Monthly water situation report: North-west England

1 Summary – May 2025

1.1 Rainfall

Rainfall for north-west England during May was classed as normal with 93% of the long-term average (LTA). The Cumbria and Lancashire (CLA) area observed 103% of the LTA classed as normal while the Greater Manchester, Merseyside and Cheshire (GMC) area observed 80% also classed as normal.

Despite the weather being dry for the first two weeks of May, higher rainfall during the remainder of the month has resulted in hydrological areas across north-west England observing rainfall classed between normal and above normal. One hydrological area observed rainfall classed as above normal while all others observed normal rainfall. The highest rainfall (in terms of LTA) was observed in the Kent hydrological area with 120%of the LTA classed as above normal and the lowest was observed in the Douglas with 77% of the LTA.

Cumulative rainfall over the past 3 months was classed between exceptionally low and notably low with higher rainfall (in terms of LTA) being recorded in southern GMC and western Cumbria. 3-month cumulative rainfall was lowest in the Mersey and Irwell hydrological area with 47% of the LTA classed as exceptionally low and highest in the Esk (Cumbria) hydrological area with 62% of the LTA classed as notably low. For north-west England this was the fourth lowest rainfall recorded for the 3-month period ending in May since 1871. The Eden, Esk (Dumfries) and Mersey and Irwell hydrological areas all recorded their second lowest 3-month cumulative rainfall ending in May since 1871.

The 6-month cumulative rainfall for north west England was classed between normal and exceptionally low with higher rainfall being observed in GMC and lower rainfall observed further north with the lowest being observed in the north of Cumbria. The highest 6-month cumulative rainfall was observed in the Cheshire Rivers Group hydrological area with 94% of the LTA classed as normal and the lowest was observed in the Esk (Dumfries) with 52% of the LTA classed as exceptionally low. This was the fifth lowest 6-month cumulative rainfall period ending in May recorded for north-west England since 1871 with the Esk (Dumfries) hydrological area recording the second lowest rainfall for this same period.

The 12-month cumulative rainfall for north-west England was classed between exceptionally low and above normal. The spatial variability of rainfall across the north-west remains largely the same as that seen for the 6-month totals with the highest rainfall recorded in GMC and the lowest in to the north of Cumbria. The highest rainfall was observed in the Cheshire Rivers

Group with 108% of the LTA classed as above normal and the lowest was observed in the Esk (Dumfries) with 69% of the LTA classed as exceptionally low.

1.2 Soil moisture deficit and recharge

Soil moisture deficits (SMD) across north-west England at the end of May were between 40mm and 100mm. Despite higher rainfall during the second half of the month, SMDs for north-west England were higher than expected for the time of year for all areas by between 26mm and 50mm.

1.3 River flows

Monthly mean river flows across north-west England were classed between normal and exceptionally low with twelve of our monitoring stations classed as normal, four as below normal, five as notably low and four as exceptionally low. The highest monthly mean river flow (in terms of LTA) was recorded in the River Esk at Cropple How with 95% of the LTA classed as normal and the lowest was recorded in the River Derwent at Seaton Mill with 33% of the LTA classed as notably low.

1.4 Groundwater levels

Groundwater levels across north-west England at the end of May were classed between exceptionally low and exceptionally high. Groundwater levels at:

- Bruntwood Hall, increased, to exceptionally high from notably high.
- Furness Abbey, decreased, to above normal from notably high.
- Richmond Park, decreased, to notably high from exceptionally high.

All other sites remained the same classification at:

- Brown Bank Lay-By, classed as normal.
- Great Musgrave, classed as exceptionally low.
- Lea Lane, classed as normal.
- Primrose Hill, classed as normal.
- Priors Heyes, classed as exceptionally high.
- Skirwith, classed as normal.
- Victoria road, classed as below normal.

Please note, levels at Priors Heyes remain high compared to historic levels because the aquifer is recovering from the effects of historically high abstractions.

1.5 Reservoir stocks

Total reservoir stocks for north-west England decreased from 71% at the end of April to 61% at the beginning of June. This is lower than the average of 84% usually seen at this time of year and also lower than last year when total reservoir stocks were 91%.

At the beginning of June, reservoir storage (in terms of percentage) was highest at Vyrnwy at 87% full and lowest at Rivington at 27%.

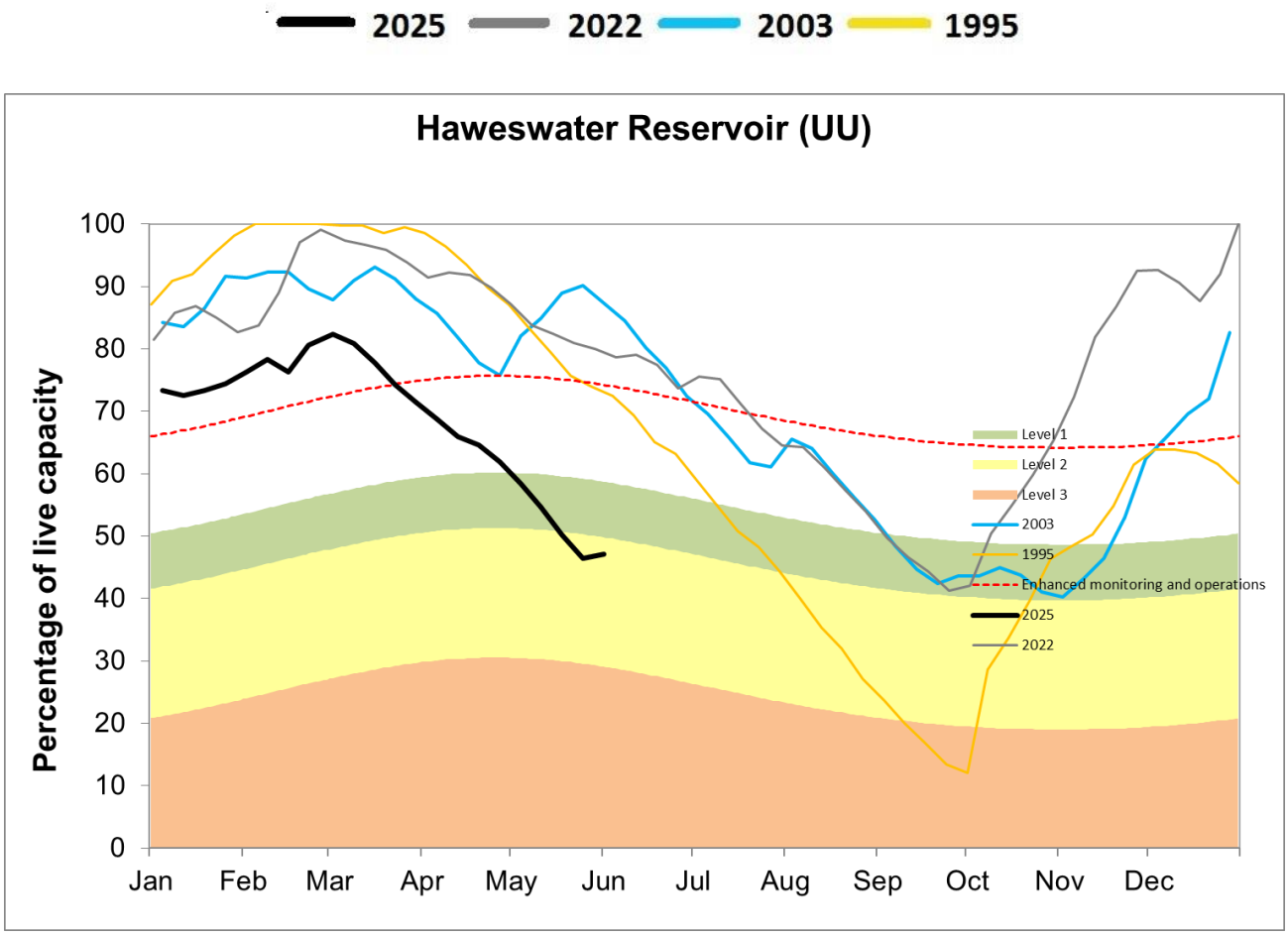
The combined storage at Haweswater and Thirlmere was 49% which is lower than the 77% average storage at this time of year and lower than last year when storage was 94%. Reservoirs kept low for maintinance works include part of the:

- Longdendale system – Audenshaw No.1, Torside
- Rivington system – Anglezarke, and High Bullough
- Bolton supply system – Dingle
- Piethorne Valley system – Norman Hill, Kitcliffe, and Rooden
- Ogden (Barley) system – Ogden Lower, and Ogden Upper
- Barnacre Group system – Barnacre North
- Longridge system - Alston No.1, Alston No.2, and Spade Mill No.2
- Dee (Celyn and Brenig) system – Llyn Celyn
- Dubbs system – Dubbs
- Watergrove system – Watergrove

1.6 Water abstraction restrictions

At the end of May, one abstraction license was being constrained in the GMC area to protect water resources and the environment. No water abstraction licenses were constrained in the CLA area.

Figure 1.5: 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)).

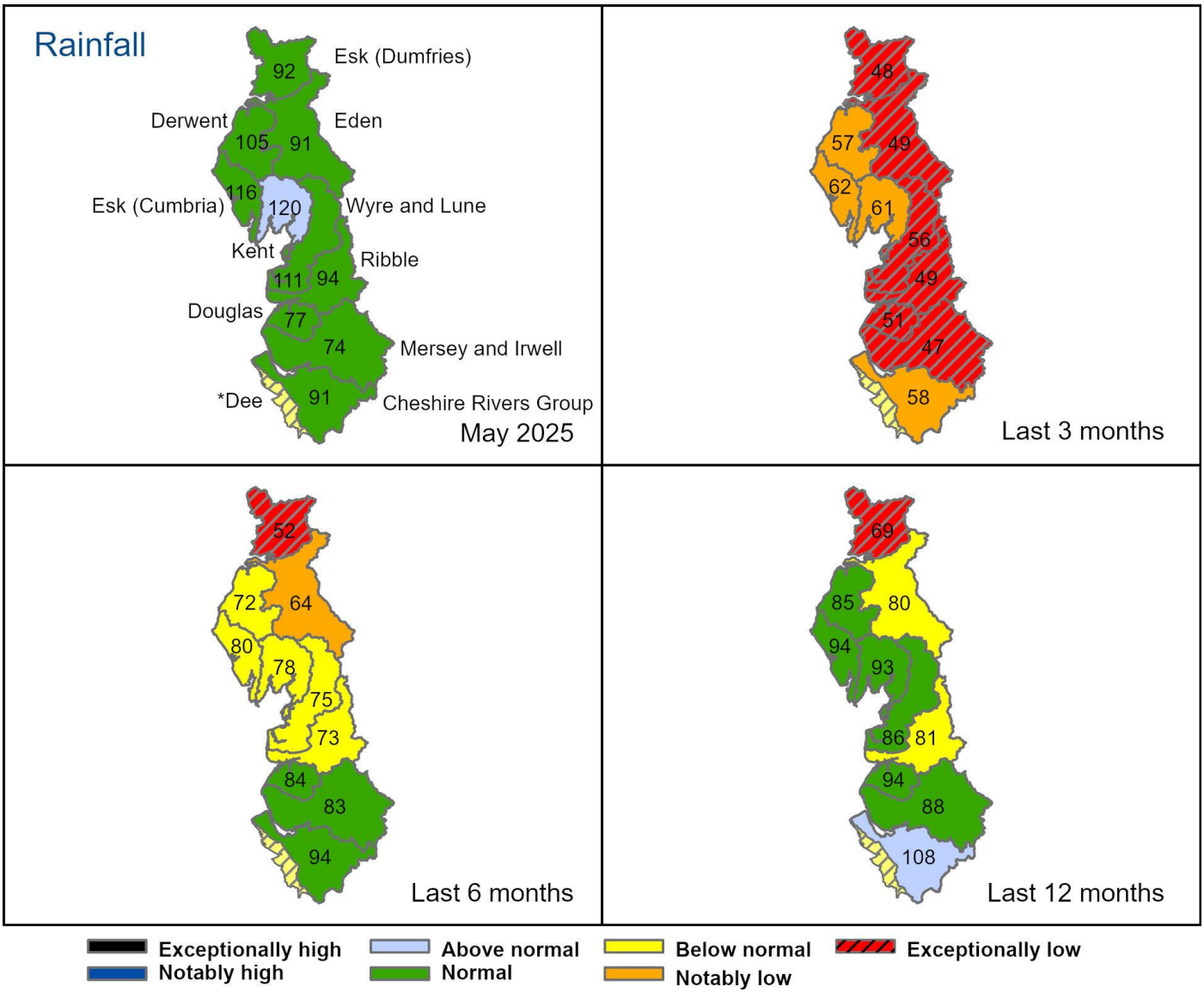


Author: Cumbria and Lancashire Hydrology Team, hydrology.CMBLNC@environment-agency.gov.uk

2 Rainfall

2.1 Rainfall map

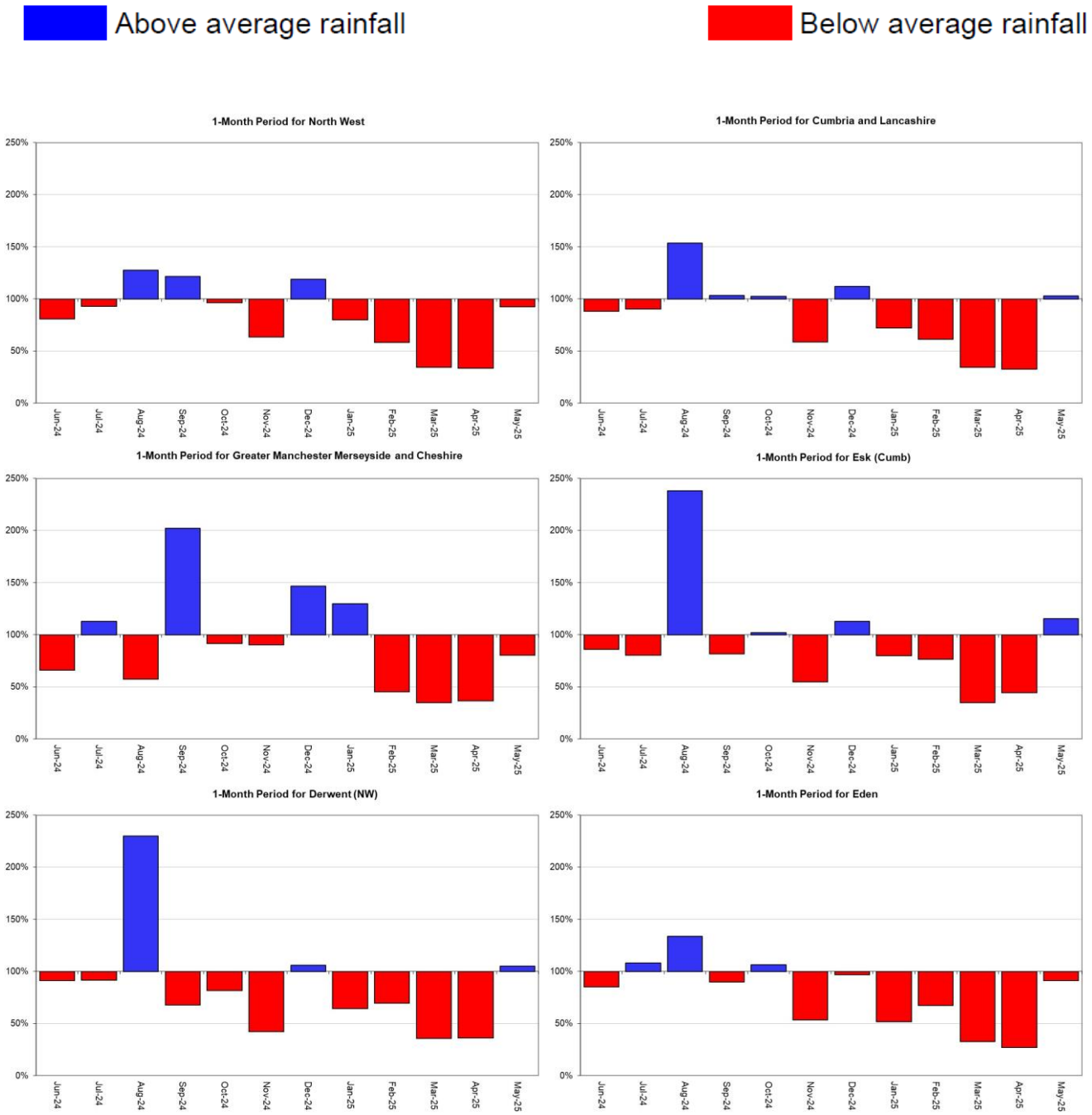
Figure 2.1: Total rainfall (as a percentage of the 1991 to 2020 long term average) for hydrological areas for the current month (up to 31 May 2025), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.

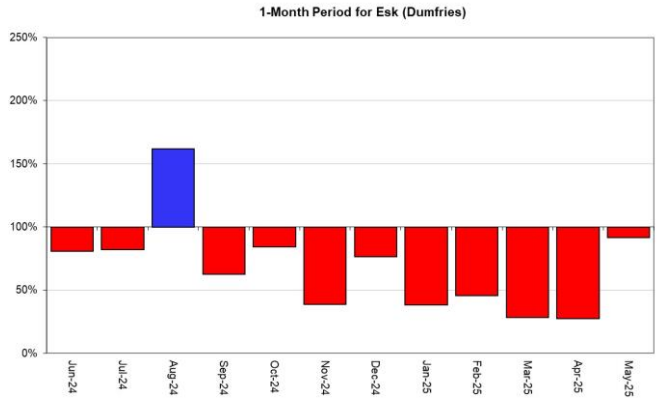


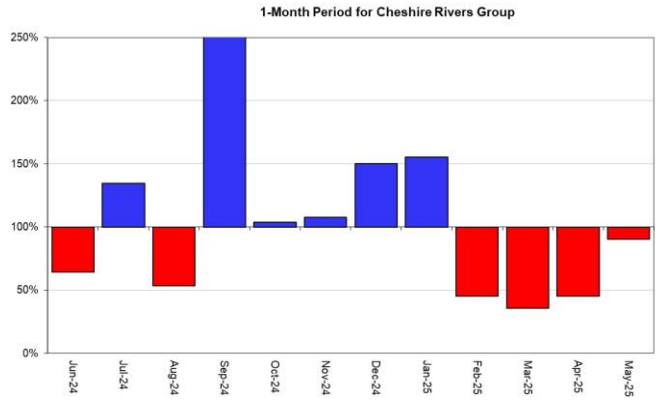
Rainfall data since October 2023, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2025). Rainfall data prior to October 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived from registered rain gauges (Source: Met Office. Crown copyright, 2025).

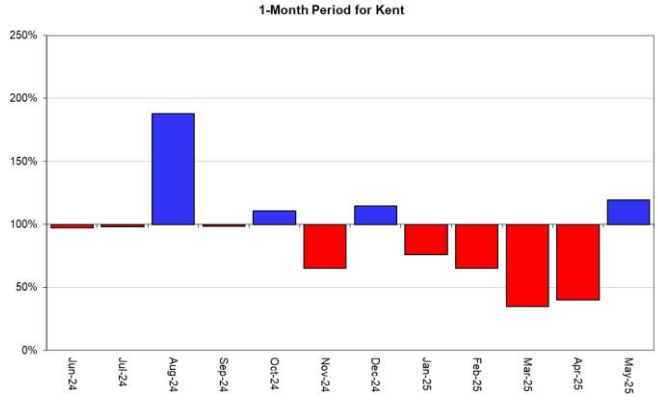
2.2 Rainfall charts

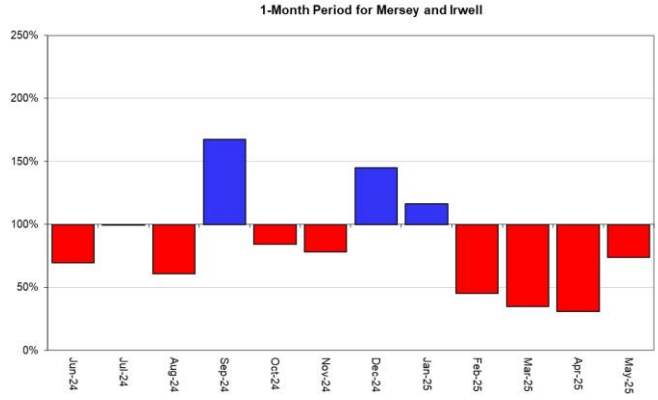
Figure 2.2: Monthly rainfall totals for the past 12 months expressed as a percentage of the 1991 to 2020 long term average for North-west England and its hydrological areas.

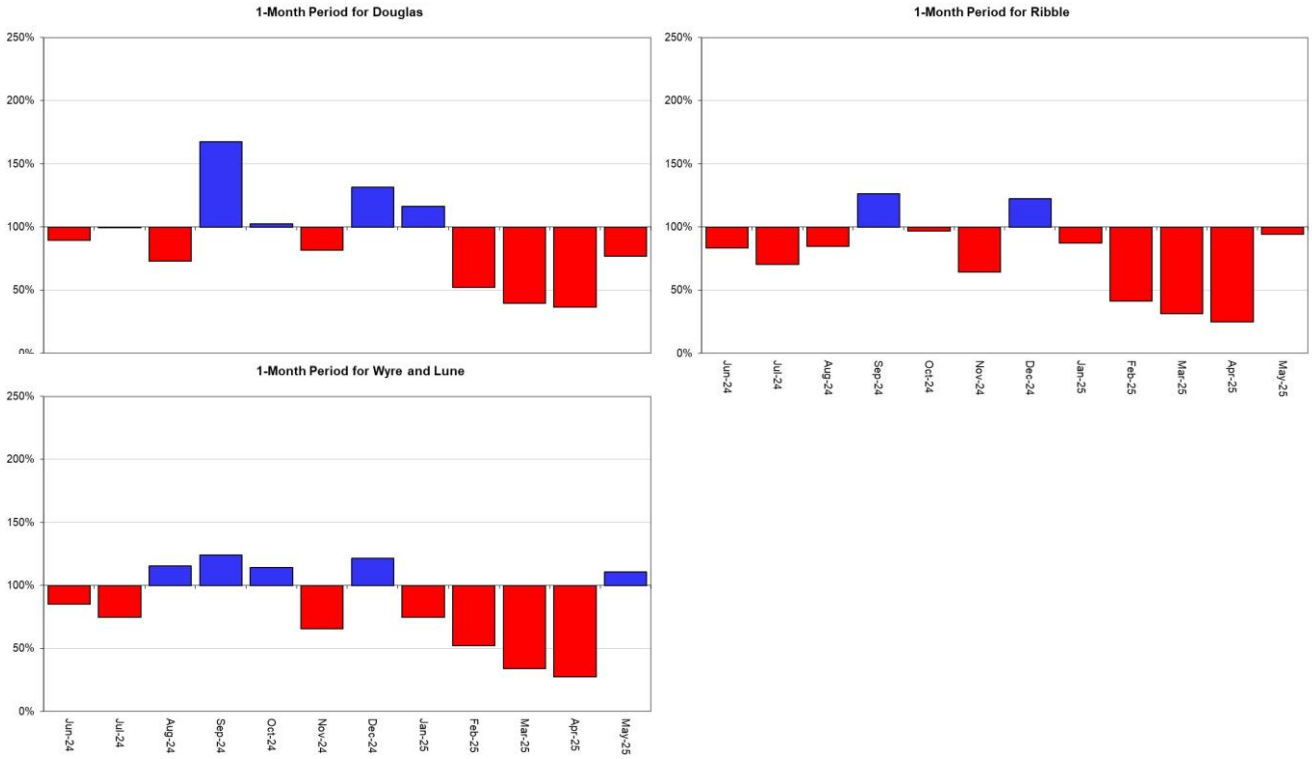



1-Month Period for Esk (Dumfries)
250%
200%
150%
100%
50%
0%
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24
Nov-24
Dec-24
Jan-25
Feb-25
Mar-25
Apr-25
May-25


1-Month Period for Cheshire Rivers Group
250%
200%
150%
100%
50%
0%
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24
Nov-24
Dec-24
Jan-25
Feb-25
Mar-25
Apr-25
May-25


1-Month Period for Kent
250%
200%
150%
100%
50%
0%
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24
Nov-24
Dec-24
Jan-25
Feb-25
Mar-25
Apr-25
May-25


1-Month Period for Mersey and Irwell
250%
200%
150%
100%
50%
0%
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24
Nov-24
Dec-24
Jan-25
Feb-25
Mar-25
Apr-25
May-25

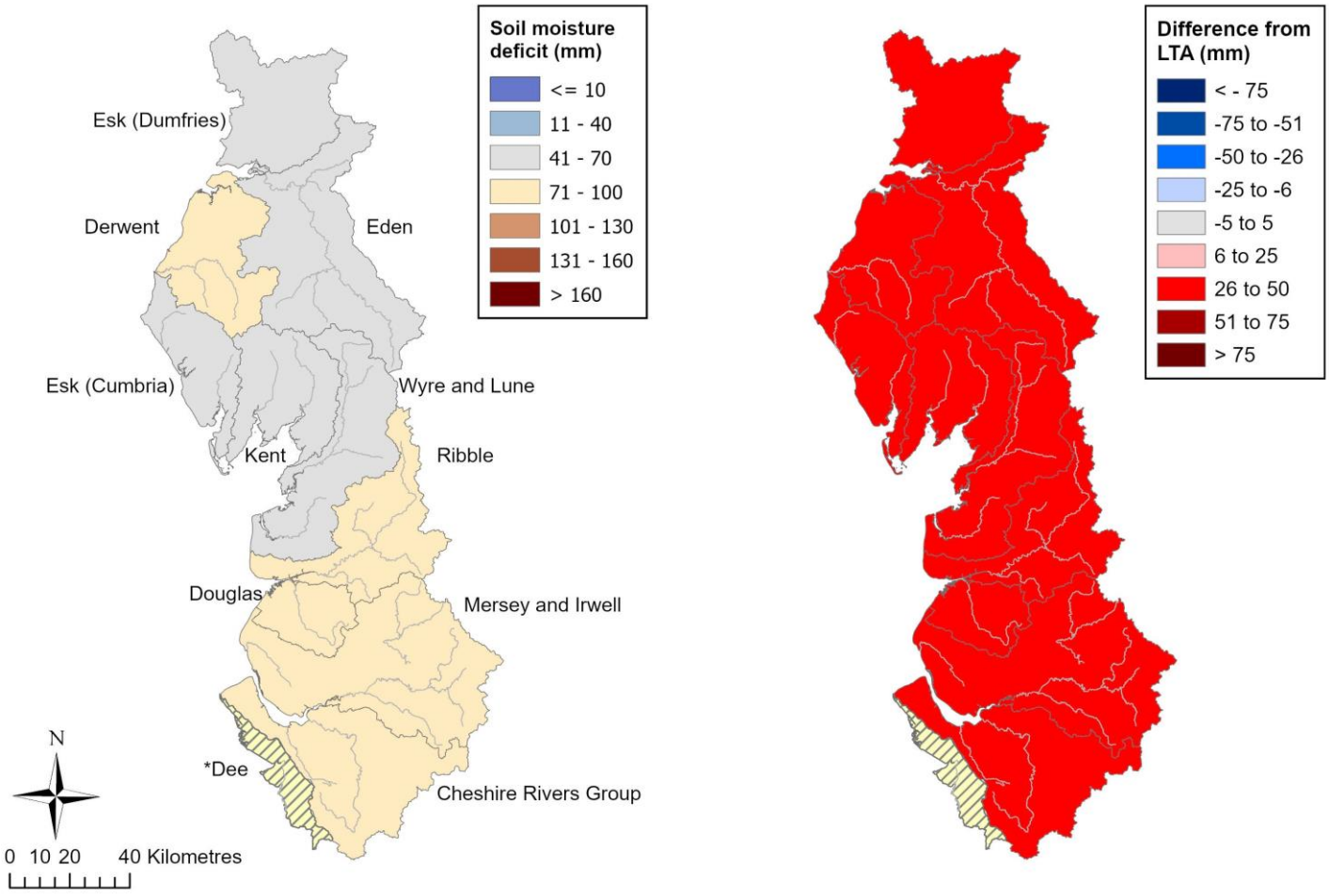


Rainfall data since October 2023, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2025). Rainfall data prior to October 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived from registered rain gauges (Source: Met Office. Crown copyright, 2025).

3 Soil moisture deficit

3.1 Soil moisture deficit map

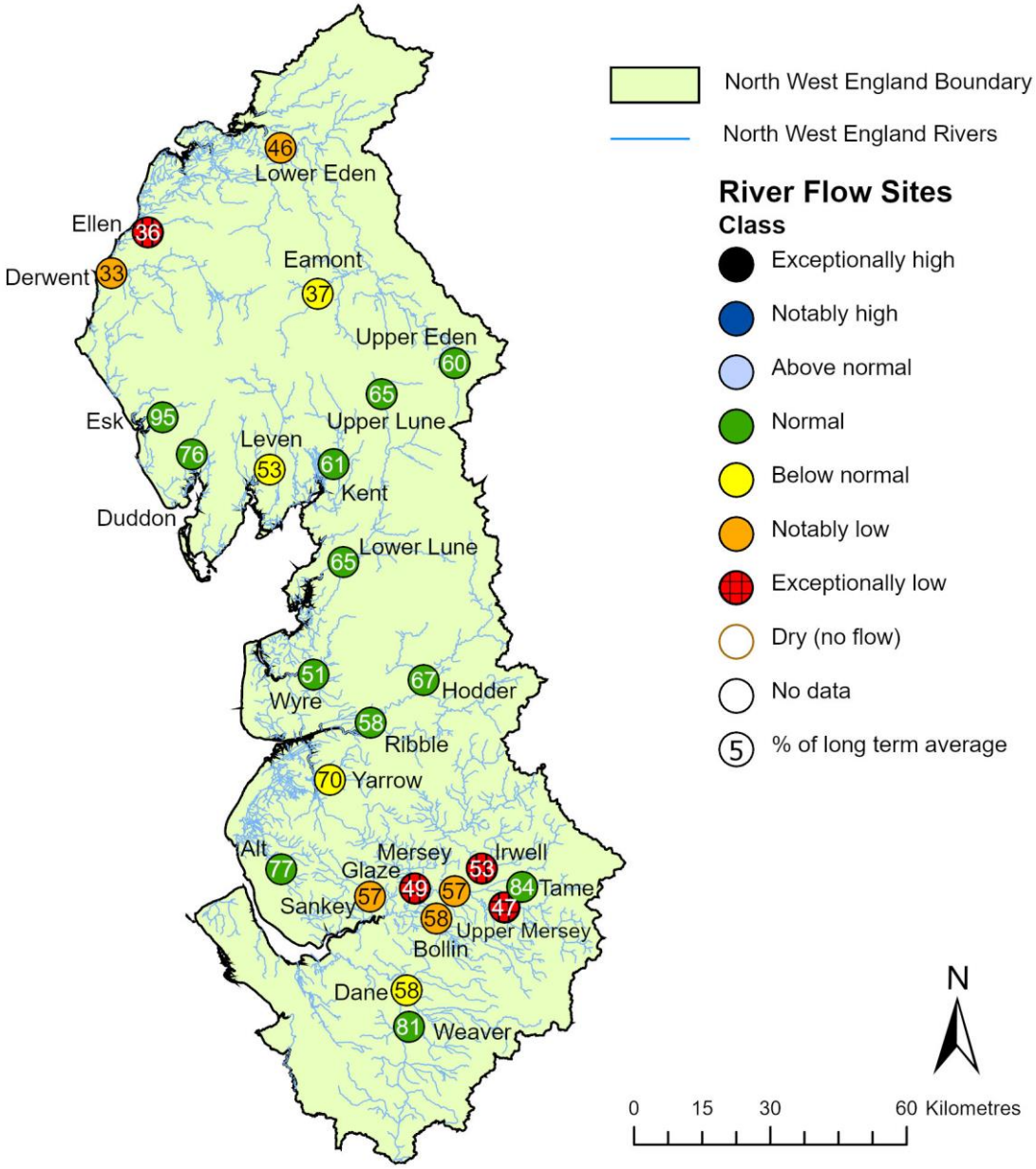
Figure 3.1: Soil moisture deficits for the week ending 30 April 2025. The map on the left shows actual soil moisture deficits (mm) and on the right shows the difference (mm) of the actual from the 1991 - 2020 long term average soil moisture deficits. MORECS data for real land use.



4 River flows

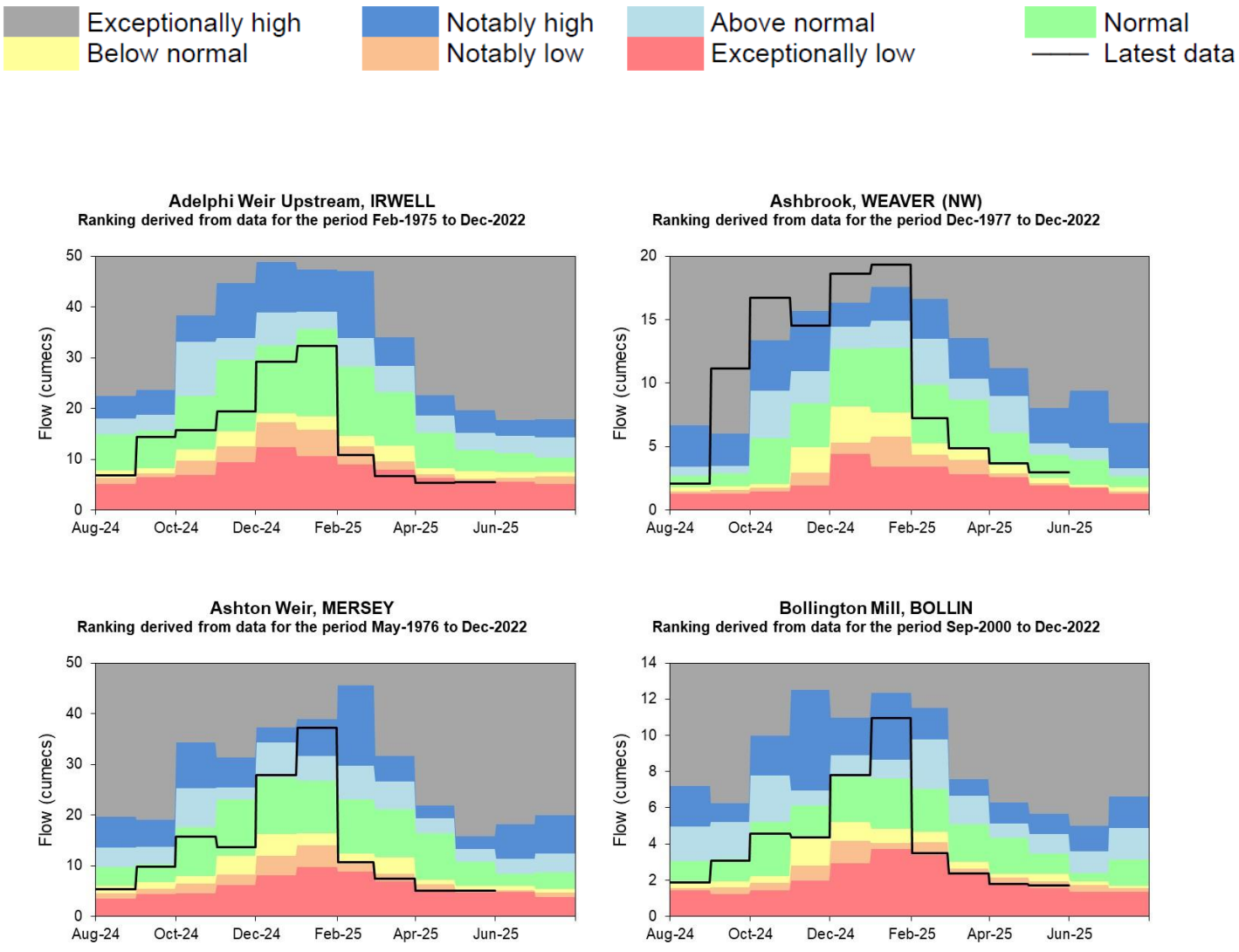
4.1 River flows map

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

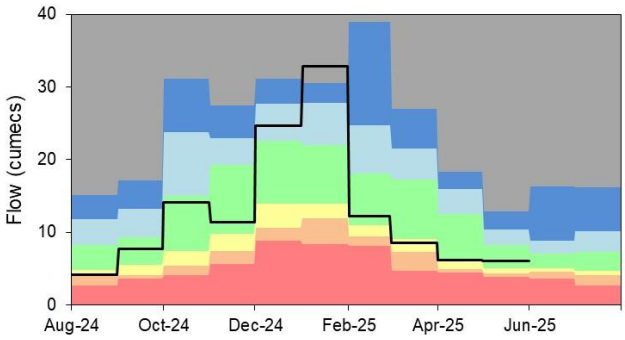


4.2 River flow charts

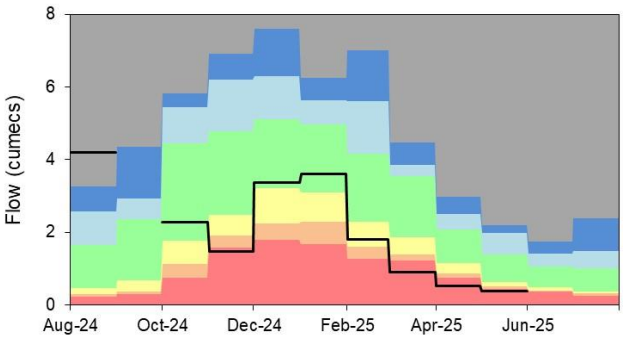
Figure 4.2: Monthly mean river flow for index sites over the past year, compared to an analysis of historic monthly mean flows.



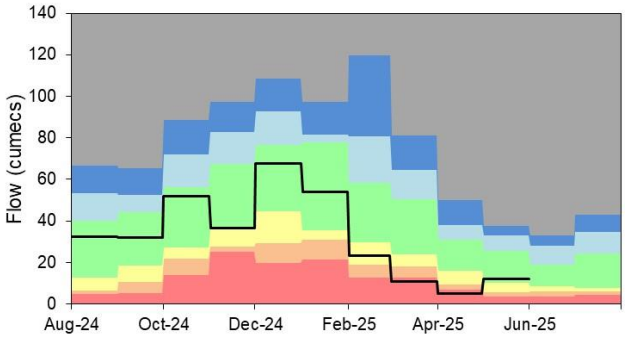
Brinksway, MERSEY
Ranking derived from data for the period Jan-1974 to Dec-2022



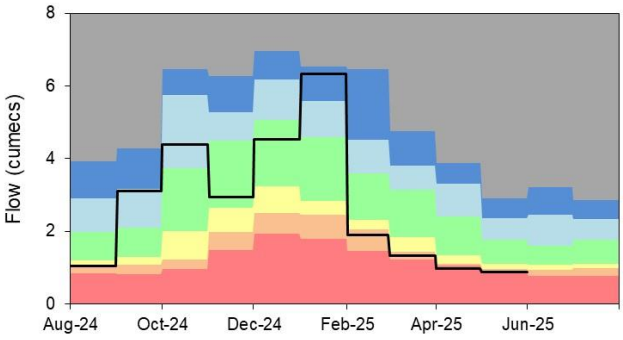
Bullgill, ELLEN
Ranking derived from data for the period Jan-1976 to Dec-2022



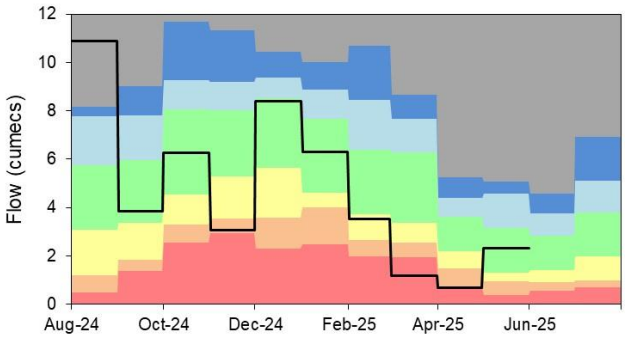
Caton, LUNE
Ranking derived from data for the period Jan-1959 to Dec-2022



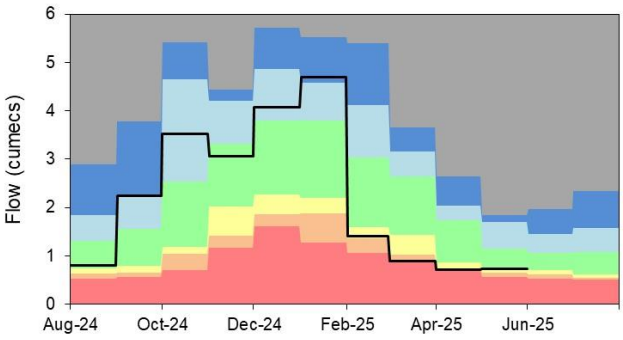
Causey Bridges, SANKEY
Ranking derived from data for the period Jan-1977 to Dec-2022



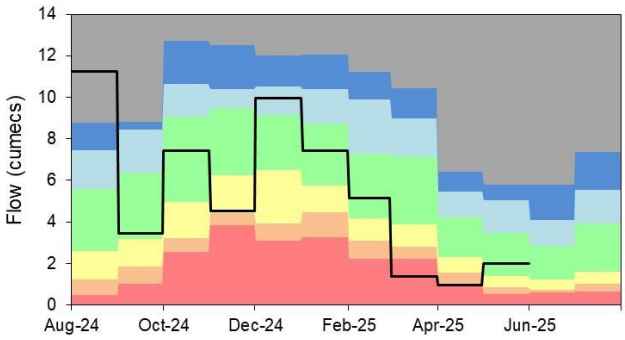
Cropple How, ESK (NW)
Ranking derived from data for the period Jan-1976 to Dec-2022



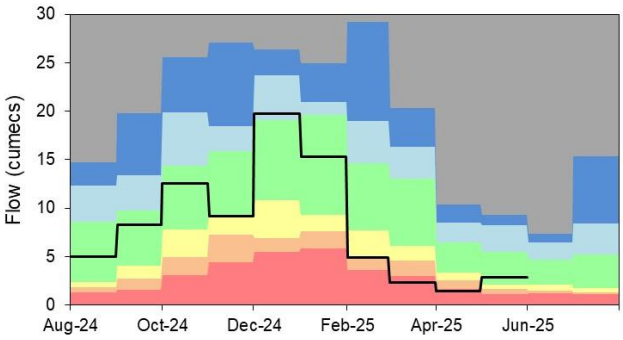
Croston, YARROW
Ranking derived from data for the period Jan-1976 to Dec-2022



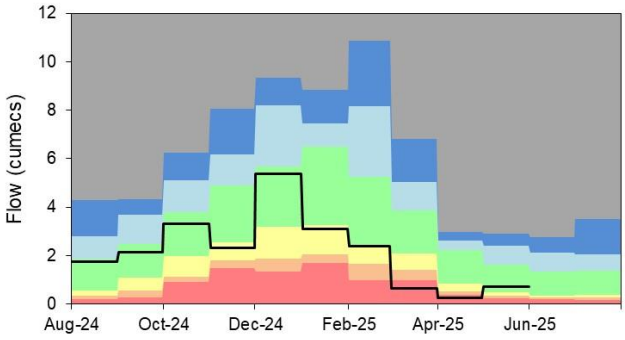
Duddon Hall, DUDDON
Ranking derived from data for the period Mar-1968 to Dec-2022



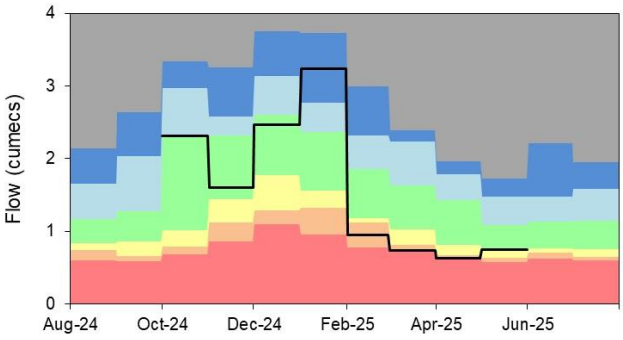
Hodder Place, HODDER
Ranking derived from data for the period Jan-1976 to Dec-2022



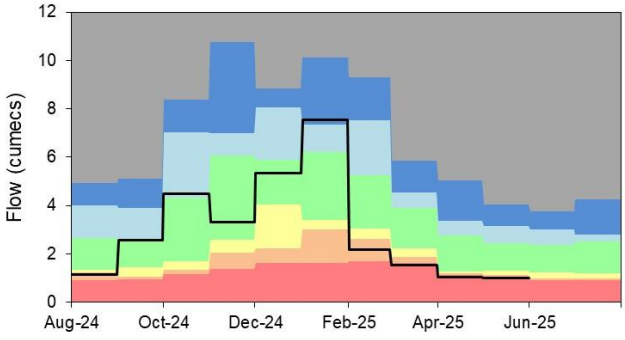
Kirkby Stephen, EDEN (NW)
Ranking derived from data for the period Oct-1971 to Dec-2022



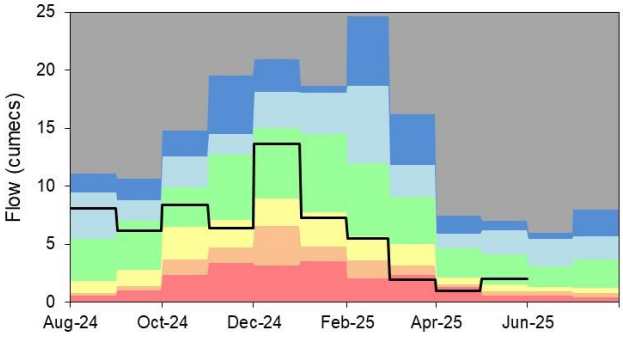
Kirkby, ALT
Ranking derived from data for the period Oct-1977 to Dec-2022



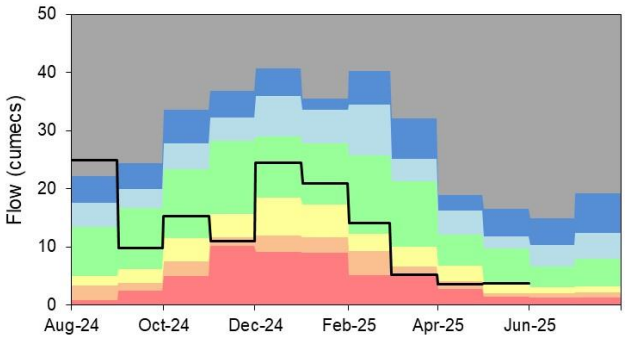
Little Woolden Hall Ultrasonic, GLAZE
Ranking derived from data for the period Jul-1995 to Dec-2022



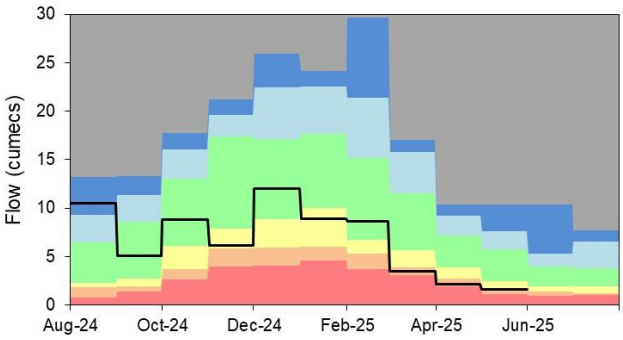
Lunes Bridge, LUNE
Ranking derived from data for the period Dec-1979 to Dec-2022



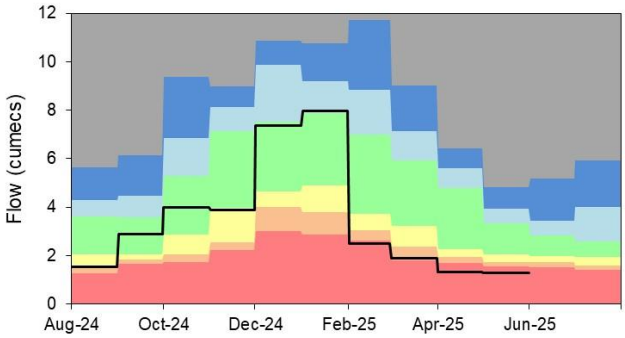
Newby Bridge FMS, LEVEN (NW)
Ranking derived from data for the period Jan-1972 to Dec-2022



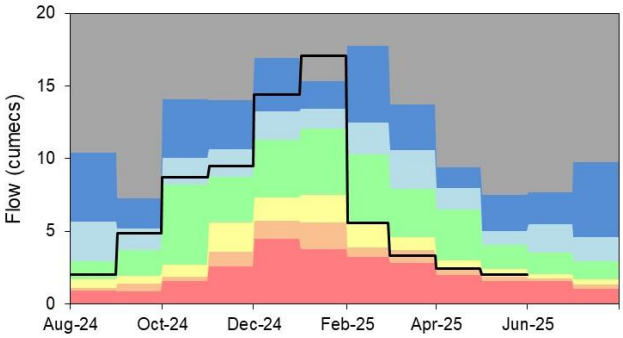
Pooley Bridge, EAMONT
Ranking derived from data for the period Jul-1970 to Dec-2022



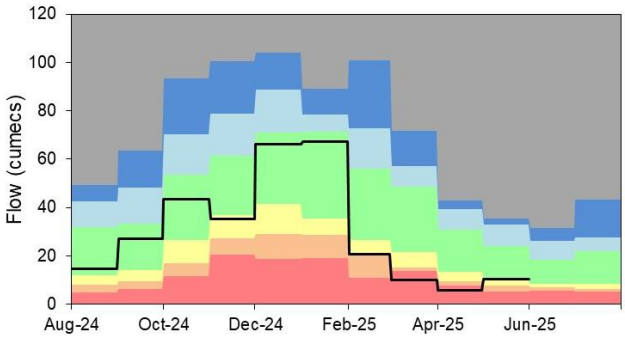
Portwood, TAME
Ranking derived from data for the period Jan-1976 to Dec-2022



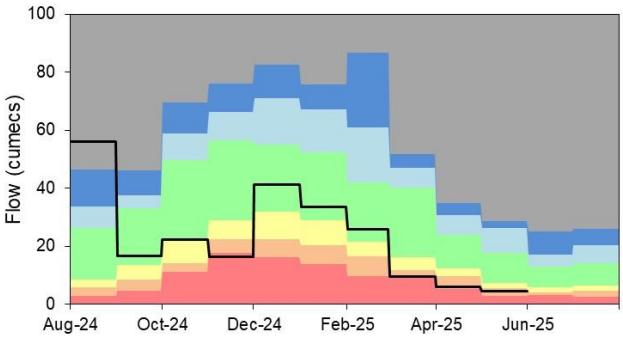
Rudheath, DANE
Ranking derived from data for the period Jan-1976 to Dec-2022

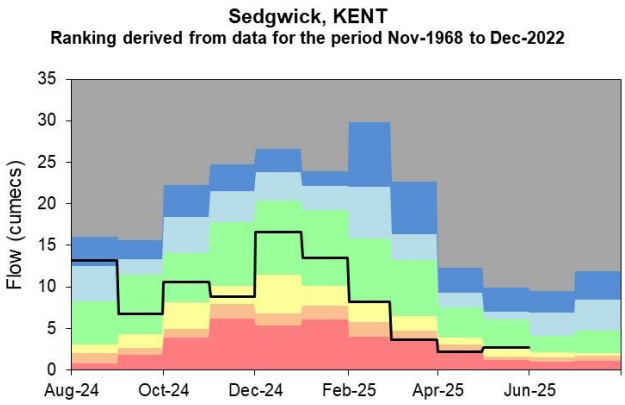


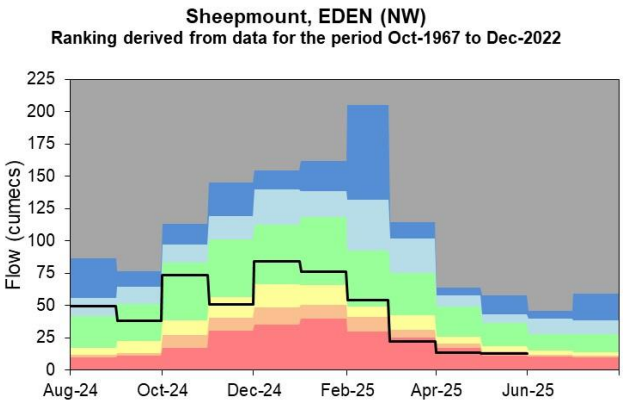
Samlesbury Pgs, RIBBLE (NW)
Ranking derived from data for the period May-1960 to Dec-2022

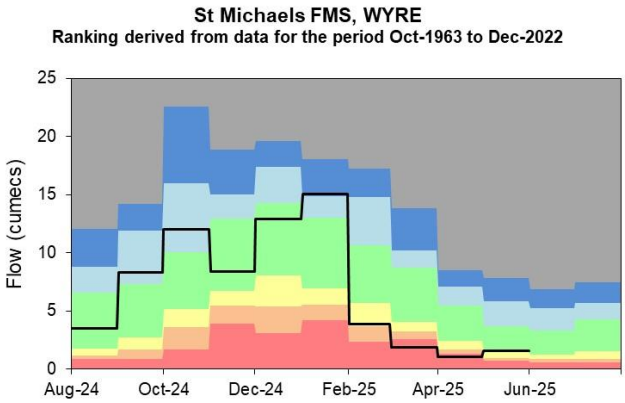


Seaton Mill, DERWENT (NW)
Ranking derived from data for the period Sep-1960 to Dec-2022







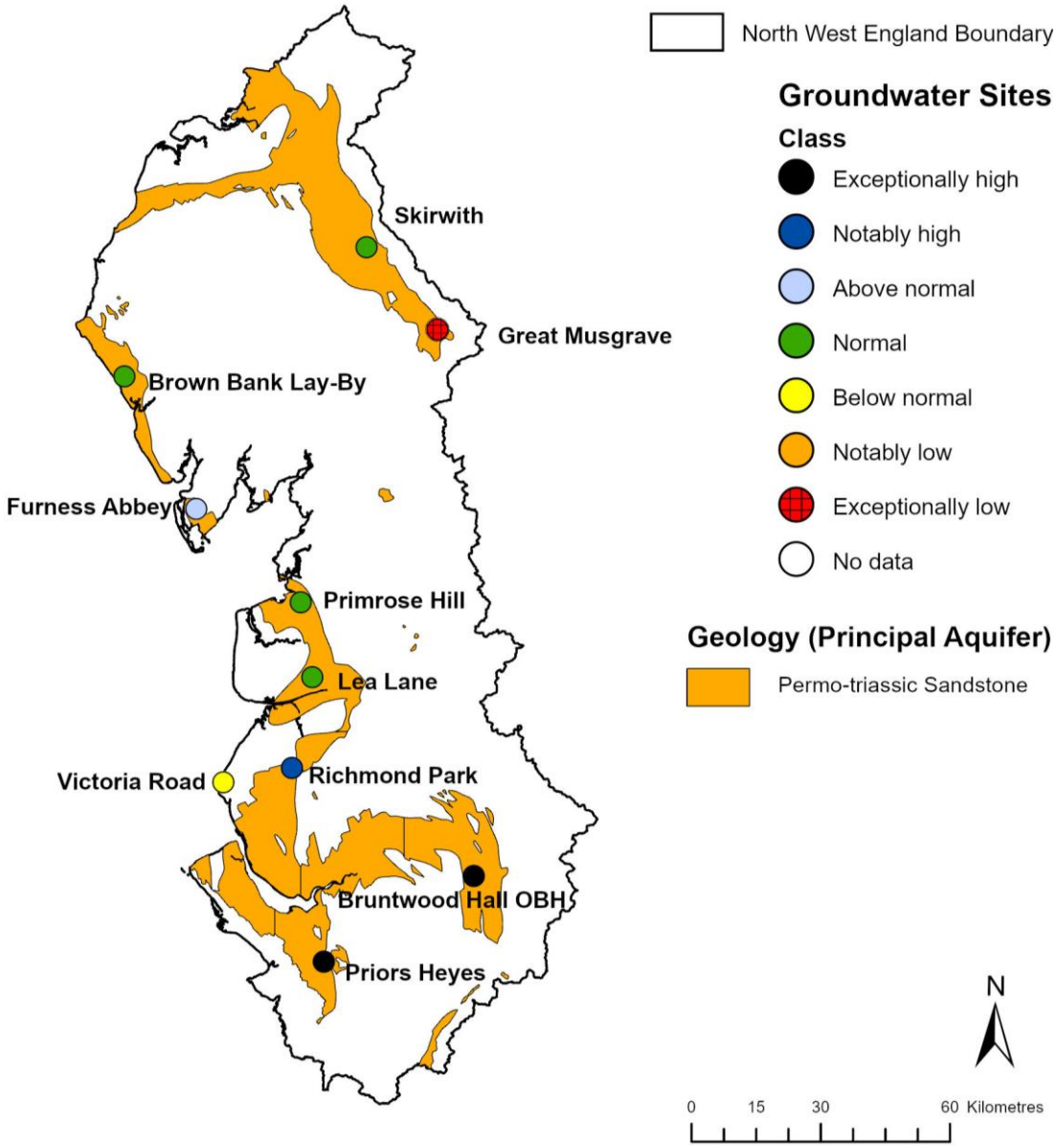


Source: Environment Agency.

5 Groundwater levels

5.1 Groundwater levels map

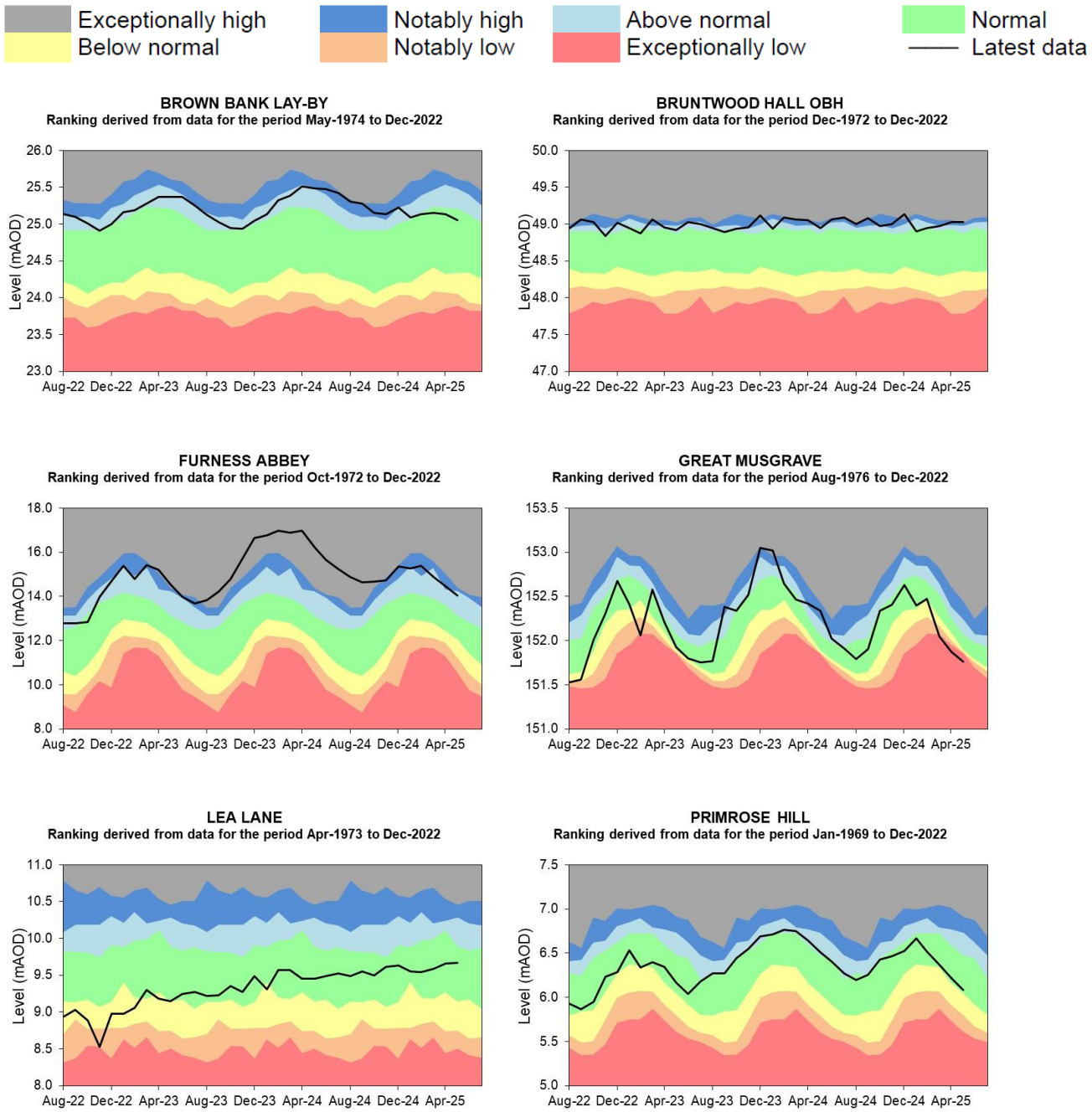
Figure 5.1: Groundwater levels for indicator sites at the end of May 2025, classed relative to an analysis of respective historic May levels. Table available in the appendices with detailed information. Please note Victoria Road Borehole sits within a superficial deposit as opposed to a bedrock aquifer.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

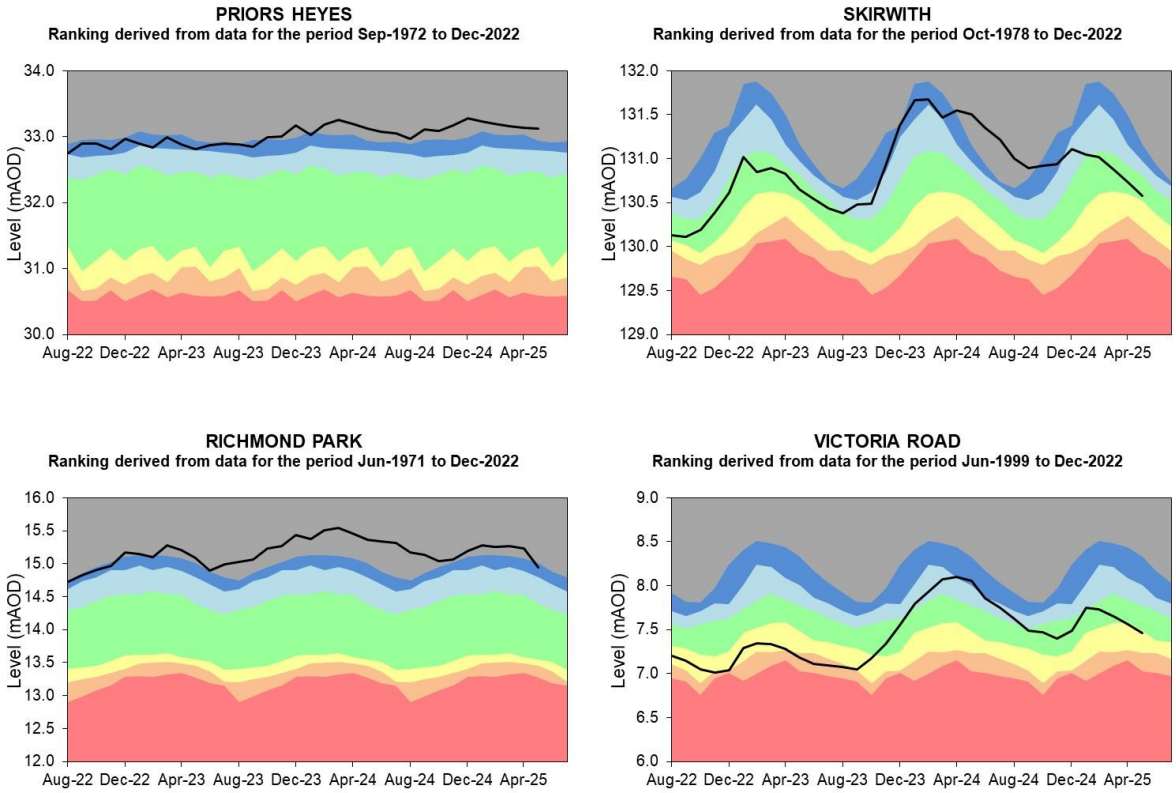


(Source: Environment Agency). Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, 100024198, 2025.

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.

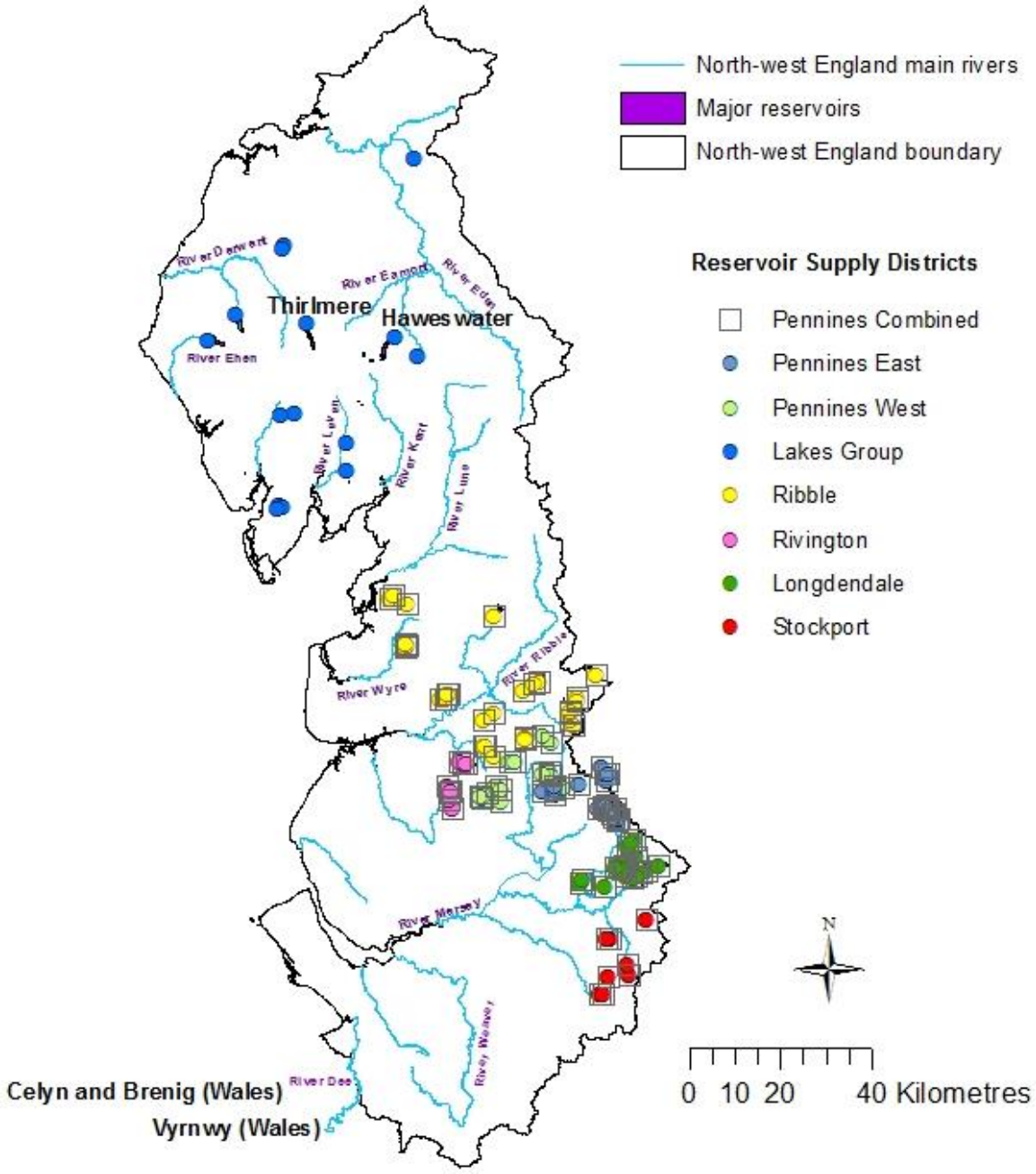
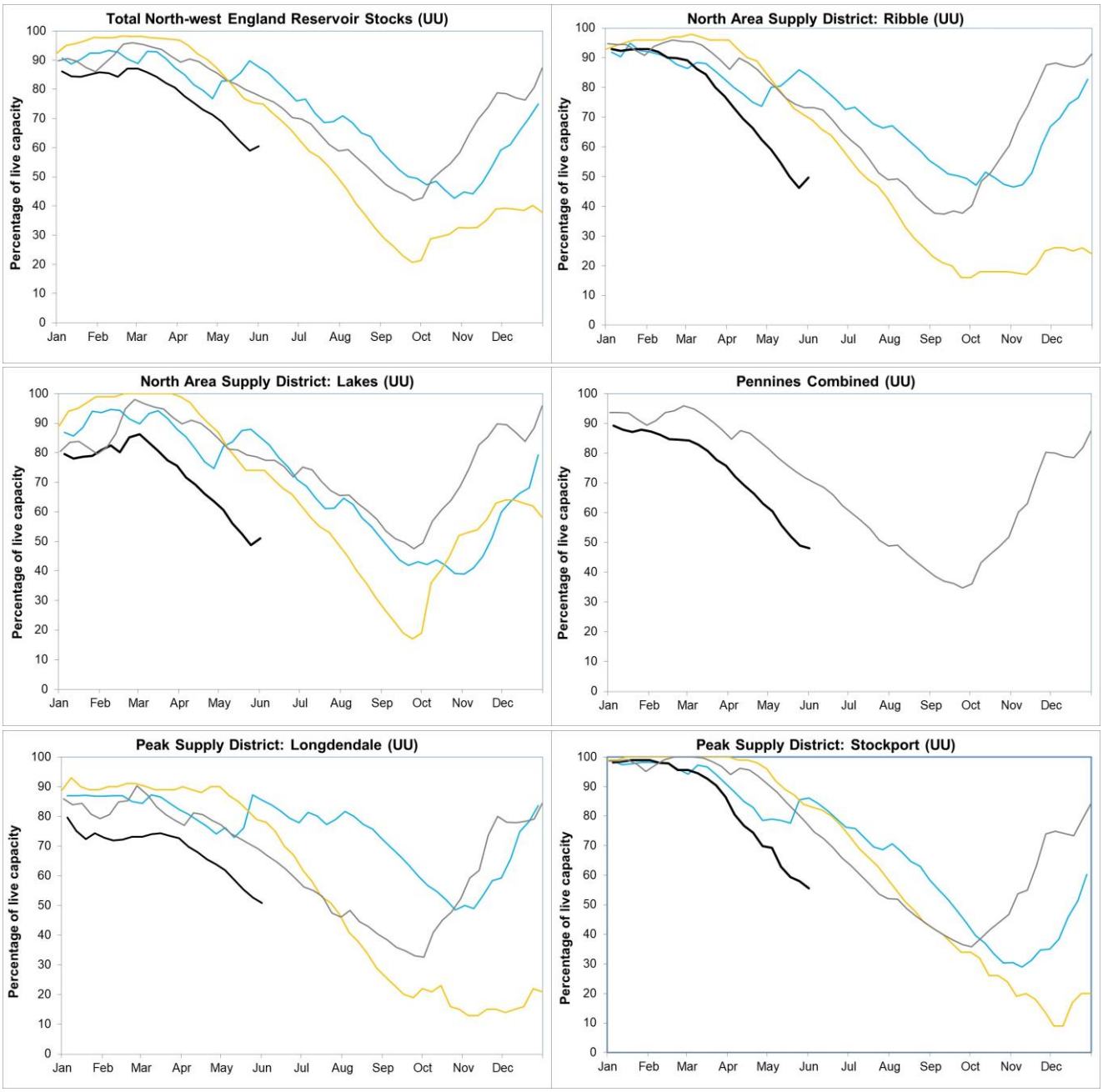
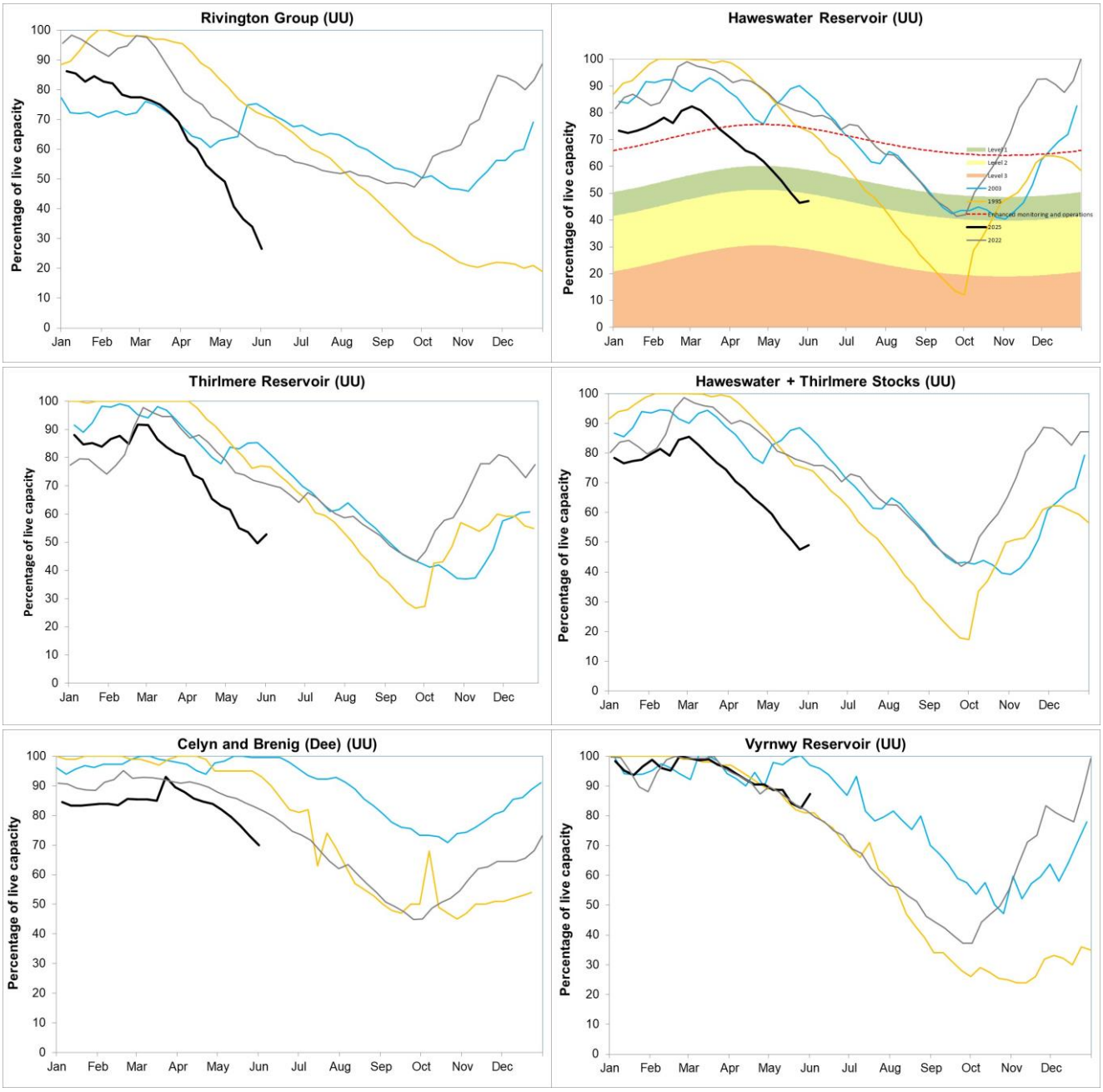


Fig 6.2: End of month reservoir stocks for supply districts across North-west England and selected individual reservoirs for current year (2025) and representative years: 1995, 2003 and 2022. Note: Historic records of individual reservoirs and reservoir groups making up the regional values vary in length.


1995
2003
2022
2025
Total North-west England Reservoir Stocks (UU)
North Area Supply District: Ribble (UU)
North Area Supply District: Lakes (UU)
Pennines Combined (UU)
Peak Supply District: Longdendale (UU)
Peak Supply District: Stockport (UU)
Percentage of live capacity
0
10
20
30
40
50
60
70
80
90
100
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec



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	May 2025 rainfall % of long term average 1991 to 2020	May 2025 band	Mar 2025 to May cumulative band	Dec 2024 to May cumulative band	Jun 2024 to May cumulative band
Cheshire Rivers Group	91	Normal	Notably low	Normal	Above normal
Derwent (NW)	105	Normal	Notably low	Below normal	Normal
Douglas	77	Normal	Exceptionally low	Normal	Normal
Eden	91	Normal	Exceptionally low	Notably low	Below normal
Esk (Cumbria)	116	Normal	Notably low	Below normal	Normal
Esk (Dumfries)	92	Normal	Exceptionally low	Exceptionally low	Exceptionally low
Kent	120	Above Normal	Notably low	Below normal	Normal
Mersey And Irwell	74	Normal	Exceptionally low	Normal	Normal
Ribble	94	Normal	Exceptionally low	Below normal	Below normal

Wyre And Lune	111	Normal	Exceptionally low	Below normal	Normal
North West	93	Normal	Exceptionally low	Below normal	Below normal

8.2 River flows table

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

Kirkby	Alt	Alt	Normal	Exceptionally low
Kirkby Stephen	Eden (NW)	Eden Cumbria Upper	Normal	Exceptionally low
Little Woolden Hall Ultrasonic	Glaze	Glaze	Exceptionally low	Exceptionally low
Lunes Bridge	Lune	Lune Upper	Normal	Exceptionally low
Newby Bridge Fms	Leven (NW)	Leven Cumbria	Below normal	Notably low
Pooley Bridge	Eamont	Eamont	Below normal	Notably low
Portwood	Tame	Tame	Exceptionally low	Exceptionally low
Rudheath	Dane	Dane	Below normal	Below normal
Samlesbury Pgs	Ribble (NW)	Ribble Lower	Normal	Exceptionally low
Seaton Mill	Derwent (NW)	Derwent Cumbria Lower	Notably low	Notably low
Sedgwick	Kent	Levens Bridge	Normal	Notably low
Sheepmount	Eden (NW)	Eden Cumbria Lower	Notably low	Exceptionally low
St Michaels Fms	Wyre	Brock	Normal	Exceptionally low

8.3 Groundwater table

Site name	Aquifer	End of May 2025 band	End of Apr 2025 band
Brown Bank Lay-by	West Cumbria Permo-triassic Sandstone	Normal	Normal
Bruntwood Hall Obh	East Cheshire Permo-triassic Sandstone	Exceptionally high	Notably high
Furness Abbey	Furness Permo-triassic Sandstone	Above normal	Notably high
Great Musgrave	Eden Valley And Carlisle Basin Permo-triassic Sandstone	Exceptionally low	Exceptionally 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	Notably high	Exceptionally 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