Monthly water situation report: Yorkshire Area

1 Summary - May 2025

For the first 23 days of May there was almost no rainfall, river flows reduced, soils continued to dry out and reservoir stocks decreased to record low levels for the time of year. From day 23 there was enough rainfall to raise river flows temporarily and ease the rate of decline in reservoir stocks. However, this rainfall was not sufficient to reverse the general trend of below normal flows, dry soils, and declining groundwater levels caused by one of the driest late winter and springs on record.

1.1 Rainfall

May rainfall was divided between the first 22 days of May, which had almost no recorded rainfall, and a much wetter period from day 26 to 29. For the month as a whole, rainfall totals were normal or below normal for the time of year, ranging from 53 to 90% of the long-term average. It was the third driest January to May since 1871, with only 1896 and 1929 having lower rainfall totals.

Until day 23 many of the rain gauges within Yorkshire recorded less than 2mm, the exceptions were the Rye and Esk catchments where small daily rainfall totals of up to 8mm occurred between day 3 to 5. From day 23 to the end of the month the weather was unsettled with monthly average rainfall totals in the Ure, Nidd, Wharfe and Aire catchments that reached the normal range. Elsewhere the rainfall amounts were below normal for the time of year.

The largest rainfall totals occurred over the highest Pennine catchments. At Beckermonds in upper Wharfedale there was no recorded rainfall for the first 22 days of May. This was followed by 88.6mm of rain between day 26 to 29, equivalent to 90% of the May long term average.

1.2 Soil moisture deficit

In general, soil moisture deficits continued to rise throughout May. In most catchments soils were dry at the start of the month and, with the exception of the Pennine Areas, became very dry by the end of the month. The driest soils occurred in the lower lying catchments of the Vale of York, the lower Ouse, the lower Don, and the Hull.

1.3 River flows

Monthly mean river flows for most Yorkshire catchments were between 31% and 76% of the long-term average for May. River flows in the Ure were within normal range. Flows were below normal in the Wharfe and Rye and notably low in Swale, Nidd, Ouse, Aire, Don and West Beck. In the Calder, Rother and Derwent river flows were exceptionally low.

River flows across most Yorkshire catchments remained below normal to exceptionally low for the time of year until day 24. The only exception was at Hunsingore in the lower Nidd where flows increased to normal from day 19.

From day 26 to the end of the month the larger rainfall totals increased river flows in the Pennine catchments from the Don to the upper Swale to between normal and exceptionally high for the time of the year. In the Esk, Rye and Derwent the response was less marked with river flows only increasing to notably low or below normal.

Throughout May, flows in the chalk catchments of West Beck remained consistent and notably low for the time of year.

1.4 Groundwater levels

Magnesian Limestone

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

Millstone Grit

The groundwater level within the Millstone Grit at Hill Top Farm decreased and remained at notably low for the time year. This observation borehole is used for water abstraction by means of a pump which may affect the groundwater level recorded here.

Sherwood Sandstone

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

Corallian Limestone

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

Chalk

The groundwater level at Wetwang decreased and remained below normal for the time of year. The groundwater level also decreased at Dalton Estate Well and was below normal for the time of year.

1.5 Reservoir stocks

Reservoir stocks continued to decline at an average rate of 3% per week throughout the month and by the end of the month were 24% lower than the long term average.

1.6 Environmental impact

In late May there were 23 abstraction licences subject to a Hands Off Flow (HOF) restriction. There were a number of reported environmental incidents related to low flows and dry weather. There were also impacts on the available water to support the Pennine canals.

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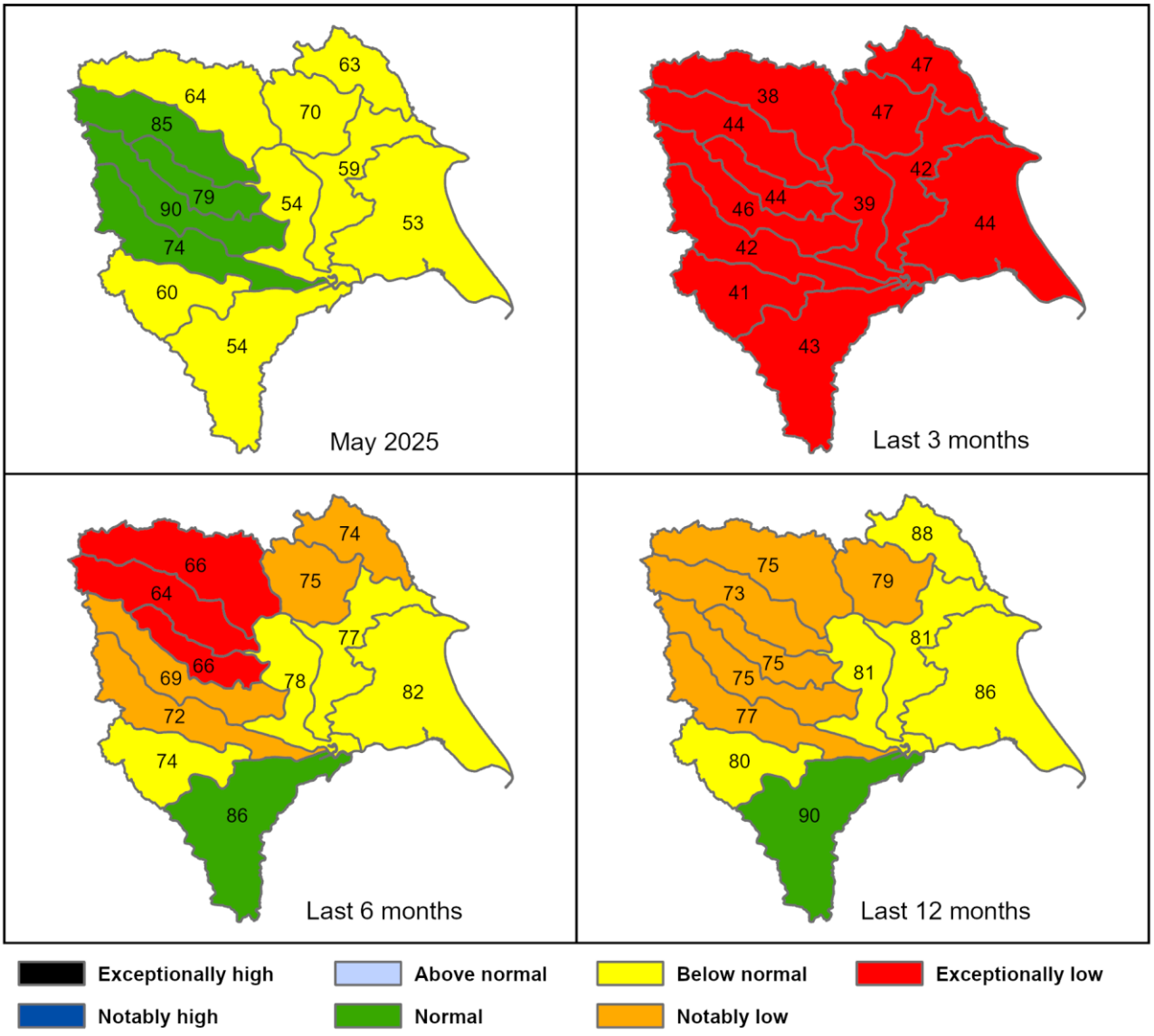
2 Rainfall

2.1 Rainfall map

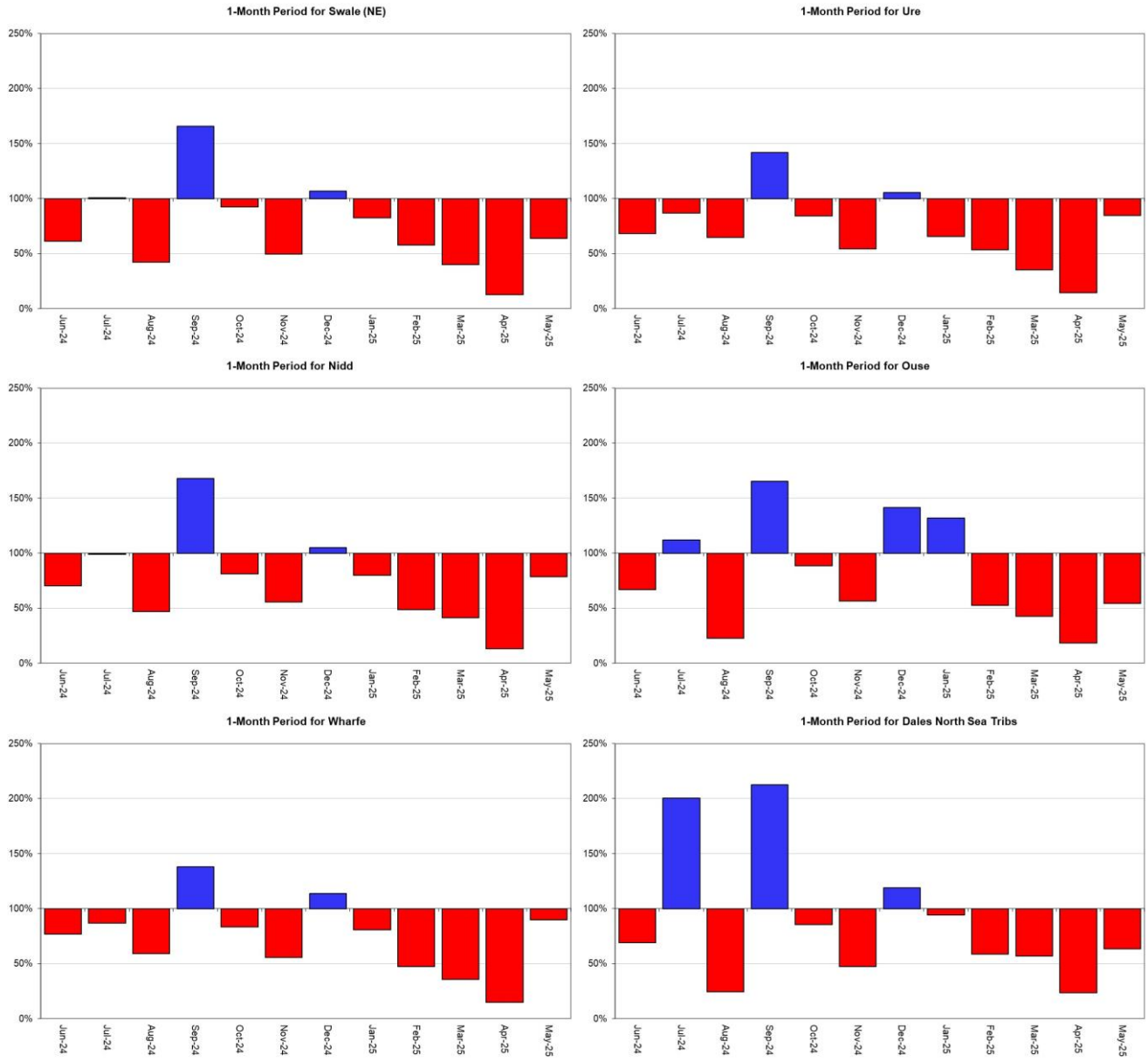
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 31 May 2025), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.

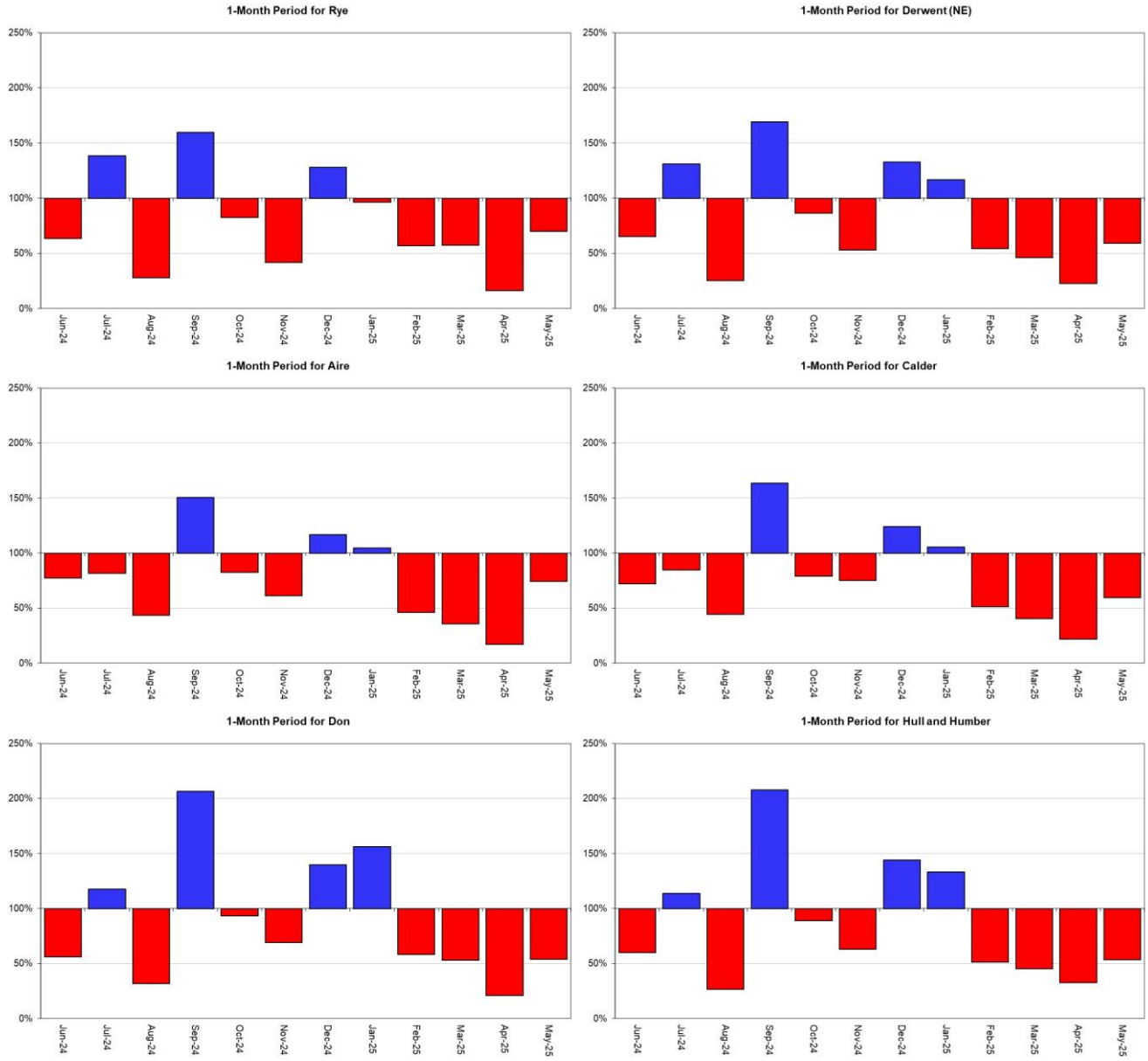


HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2025). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved.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

2.2 Rainfall charts

Figure 2.2: Monthly rainfall totals for the past 24 months as a percentage of the 1991 to 2020 long term average for each region and for England.



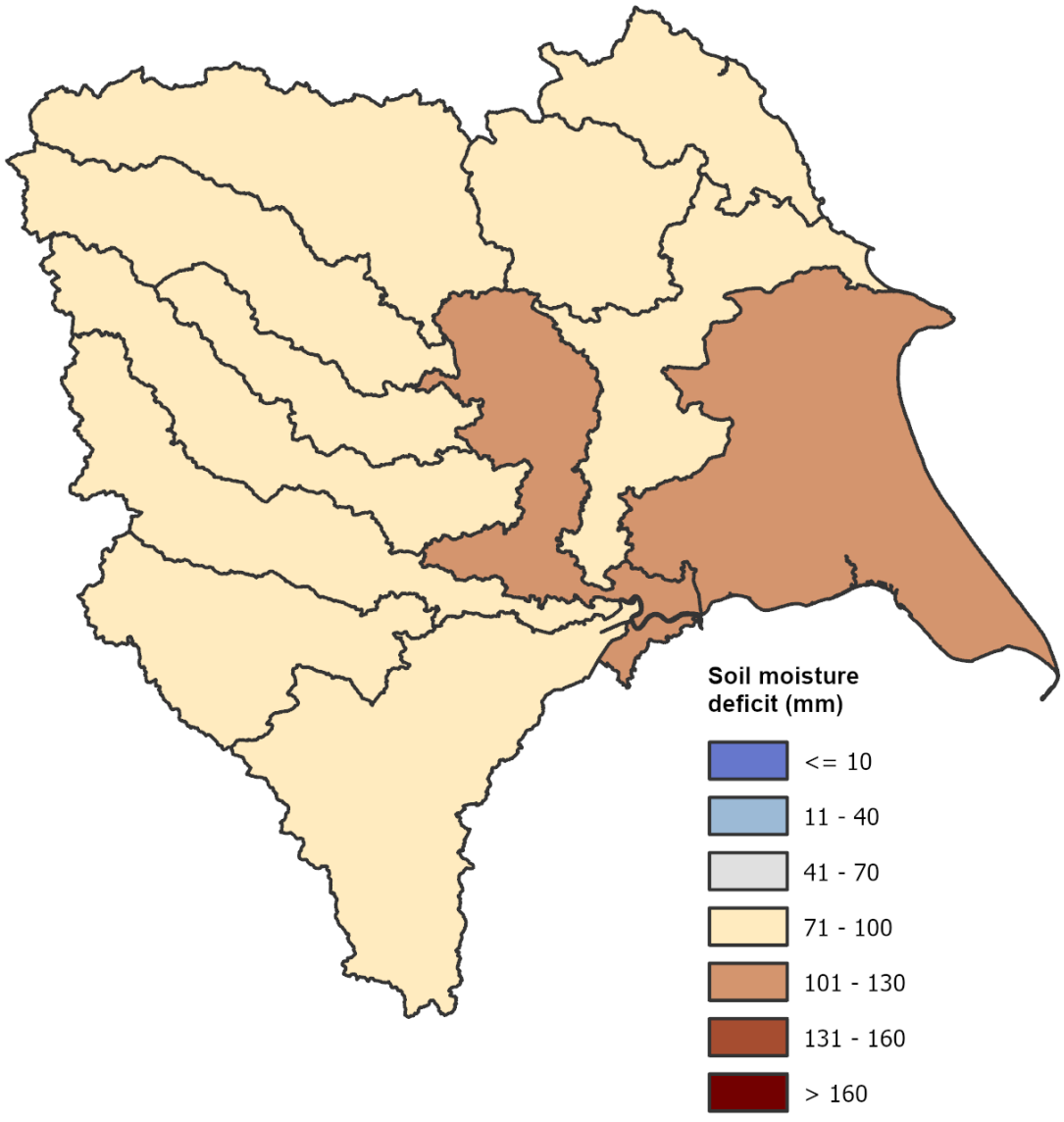


Rainfall data for 2024 and 2025, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2025). Rainfall data prior to October 2023 extracted from Met Office HadUK 1km gridded rainfall dataset derived from registered rain gauges (Source: Met Office. Crown copyright, 2025).

3 Soil moisture deficit

3.1 Soil moisture deficit map

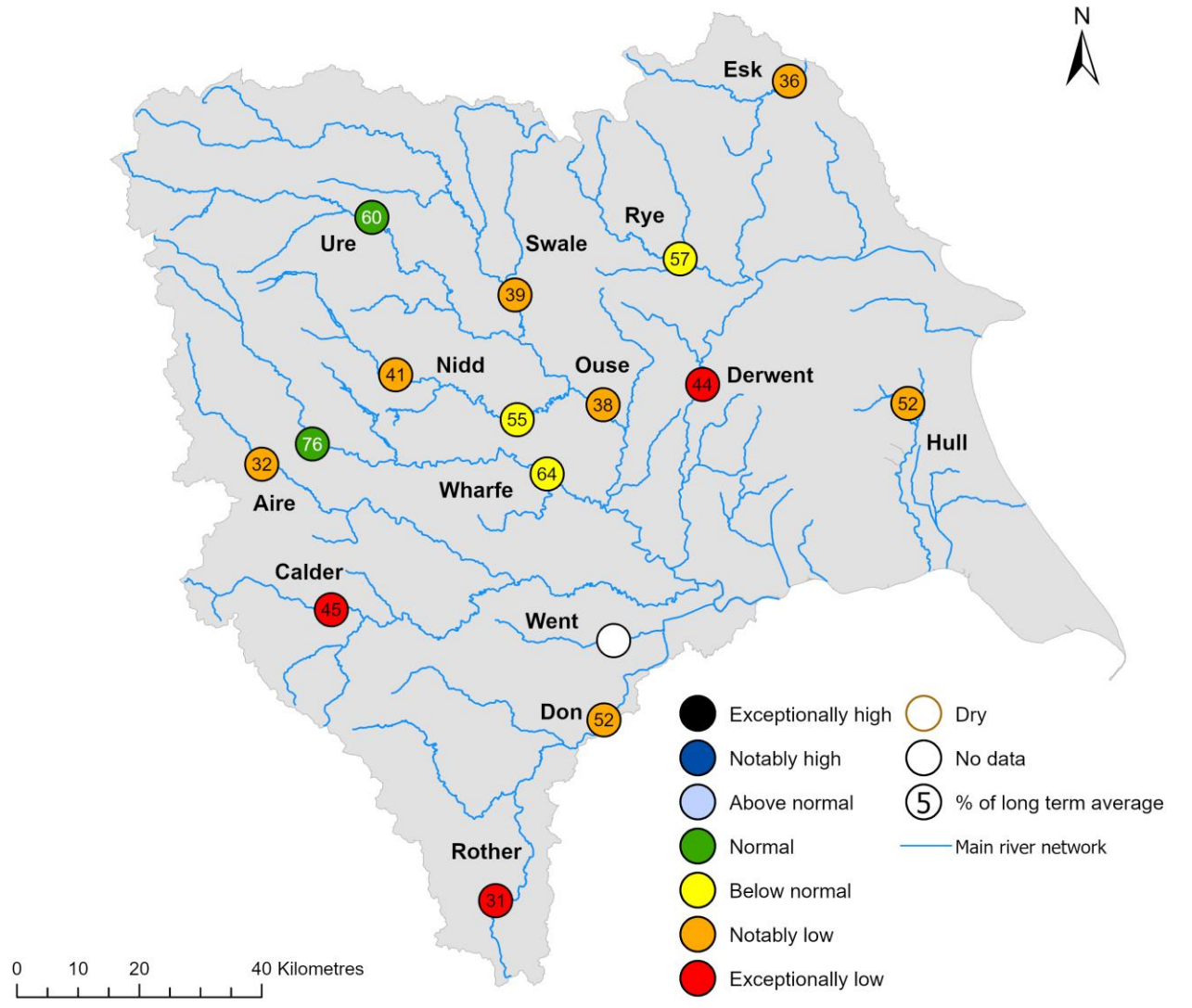
Figure 3.1: Soil moisture deficits for weeks ending 31 May 2025. Shows the difference (mm) of the actual soil moisture deficit from the 1991 to 2020 long term average soil moisture deficits. MORECS data for real land use.



4 River flows

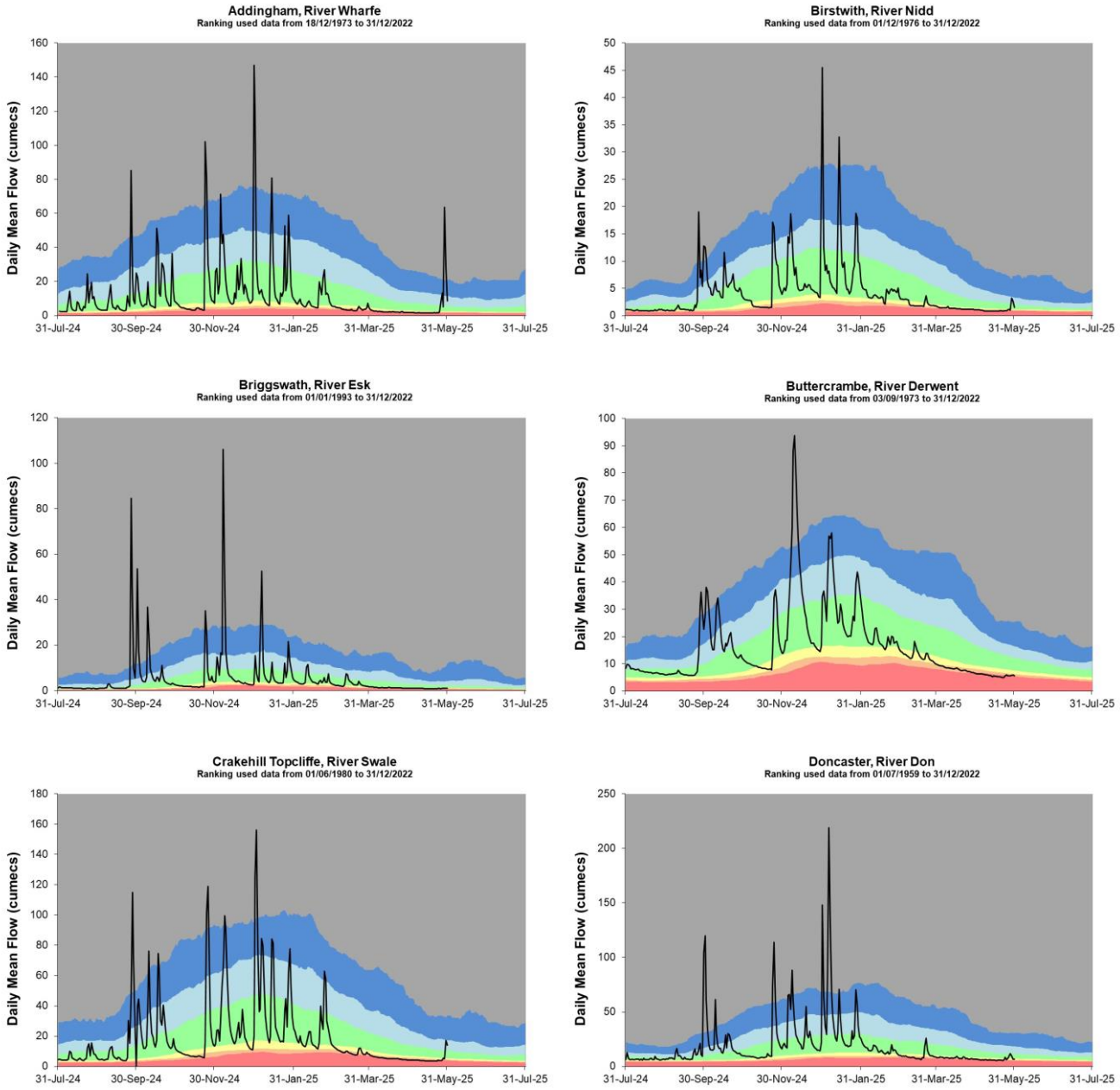
4.1 River flows map

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

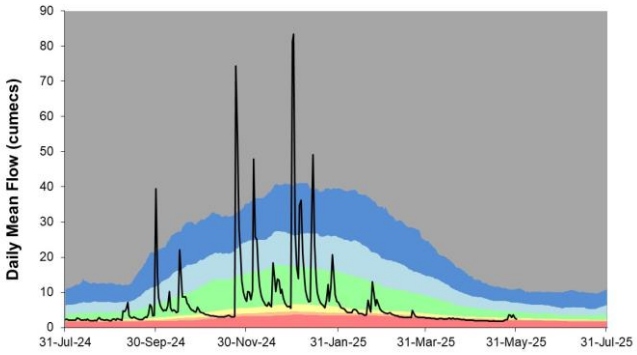


4.2 River flow charts

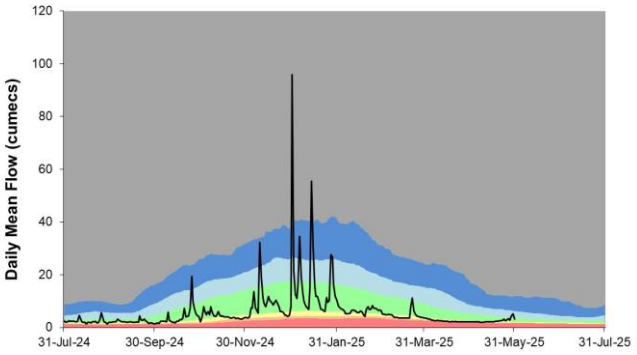
Figure 4.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows.



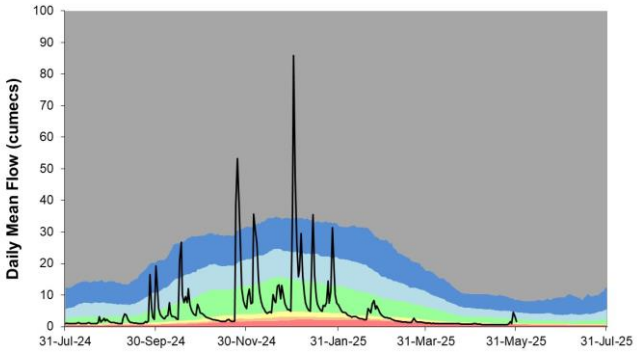
Elland, River Calder
Ranking used data from 01/07/1971 to 31/12/2022



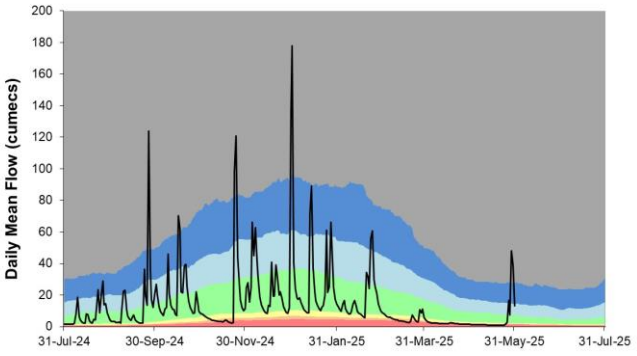
Hunsingore, River Nidd
Ranking used data from 01/10/1968 to 31/12/2022



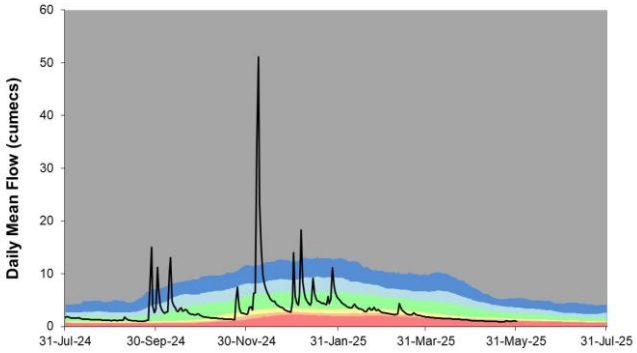
Kildwick, River Aire
Ranking used data from 01/08/1971 to 31/12/2022



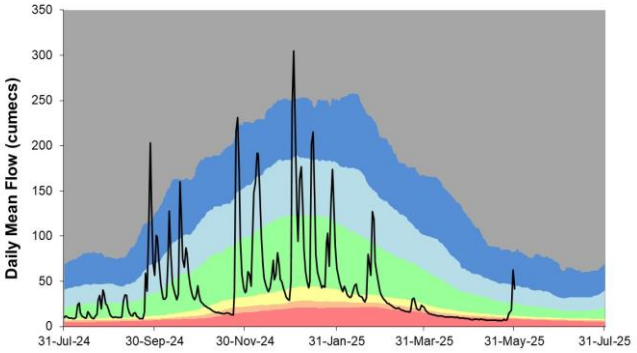
Kilgram Bridge, River Ure
Ranking used data from 01/08/1971 to 31/12/2022

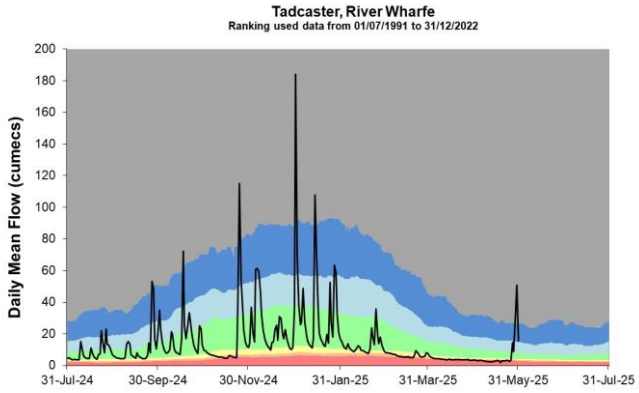


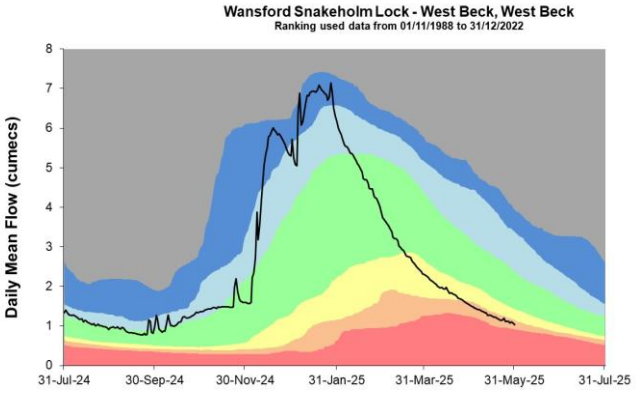
Ness, River Rye
Ranking used data from 01/09/1974 to 31/12/2022

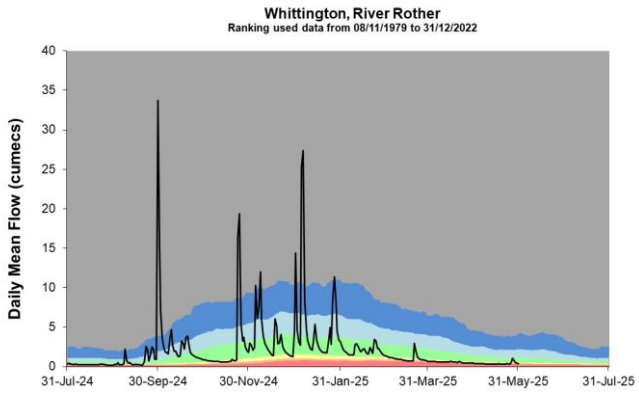


Skelton, River Ouse
Ranking used data from 18/09/1969 to 31/12/2022





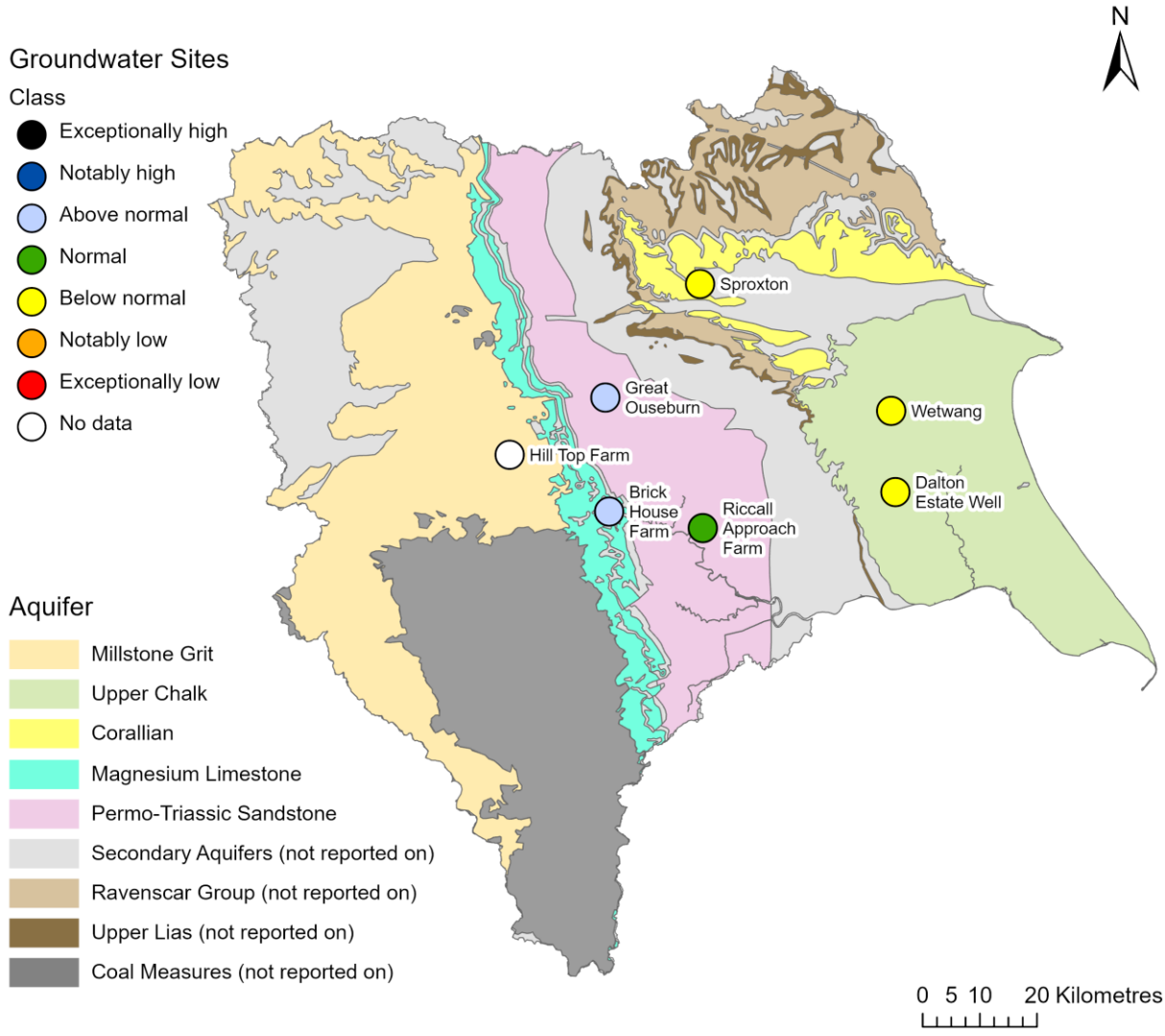




5 Groundwater levels

5.1 Groundwater levels map

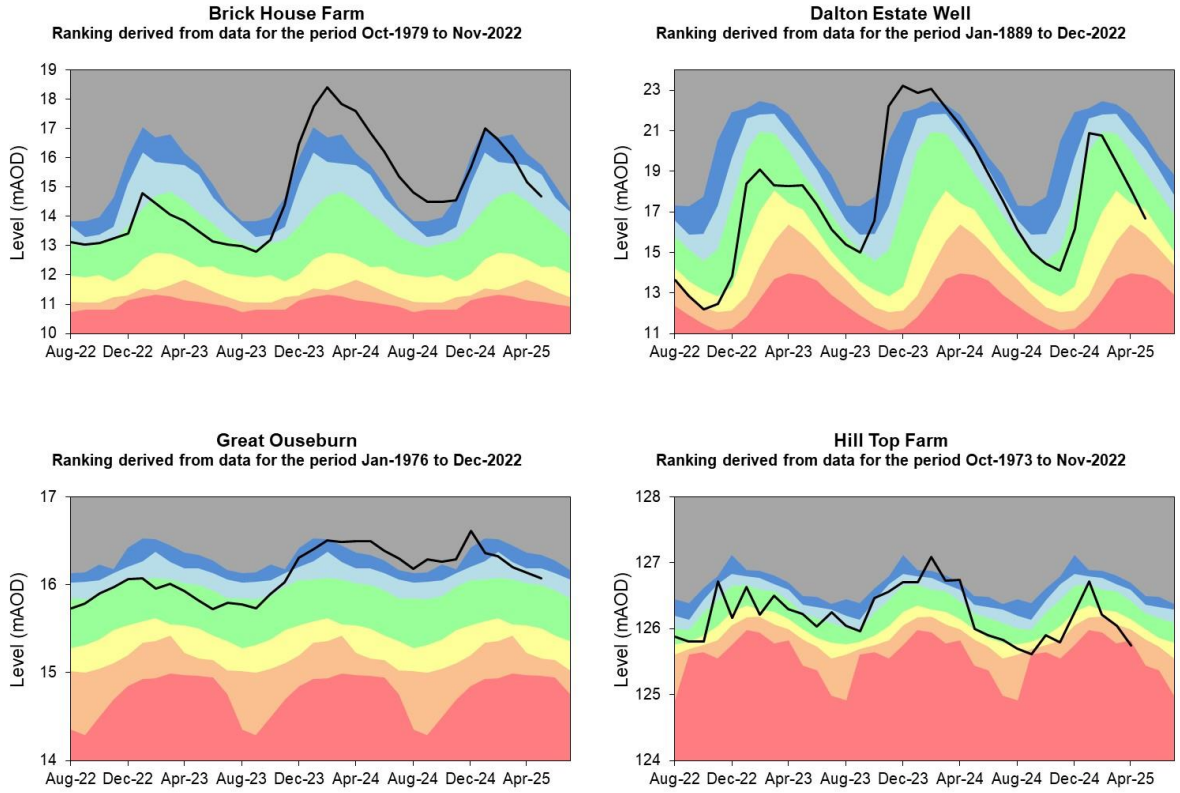
Figure 5.1: Groundwater levels for indicator sites at the end of May 2025, classed relative to an analysis of respective historic May levels. Table available in the appendices with detailed information.

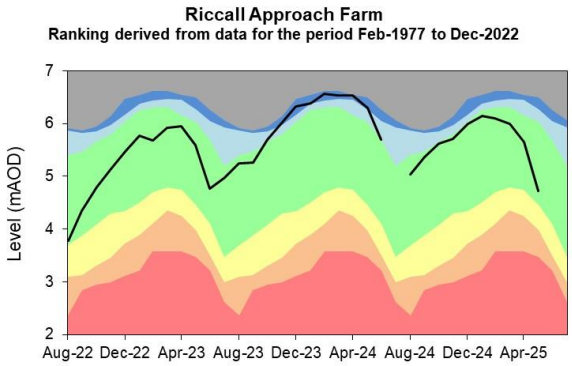


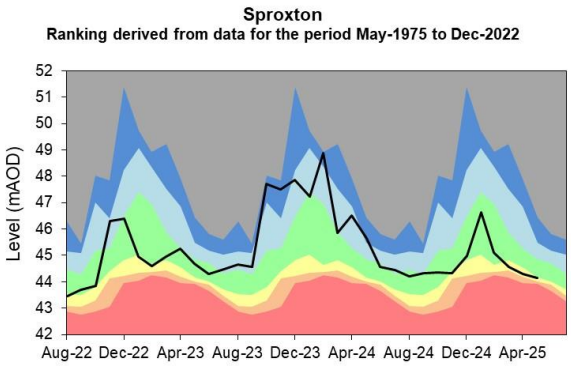
(Source: Environment Agency). Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, 100024198, 2025.

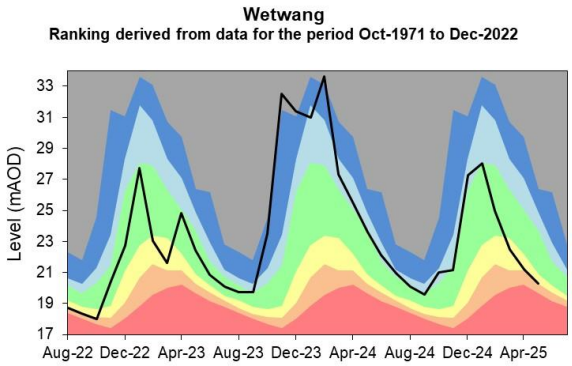
5.2 Groundwater level charts

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









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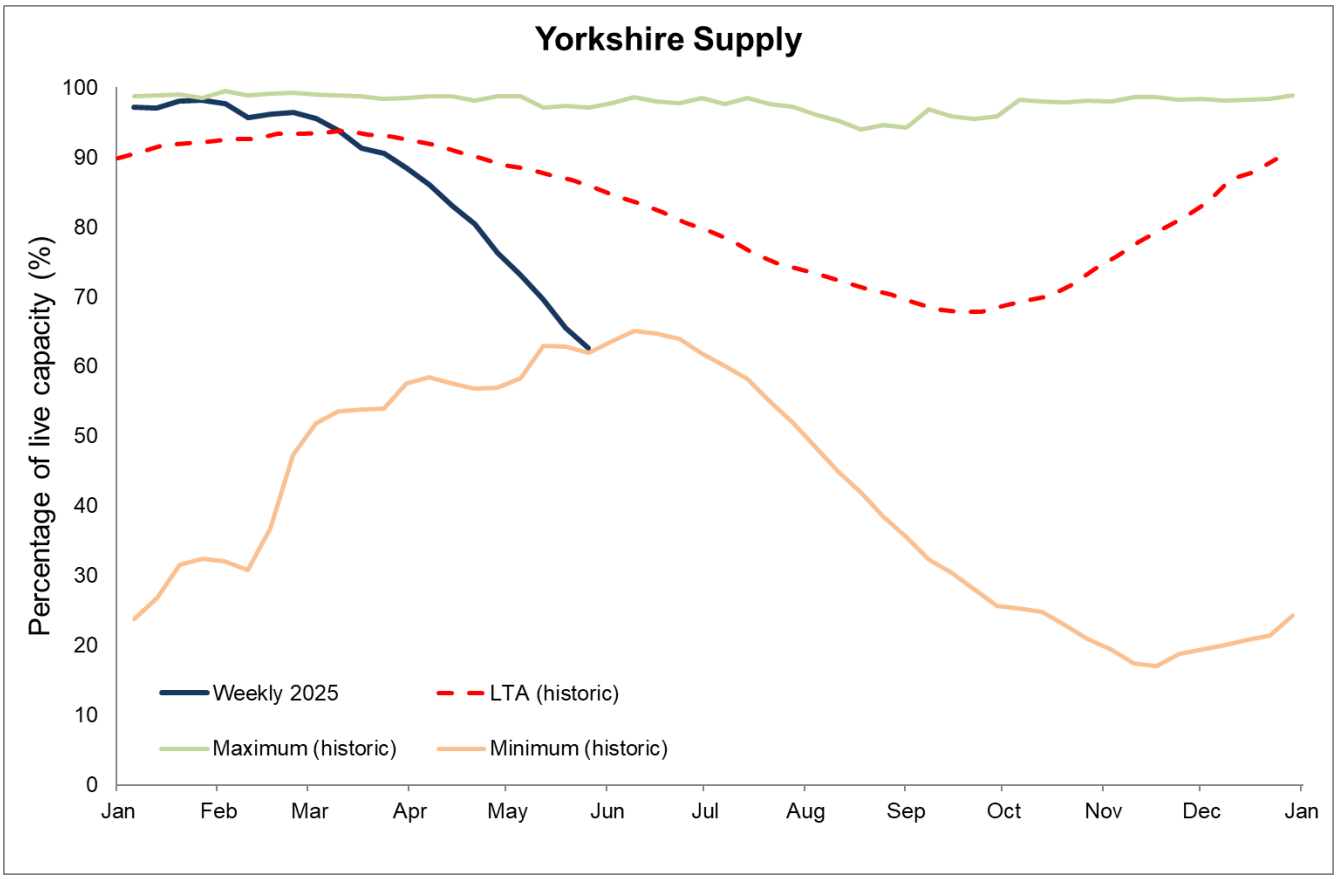
N.B. Hill Top Farm observation borehole is used for abstraction. Therefore the groundwater level record may be directly affected by pumping

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 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
Aire	74	Normal	Exceptionally low	Notably low	Notably low
Calder	60	Below Normal	Exceptionally low	Below normal	Below normal
Dales North Sea Tribs	63	Below Normal	Exceptionally low	Notably low	Below normal
Derwent (Yorkshire)	59	Below Normal	Exceptionally low	Below normal	Below normal
Don	54	Below Normal	Exceptionally low	Normal	Normal
Hull and Humber	53	Below Normal	Exceptionally low	Below normal	Below normal
Nidd	79	Normal	Exceptionally low	Exceptionally low	Notably low
Ouse	54	Below Normal	Exceptionally low	Below normal	Below normal
Rye	70	Below Normal	Exceptionally low	Notably low	Notably low

Swale (Yorkshire)	64	Below Normal	Exceptionally low	Exceptionally low	Notably low
Ure	85	Normal	Exceptionally low	Exceptionally low	Notably low
Wharfe	90	Normal	Exceptionally low	Notably low	Notably low

8.2 River flows table

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

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

8.3 Groundwater table

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