Monthly water situation report: Yorkshire Area

1 Summary - April 2025

This month rainfall totals in Yorkshire were significantly low. Flows declined across all catchments, soils began to dry after many weeks of remaining wet and reservoirs stocks deviated further below the long term average (LTA) and continued to decrease. Groundwater levels decreased in all aquifers. Hands off flow (HoF) restrictions were put in place on abstractions in many river catchments.

1.1 Rainfall

This month saw a continuation of below long term average rainfall, with catchments experiencing between 13% and 33% of the monthly LTA. It was the third consecutive month of below average rainfall across the whole of Yorkshire. This was the third driest January to April in the Met Office Had-UK rainfall record starting 1871, with only 1887 and 1929 having lower rainfall totals. Rain gauges recorded up to 25 dry days this month, as was the case at Headingley in the Aire catchment and Romanby in the Swale catchment.

The Pennine region saw the lowest totals. The Swale, Ure, Nidd, Wharfe, Aire and Calder catchments were almost completely dry until day 14. There were then small amounts of rain between day 14 and day 21 before, from day 22 onwards, most rain gauges in these catchments received no rain for the remainder of the month. All of these catchments' monthly rainfall totals were classified as exceptionally low, except for the Calder which had just enough rainfall to be classified as notably low. In the Wharfe, this April was the second driest in over 150 years of record.

The Don and Rother catchments also had notably low amounts of rainfall.

The Esk, Rye, Ouse, Derwent and Hull catchments were also very dry aside from two small showers; on days 14 and 15 and on days 21 and 22. Rainfall in these catchments was categorised as notably low, except the Rye which was exceptionally low.

The 12-month cumulative rainfall totals, which were normal last month, are now below normal in most catchments.

1.2 Soil moisture deficit

After weeks of being consistently wet, soils began to dry out in April. By day 15, soils had normal levels of moisture. They dried further still until by the month's end some areas were

classified as dry, particularly in the south of Yorkshire. Across all catchments, soils were between 26 to 50m drier than the LTA for April.

1.3 River flows

Flows declined across Yorkshire over the course of April. Monthly mean flows were below average in all catchments and ranged from 19% to 35% of the LTA on most rivers, generally classified as notably or exceptionally low. They were slightly higher on the Derwent, Aire, Rye and chalk-fed West Beck at 42%, 46%, 52 and 62% of the LTA respectively.

Many sites experienced the lowest April monthly mean flows on record including Addingham and Tadcaster on the Wharfe, Crakehill Topcliffe on the Swale, Doncaster on the Don, Elland on the Calder, Kilgram Bridge on the Ure and Skelton on the Ouse.

In the Swale, Ure, Nidd and Wharfe, flows declined steeply in the first week and then more gradually for the rest of the month, with all except the Nidd ending the month with exceptionally low flows.

The flows in the Aire and Calder remained exceptionally low for most of the month.

In the Esk at Briggswath, flows fluctuated between the normal April flow range and below normal but also declined overall.

Flows in the Rye and Derwent, and the chalk-fed West Beck were below normal and notably low respectively for most of the month, declining steadily throughout. By the month's end they had been reduced to exceptionally low and notably low flows.

In the Don and Rother flows were very slightly influenced by the small amount of rainfall, they increased around day 16 and then again around day 21. They both remained well below normal throughout.

1.4 Groundwater levels

Magnesian Limestone

The groundwater level within the Magnesian Limestone at Brick House Farm decreased this month and was above normal for the time of year.

Millstone Grit

There was no update for Hill Top Farm for April.

Sherwood Sandstone

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

Corallian Limestone

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

Chalk

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

1.5 Reservoir stocks

Reservoir stocks continued to decline at an average rate of around 3% per week. At the end of April, stocks were at 76.3%, 13.5% less than the LTA. This is the lowest reservoir stocks have been in April since 1996.

1.6 Environmental impact

In late April, there were 17 abstraction licences with a HoF condition in force, and another 47 abstraction licence holders had been given advance warning that flows were low. At the time of reporting at the end of April, the number of HoFs in in place continues to change in response to the low flow conditions.

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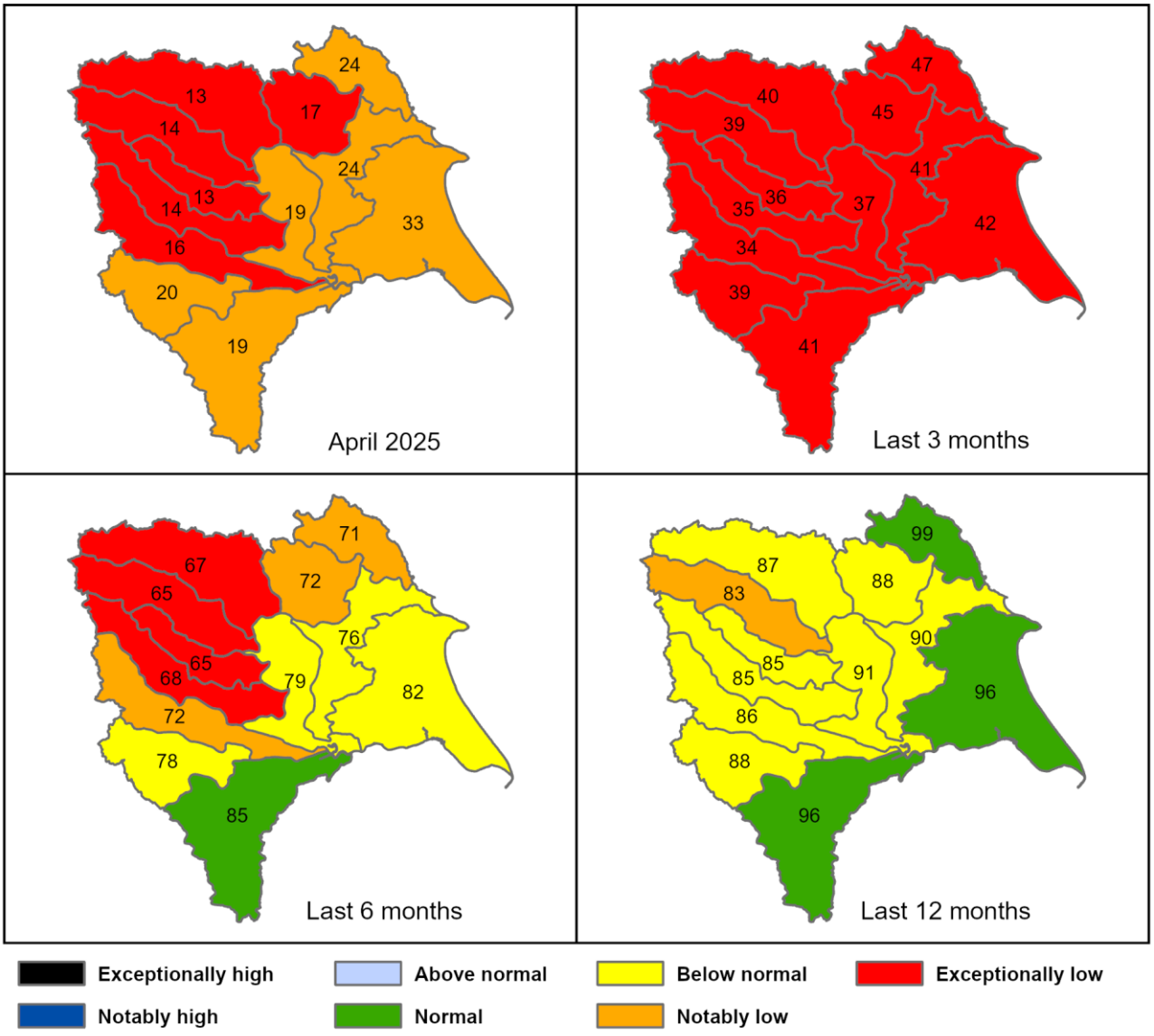
2 Rainfall

2.1 Rainfall map

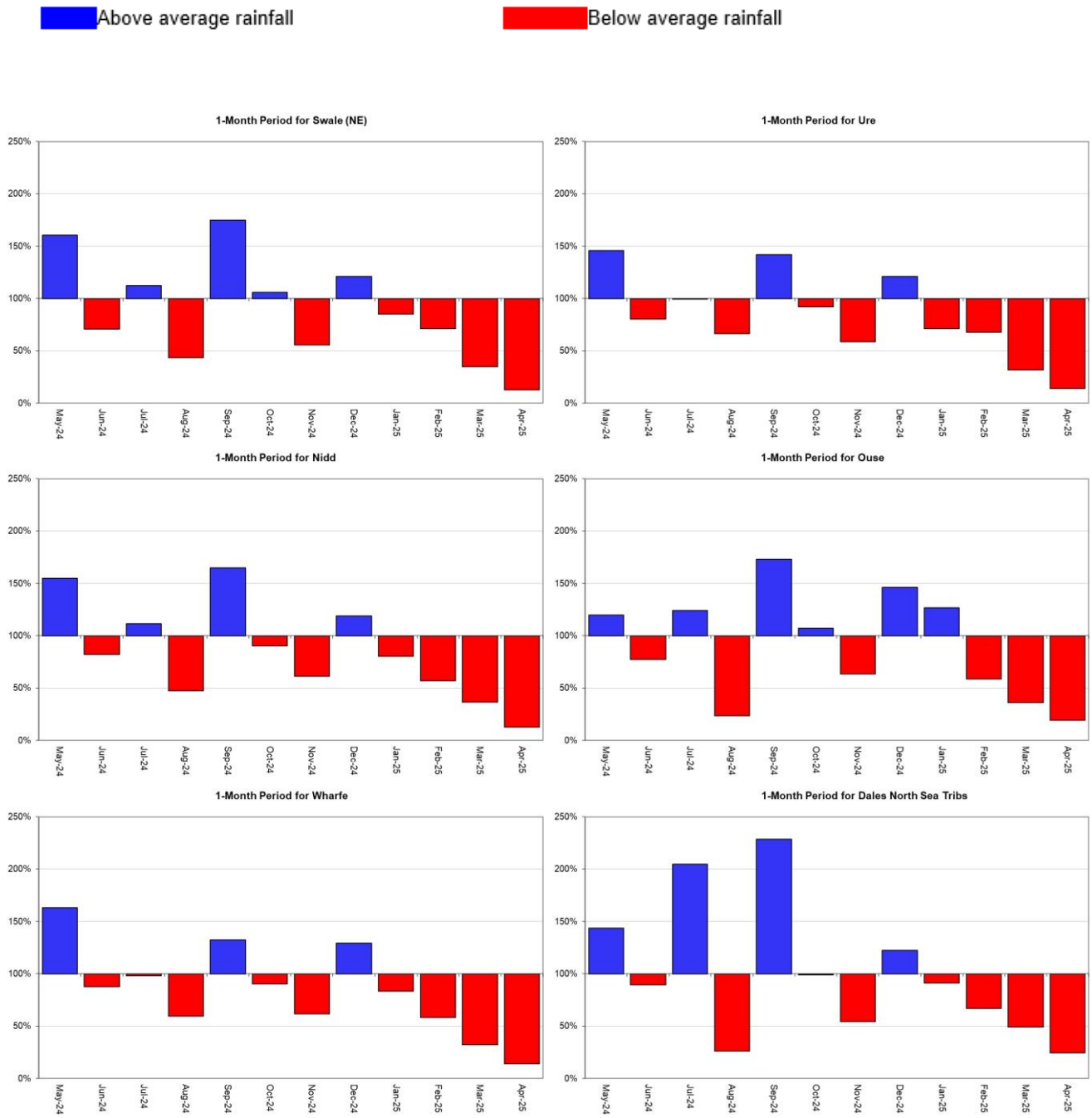
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 30 April 2025), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.

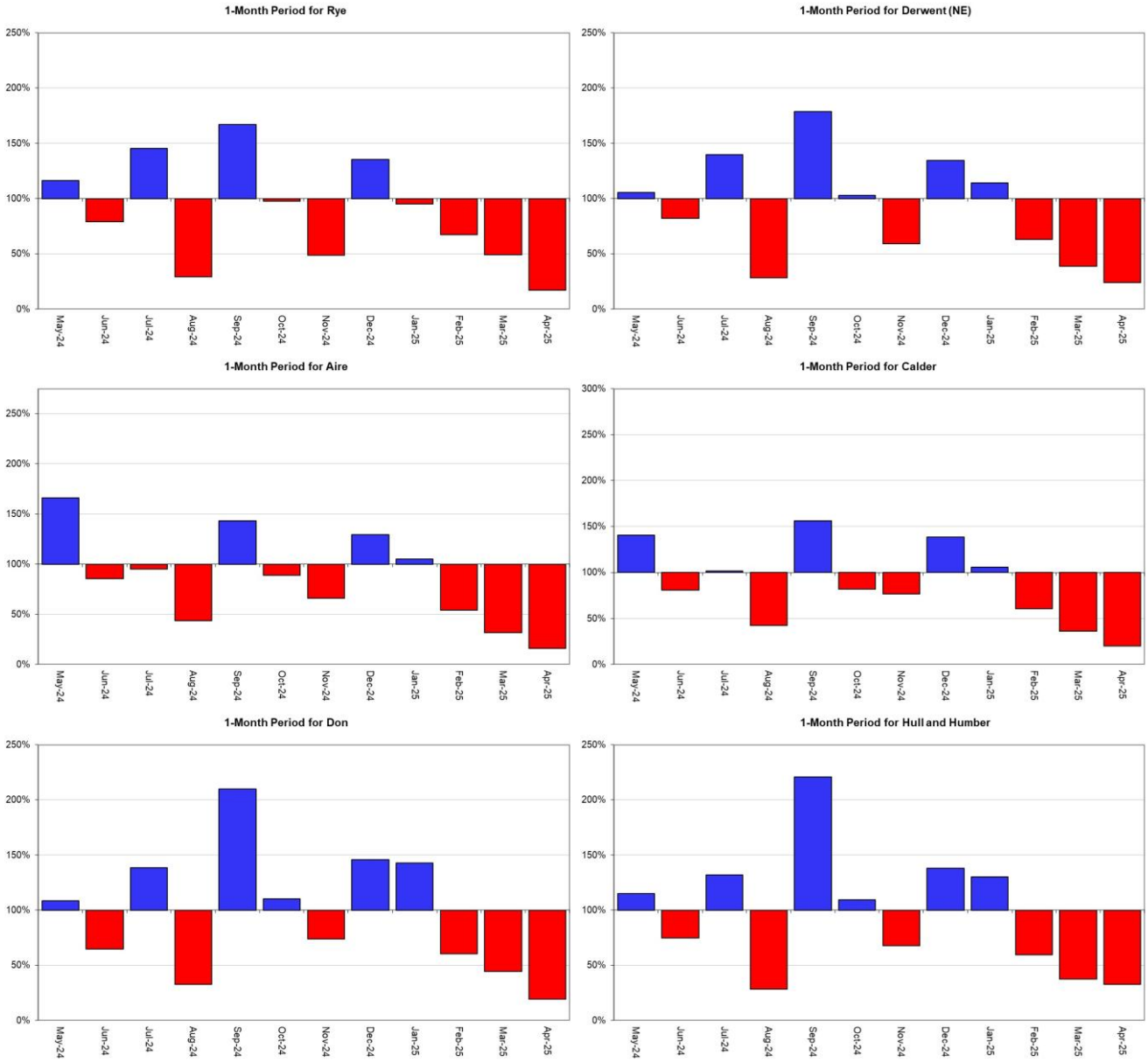


HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2025). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved. Environment Agency, 100024198, 2025.

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.



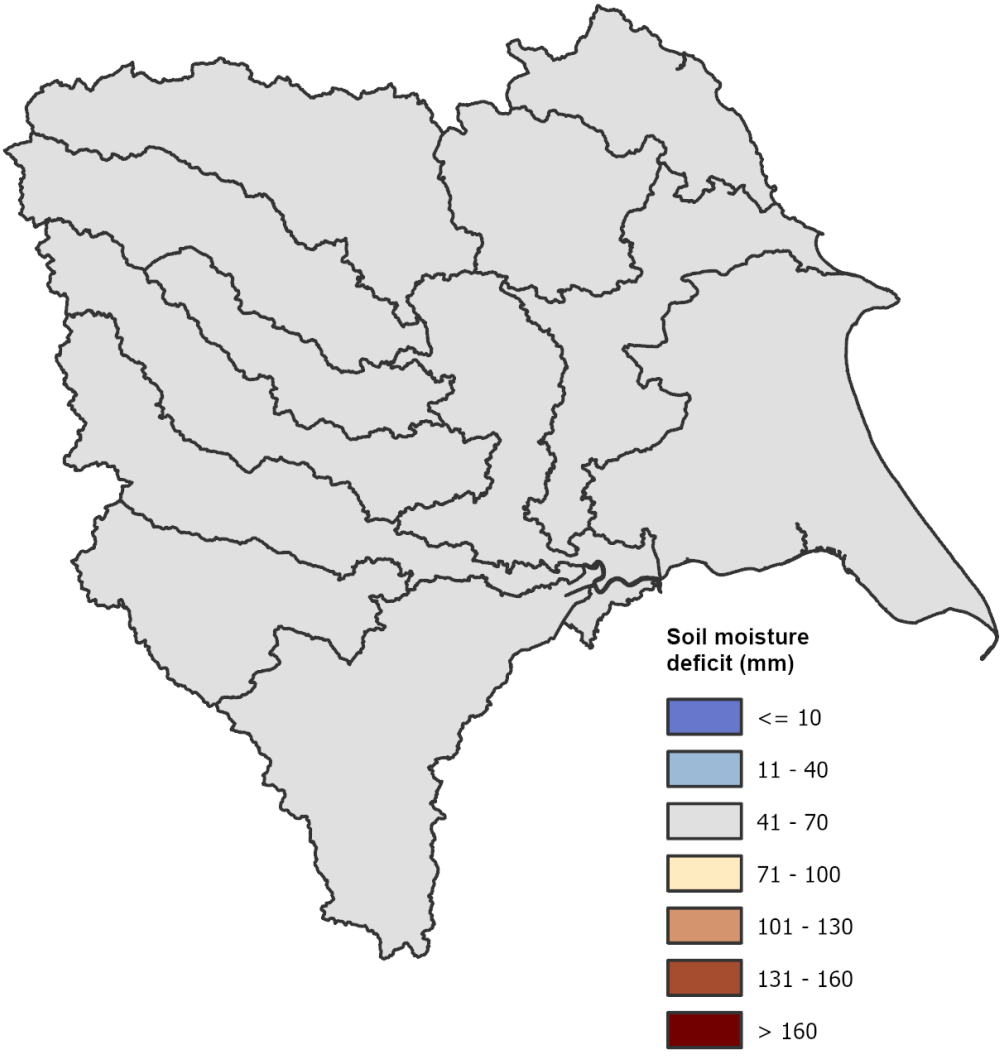


Rainfall data for October 2023 onwards, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2025). Rainfall data prior to October 2023, extracted from Met Office HadUK 1km gridded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

3 Soil moisture deficit

3.1 Soil moisture deficit map

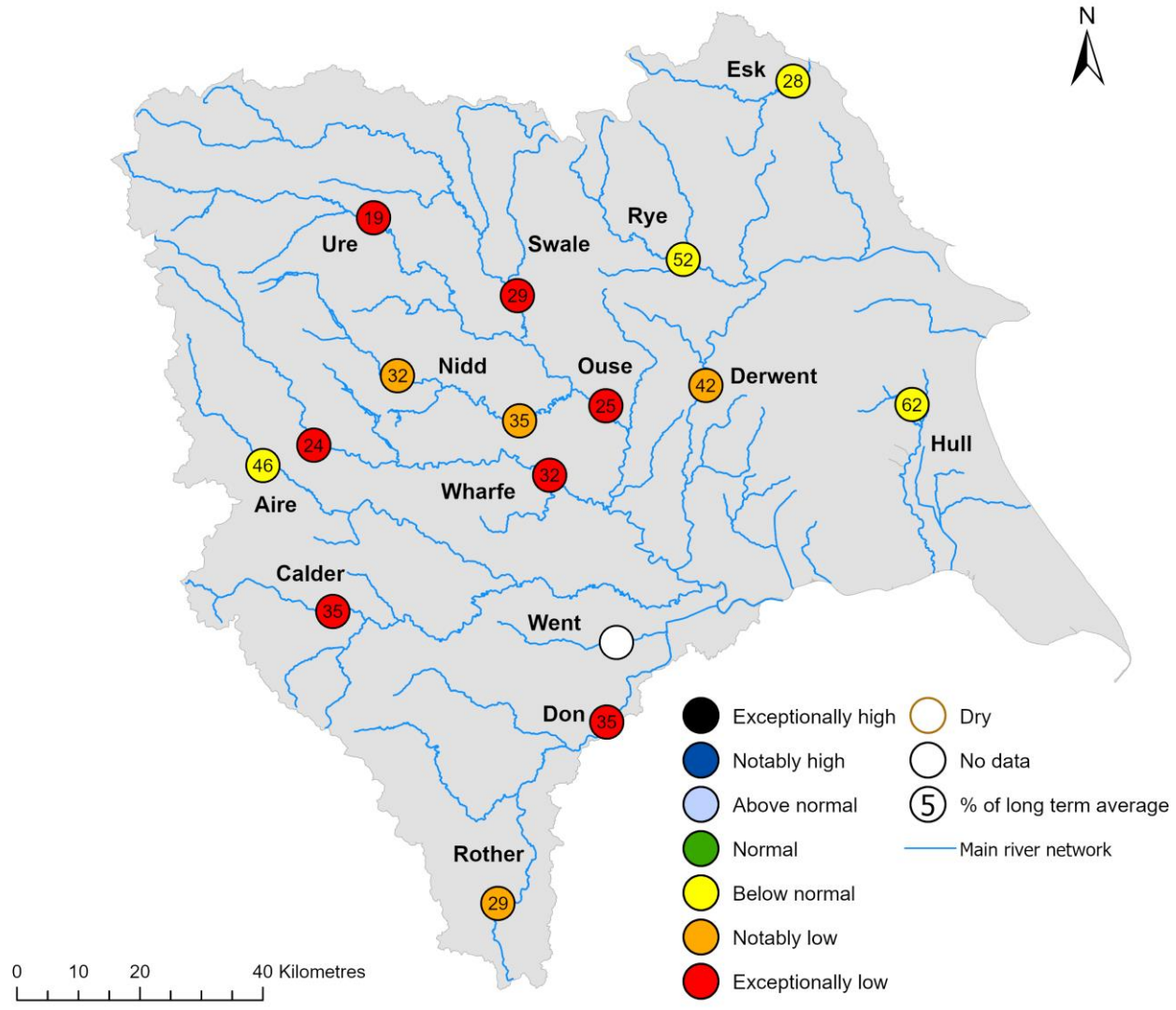
Figure 3.1: Soil moisture deficits for weeks ending 30 April 2025. Shows the difference (mm) of the actual soil moisture deficit from the 1961 to 1990 long term average soil moisture deficits. MORECS data for real land use.



4 River flows

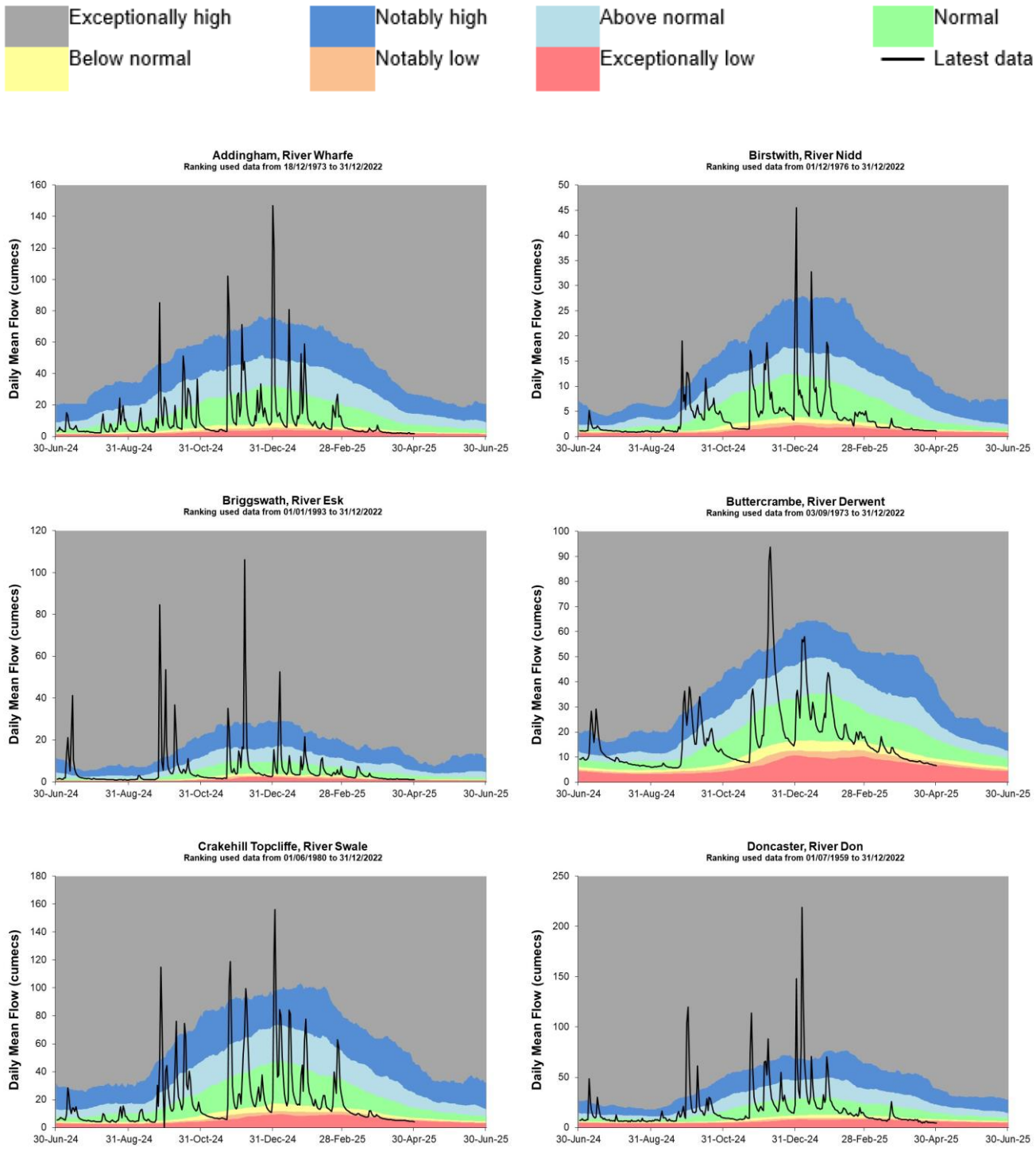
4.1 River flows map

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

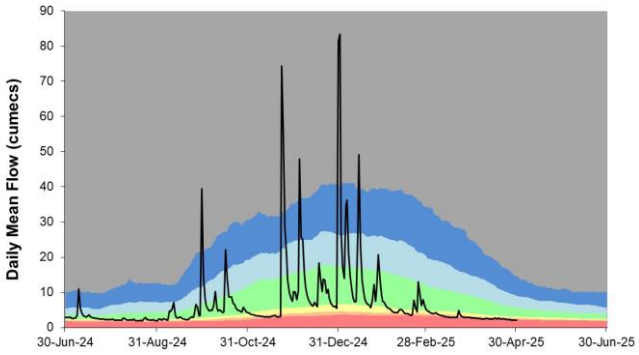


4.2 River flow charts

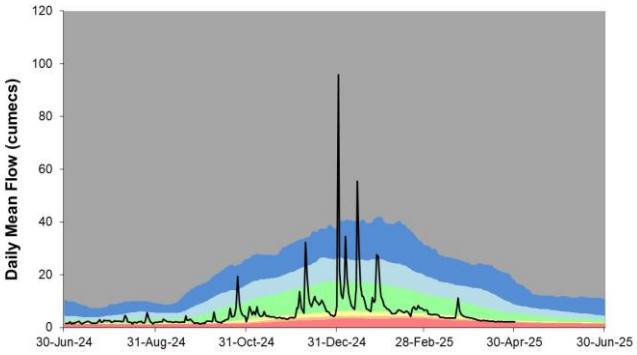
Figure 4.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows.



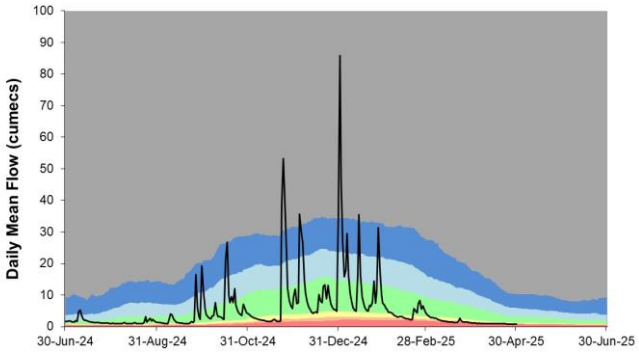
Elland, River Calder
Ranking used data from 01/07/1971 to 31/12/2022



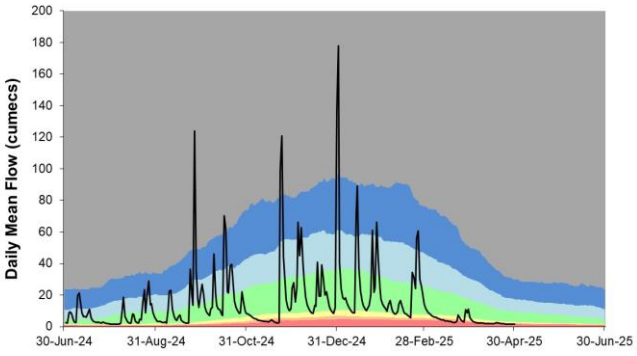
Hunsingore, River Nidd
Ranking used data from 01/10/1968 to 31/12/2022



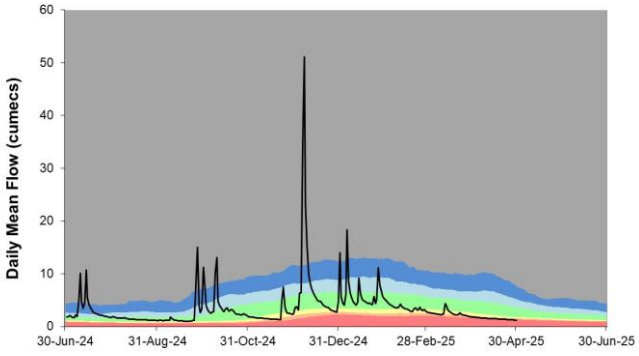
Kildwick, River Aire
Ranking used data from 01/08/1971 to 31/12/2022



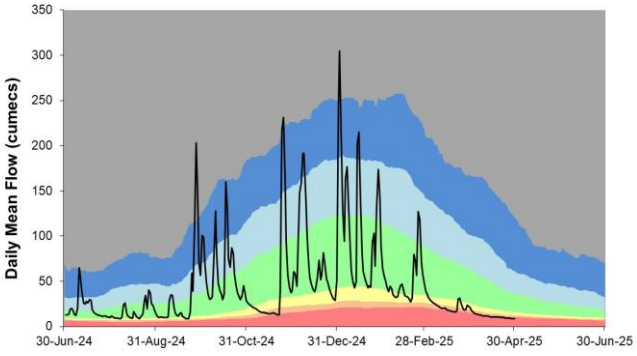
Kilgram Bridge, River Ure
Ranking used data from 01/08/1971 to 31/12/2022

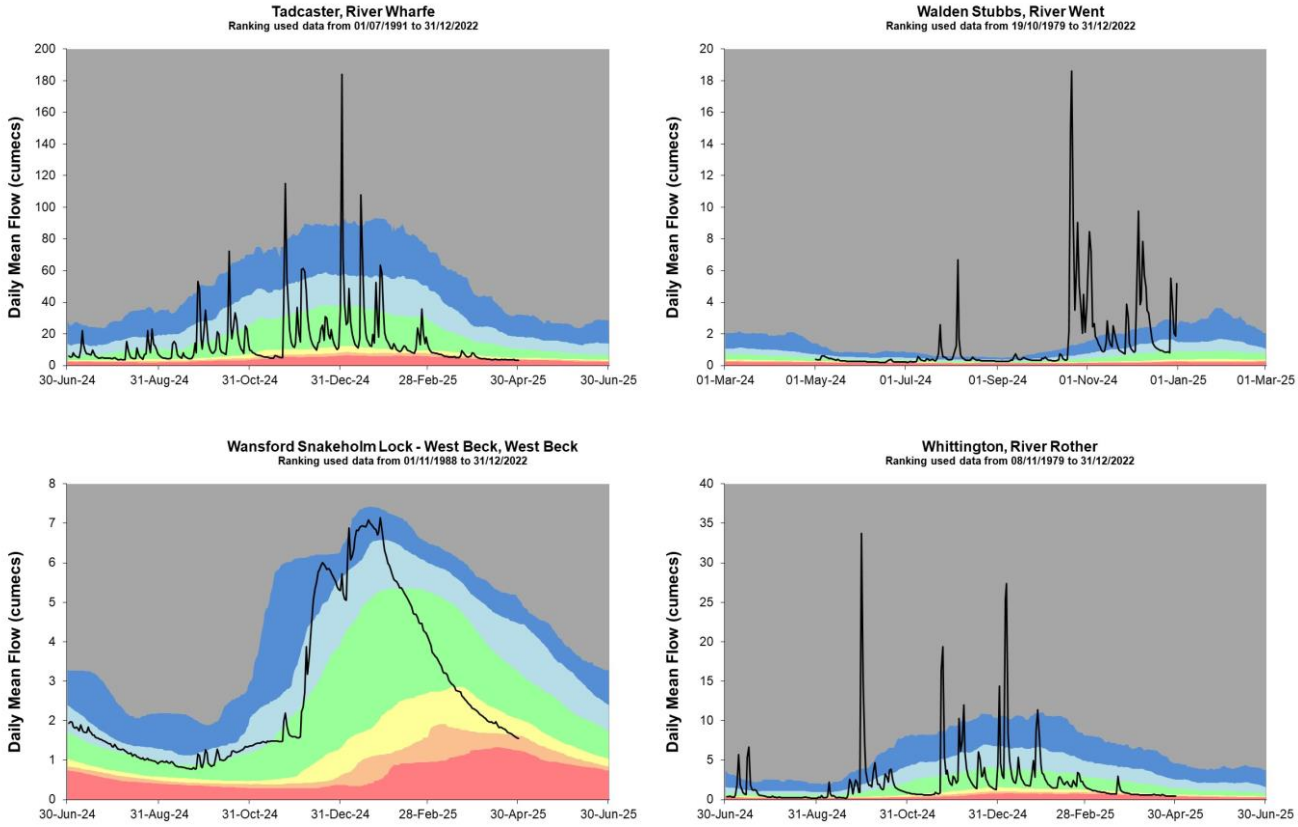


Ness, River Rye
Ranking used data from 01/09/1974 to 31/12/2022



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

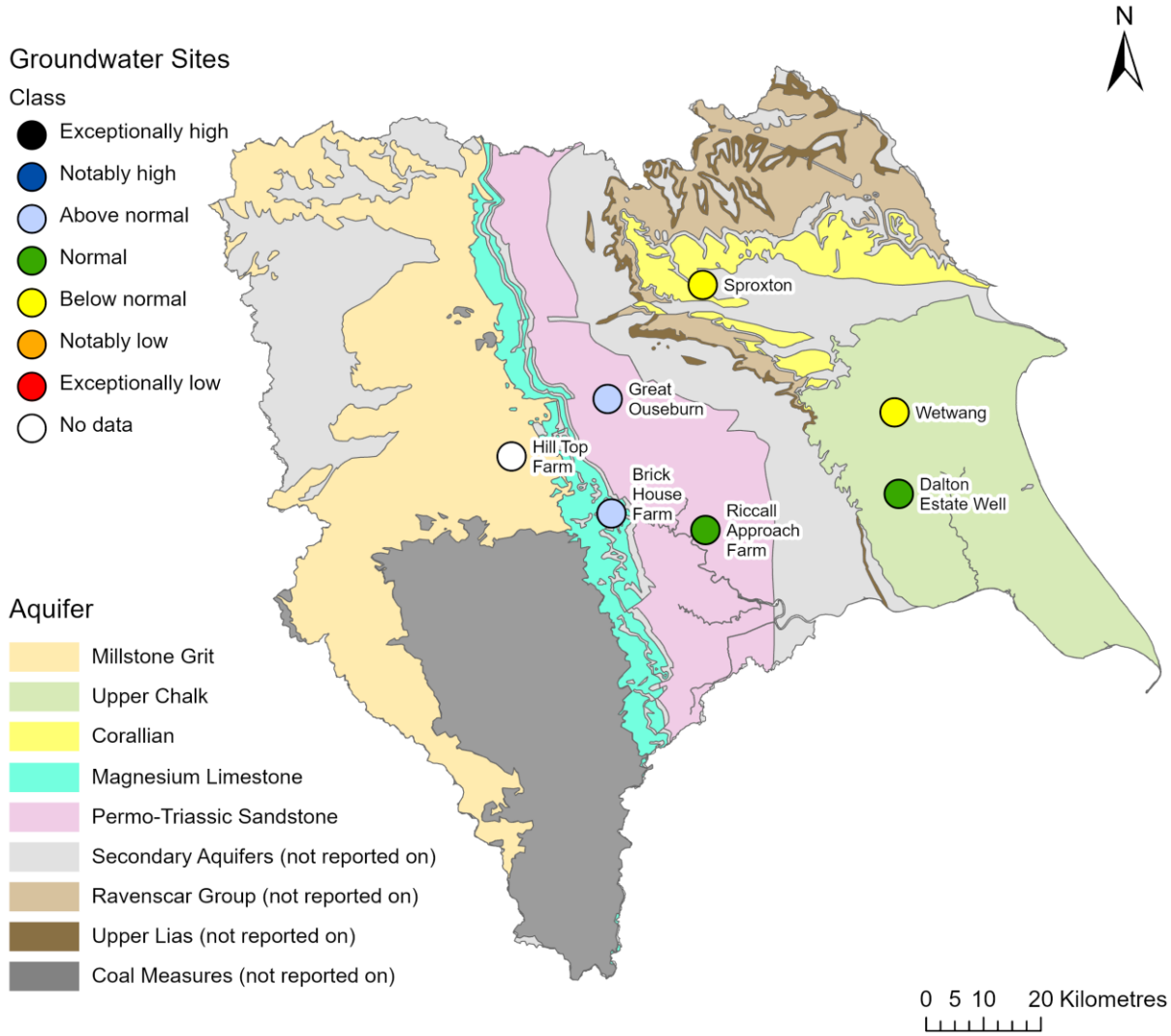




5 Groundwater levels

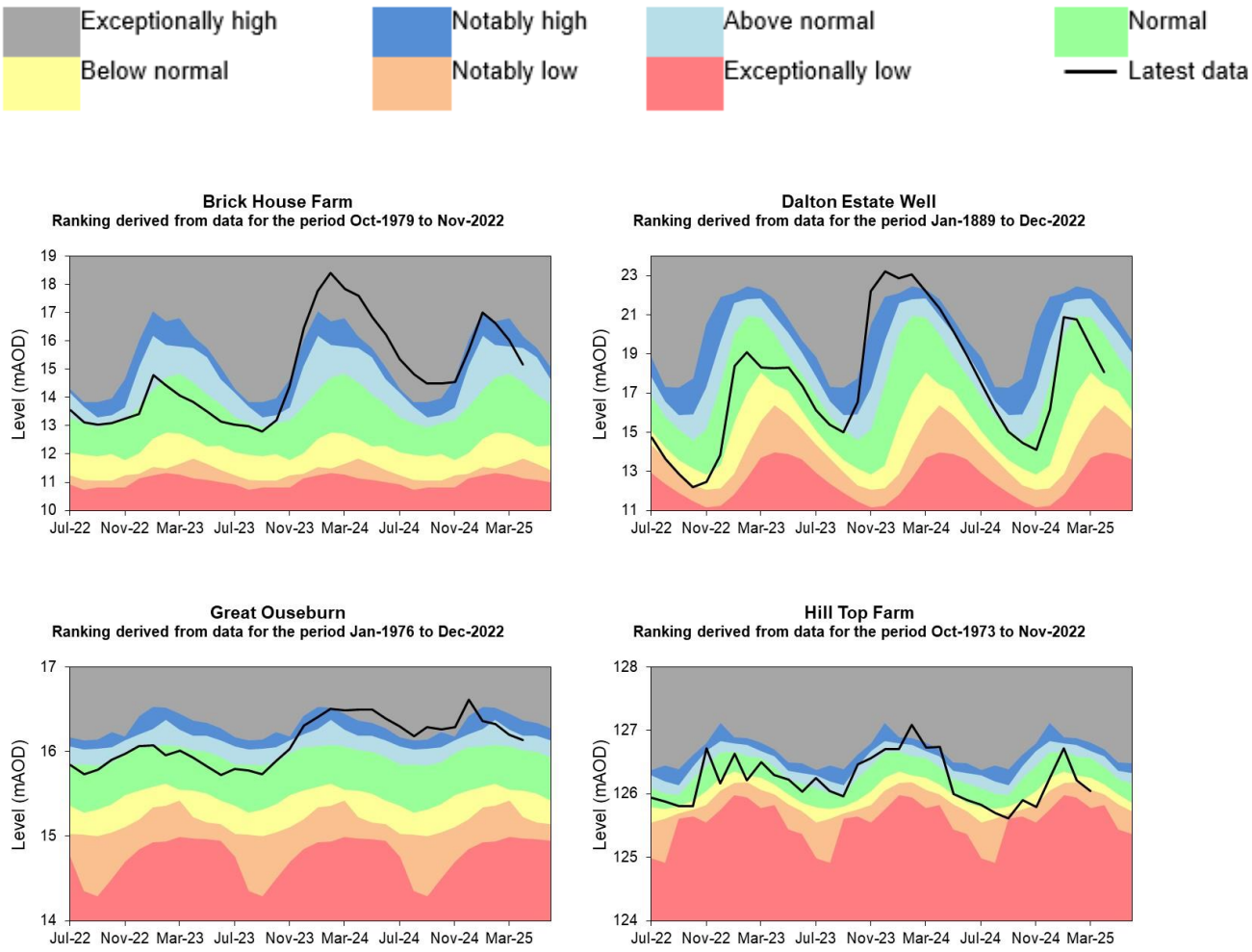
5.1 Groundwater levels map

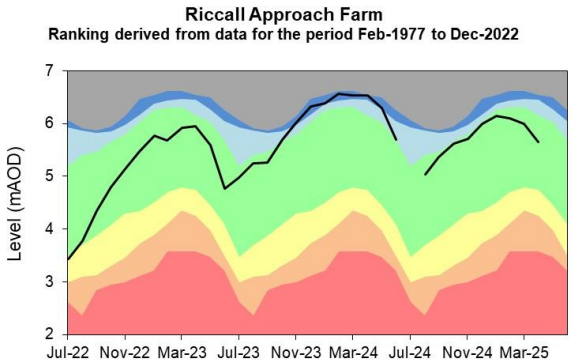
Figure 5.1: Groundwater levels for indicator sites at the end of April 2025, classed relative to an analysis of respective historic April levels. Table available in the appendices with detailed information.

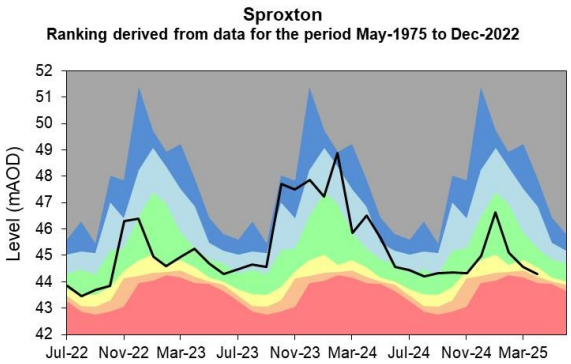


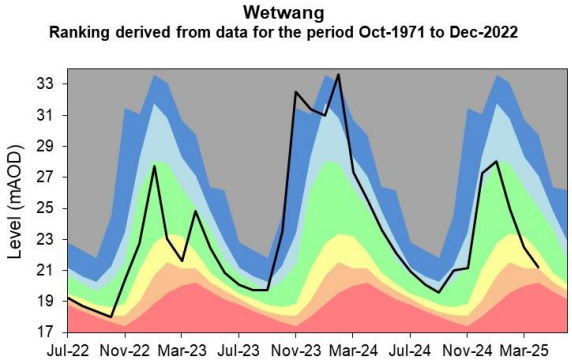
5.2 Groundwater level charts

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.





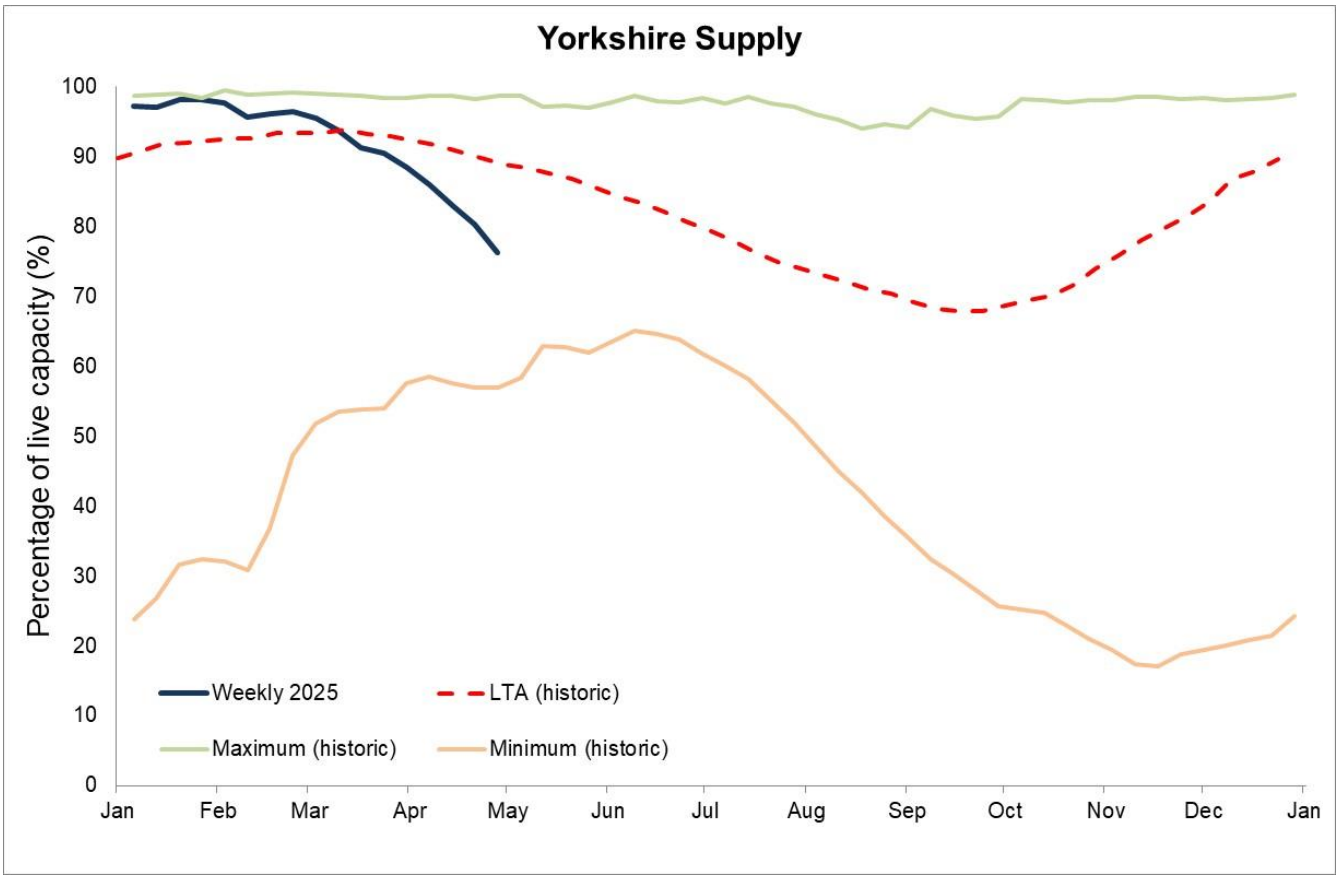




 N.B. Hill Top Farm observation borehole is used for abstraction. Therefore the groundwater level record will be directly affected by pumping

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	Apr 2025 rainfall % of long term average 1961 to 1990	Apr 2025 band	Feb 2025 to April cumulative band	Nov 2024 to April cumulative band	May 2024 to April cumulative band
Aire	16	Exceptionally low	Exceptionally low	Notably low	Below normal
Calder	20	Notably low	Exceptionally low	Below normal	Below normal
Dales North Sea Tribs	24	Notably low	Exceptionally low	Notably low	Normal
Derwent (ne)	24	Notably low	Exceptionally low	Below normal	Below normal
Don	19	Notably low	Exceptionally low	Normal	Normal
Hull And Humber	33	Notably low	Exceptionally low	Below normal	Normal
Nidd	13	Exceptionally low	Exceptionally low	Exceptionally low	Below normal
Ouse	19	Notably low	Exceptionally low	Below normal	Below normal
Rye	17	Exceptionally low	Exceptionally low	Notably low	Below normal

Swale (ne)	13	Exceptionally low	Exceptionally low	Exceptionally low	Below normal
Ure	14	Exceptionally low	Exceptionally low	Exceptionally low	Notably low
Wharfe	14	Exceptionally low	Exceptionally low	Exceptionally low	Below normal

8.2 River flows table

Site name	River	Catchment	Apr 2025 band	Mar 2025 band
Addingham	Wharfe	Wharfe Middle	Exceptionally low	Exceptionally low
Birstwith	Nidd	Nidd Middle	Notably low	Notably low
Briggswath	Esk	Esk Yorks	Below normal	Below normal
Buttercrambe	Derwent	Derwent Yorks Middle	Notably low	Below normal
Crakehill Topcliffe	Swale	Swale Lower	Exceptionally low	Exceptionally low
Doncaster	Don	Don Lower	Exceptionally low	Notably low
Elland	Calder	Calder Yorks Upper	Exceptionally low	Exceptionally low
Hunsingore	Nidd	Nidd Lower	Notably low	Below normal
Kildwick	Aire	Aire Upper	Below normal	Below normal
Kilgram Bridge	Ure	Ure Middle	Exceptionally low	Exceptionally low
Ness	Rye	Rye	Below normal	Notably low
Skelton	Ouse	Ouse Yorks	Exceptionally low	Exceptionally low

Tadcaster	Wharfe	Wharfe Lower	Exceptionally low	Exceptionally low
Walden Stubbs	Went	Don Lower		
Wansford Snakeholm Lock	West Beck	Hull Upper	Below normal	Below normal
Whittington	Rother	Rother Yorks	Notably low	Notably low

8.3 Groundwater table

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