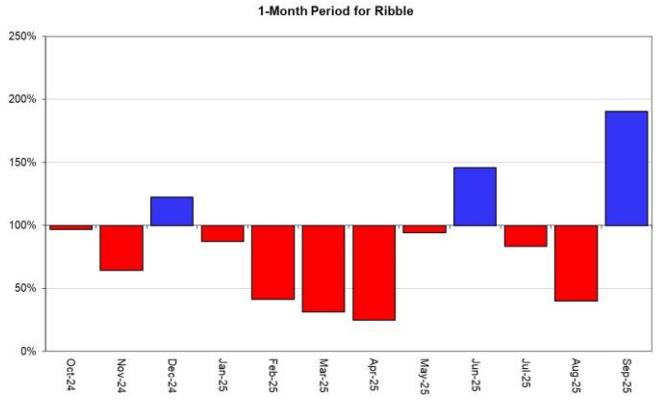
1-Month Period for Ribble
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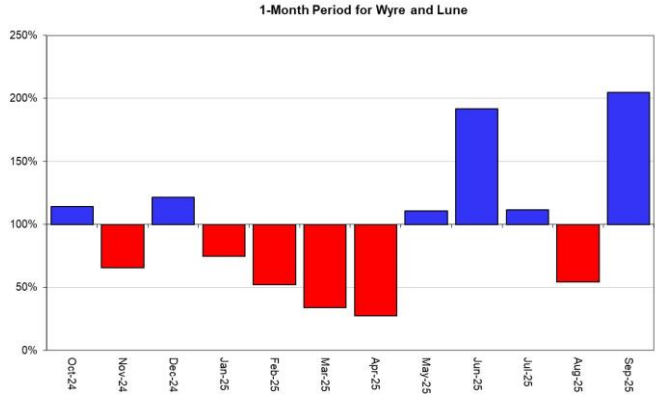
1-Month Period for Wyre and Lune
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100%
50%
0%
Oct-24
Nov-24
Dec-24
Jan-25
Feb-25
Mar-25
Apr-25
May-25
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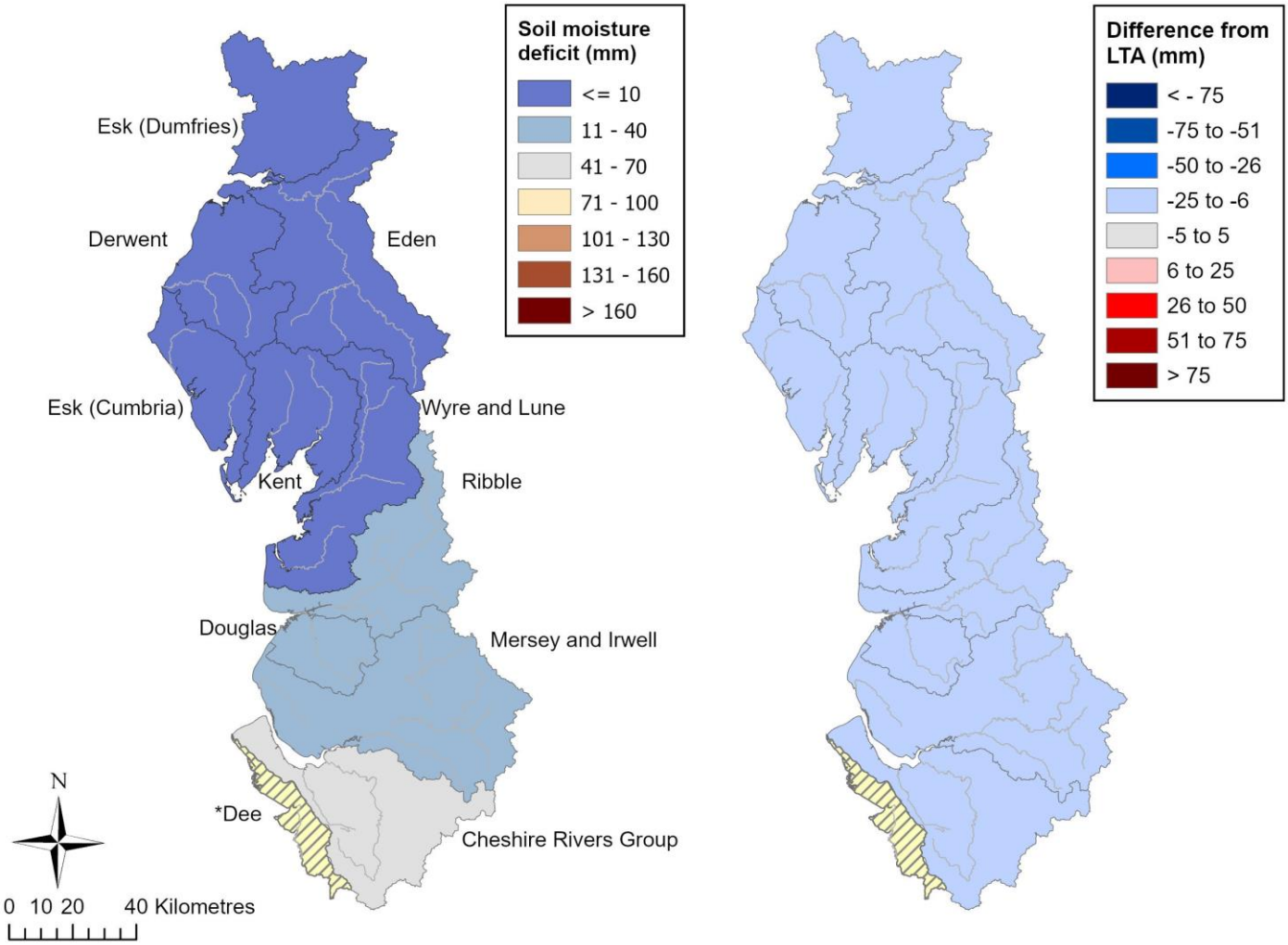
Aug-25
Sep-25

Rainfall data since October 2023, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, AC0000807064, 2025). Rainfall data prior to October 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived from registered rain gauges (Source: Met Office. Crown copyright, 2025).

3 Soil moisture deficit

3.1 Soil moisture deficit map

Figure 3.1: Soil moisture deficits for the week ending 28 September 2025. The map on the left shows actual soil moisture deficits (mm) and on the right shows the difference (mm) of the actual from the 1991 - 2020 long term average soil moisture deficits. MORECS data for real land use.

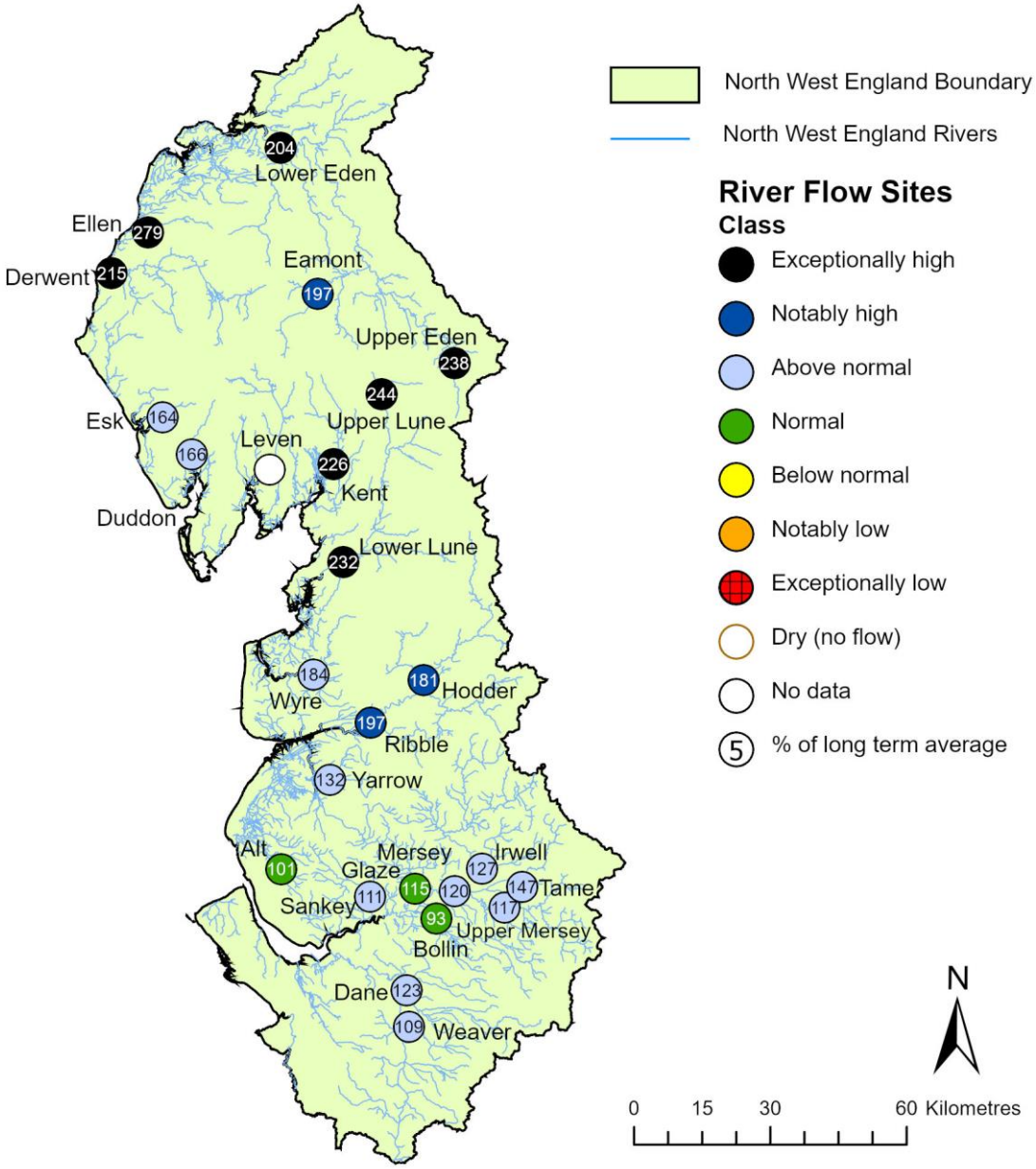


(Source: Met Office. Crown copyright, 2025). All rights reserved. Environment Agency, AC0000807064, 2025. *Dee catchment is operationally managed by Natural Resources Wales.

4 River flows

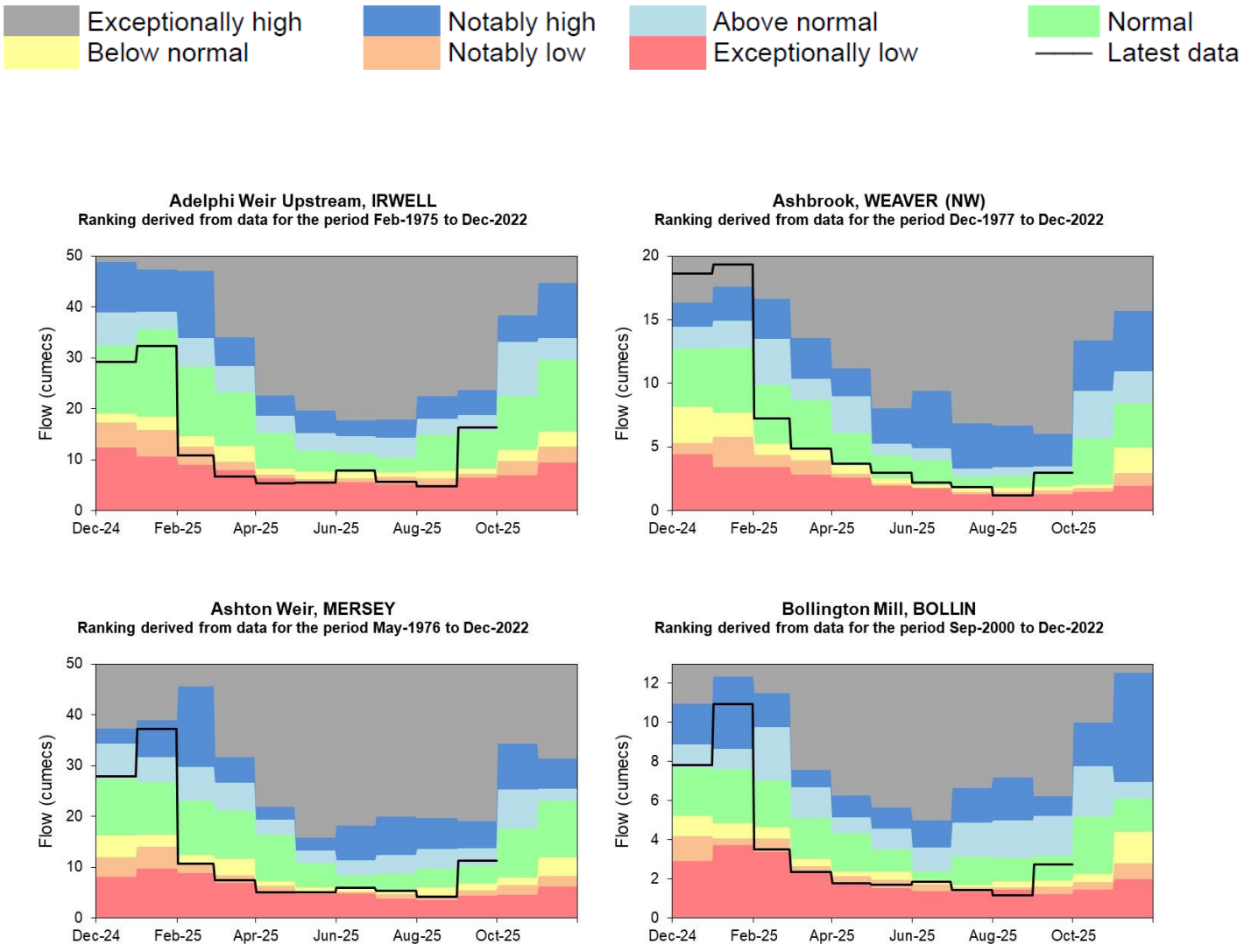
4.1 River flows map

Figure 4.1: Monthly mean river flow for indicator sites for September 2025, expressed as a percentage of the respective long term average and classed relative to an analysis of historic September monthly means. Table available in the appendices with detailed information.

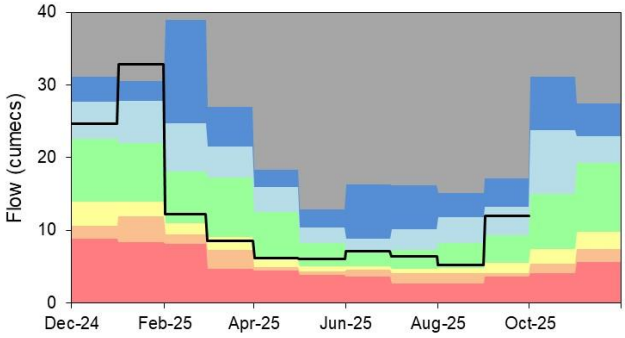


4.2 River flow charts

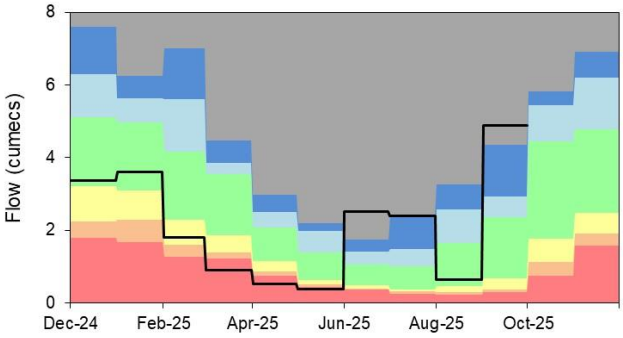
Figure 4.2: Monthly mean river flow for index sites over the past year, compared to an analysis of historic monthly mean flows.



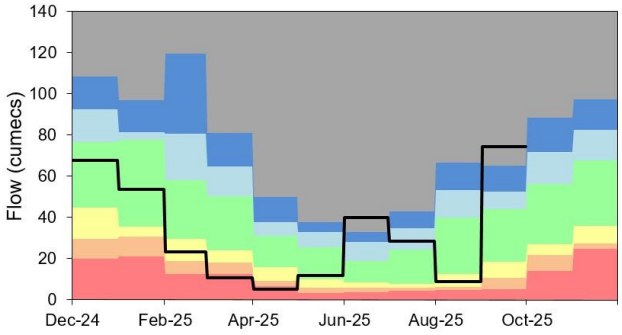
Brinksway, MERSEY
Ranking derived from data for the period Jan-1974 to Dec-2022



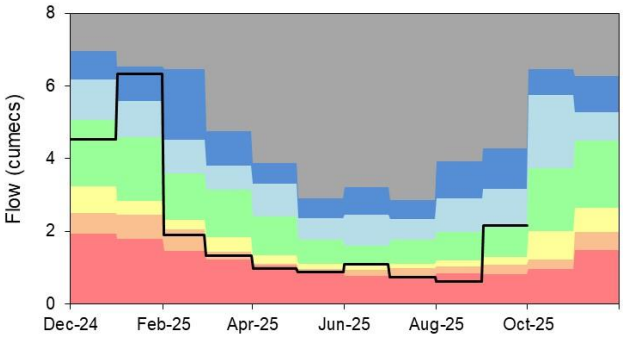
Bullgill, ELLEN
Ranking derived from data for the period Jan-1976 to Dec-2022



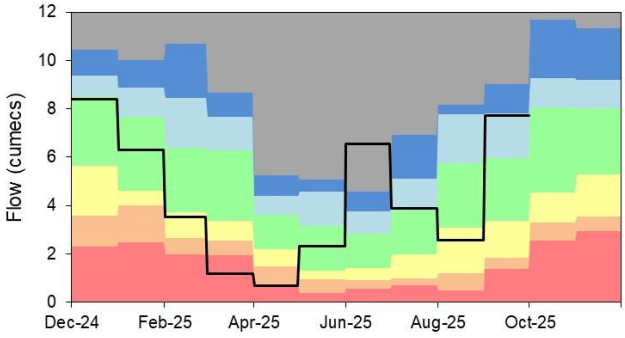
Caton, LUNE
Ranking derived from data for the period Jan-1959 to Dec-2022



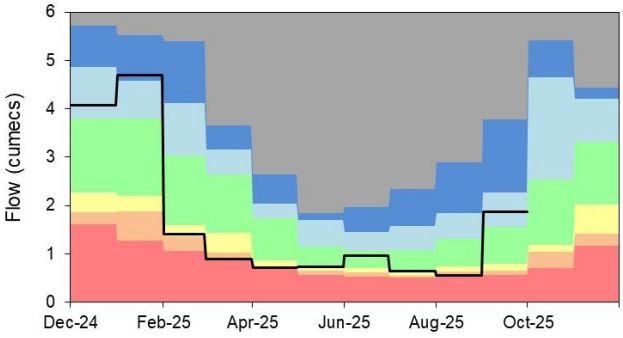
Causey Bridges, SANKEY
Ranking derived from data for the period Jan-1977 to Dec-2022



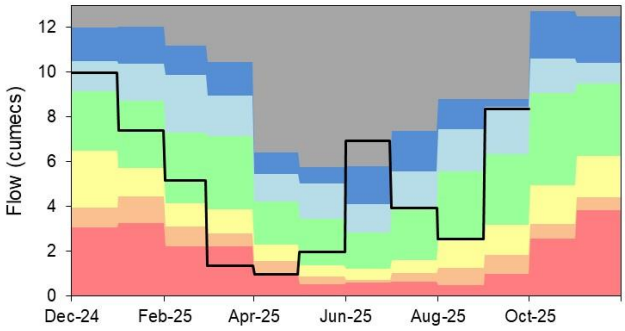
Cropple How, ESK (NW)
Ranking derived from data for the period Jan-1976 to Dec-2022



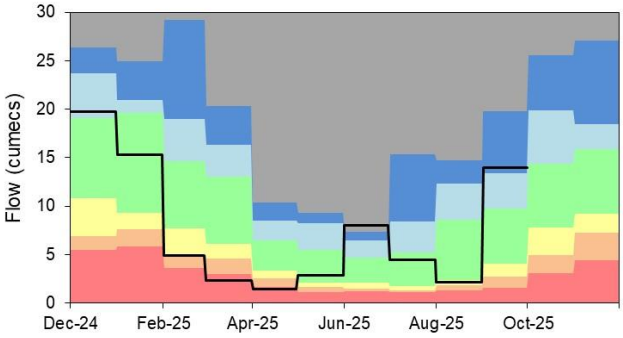
Croston, YARROW
Ranking derived from data for the period Jan-1976 to Dec-2022



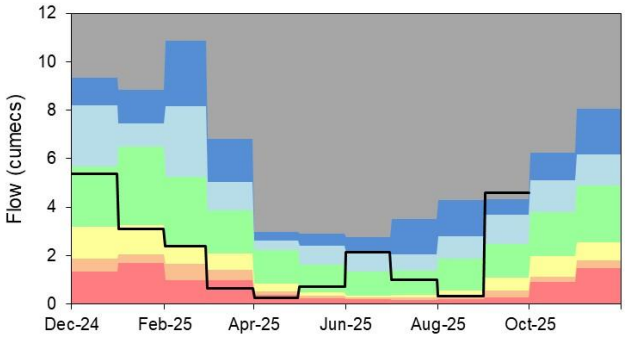
Duddon Hall, DUDDON
Ranking derived from data for the period Mar-1968 to Dec-2022



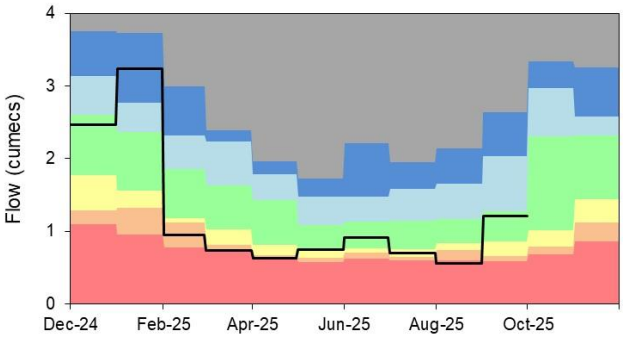
Hodder Place, HODDER
Ranking derived from data for the period Jan-1976 to Dec-2022



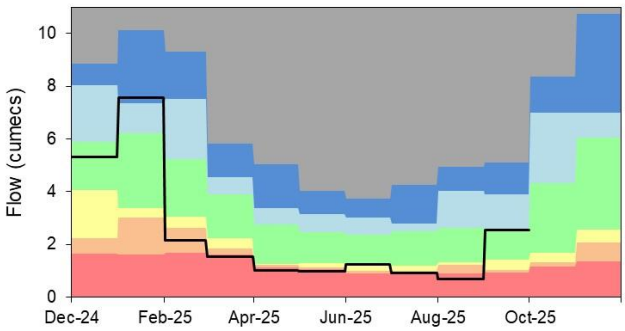
Kirkby Stephen, EDEN (NW)
Ranking derived from data for the period Oct-1971 to Dec-2022



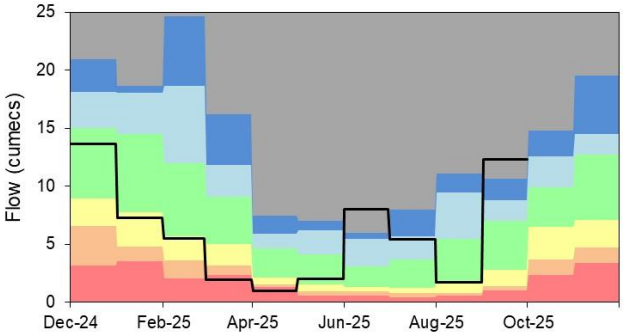
Kirkby, ALT
Ranking derived from data for the period Oct-1977 to Dec-2022



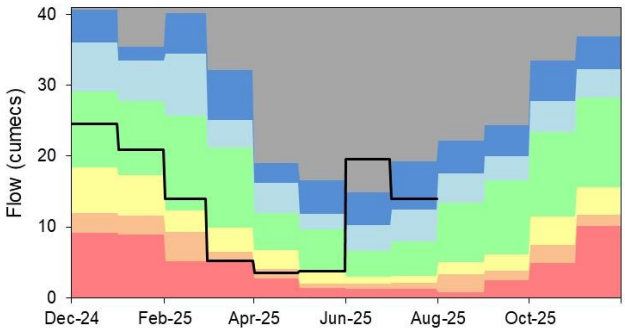
Little Woolden Hall Ultrasonic, GLAZE
Ranking derived from data for the period Jul-1995 to Dec-2022



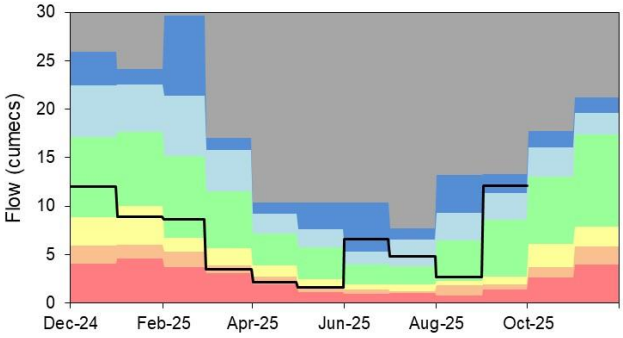
Lunes Bridge, LUNE
Ranking derived from data for the period Dec-1979 to Dec-2022



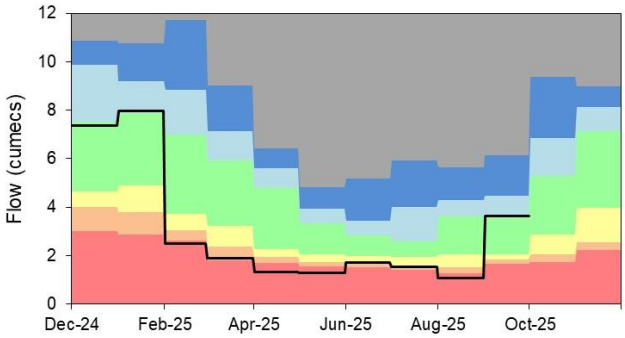
Newby Bridge FMS, LEVEN (NW)
Ranking derived from data for the period Jan-1972 to Dec-2022



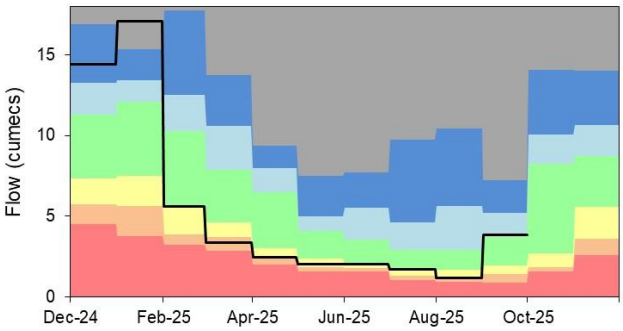
Pooley Bridge, EAMONT
Ranking derived from data for the period Jul-1970 to Dec-2022



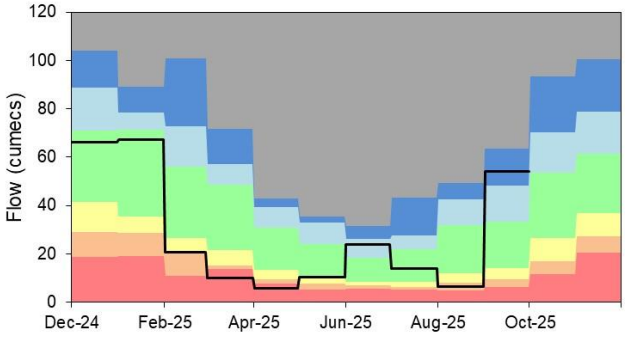
Portwood, TAME
Ranking derived from data for the period Jan-1976 to Dec-2022



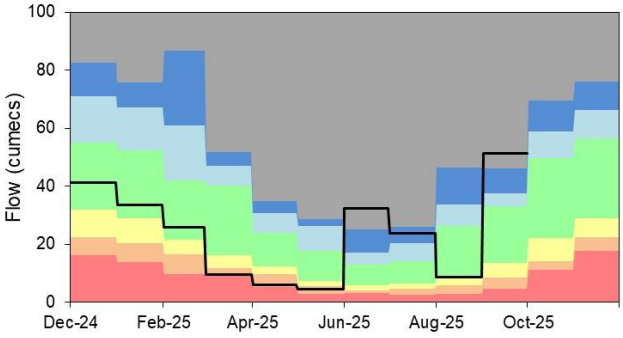
Rudheath, DANE
Ranking derived from data for the period Jan-1976 to Dec-2022

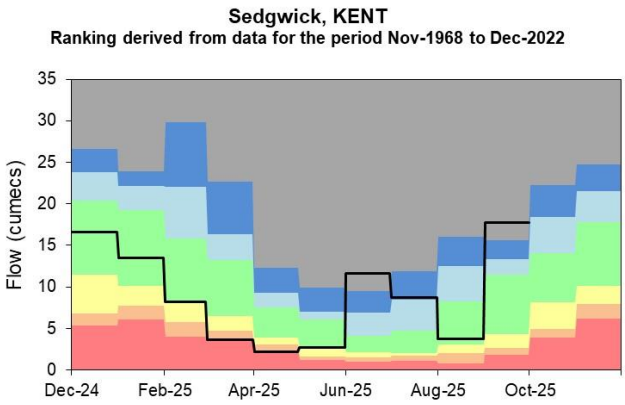


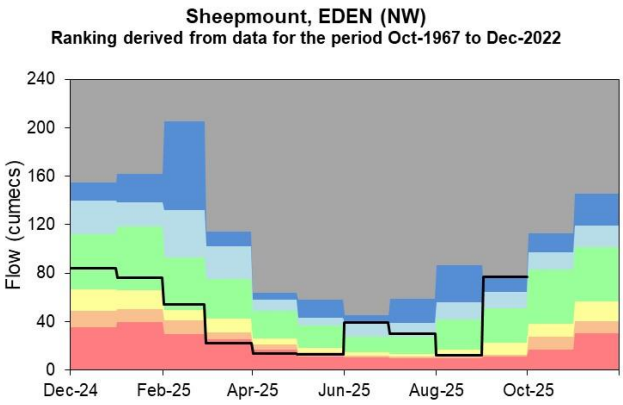
Samlesbury Pgs, RIBBLE (NW)
Ranking derived from data for the period May-1960 to Dec-2022

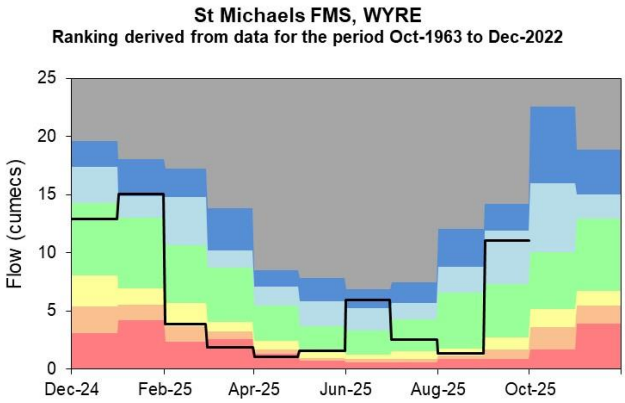


Seaton Mill, DERWENT (NW)
Ranking derived from data for the period Sep-1960 to Dec-2022







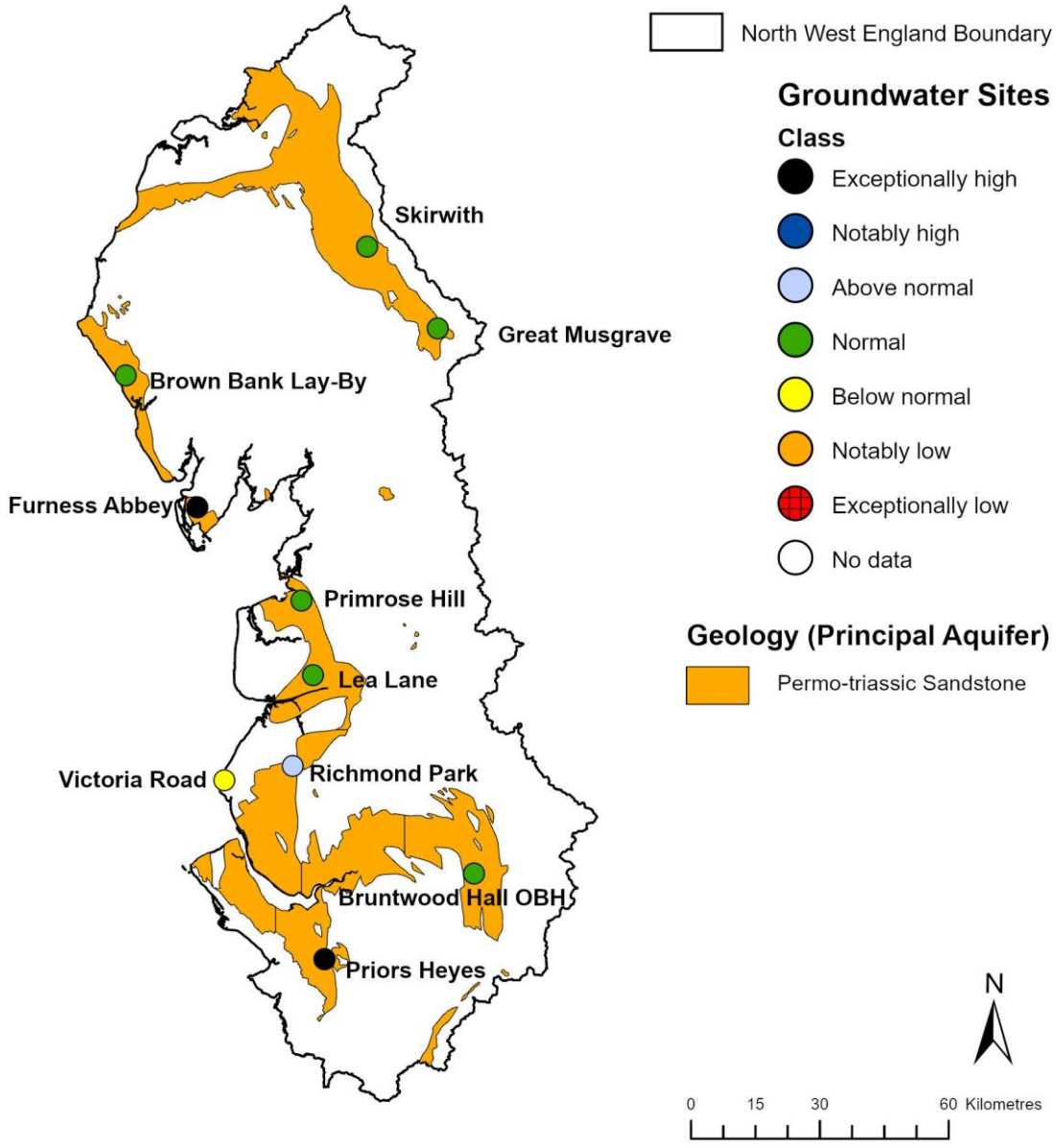


Source: Environment Agency.

5 Groundwater levels

5.1 Groundwater levels map

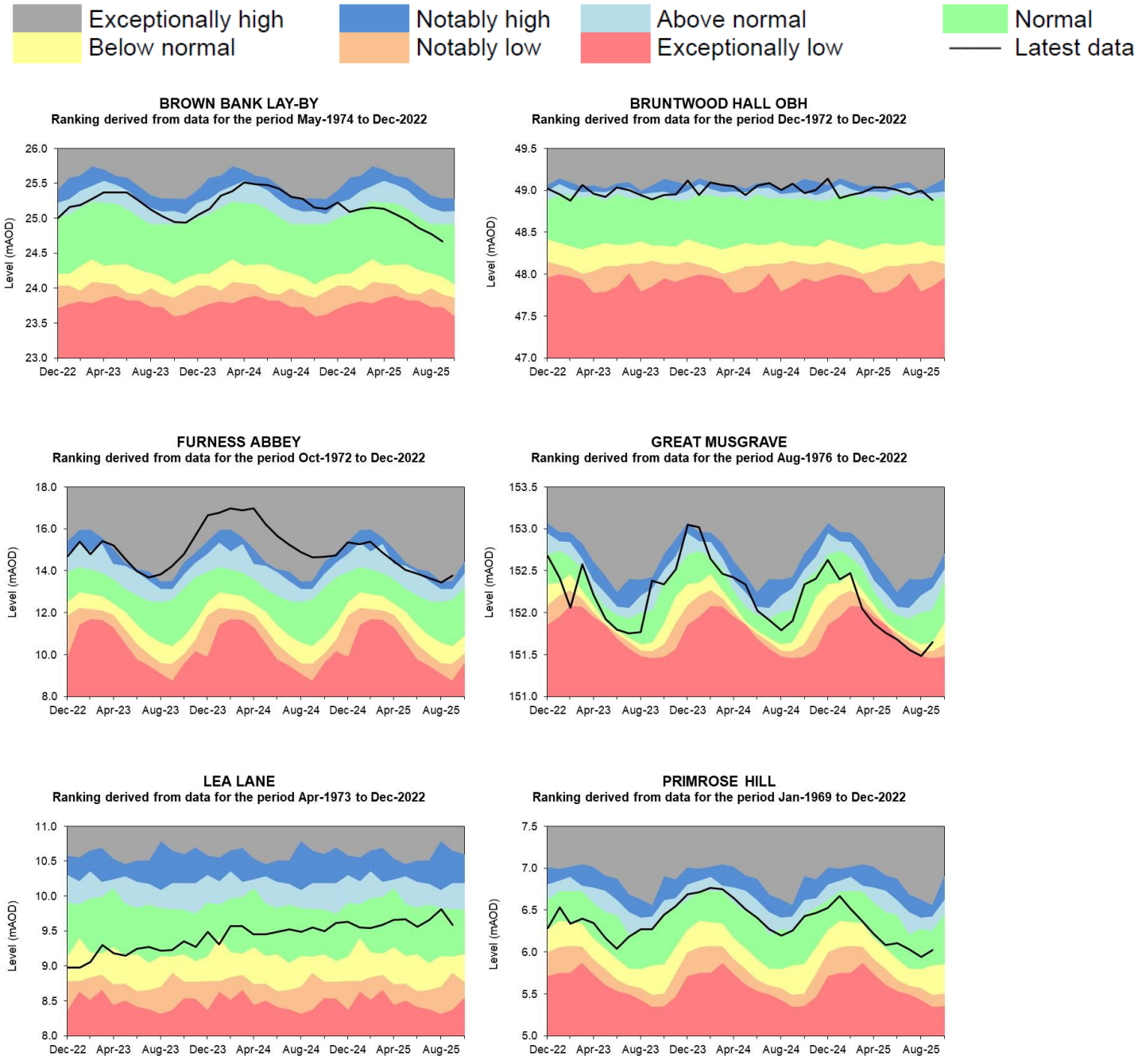
Figure 5.1: Groundwater levels for indicator sites at the end of September 2025, classed relative to an analysis of respective historic September levels. Table available in the appendices with detailed information. Please note Victoria Road Borehole sits within a superficial deposit as opposed to a bedrock aquifer. This is why the geology type is not marked on the map.

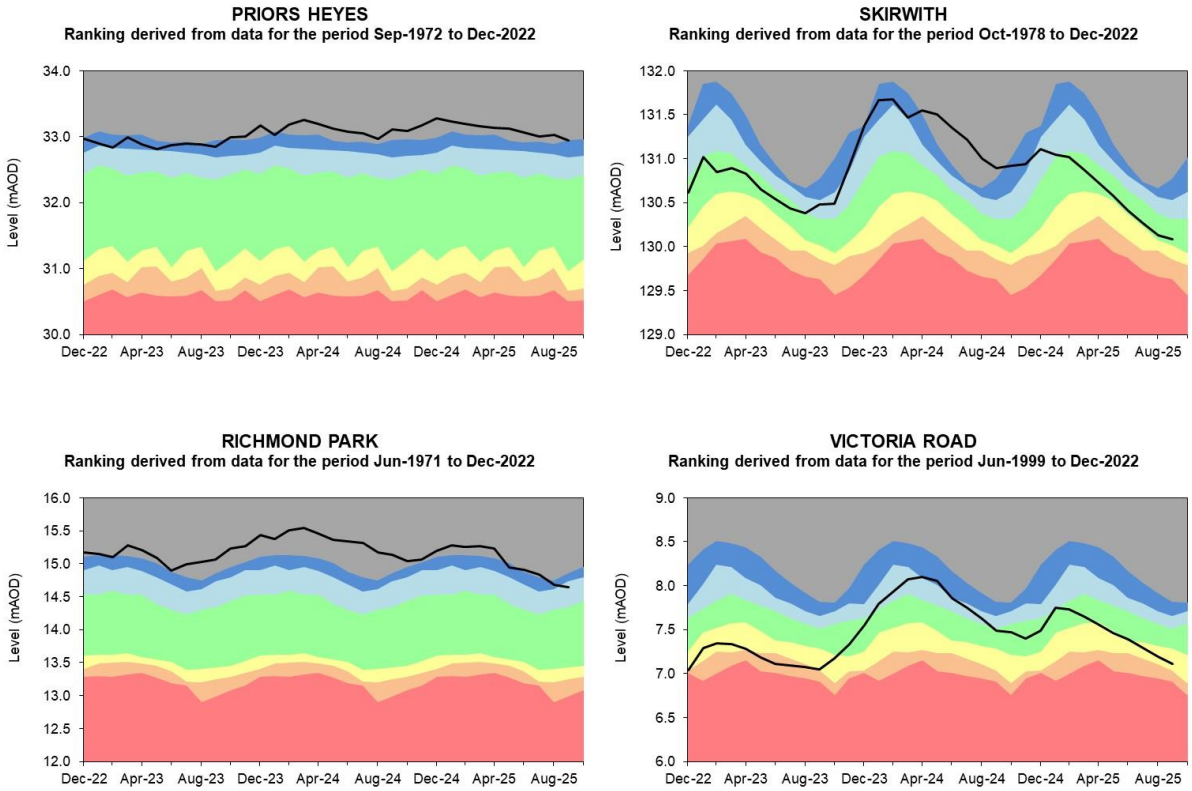


(Source: Environment Agency). Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, AC0000807064, 2025.

5.2 Groundwater level charts

Figure 5.2: End of month groundwater levels at index groundwater level sites for major aquifers. 34 months compared to an analysis of historic end of month levels and long-term maximum and minimum levels.





Source: Environment Agency, 2025.

6 Reservoir stocks

Figure 6.1: The location of reservoirs that comprise the supply districts across north-west England and selected individual reservoirs.

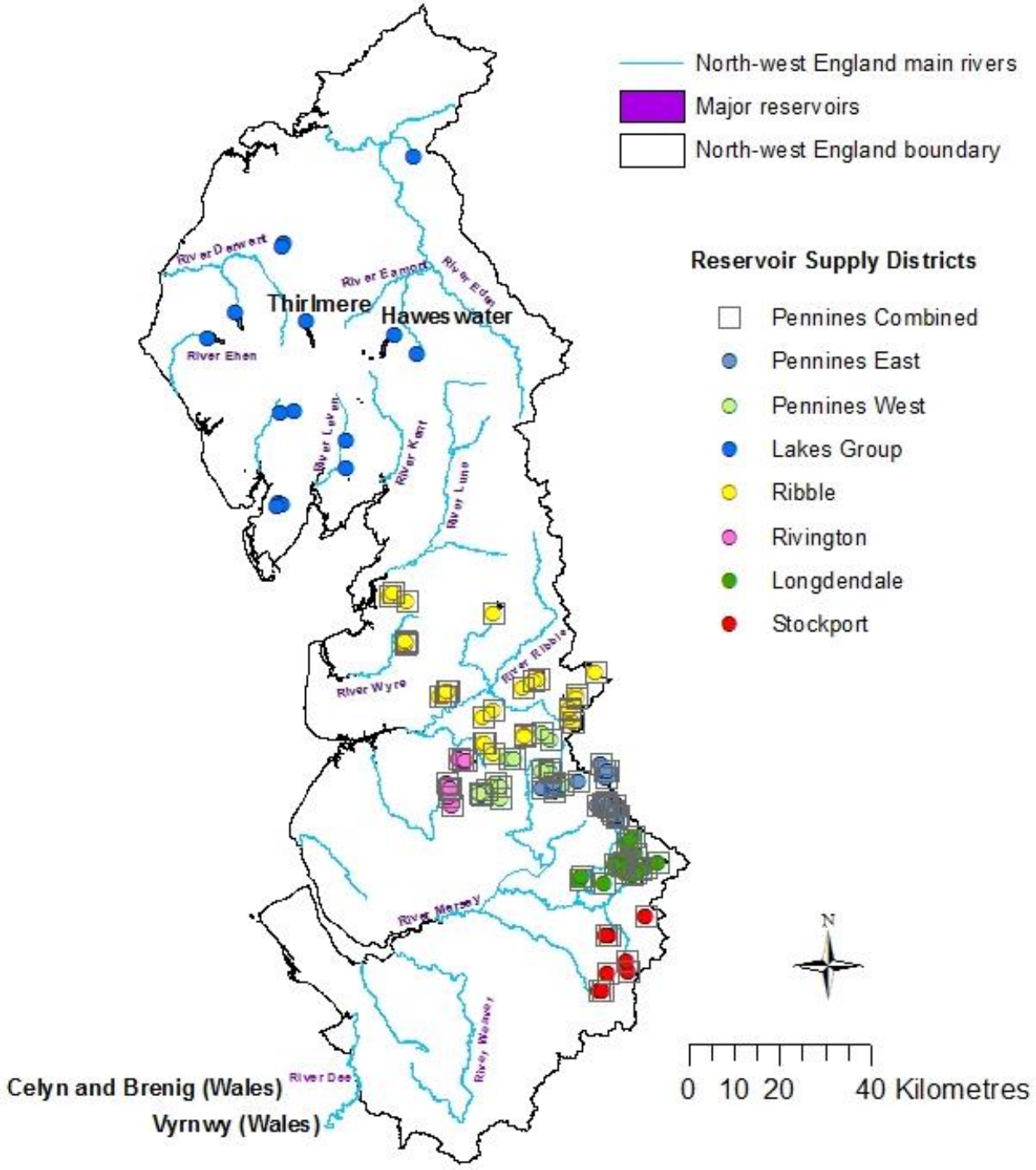
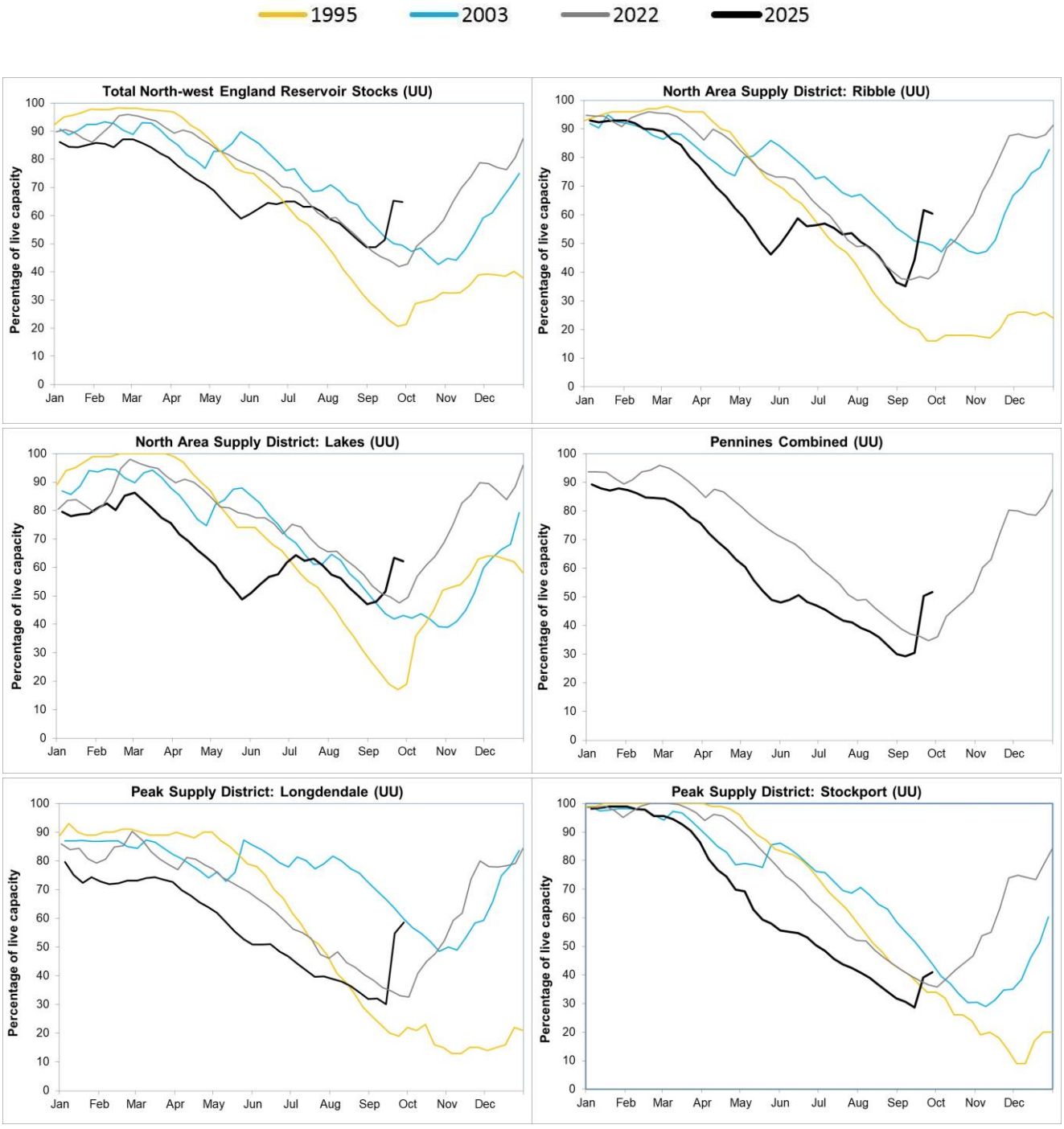
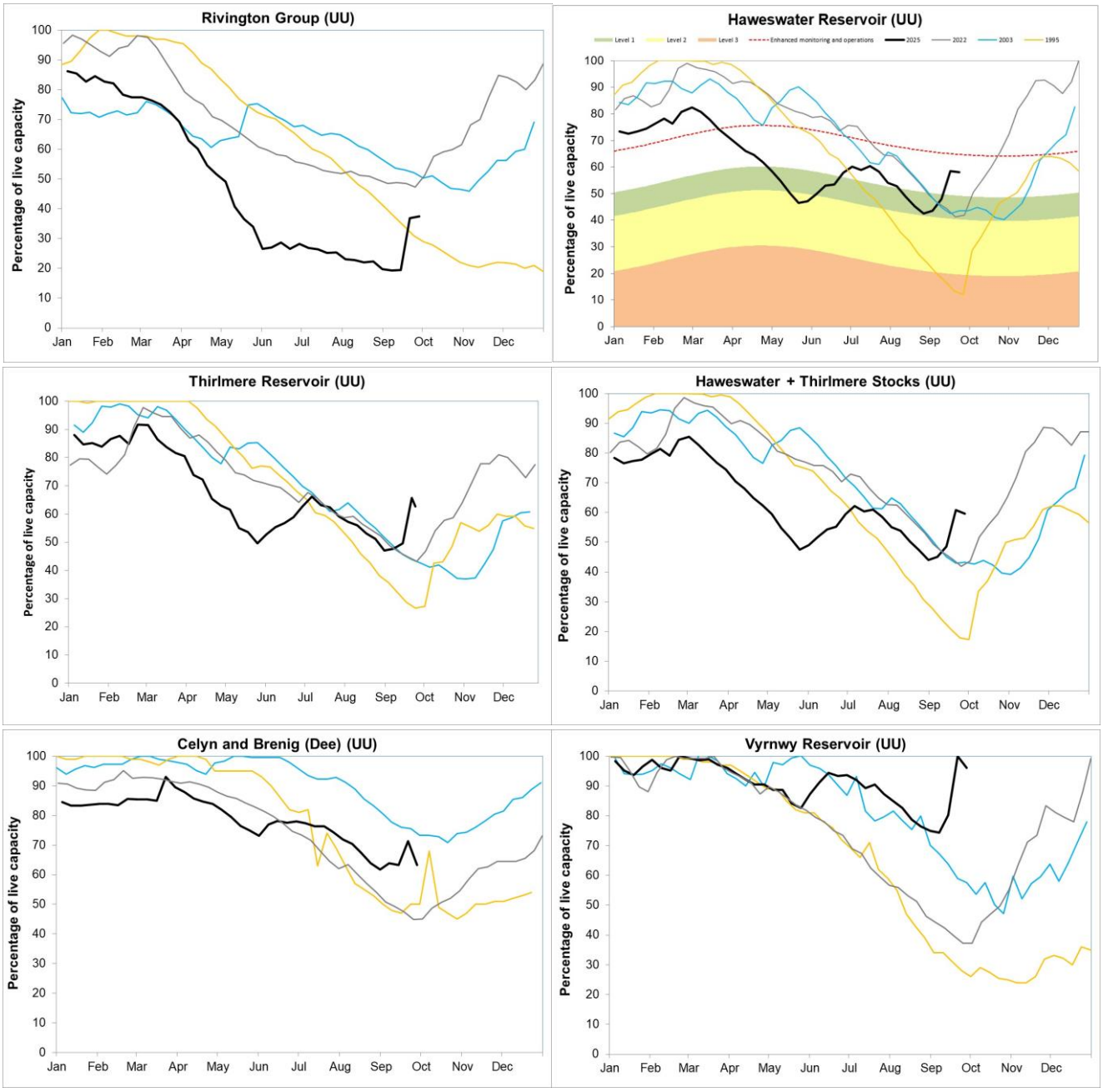


Figure 6.2: End of month reservoir stocks for supply districts across north-west England and selected individual reservoirs for current year (2025) and representative years: 1995, 2003 and 2022. Note: Historic records of individual reservoirs and reservoir groups making up the regional values vary in length.





Source: (UU) United Utilities, (EA) The Environment Agency.

7 Glossary

7.1 Terminology

Aquifer

A geological formation able to store and transmit water.

Areal average rainfall

The estimated average depth of rainfall over a defined area. Expressed in depth of water (mm).

Artesian

The condition where the groundwater level is above ground surface but is prevented from rising to this level by an overlying continuous low permeability layer, such as clay.

Artesian borehole

Borehole where the level of groundwater is above the top of the borehole and groundwater flows out of the borehole when unsealed.

Cumecs

Cubic metres per second (m^{3s-1}).

Effective rainfall

The rainfall available to percolate into the soil or produce river flow. Expressed in depth of water (mm).

Flood alert and flood warning

Three levels of warnings may be issued by the Environment Agency. Flood alerts indicate flooding is possible. Flood warnings indicate flooding is expected. Severe flood warnings indicate severe flooding.

Groundwater

The water found in an aquifer.

Long term average (LTA)

The arithmetic mean calculated from the historic record, usually based on the period 1991 to 2020. However, the period used may vary by parameter being reported on (see figure captions for details).

mAOD

Metres above ordnance datum (mean sea level at Newlyn Cornwall).

MORECS

Met Office Rainfall and Evaporation Calculation System. Met Office service providing real time calculation of evapotranspiration, soil moisture deficit and effective rainfall on a 40 by 40 km grid.

Naturalised flow

River flow with the impacts of artificial influences removed. Artificial influences may include abstractions, discharges, transfers, augmentation and impoundments.

NCIC

National Climate Information Centre. NCIC area monthly rainfall totals are derived using the Met Office 5 km gridded dataset, which uses rain gauge observations.

Recharge

The process of increasing the water stored in the saturated zone of an aquifer. Expressed in depth of water (mm).

Reservoir gross capacity

The total capacity of a reservoir.

Reservoir live capacity

The capacity of the reservoir that is normally usable for storage to meet established reservoir operating requirements. This excludes any capacity not available for use (for example, storage held back for emergency services, operating agreements or physical restrictions). May also be referred to as ‘net’ or ‘deployable’ capacity.

Soil moisture deficit (SMD)

The difference between the amount of water actually in the soil and the amount of water the soil can hold. Expressed in depth of water (mm).

7.2 Categories

Exceptionally high

Value likely to fall within this band 5% of the time.

Notably high

Value likely to fall within this band 8% of the time.

Above normal

Value likely to fall within this band 15% of the time.

Normal

Value likely to fall within this band 44% of the time.

Below normal

Value likely to fall within this band 15% of the time.

Notably low

Value likely to fall within this band 8% of the time.

Exceptionally low

Value likely to fall within this band 5% of the time.

8 Appendices

8.1 Rainfall table

Hydrological area	Sep 2025 rainfall % of long term average 1991 to 2020	Sep 2025 band	Jul 2025 to September cumulative band	Apr 2025 to September cumulative band	Oct 2024 to September cumulative band
Cheshire Rivers Group	177	Exceptionally High	Normal	Normal	Normal
Derwent (NW)	201	Exceptionally High	Notably high	Exceptionally high	Normal
Douglas	183	Exceptionally High	Normal	Normal	Normal
Eden	212	Exceptionally High	Above normal	Above normal	Normal
Esk (Cumbria)	185	Exceptionally High	Above normal	Exceptionally high	Normal
Esk (Dumfries)	174	Notably High	Normal	Normal	Notably low
Kent	195	Exceptionally High	Notably high	Exceptionally high	Above normal
Mersey And Irwell	180	Exceptionally High	Normal	Below normal	Normal
Ribble	190	Exceptionally High	Normal	Normal	Normal

Wyre And Lune	205	Exceptionally High	Above normal	Notably high	Normal
North-west England	190	Exceptionally High	Above normal	Normal	Normal

8.2 River flows table

Site name	River	Catchment	Sep 2025 band	Aug 2025 band
Adelphi Weir Upstream	Irwell	Irwell (Croal to Irk)	Above normal	Exceptionally low
Ashbrook	Weaver (NW)	Weaver Upper	Above normal	Exceptionally low
Ashton Weir	Mersey	Mersey Non Tidal	Above normal	Notably low
Bollington Mill	Bollin	Bollin	Normal	Exceptionally low
Brinksway	Mersey	Mersey Non Tidal	Above normal	Normal
Bullgill	Ellen	Ellen Lower	Exceptionally high	Normal
Caton	Lune	Lune Lower Tidal	Exceptionally high	Below normal
Causey Bridges	Sankey	Mersey Non Tidal	Above normal	Exceptionally low
Cropple How	Esk (NW)	Esk (South West Lakes)	Above normal	Below normal
Croston	Yarrow	Yarrow Lower	Above normal	Notably low
Duddon Hall	Duddon	Duddon	Above normal	Below normal
Hodder Place	Hodder	Hodder Lower	Notably high	Below normal

Kirkby	Alt	Alt	Normal	Exceptionally low
Kirkby Stephen	Eden (NW)	Eden Cumbria Upper	Exceptionally high	Notably low
Little Woolden Hall Ultrasonic	Glaze	Glaze	Normal	Exceptionally low
Lunes Bridge	Lune	Lune Upper	Exceptionally high	Below normal
Newby Bridge Fms	Leven (NW)	Leven Cumbria	No data (site temporarily suspended)	No data (site temporarily suspended)
Pooley Bridge	Eamont	Eamont	Notably high	Normal
Portwood	Tame	Tame	Above normal	Exceptionally low
Rudheath	Dane	Dane	Above normal	Below normal
Samlesbury Pgs	Ribble (NW)	Ribble Lower	Notably high	Notably low
Seaton Mill	Derwent (NW)	Derwent Cumbria Lower	Exceptionally high	Below normal
Sedgwick	Kent	Levens Bridge	Exceptionally high	Normal
Sheepmount	Eden (NW)	Eden Cumbria Lower	Exceptionally high	Below normal
St Michaels Fms	Wyre	Brock	Above normal	Below normal

8.3 Groundwater table

Site name	Aquifer	End of Sep 2025 band	End of Aug 2025 band
Brown Bank Lay-by	West Cumbria Permo-triassic Sandstone	Normal	Normal
Bruntwood Hall Obh	East Cheshire Permo-triassic Sandstone	Normal	Exceptionally high
Furness Abbey	Furness Permo-triassic Sandstone	Exceptionally high	Notably high
Great Musgrave	Eden Valley And Carlisle Basin Permo-triassic Sandstone	Normal	Notably low
Lea Lane	Fylde Permo-triassic Sandstone	Normal	Normal
Priors Heyes	West Cheshire Permo-triassic Sandstone	Exceptionally high	Exceptionally high
Primrose Hill	Fylde Permo-triassic Sandstone	Normal	Normal
Richmond Park	Rufford Permo-triassic Sandstone	Above normal	Notably high

Skirwith	Eden Valley And Carlisle Basin Permo-triassic Sandstone	Normal	Normal
Victoria Road Entrance	West Lancashire Quarternary Sand And Gravel Superficial Deposits	Below normal	Below normal