Monthly water situation report: Yorkshire Area

1 Summary - February 2025

Rainfall was below normal in most catchments this month. River flows reflected this, fluctuating between normal and below normal but mostly decreasing overall. Soils were wet throughout the month and close to being fully saturated. Groundwater levels declined but in most aquifers were normal for February or higher. Reservoir stocks decreased slightly overall but remained close to capacity and above the long term average.

1.1 Rainfall

Overall, the amount of rainfall that Yorkshire experienced in February was less than expected for the time of year. Rainfall was below normal in all catchments except the Swale, Don and Rother catchments where rainfall was in the normal range. Monthly totals ranged between 54% of the long term average (LTA) in the Aire and 71% of the LTA in the Swale. Much of the month's rain fell between day 19 and day 26, with day 23 having the highest rainfall in most catchments.

Monthly rainfall recorded at our key indicator sites ranged from 15.8mm at South Elmsall in the Don catchment to 98.2mm at Tow Hill in the Ure catchment.

The highest daily total of the month was on day 23 in the Ure catchment when 31.4mm fell at Tow Hill, this made up 25% of the LTA at this site.

In the Pennine catchments the wettest spells were days 4, 8 to 12 and 19 to 26. In the Don catchment rainfall was very low and sporadic during the month. In the Ouse, Rye, Hull and Derwent catchments, the month began dry before there was a small amount of rain around day 10. It was then largely dry again before some rain on days 20, 23 and 26.

For most of Yorkshire, this month is the first since before Storm Babet in October 2023 in which the 12 month cumulative rainfall has returned to normal from wetter conditions.

1.2 Soil moisture deficit

Soils were classified as wet and effectively saturated across Yorkshire for the whole of February. Despite below average rainfall, evaporation was also low thus maintaining wet soil conditions.

1.3 River flows

Over the course of the month, flows declined in all catchments. Monthly mean flows were generally below average and classified as below normal or normal. They ranged from 43% of the LTA in the Calder to 72% in the Derwent. The exception was the West Beck in the Hull catchment where the monthly mean was 127% of the LTA, supported by spring flows from the Chalk. This was in the normal range for February.

Within the Pennine catchments, flows steady declined from the start of the month with most becoming below normal by the end of the first week. There was a slight response to the rainfall after day 9 and then the gradual decline continued from day 13. In the Aire, Calder and upper Wharfe daily mean flows were notably low by the middle of the third week. Indeed, the gauging station at Elland in the Calder recorded exceptionally low flows temporarily on day 18. Following rainfall, moderate increases in flow occurred, peaking on day 20 to 21 and day 24 to 25. This returned flows to the normal range. The Ouse seemed to follow a similar pattern.

The Rother, Don, Esk, Rye and Derwent showed more subtle fluctuations but also had a reduction in flow overall.

After peaking at the end of January, flows in the chalk-fed West Beck were above normal until day 11 when they returned to the normal range.

1.4 Groundwater levels

Magnesian Limestone

The groundwater level within the Magnesian Limestone at Brick House Farm decreased this month but remained notably high for the time of year.

Millstone Grit

The groundwater level decreased within the Millstone Grit at Hill Top Farm and fell below normal for the time year. *It should be noted that this observation borehole is used for water abstraction by means of a pump. Therefore, the groundwater level recorded here may be subject to the effects of this.*

Sherwood Sandstone

The groundwater level in the Sherwood Sandstone at Great Ouseburn decreased to above normal for the time of year. Groundwater levels also decreased at Riccall Approach Farm, remaining normal for the time of year.

Corallian Limestone

The groundwater level decreased within the Corallian Limestone at Sproxton and remained normal for the time of year.

Chalk

The groundwater level decreased at Wetwang and remained normal for the time of year (northern Yorkshire Wolds chalk). At Dalton Estate (central Yorkshire Wolds chalk) the level decreased into normal for the time of year.

1.5 Reservoir stocks

The reservoir stocks remained higher than the LTA throughout this month. Overall, they decreased by 1.3% of the total capacity.

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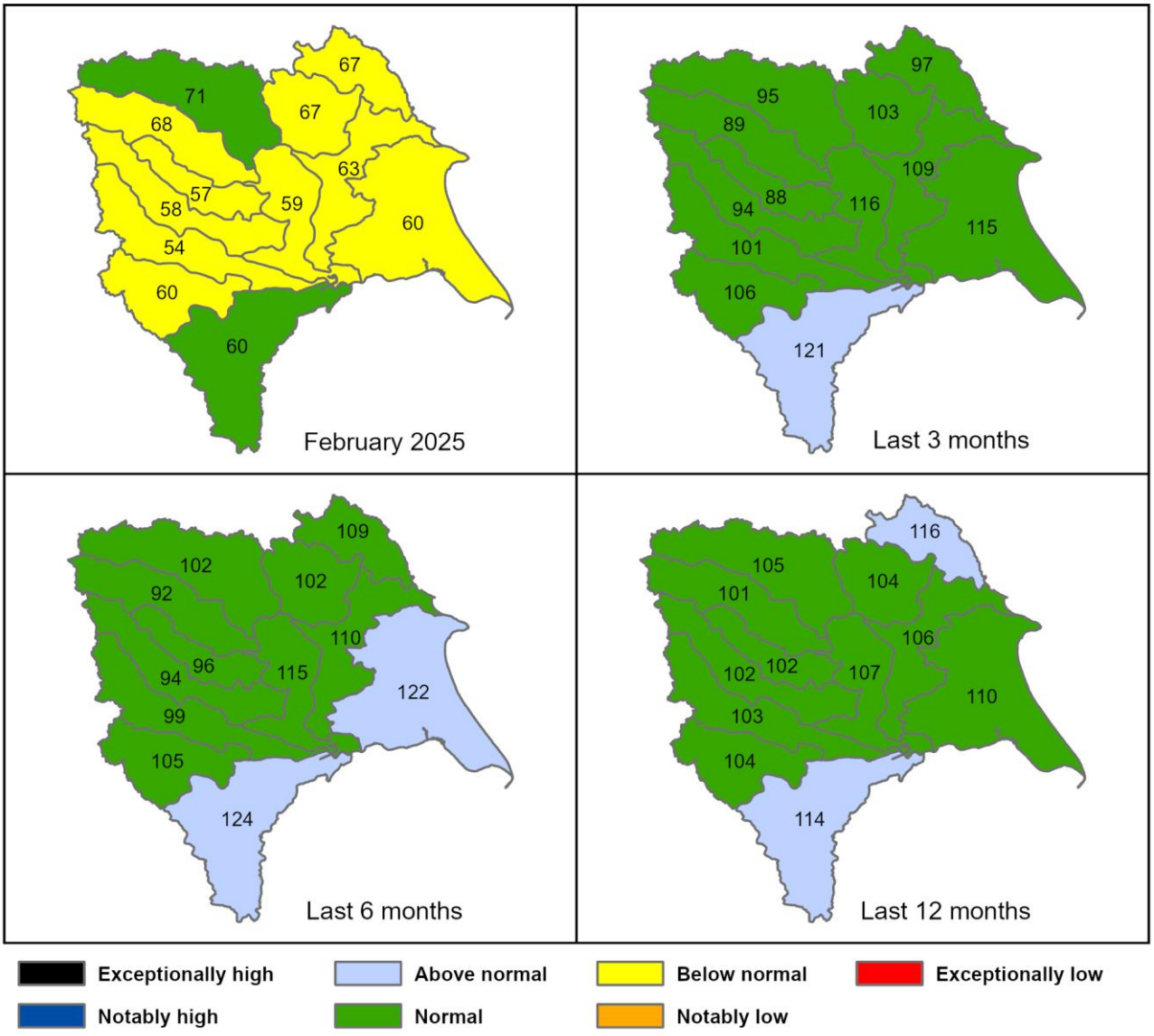
2 Rainfall

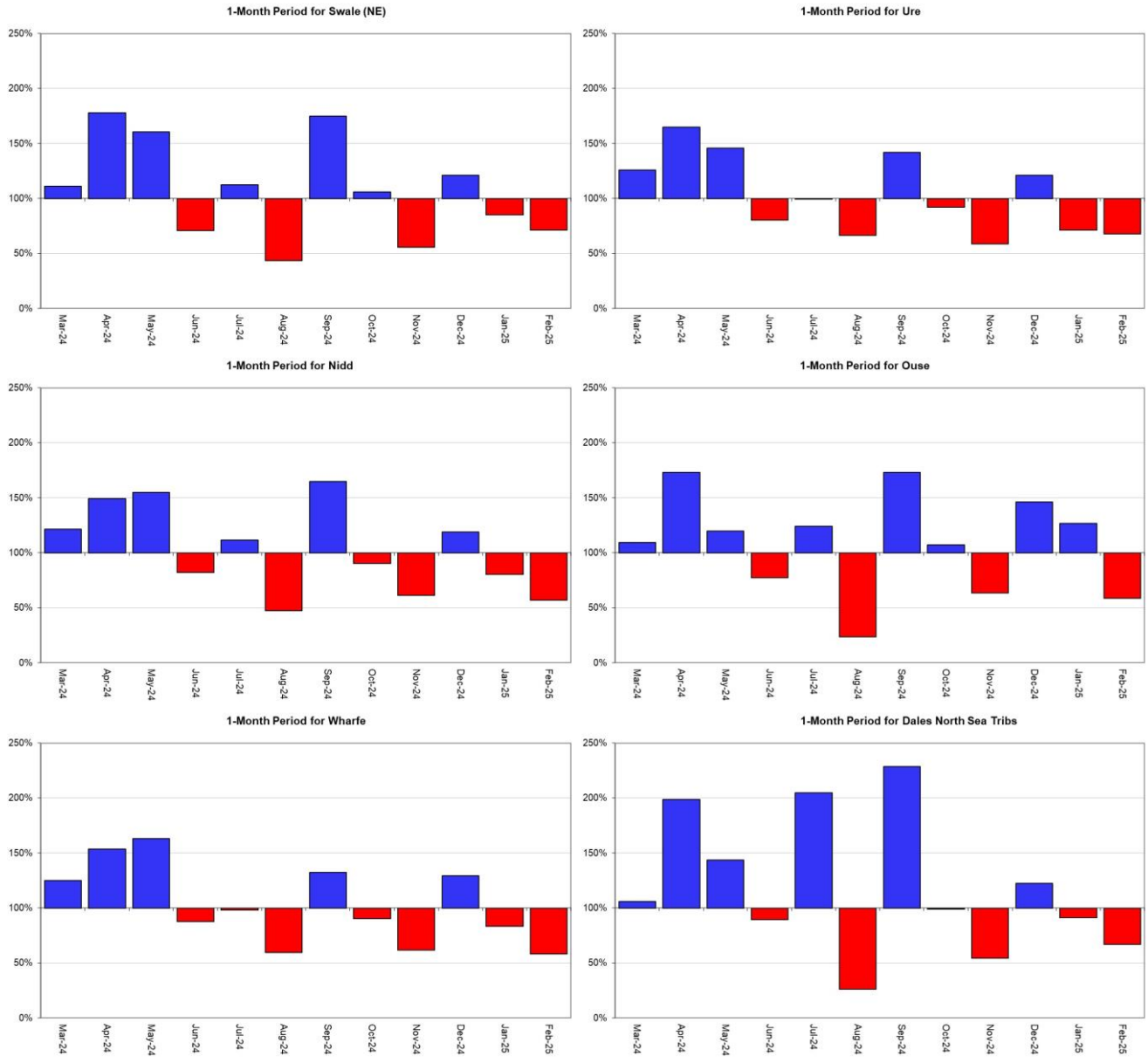
2.1 Rainfall map

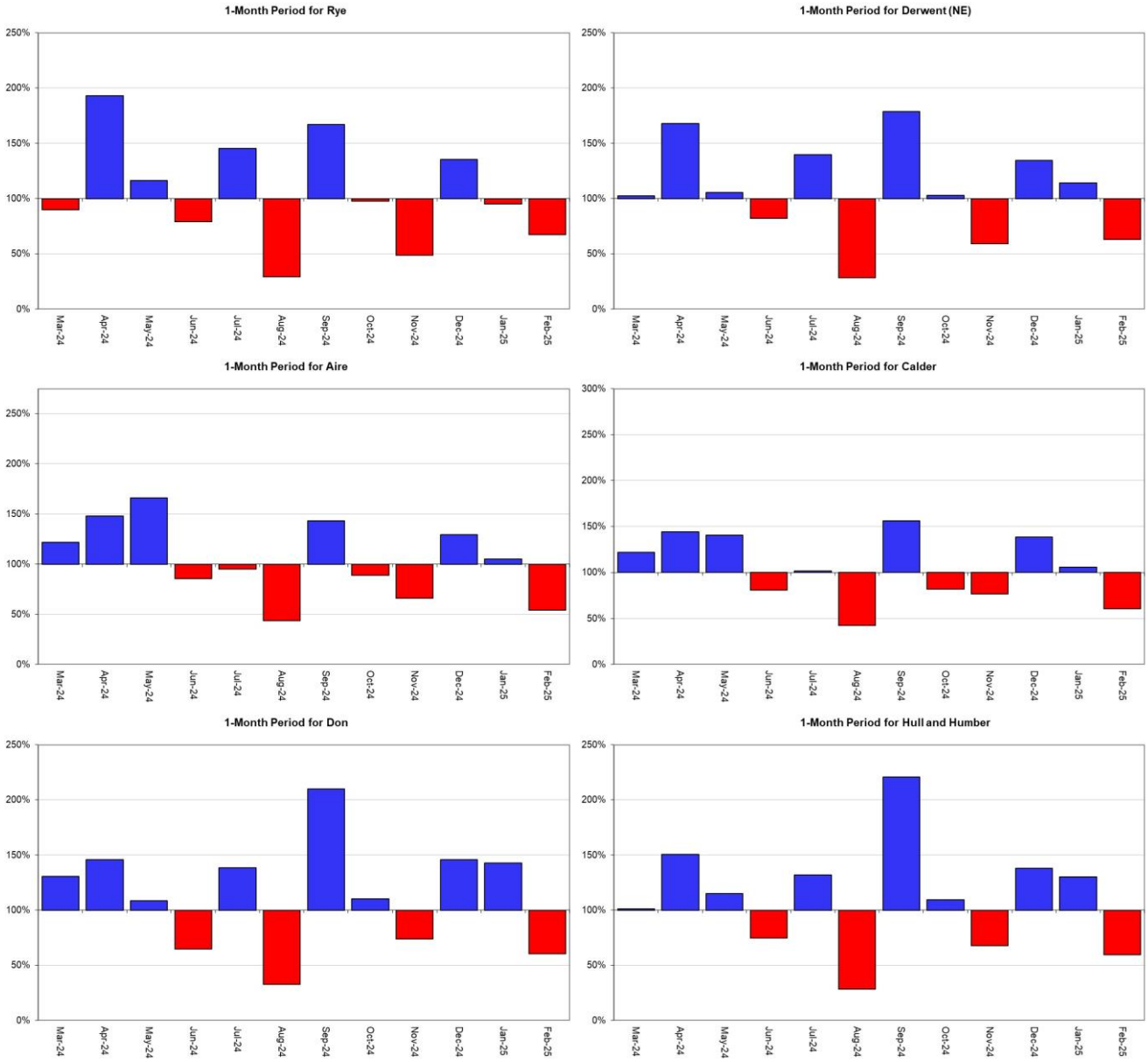
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 28 February 2025), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



2.2 Rainfall charts

Figure 2.2: Monthly rainfall totals for the past 24 months as a percentage of the 1961 to 1990 long term average for each region and for England.



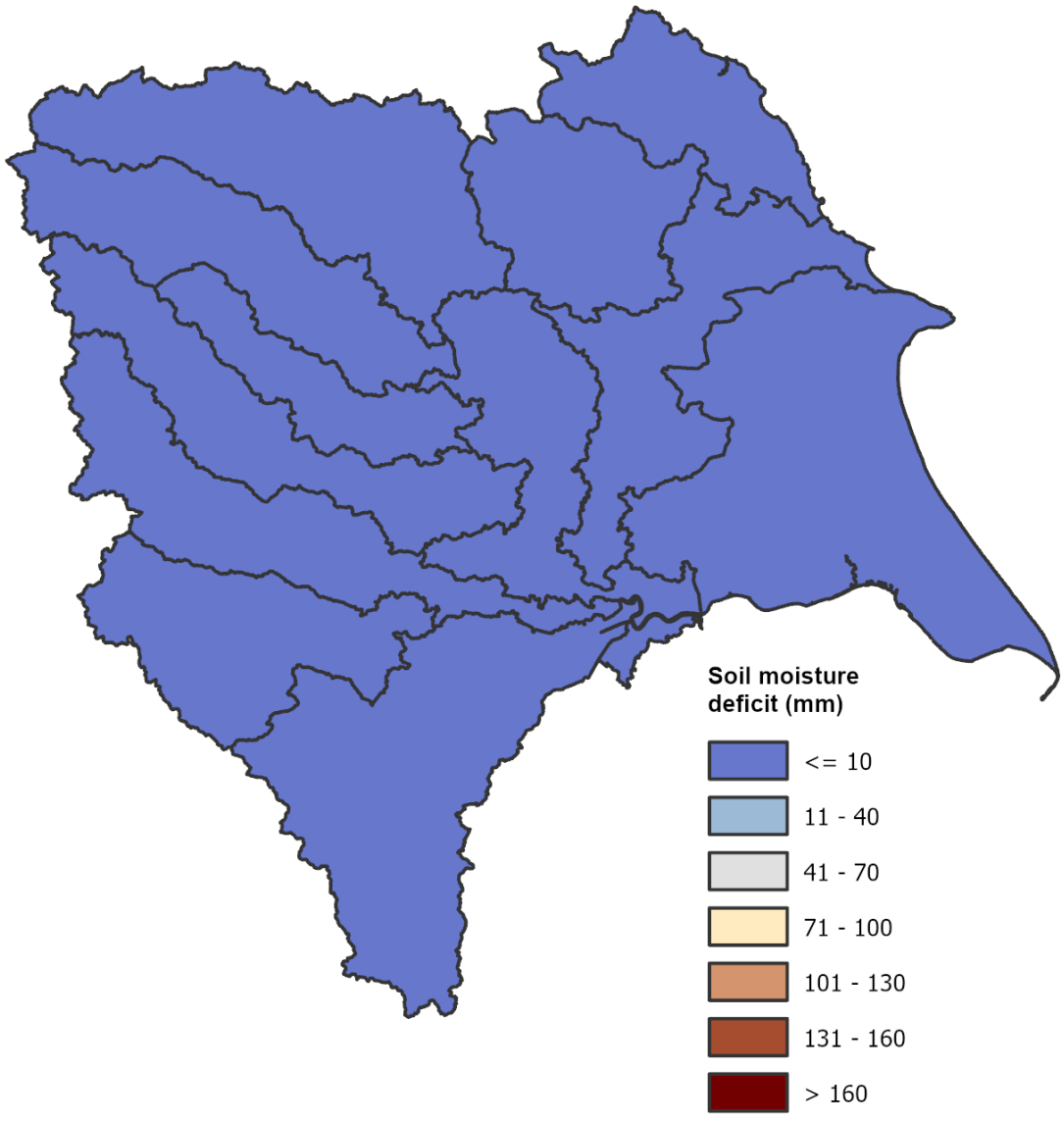


Rainfall data for October 2023 onwards, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2025). Rainfall data prior to October 2023, extracted from Met Office HadUK 1km gridded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

3 Soil moisture deficit

3.1 Soil moisture deficit map

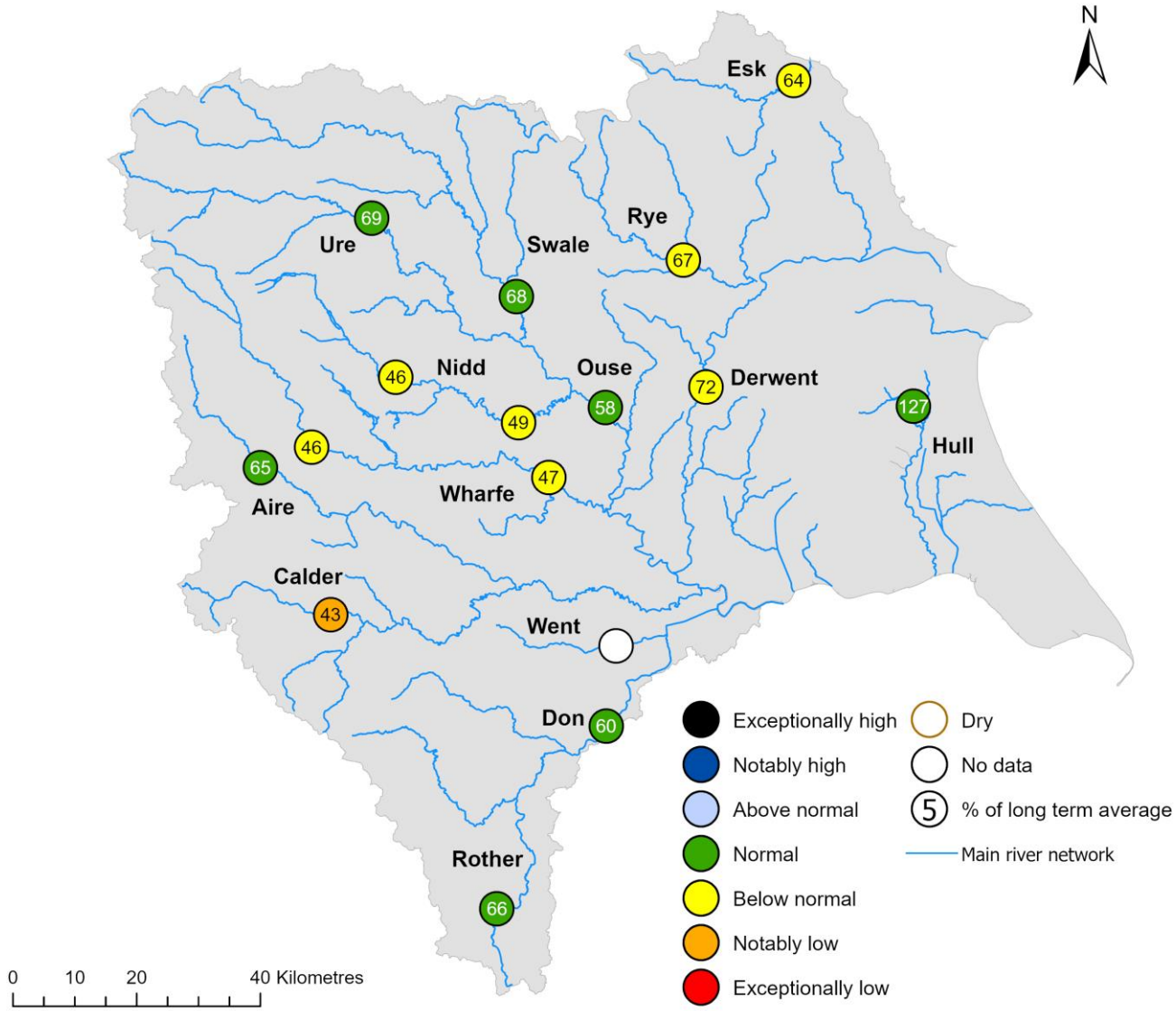
Figure 3.1: Soil moisture deficits for weeks ending 28 February 2025. Shows the difference (mm) of the actual soil moisture deficit from the 1961 to 1990 long term average soil moisture deficits. MORECS data for real land use.



4 River flows

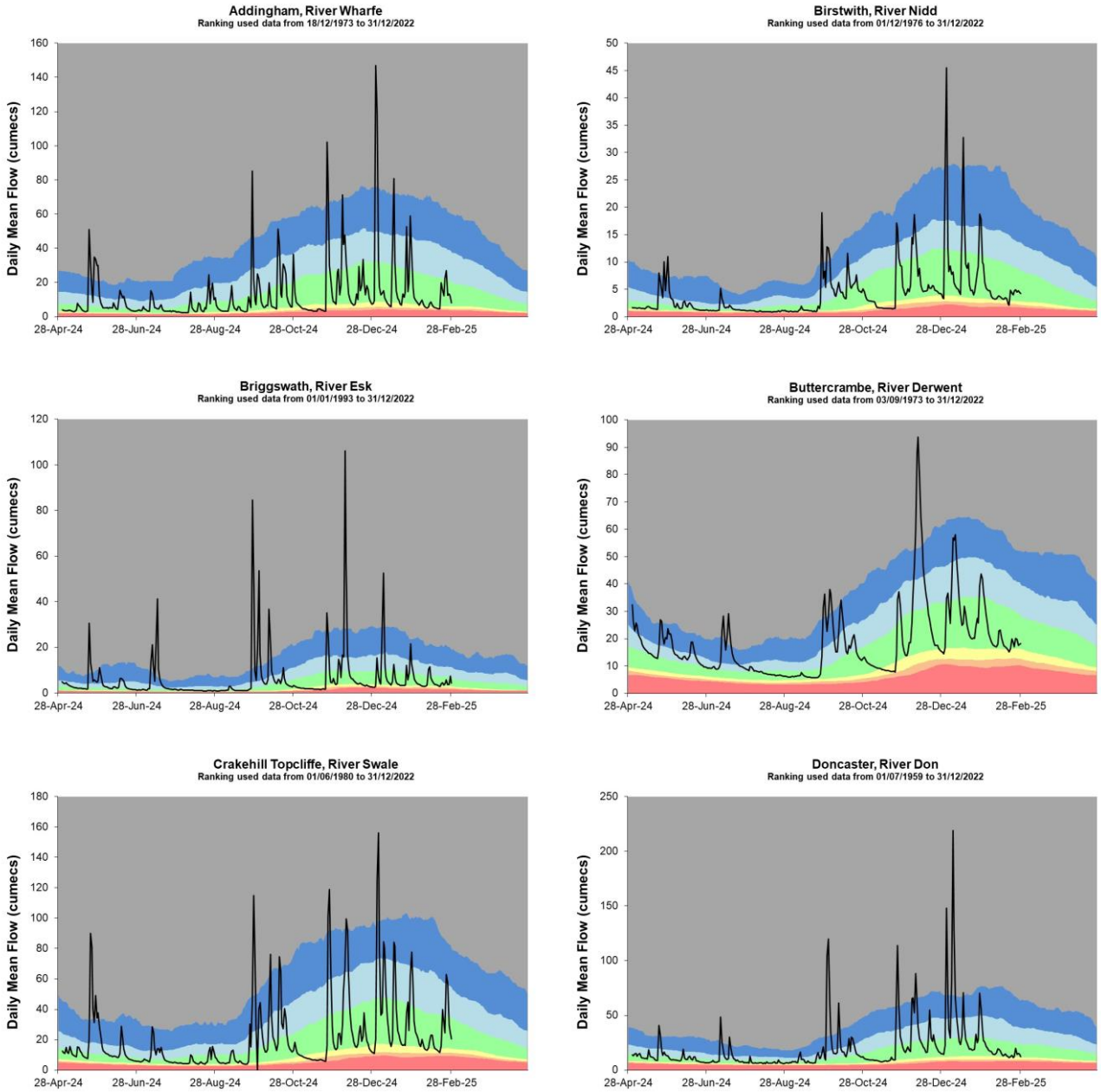
4.1 River flows map

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

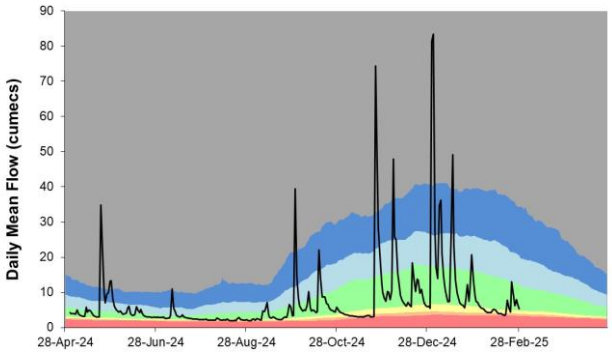


4.2 River flow charts

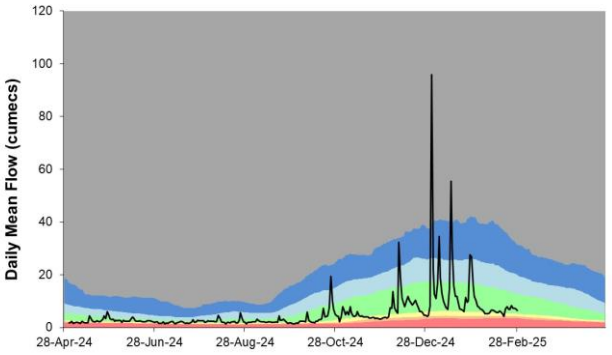
Figure 4.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows.



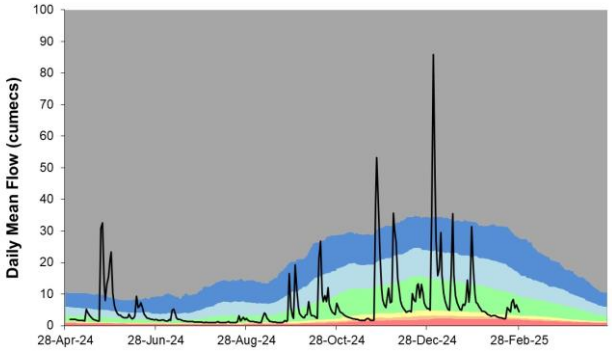
Elland, River Calder
Ranking used data from 01/07/1971 to 31/12/2022



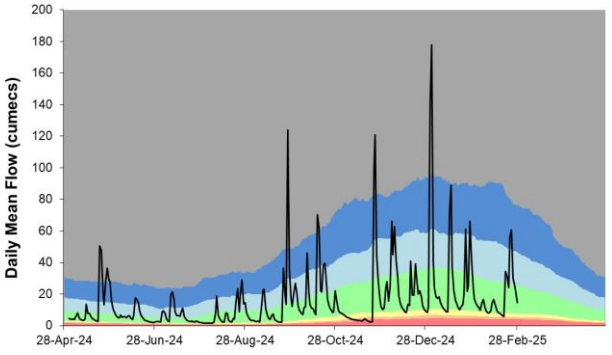
Hunsingore, River Nidd
Ranking used data from 01/10/1968 to 31/12/2022



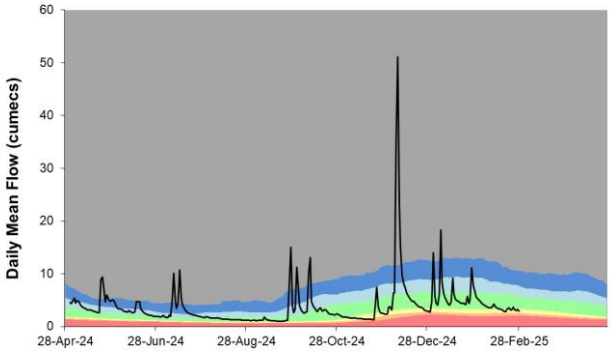
Kildwick, River Aire
Ranking used data from 01/08/1971 to 31/12/2022



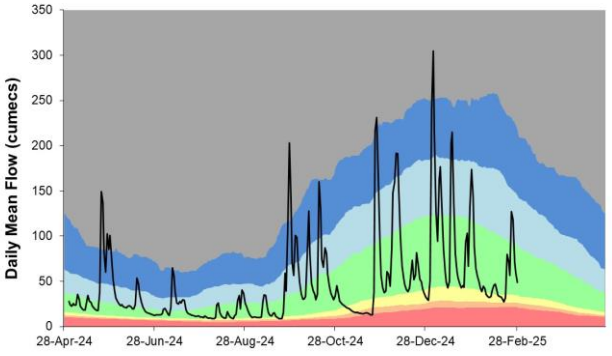
Kilgram Bridge, River Ure
Ranking used data from 01/08/1971 to 31/12/2022

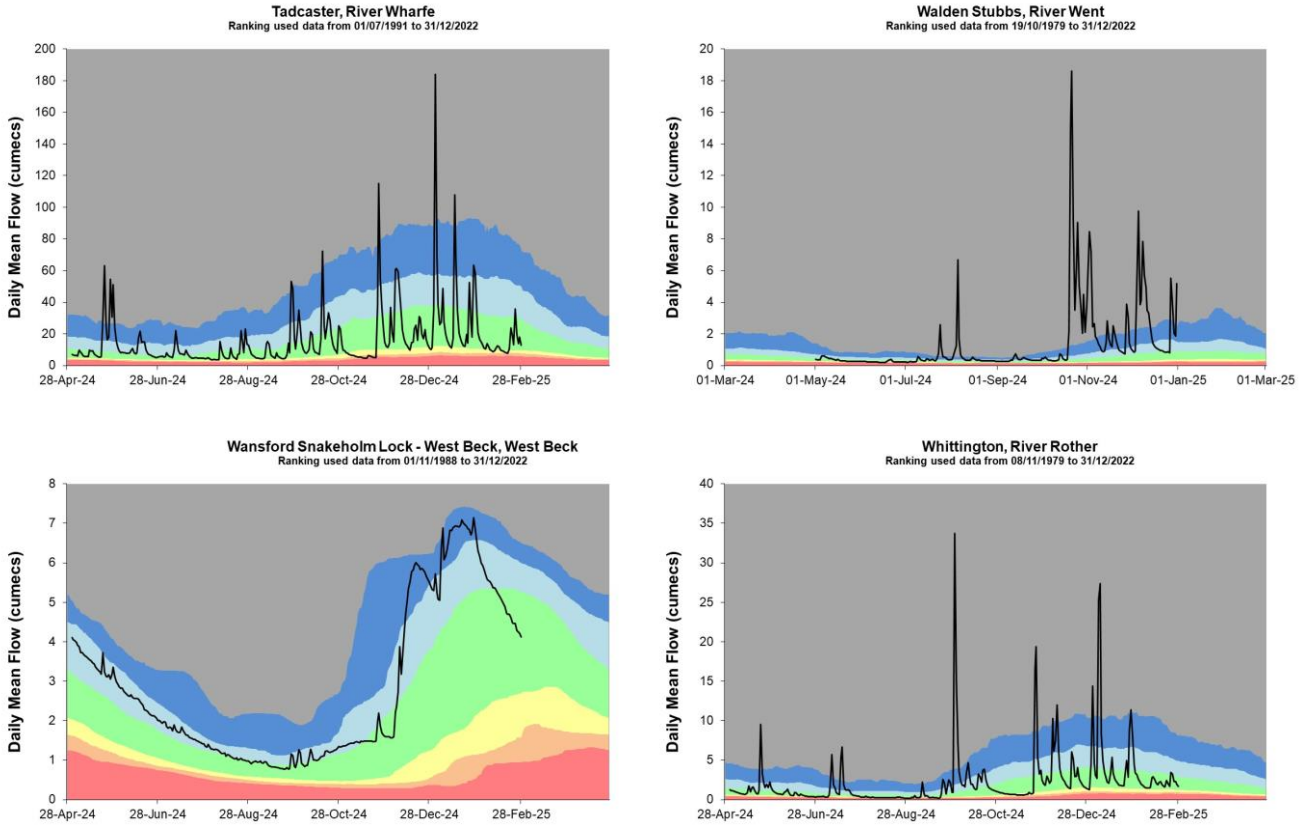


Ness, River Rye
Ranking used data from 01/09/1974 to 31/12/2022



Skelton, River Ouse
Ranking used data from 18/09/1969 to 31/12/2022

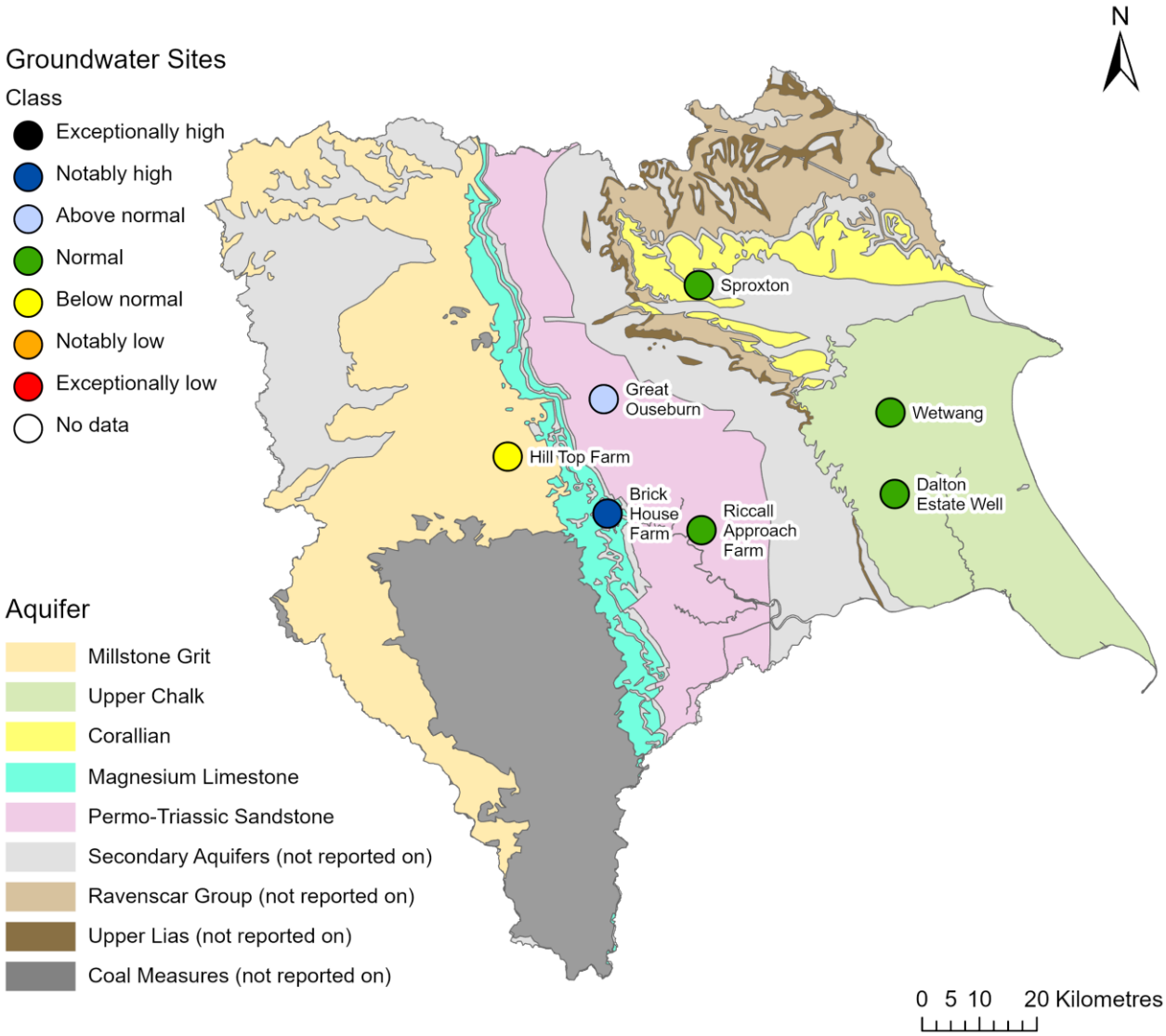




5 Groundwater levels

5.1 Groundwater levels map

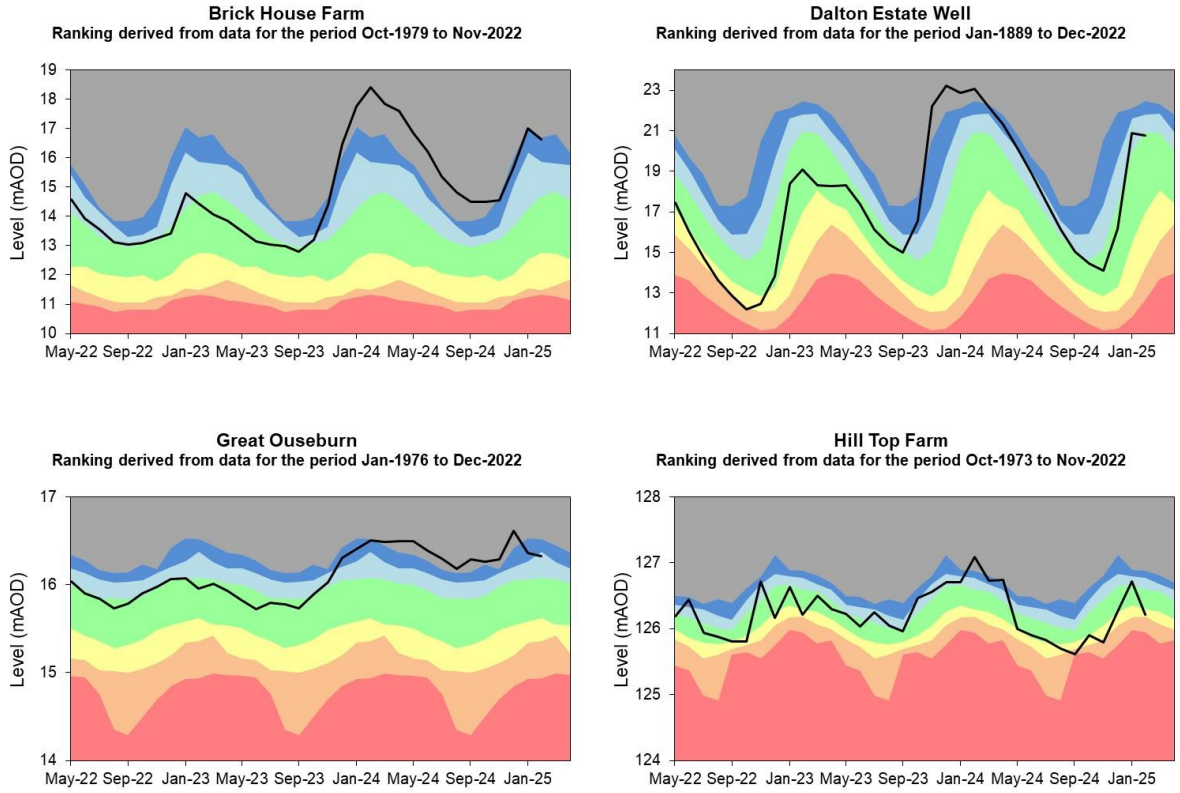
Figure 5.1: Groundwater levels for indicator sites at the end of February 2025, classed relative to an analysis of respective historic February levels. Table available in the appendices with detailed information.

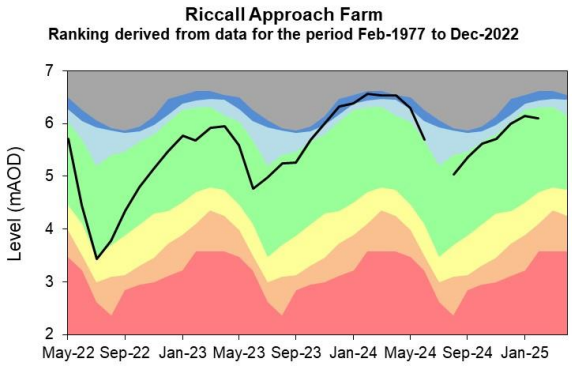


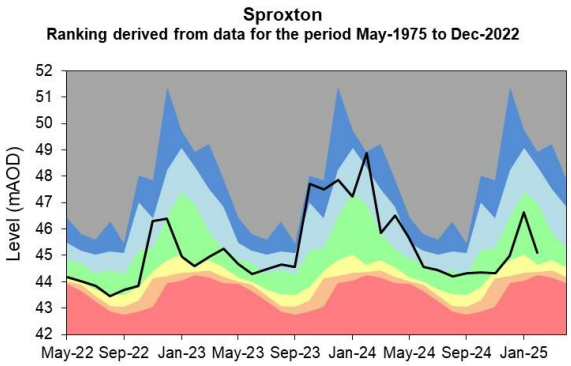
(Source: Environment Agency). Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, 100024198, 2025.

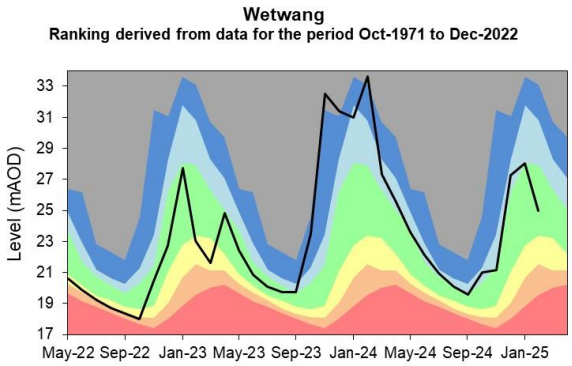
5.2 Groundwater level charts

Figure 5.2: End of month groundwater levels at index groundwater level sites for major aquifers. 22 months compared to an analysis of historic end of month.





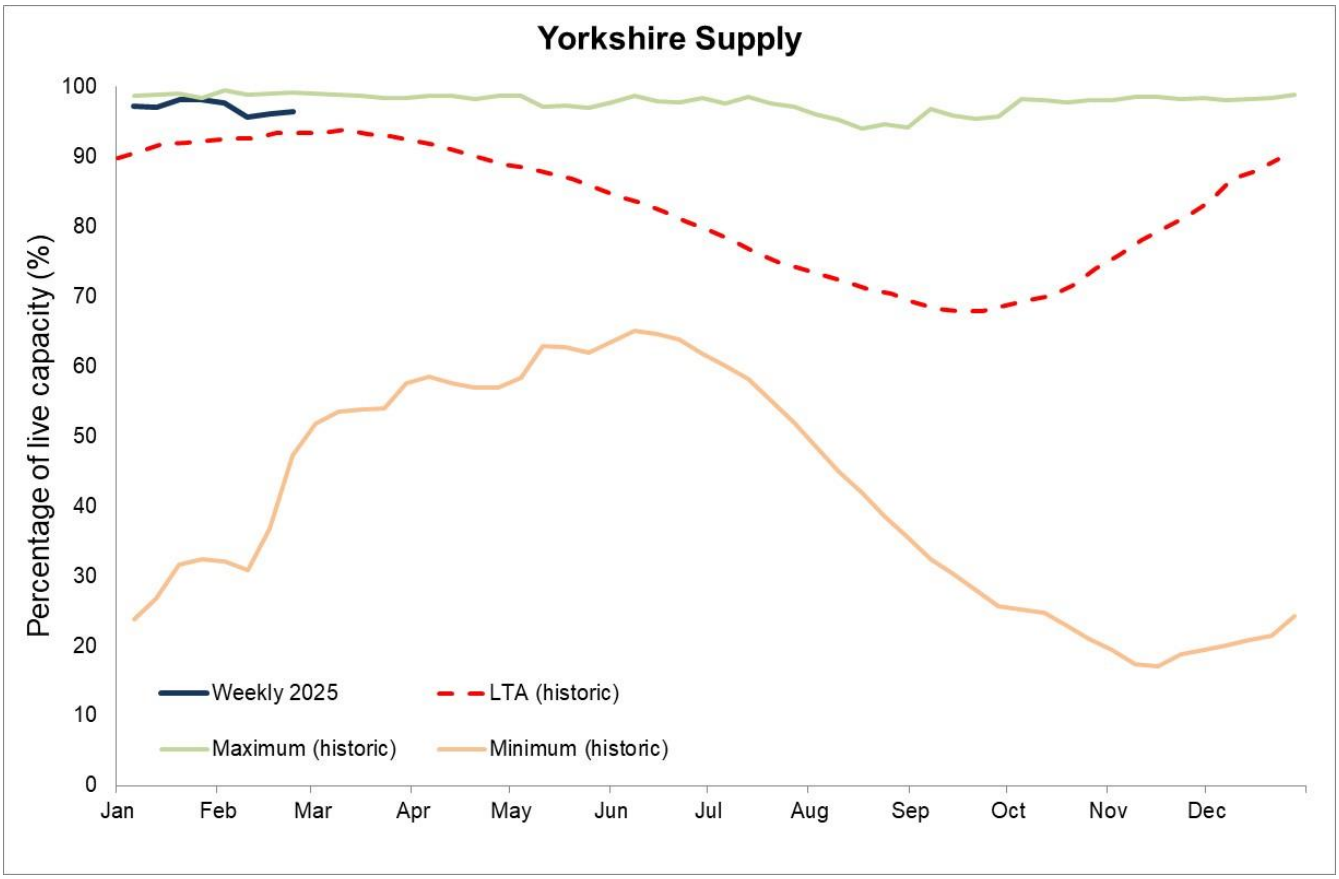




 N.B. Hill Top Farm observation borehole is used for abstraction. Therefore, the groundwater level record will be directly affected by pumping.

6 Reservoir stocks

Figure 6.1: End of month regional reservoir stocks compared to long term maximum, minimum and average stocks. Note: Historic records of individual reservoirs and reservoir groups making up the regional values vary in length.



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	Feb 2025 rainfall % of long term average 1961 to 1990	Feb 2025 band	Dec 2024 to February cumulative band	Sep 2024 to February cumulative band	Mar 2024 to February cumulative band
Aire	54	Below Normal	Normal	Normal	Normal
Calder	60	Below Normal	Normal	Normal	Normal
Dales North Sea Tribs	67	Below Normal	Normal	Normal	Above normal
Derwent (ne)	63	Below Normal	Normal	Normal	Normal
Don	60	Normal	Above normal	Above normal	Above normal
Hull and Humber	60	Below Normal	Normal	Above normal	Normal
Nidd	57	Below Normal	Normal	Normal	Normal
Ouse	59	Below Normal	Normal	Normal	Normal
Rye	67	Below Normal	Normal	Normal	Normal
Swale (ne)	71	Normal	Normal	Normal	Normal

Ure	68	Below Normal	Normal	Normal	Normal
Wharfe	58	Below Normal	Normal	Normal	Normal

8.2 River flows table

Site name	River	Catchment	Feb 2025 band	Jan 2025 band
Addingham	Wharfe	Wharfe Middle	Below normal	Normal
Birstwith	Nidd	Nidd Middle	Below normal	Normal
Briggswath	Esk	Esk Yorks	Below normal	Normal
Buttercrambe	Derwent	Derwent Yorks Middle	Below normal	Normal
Crakehill Topcliffe	Swale	Swale Lower	Normal	Above normal
Doncaster	Don	Don Lower	Normal	Notably high
Elland	Calder	Calder Yorks Upper	Notably low	Normal
Hunsingore	Nidd	Nidd Lower	Below normal	Above normal
Kildwick	Aire	Aire Upper	Normal	Above normal
Kilgram Bridge	Ure	Ure Middle	Normal	Normal
Ness	Rye	Rye	Below normal	Normal
Skelton	Ouse	Ouse Yorks	Normal	Normal
Tadcaster	Wharfe	Wharfe Lower	Below normal	Normal
Walden Stubbs	Went	Don Lower		

Wansford Snakeholm Lock	West Beck	Hull Upper	Normal	Notably high
Whittington	Rother	Rother Yorks	Normal	Above normal

8.3 Groundwater table

Site name	Aquifer	End of Feb 2025 band	End of Jan 2025 band
Brick House Farm	Wharfe Magnesian Limestone	Notably high	Notably high
Dalton Estate Well	Hull and East Riding Chalk	Normal	Above normal
Great Ouseburn	Sherwood Sandstone	Above normal	Notably high
Hill Top Farm	Millstone Grit and Carboniferous Limestone	Below normal	Above normal
Riccall Approach Farm	Sherwood Sandstone	Normal	Normal
Sproxton	Sherwood Sandstone	Normal	Normal
Wetwang	Hull and East Riding Chalk	Normal	Normal