Monthly water situation report: North-west England

1 Summary – March 2025

1.1 Rainfall

Rainfall for north-west England during March was classed as exceptionally low with 33% of the long-term average (LTA). The Cumbria and Lancashire area observed 33% of the LTA classed as exceptionally low while the Greater Manchester Merseyside and Cheshire (GMC) received 32% classed as notably low.

Over the course of March rainfall observed for the hydrological areas across north-west England was classed between notably low and exceptionally low. Six hydrological areas were classed as notably low and four were classed as exceptionally low. The highest rainfall (in terms of the LTA) was observed in the Esk (Dumfries) with 36% of the LTA classed as exceptionally low and the lowest was observed in the Ribble with 30% of the LTA also classed as exceptionally low. All hydrological areas except for the Douglas received rainfall within their top ten lowest for March since 1871. Rainfall was low throughout north-west England for March and spread evenly across the whole area with no high points.

Cumulative rainfall over the past 3 months was classed between normal and exceptionally low with lower rainfall being seen further north and higher rainfall further south. The lowest rainfall was in the Esk (Dumfries) with 57% of the LTA classed as exceptionally low. The highest was in Cheshire Rivers Group hydrological area with 83% of the LTA classed as normal.

The 6-month cumulative rainfall totals show a similar pattern to the 3-month totals with higher rainfall being observed further south and lower toward the north. The 6-month cumulative rainfall was classed between above normal and notably low with the highest (in terms of LTA) again being seen in Cheshire Rivers Group with 109% of the LTA classed as above normal and the lowest being recorded in the Esk (Dumfries) and Derwent hydrological areas both with 78% of the LTA and being classed as notably low and below normal respectively.

The 12-month cumulative rainfall totals for north-west England were classed between exceptionally high and normal. The highest rainfall (in terms of LTA) was once again recorded in the Cheshire Rivers Group with 127% of the LTA classed as exceptionally high and the lowest in the Ribble with 98% of the LTA classed as normal. Unlike the 3-month and 6-month cumulative rainfall totals there is less of a clear pattern in spatial variability.

1.2 Soil moisture deficit and recharge

Low rainfall during March across the north-west of England resulted in a noticeable increase in soil moisture deficit from the saturated conditions at the end of February. SMD levels fell between 0 and 40mm and were slightly higher than expected for the time of year except in north Cumbria where they were as expected.

1.3 River flows

As a result of the low rainfall during March there was a further reduction in river flows across north-west England with many of the sites beginning to report low flow alarms. Monthly mean river flows for north-west England for March were classed between below normal and exceptionally low, two being classed as below normal, seven as notably low and 16 as exceptionally low with the lowest flows being observed in CLA and the higher ones in GMC. The highest monthly mean river flow (in terms of LTA) was recorded in the River Bollin at Bollington Mill with 55% of the LTA classed as Exceptionally low and the lowest was in the River Eden at Kirkby Stephen with 21% of the LTA also classed as exceptionally low.

1.4 Groundwater levels

Groundwater levels across north-west England at the end of March were classed as between exceptionally high and exceptionally low. Two sites have changed classification since the end of February.

- Furness Abbey decreased from notably high to above normal.
- Great Musgrave decreased from normal to exceptionally low.

All other sites remained the same classification at:

- Brown bank lay by as normal.
- Bruntwood Hall as above normal.
- Lea Lane as normal.
- Primrose Hill as normal.
- Skirwith as normal.
- Victoria Road as normal.
- Priors Heyes as exceptionally high.
- Richmond Park as exceptionally high.

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 87% at the end of February to 81% at the end of March. This is lower than the average of 94% at this time of year as well as lower than this time last year when total reservoir stocks were 93%.

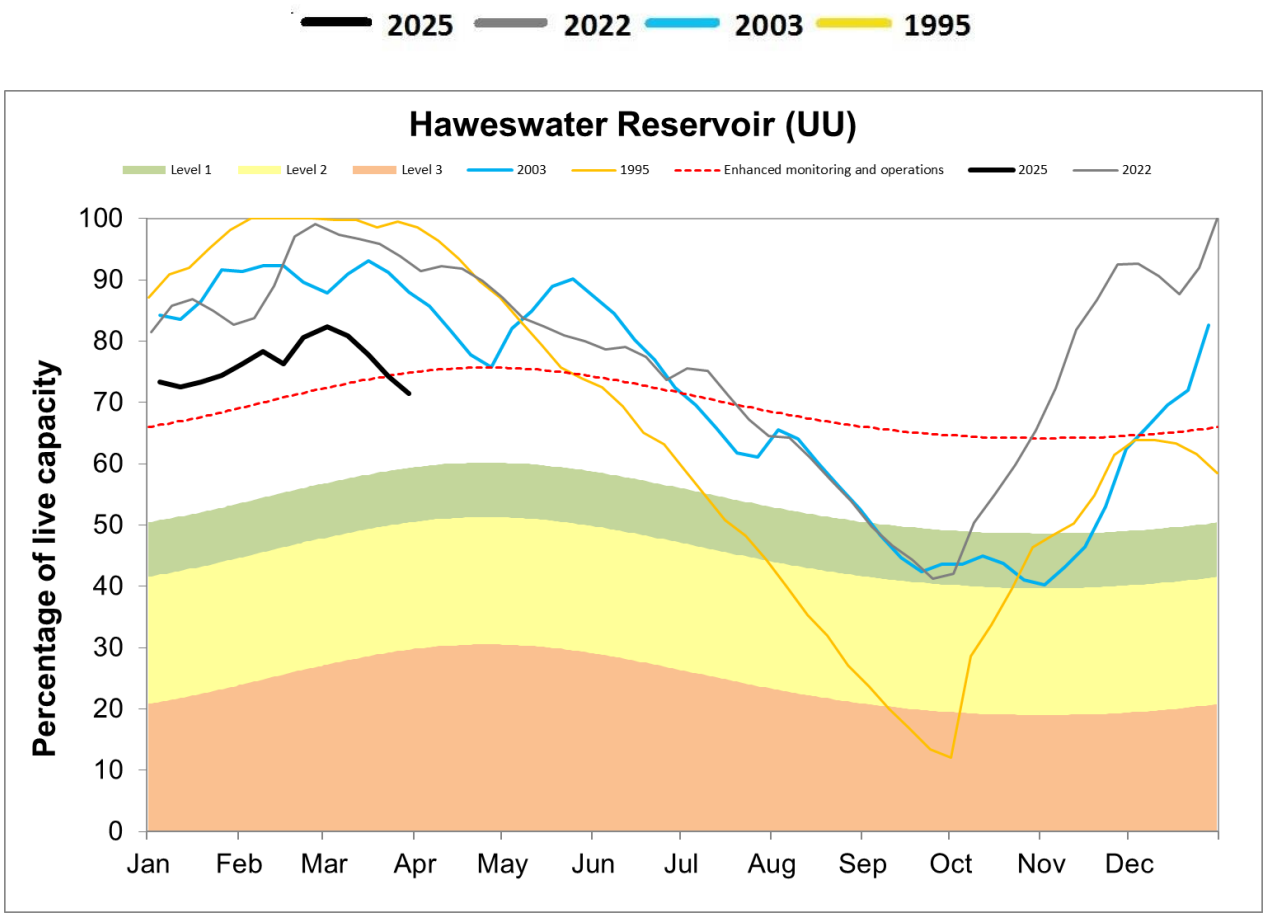
At the end of March reservoir storage (in terms of percentage) was highest at Crummock water at 100% full and lowest at Rivington at 69%.

The combined storage at Haweswater and Thirlmere was 75% being lower than the 94% average storage at this time of year and lower than last year when storage was 98%. Haweswater storage is the lowest it has been at the end of March since records began in 1980.

Reservoirs kept low for maintenance 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

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)).

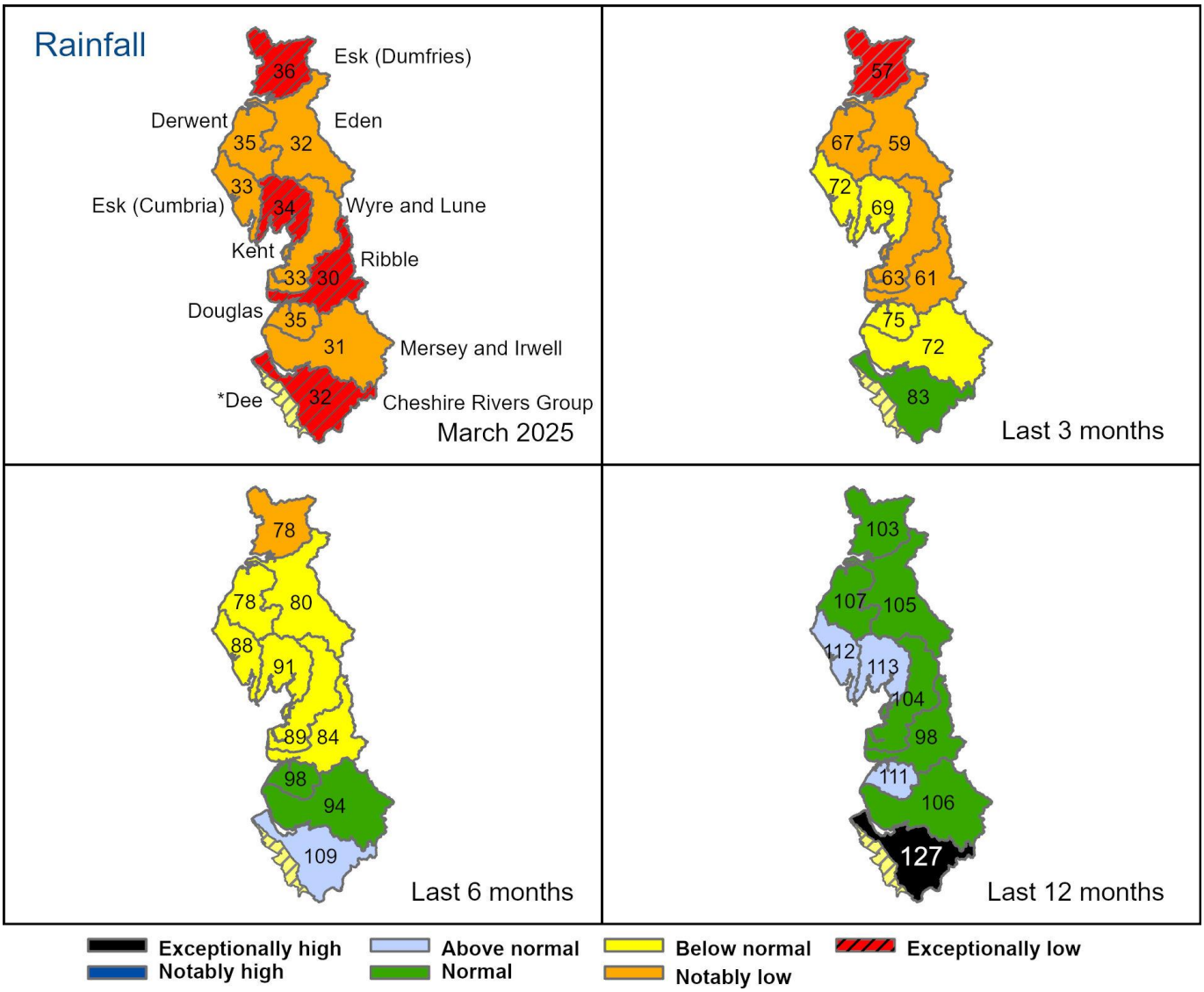


Author: Greater Manchester, Merseyside and Cheshire, hydrology.GMMYCH@environment-agency.gov.uk

2 Rainfall

2.1 Rainfall map

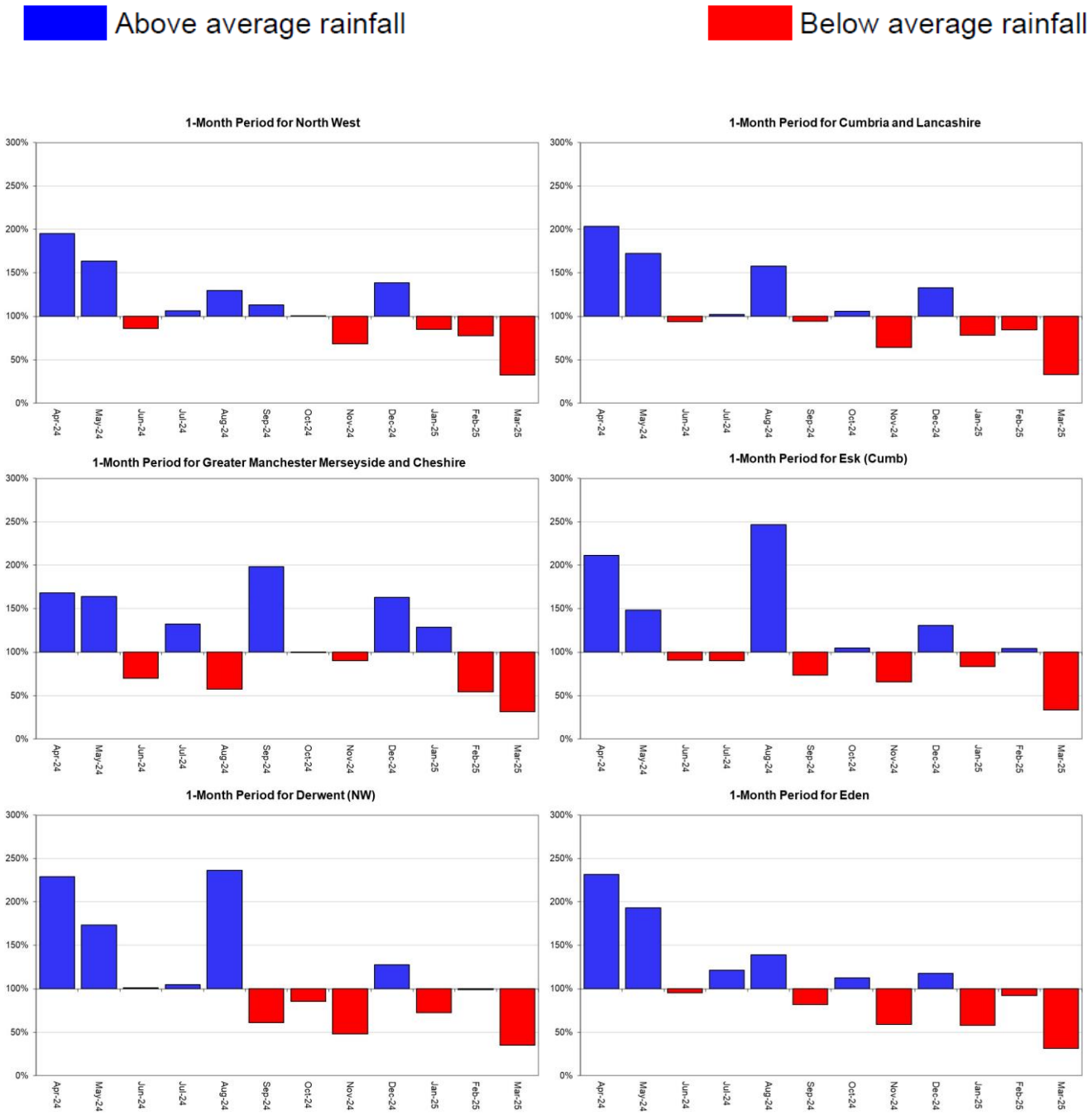
Figure 2.1: Total rainfall (as a percentage) for hydrological areas for the current month (up to 31 March 2025), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.

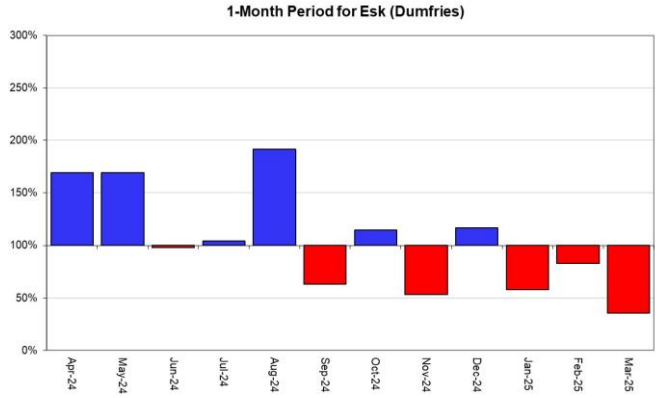


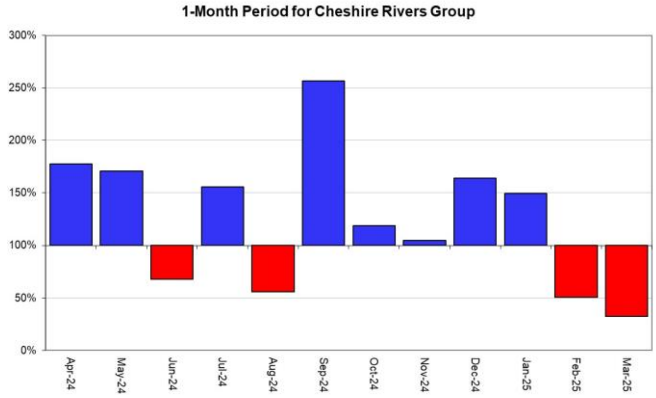
Rainfall data since 2023, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2025). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived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

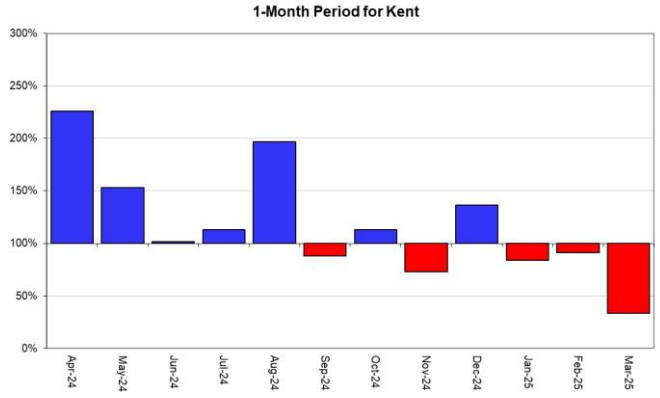
2.2 Rainfall charts

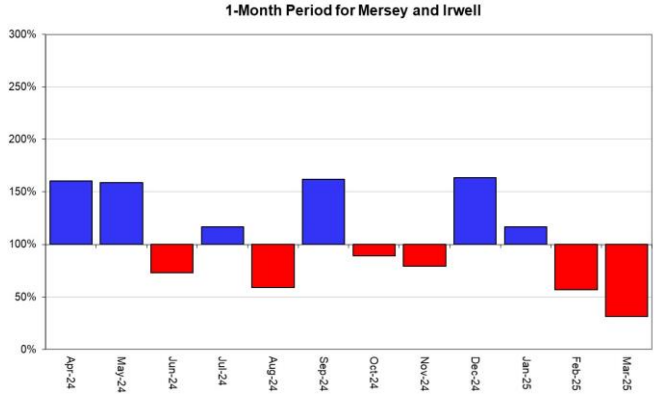
Figure 2.2: Monthly rainfall totals for the past 12 months expressed as a percentage of the 1961 to 1990 long term average for North-west England and its hydrological areas.

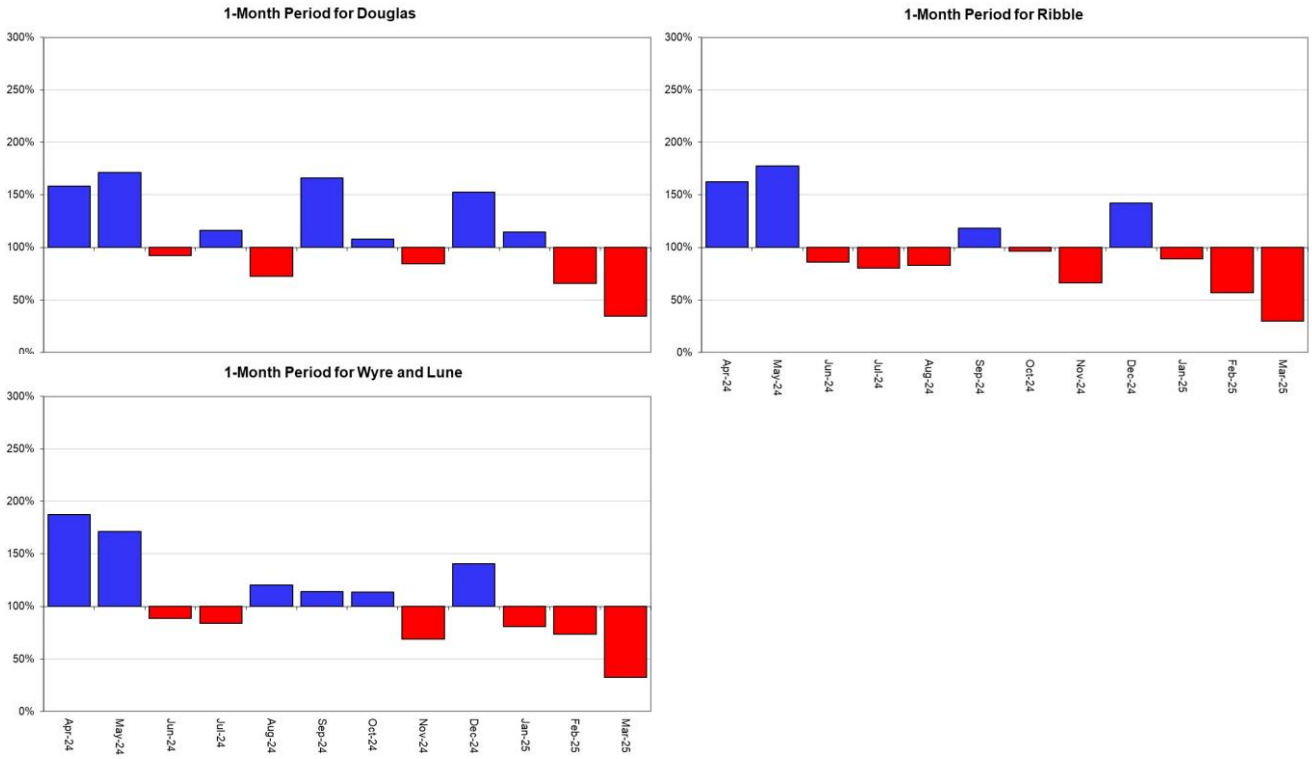



1-Month Period for Esk (Dumfries)
300%
250%
200%
150%
100%
50%
0%
Apr-24
May-24
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24
Nov-24
Dec-24
Jan-25
Feb-25
Mar-25


1-Month Period for Cheshire Rivers Group
300%
250%
200%
150%
100%
50%
0%
Apr-24
May-24
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24
Nov-24
Dec-24
Jan-25
Feb-25
Mar-25


1-Month Period for Kent
300%
250%
200%
150%
100%
50%
0%
Apr-24
May-24
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24
Nov-24
Dec-24
Jan-25
Feb-25
Mar-25


1-Month Period for Mersey and Irwell
300%
250%
200%
150%
100%
50%
0%
Apr-24
May-24
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24
Nov-24
Dec-24
Jan-25
Feb-25
Mar-25

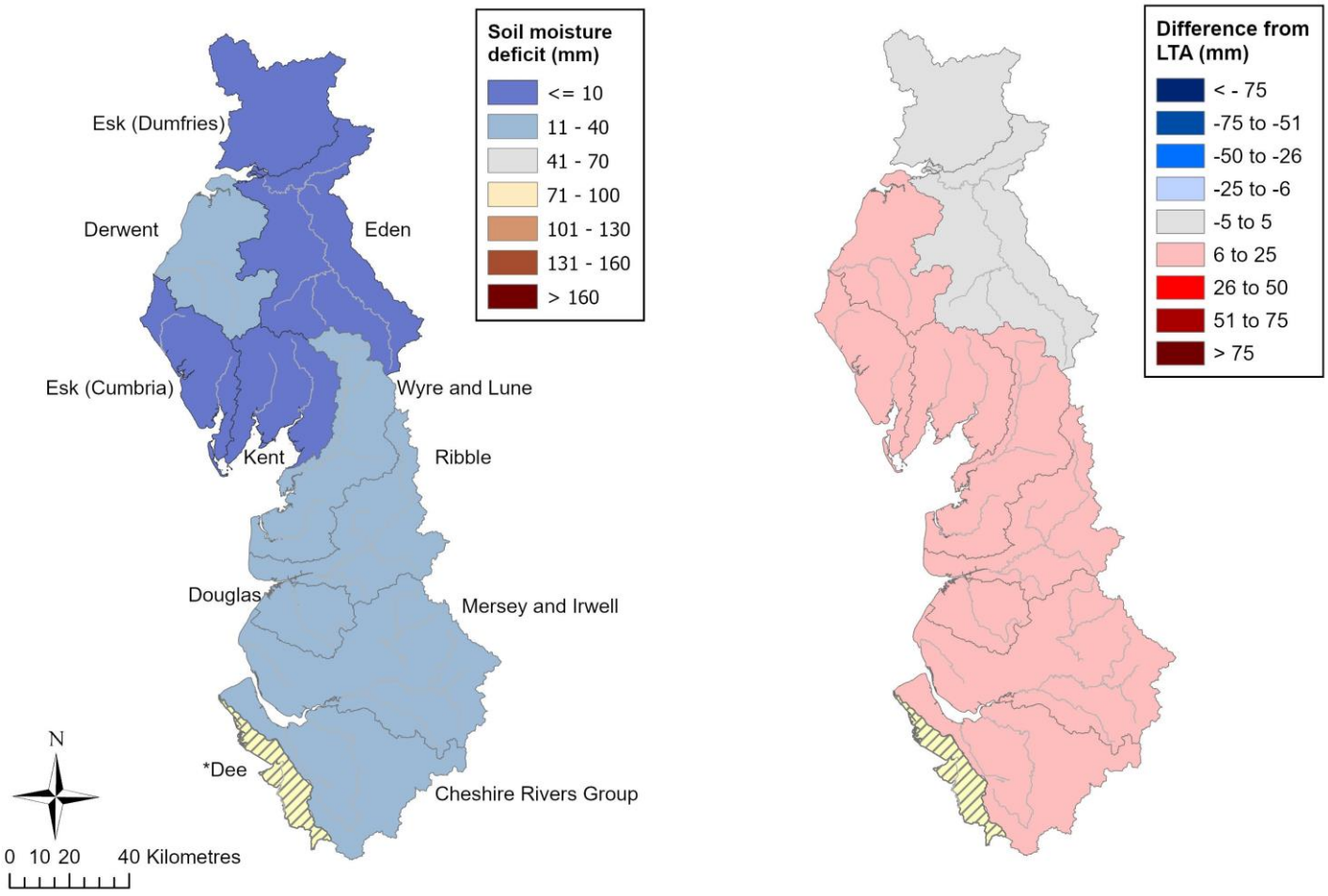


Rainfall data since 2023, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2025). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived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

3 Soil moisture deficit

3.1 Soil moisture deficit map

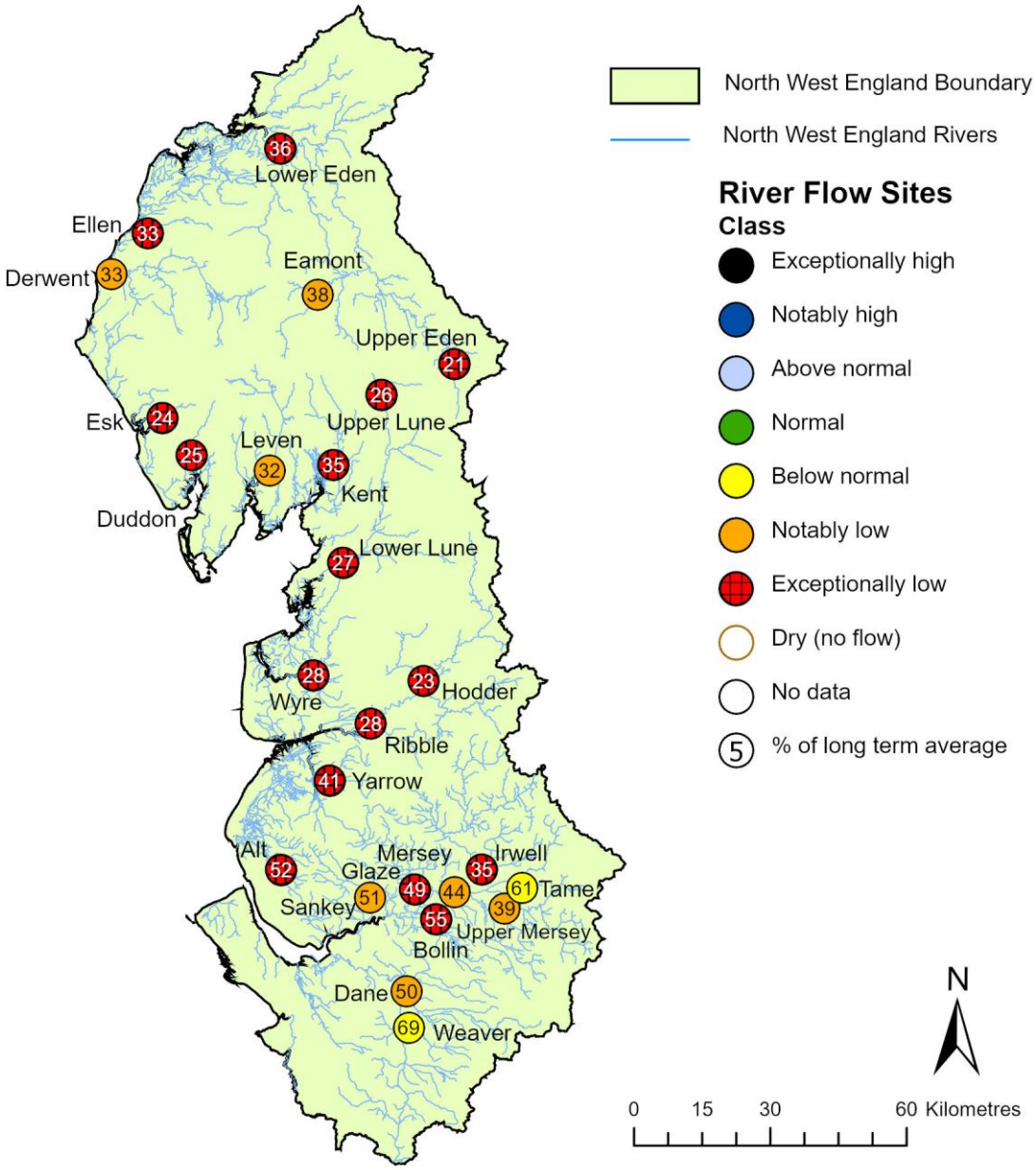
Figure 3.1: Soil moisture deficits for weeks ending 27 March 2025[1] (left panel) and Difference from LTA 27 March 2025[2] (right panel).



4 River flows

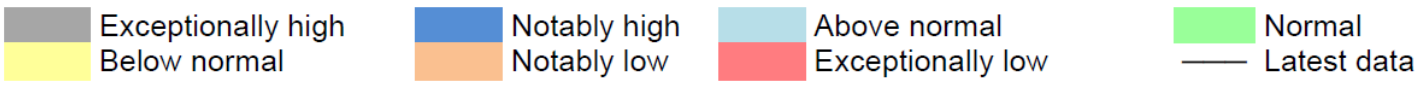
4.1 River flows map

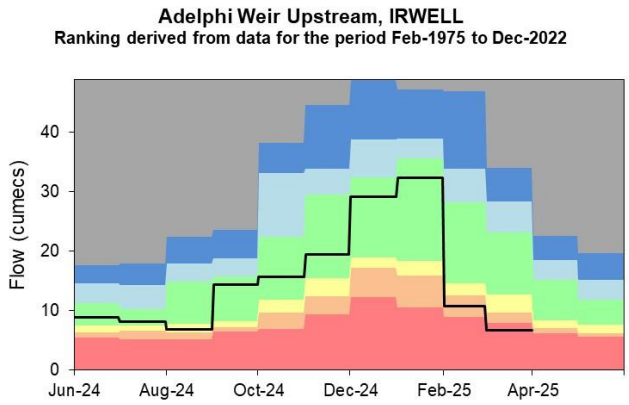
Figure 4.1: Monthly mean river flow for indicator sites for March 2025, expressed as a percentage of the respective long term average and classed relative to an analysis of historic March monthly means. Table available in the appendices with detailed information.

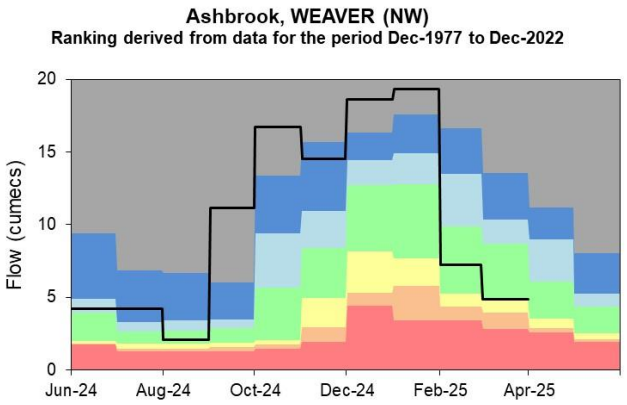


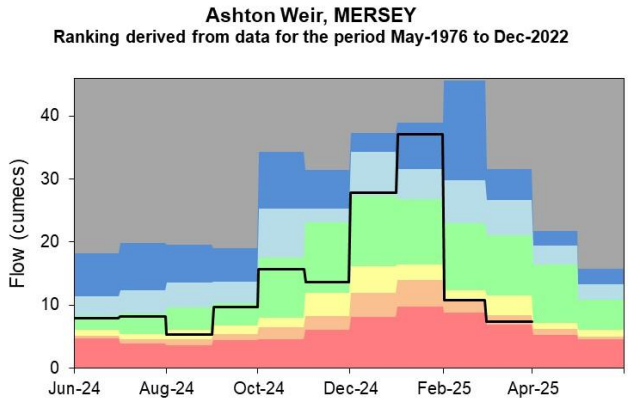
4.2 River flow charts

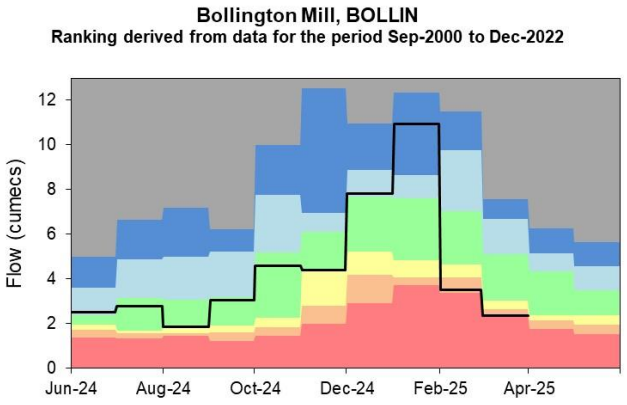
Figure 4.2: Monthly mean river flow for index sites over the past year, compared to an analysis of historic monthly mean flows.



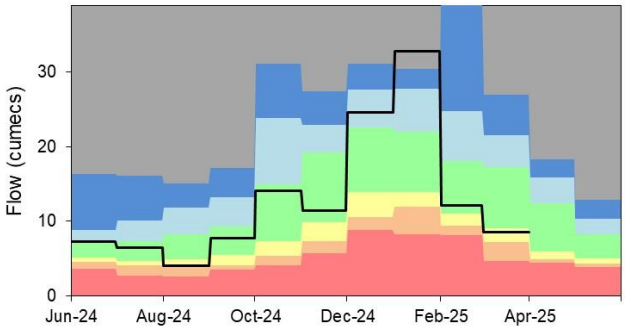




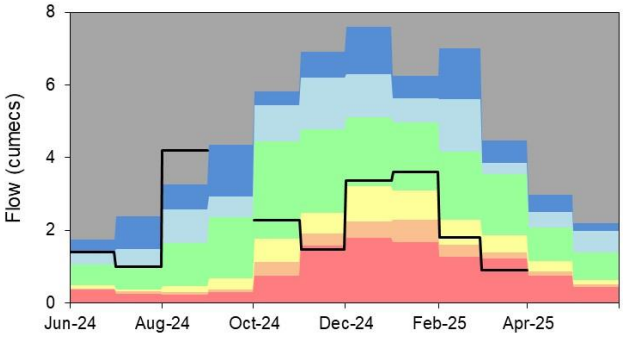




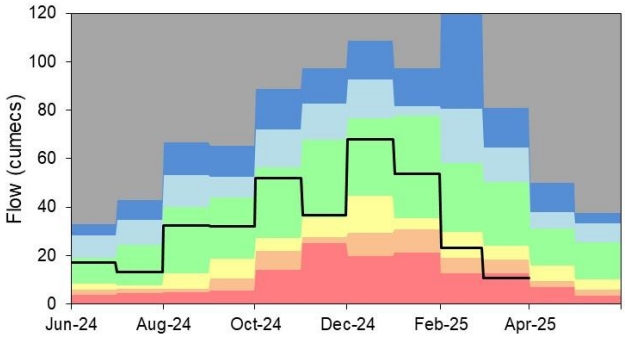
Brinksway, MERSEY
Ranking derived from data for the period Jan-1974 to Dec-2022



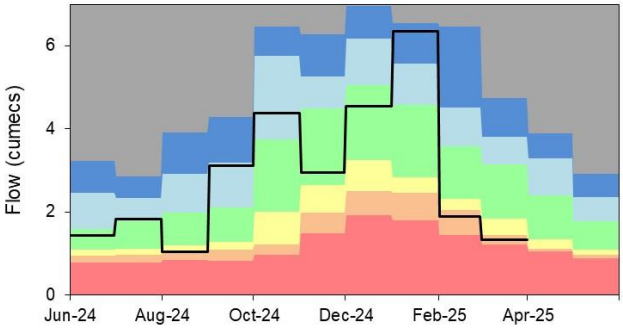
Bullgill, ELLEN
Ranking derived from data for the period Jan-1976 to Dec-2022



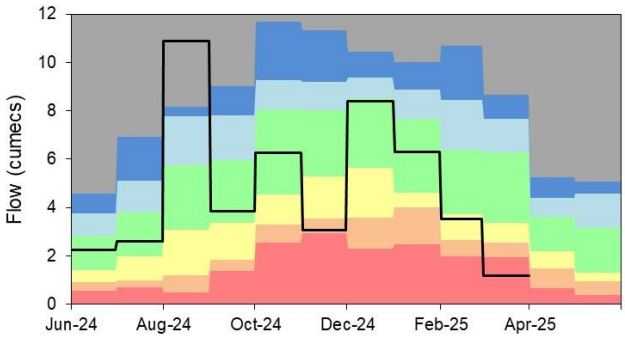
Caton, LUNE
Ranking derived from data for the period Jan-1959 to Dec-2022



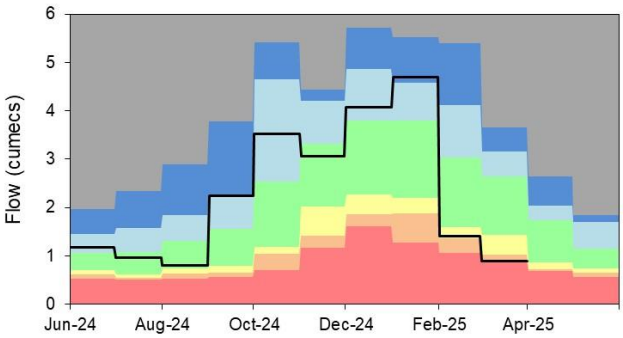
Causey Bridges, SANKEY
Ranking derived from data for the period Jan-1977 to Dec-2022



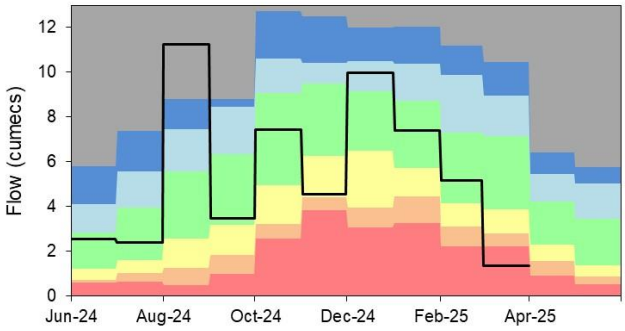
Cropple How, ESK (NW)
Ranking derived from data for the period Jan-1976 to Dec-2022



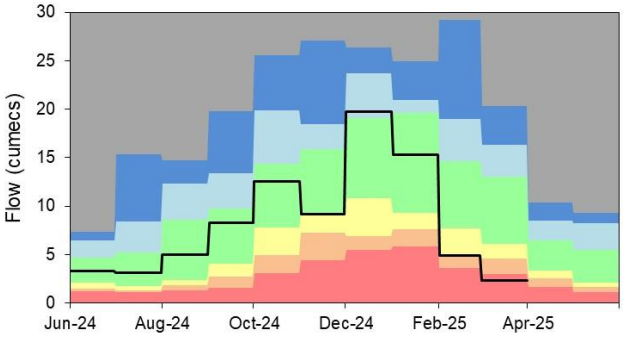
Croston, YARROW
Ranking derived from data for the period Jan-1976 to Dec-2022



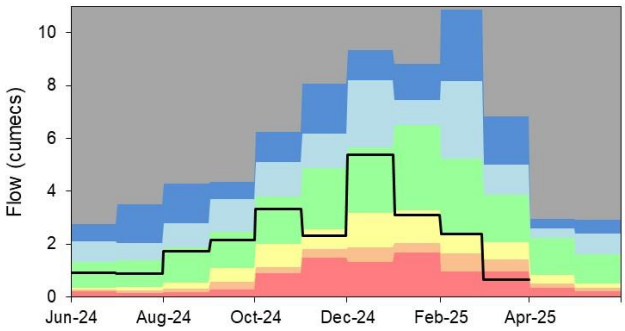
Duddon Hall, DUDDON
Ranking derived from data for the period Mar-1968 to Dec-2022



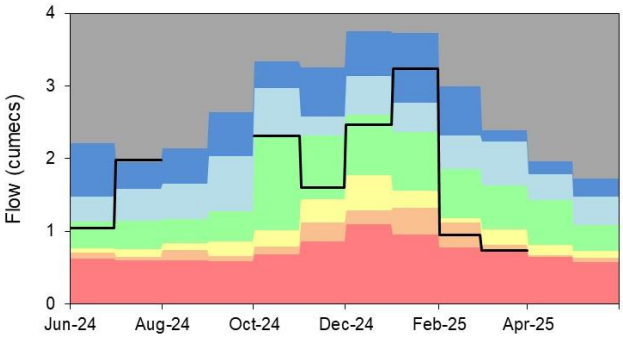
Hodder Place, HODDER
Ranking derived from data for the period Jan-1976 to Dec-2022



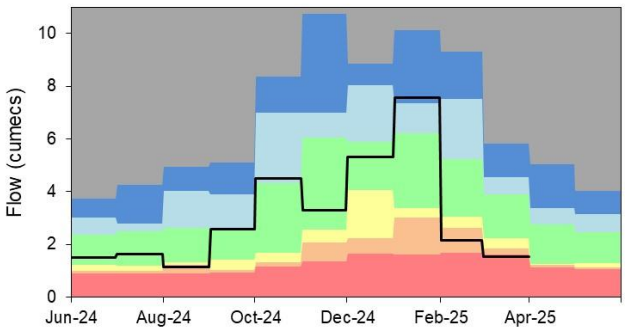
Kirkby Stephen, EDEN (NW)
Ranking derived from data for the period Oct-1971 to Dec-2022



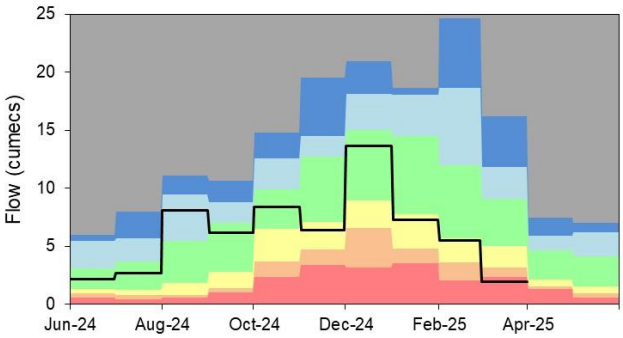
Kirkby, ALT
Ranking derived from data for the period Oct-1977 to Dec-2022



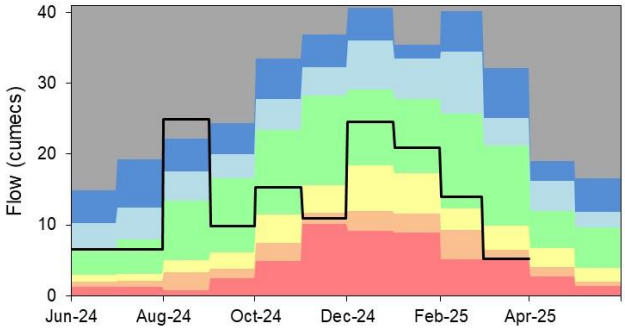
Little Woolden Hall Ultrasonic, GLAZE
Ranking derived from data for the period Jul-1995 to Dec-2022



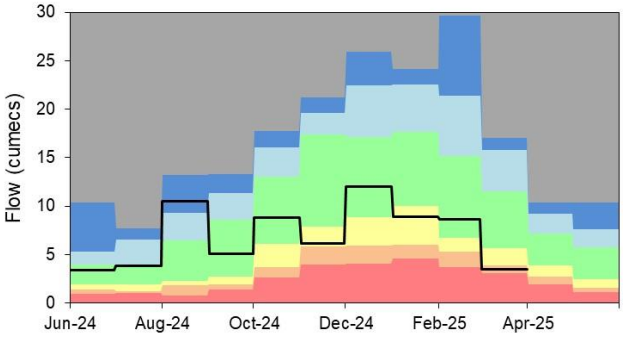
Lunes Bridge, LUNE
Ranking derived from data for the period Dec-1979 to Dec-2022



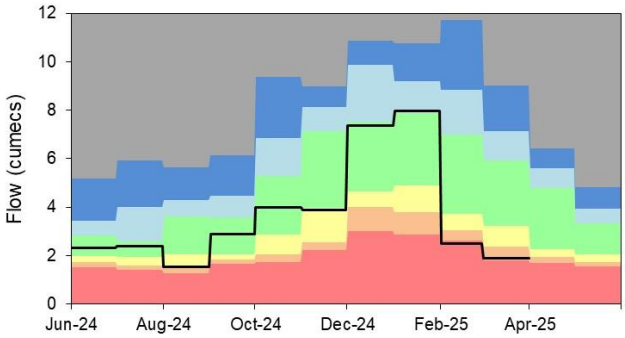
Newby Bridge FMS, LEVEN (NW)
Ranking derived from data for the period Jan-1972 to Dec-2022



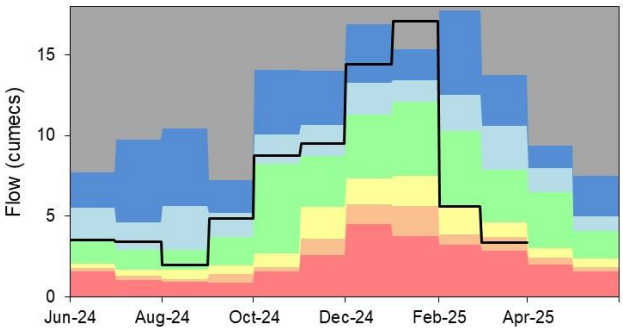
Pooley Bridge, EAMONT
Ranking derived from data for the period Jul-1970 to Dec-2022



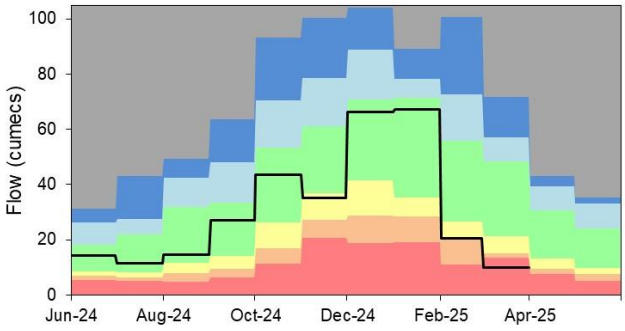
Portwood, TAME
Ranking derived from data for the period Jan-1976 to Dec-2022



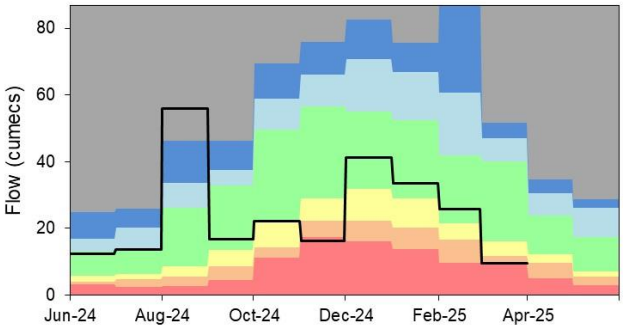
Rudheath, DANE
Ranking derived from data for the period Jan-1976 to Dec-2022

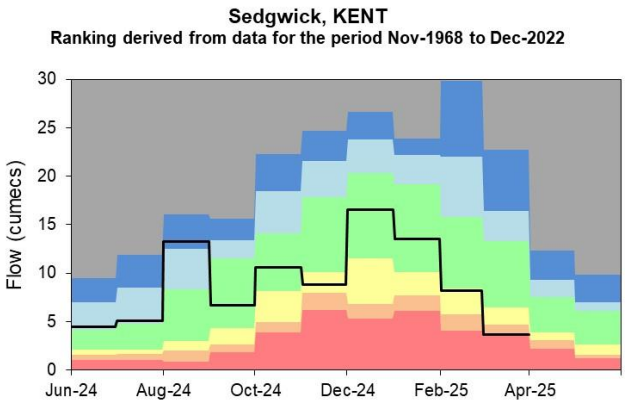


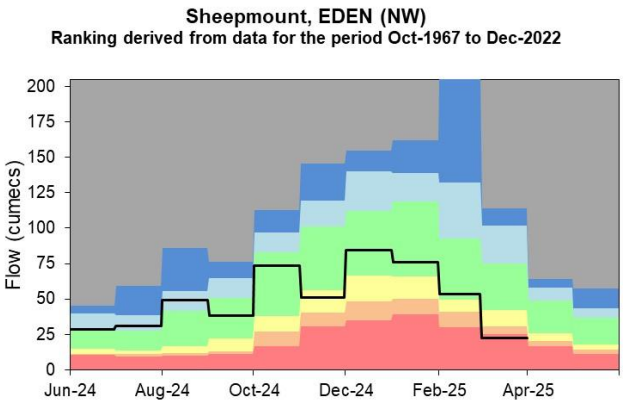
Samlesbury Pgs, RIBBLE (NW)
Ranking derived from data for the period May-1960 to Dec-2022

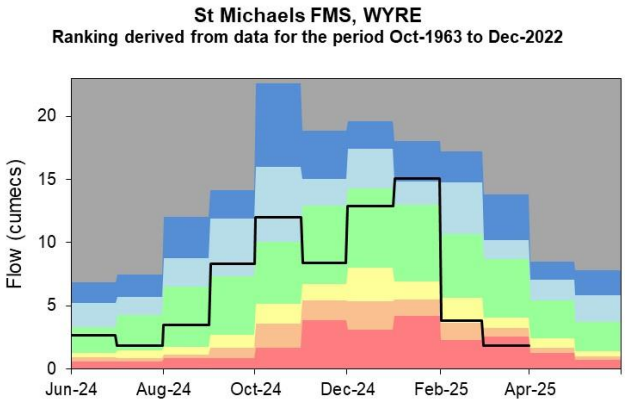


Seaton Mill, DERWENT (NW)
Ranking derived from data for the period Sep-1960 to Dec-2022







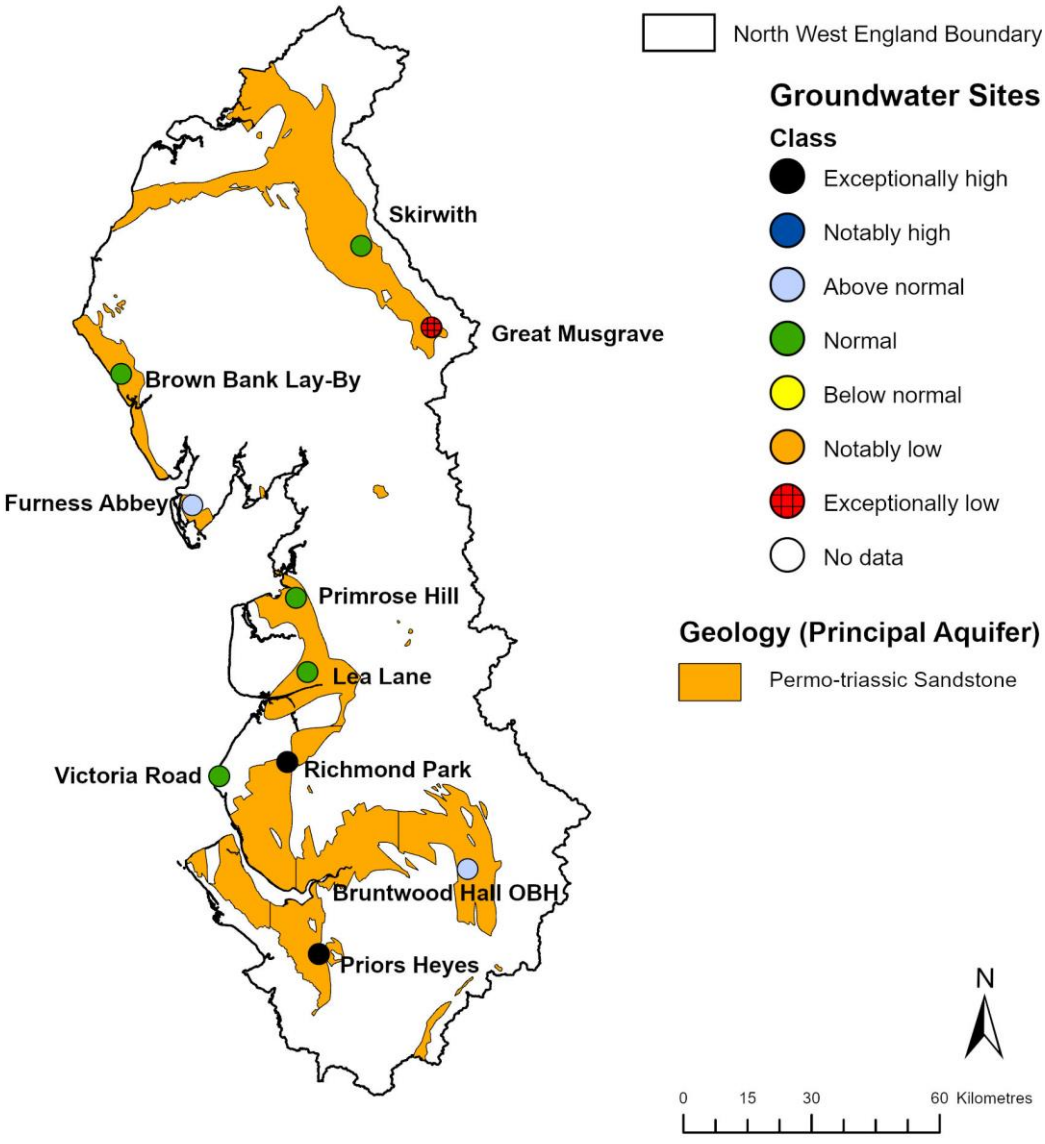


Source: Environment Agency.

5 Groundwater levels

5.1 Groundwater levels map

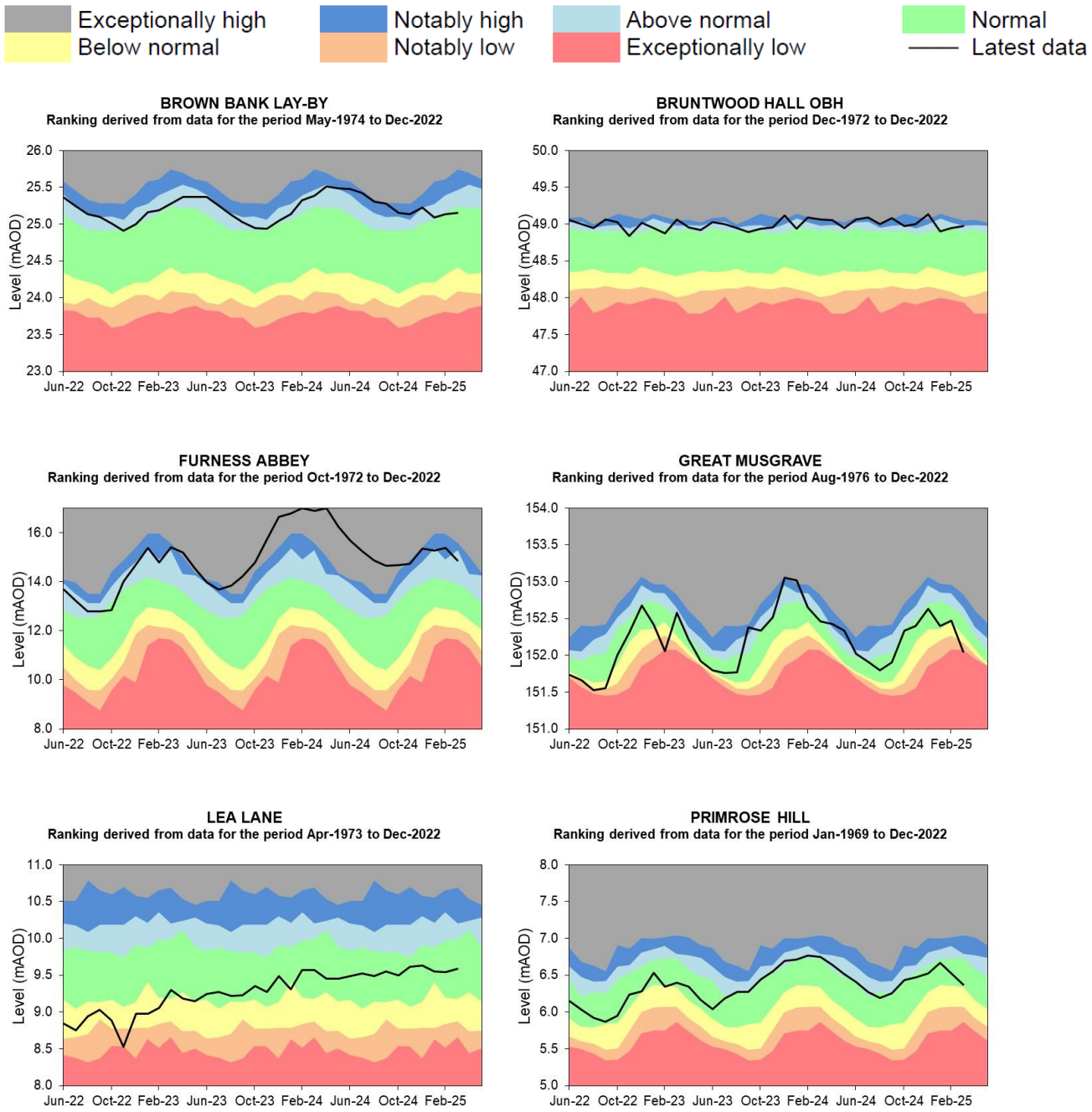
Figure 5.1: Groundwater levels for indicator sites at the end of March 2025, classed relative to an analysis of respective historic March levels. Table available in the appendices with detailed information. Please note Victoria Road Borehole sits within a superficial deposit as opposed to a bedrock aquifer.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

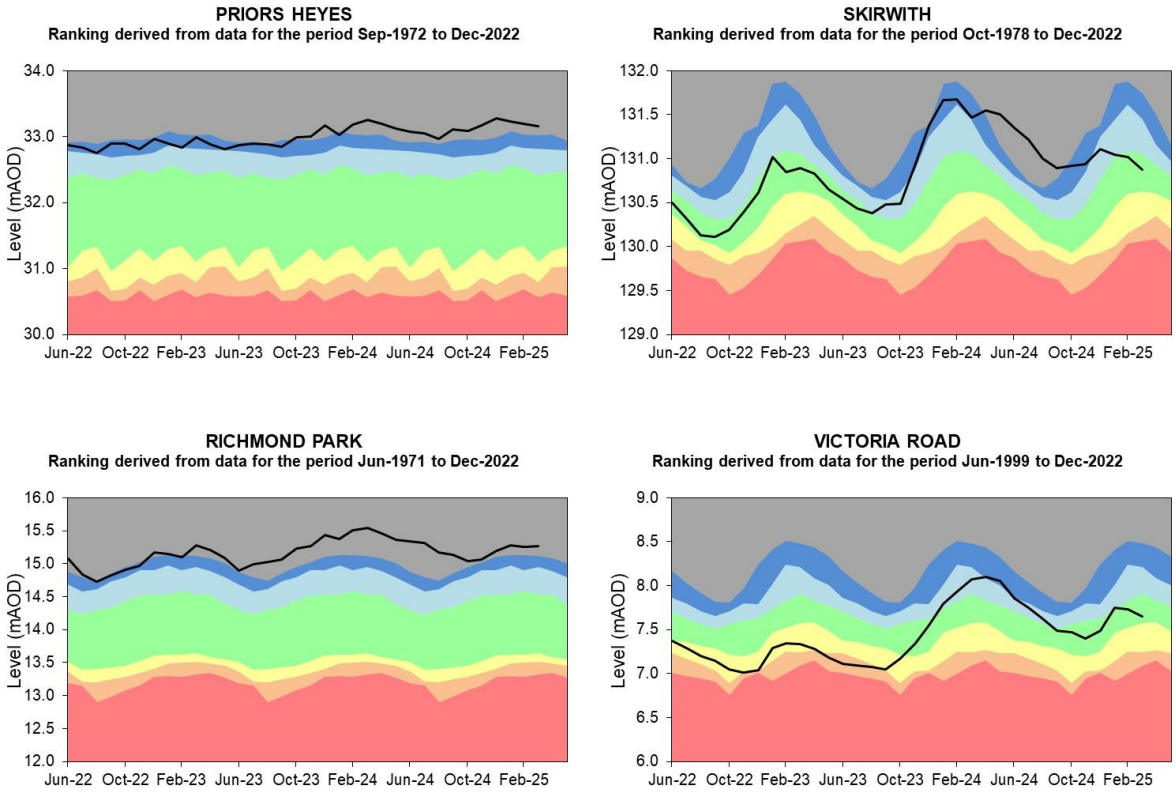


(Source: Environment Agency). Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, 100024198, 2025.

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 storage

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

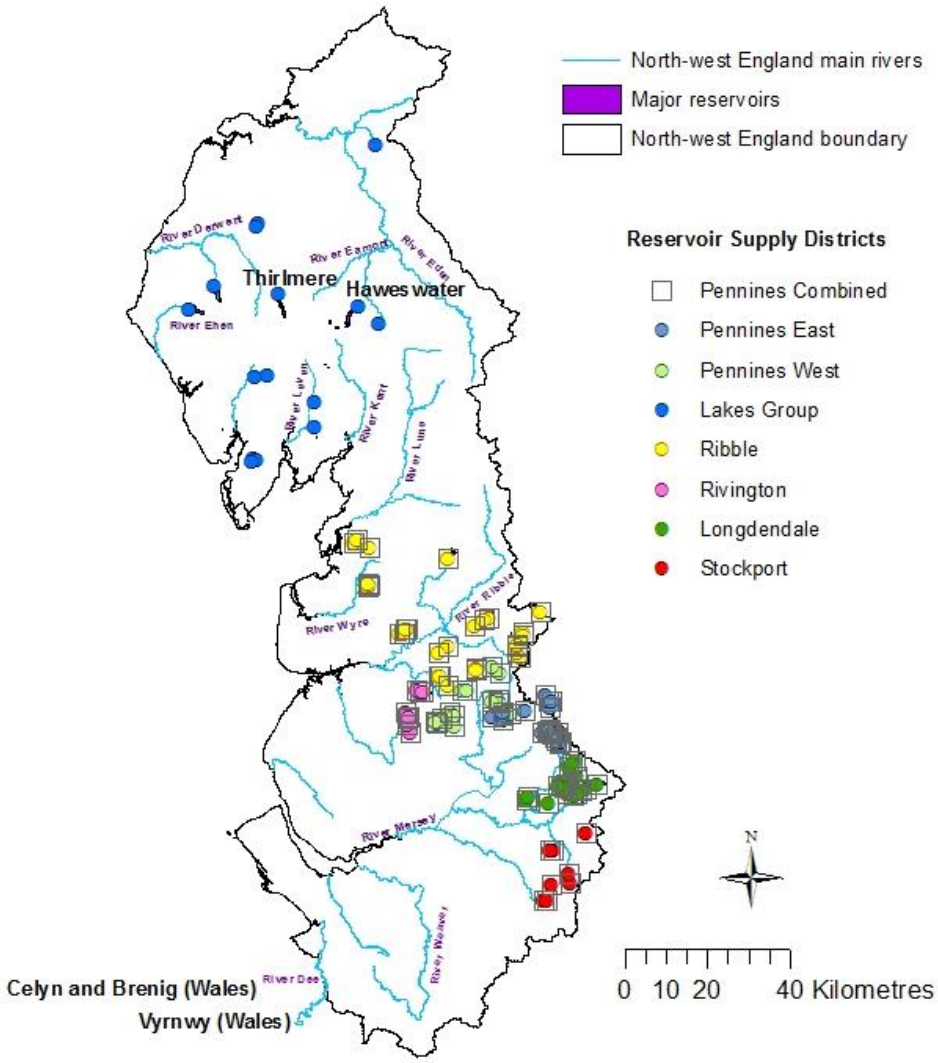
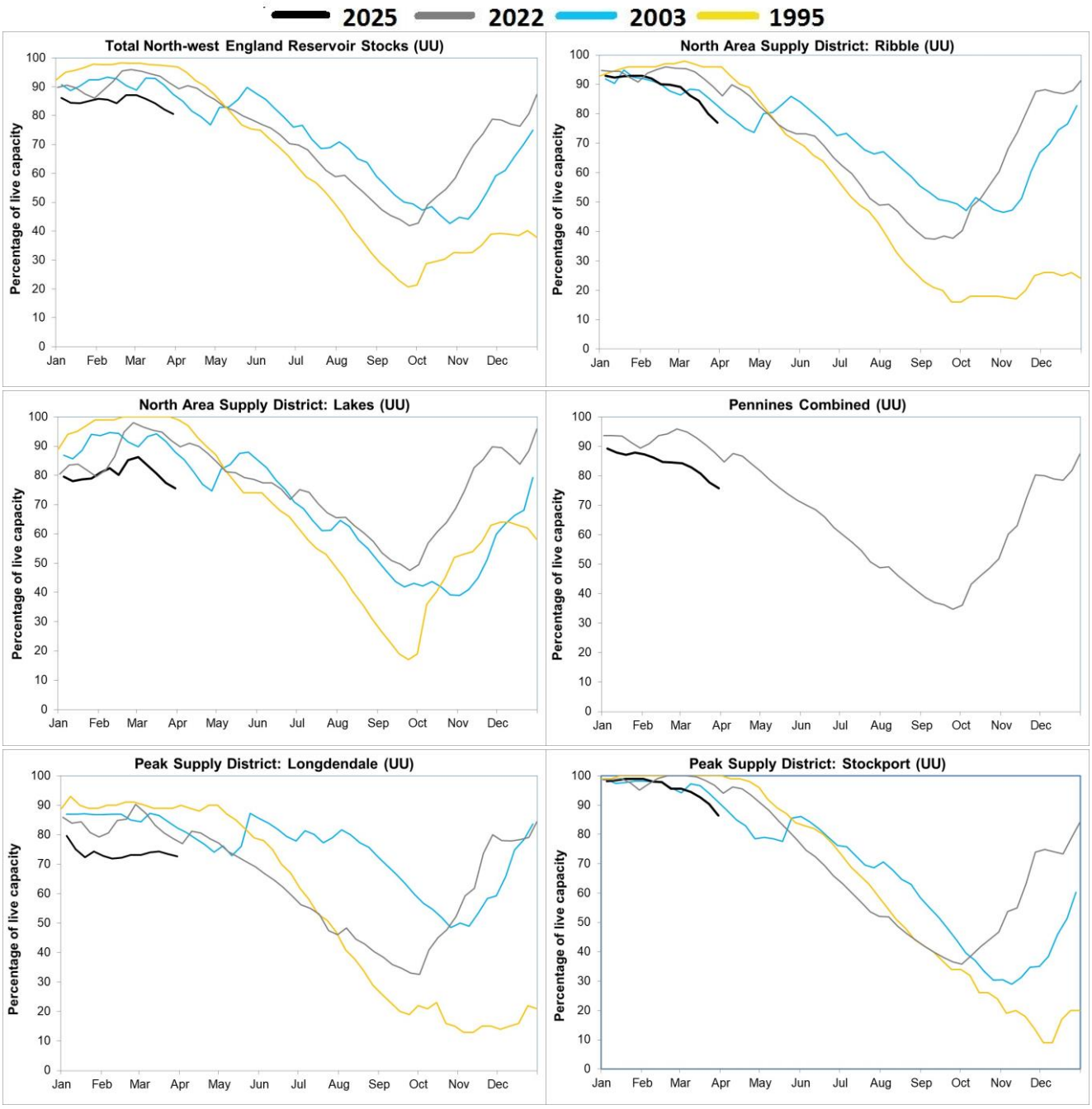
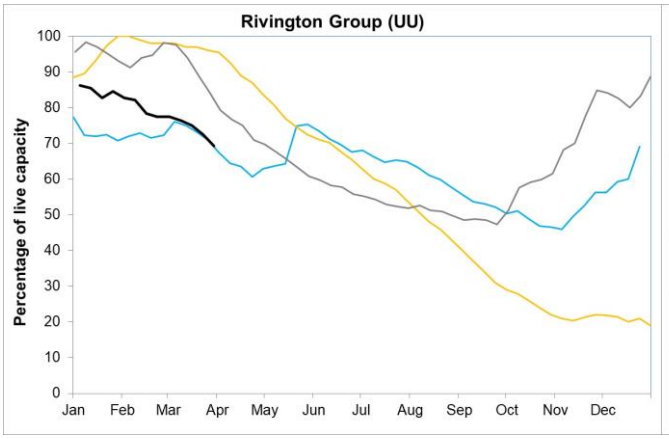
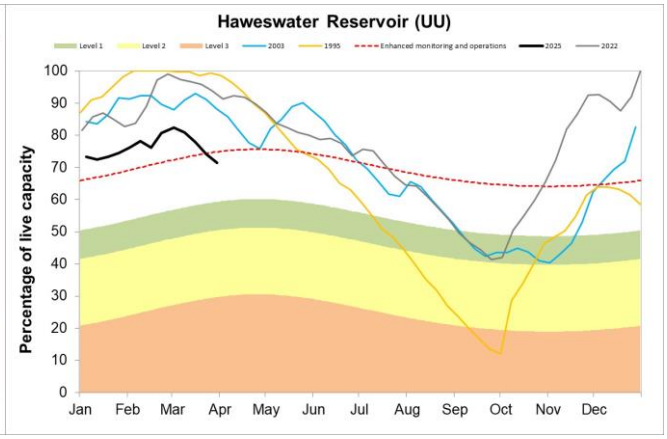
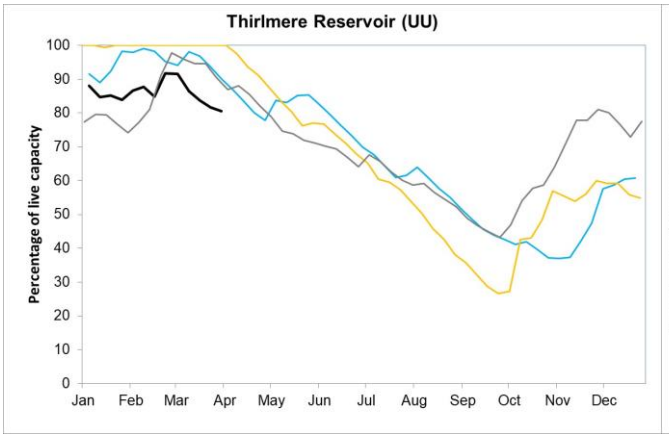


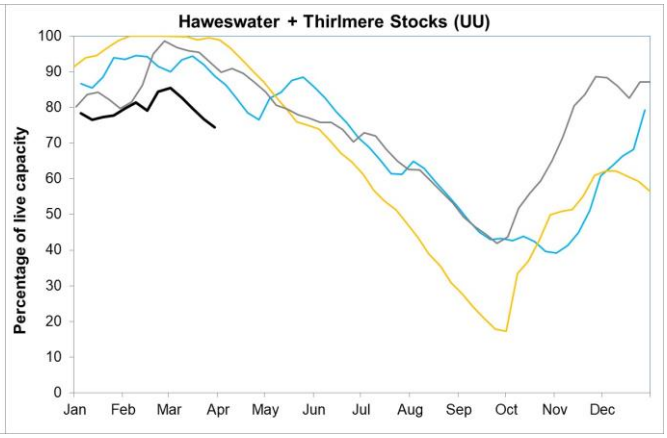
Figure 6.2: End of month reservoir storage for supply districts across North-west England and selected individual reservoirs for current year (2025) and representative years: 1995, 2003 and 2022. Note: Historic records of individual reservoirs and reservoir groups making up the regional values vary in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

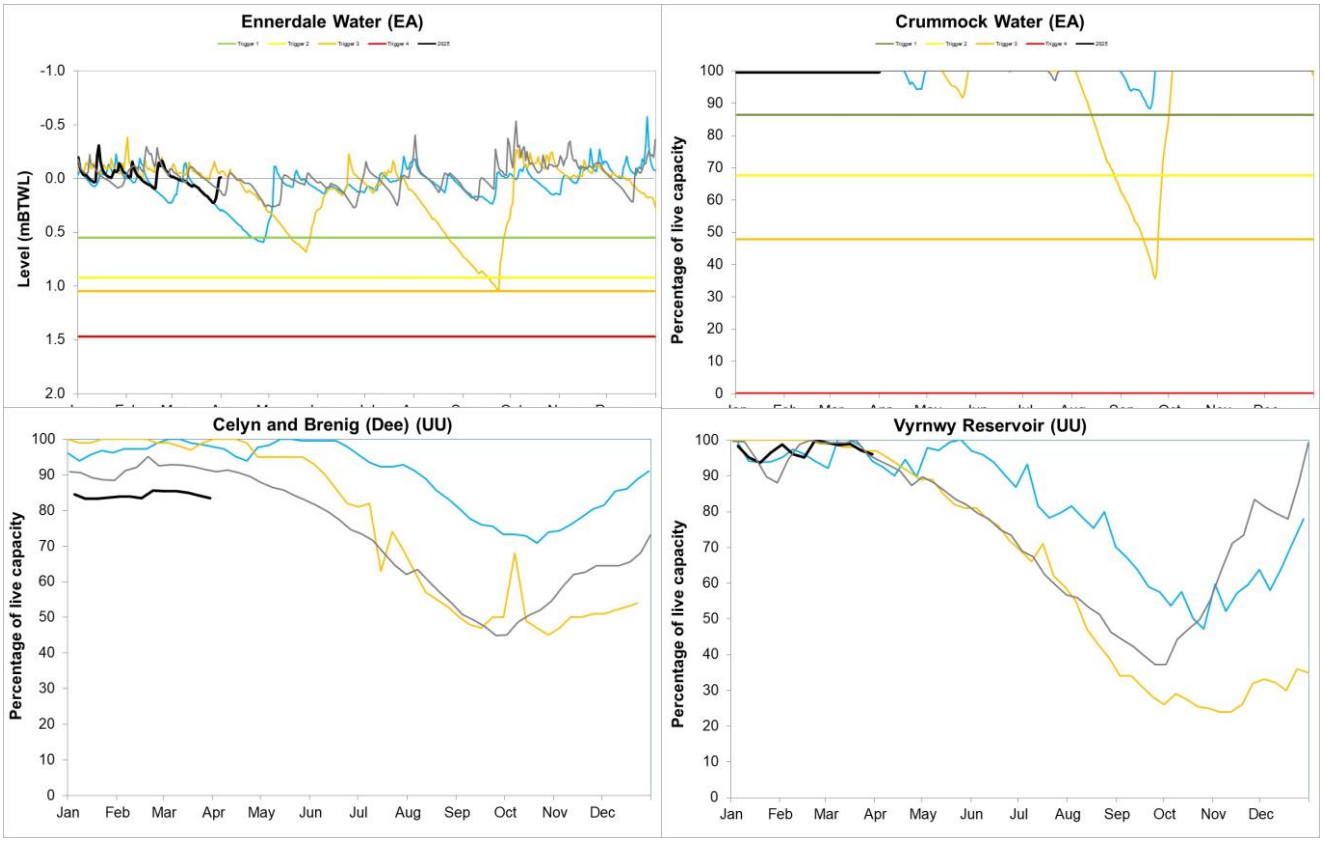

2025
2022
2003
1995
Total North-west England Reservoir Stocks (UU)
North Area Supply District: Ribble (UU)
North Area Supply District: Lakes (UU)
Pennines Combined (UU)
Peak Supply District: Longdendale (UU)
Peak Supply District: Stockport (UU)
Percentage of live capacity
0
10
20
30
40
50
60
70
80
90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


Rivington Group (UU)
Percentage of live capacity
100
90
80
70
60
50
40
30
20
10
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Haweswater Reservoir (UU)
Level 1
Level 2
Level 3
2003
1995
Enhanced monitoring and operations
2025
2022
Percentage of live capacity
100
90
80
70
60
50
40
30
20
10
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Thirlmere Reservoir (UU)
Percentage of live capacity
100
90
80
70
60
50
40
30
20
10
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Haweswater + Thirlmere Stocks (UU)
Percentage of live capacity
100
90
80
70
60
50
40
30
20
10
0
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 1961 to 1990. 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	Mar 2025 rainfall % of long term average 1961 to 1990	Mar 2025 band	Jan 2025 to March cumulative band	Oct 2024 to March cumulative band	Apr 2024 to March cumulative band
Cheshire Rivers Group	32	Exceptionally Low	Normal	Above normal	Exceptionally high
Derwent (NW)	35	Notably Low	Notably low	Below normal	Normal
Douglas	35	Notably Low	Below normal	Normal	Above normal
Eden	32	Notably Low	Notably low	Below normal	Normal
Esk (Cumbria)	33	Notably Low	Below normal	Below normal	Above normal
Esk (Dumfries)	36	Exceptionally Low	Exceptionally low	Notably low	Normal
Kent	34	Exceptionally Low	Below normal	Below normal	Above normal
Mersey And Irwell	31	Notably Low	Below normal	Normal	Normal
Ribble	30	Exceptionally Low	Notably low	Below normal	Normal
Wyre And Lune	33	Notably Low	Notably low	Below normal	Normal

North West	33	Exceptionally Low	Notably low	Below normal	Normal

8.2 River flows table

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

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

St Michaels Fms	Wyre	Brock	Exceptionally low	Below normal

8.3 Groundwater table

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