Monthly water situation report: Lincolnshire and Northamptonshire Area

1 Summary - January 2025

Following three consecutive months of normal rainfall, Lincolnshire and Northamptonshire area received above normal levels of rainfall (67mm), which was 130% of the long-term average (LTA). Rainfall across the area ranged from 53mm to 77mm (114% - 144% of the LTA), meaning that catchments received normal to above normal rainfall for this time of year. Soil moisture deficits (SMD) decreased in all hydrological areas. By the end of January, the area had an SMD of 1.3mm, which falls within the notably low category for this time of year. River flows at most sites responded in line with the rainfall received across January. Monthly mean river flows ranged from 121% to 208% of the LTA, with classifications ranging from normal to notably high. Following the above average rainfall and notably low SMD across the area in January, groundwater levels remained normal or higher at all sites with available data. With the exception of Covenham, reservoirs in the area ended the month above their normal operating curves.

1.1 Rainfall

Overall, January brought above normal levels of rainfall, with an average total of 67mm – 130% of the LTA for Lincolnshire and Northamptonshire. A significant proportion of January's rainfall fell in the first week of the month, with almost 57% recorded across two days (4 and 5 January).

On the 5 January, an Atlantic low-pressure system brought substantial rainfall. Totals included 38mm recorded in Louth Grimsby and Ancholme, 37mm in Witham to Chapel Hill, and an average of 31mm of rainfall across the six hydrological areas. This made it the wettest day of the month. Rainfall was generally slightly higher in the northern areas than in the south. Rainfall across the hydrological areas ranged from 53mm to 77mm (114% - 144% of the LTA), resulting in classifications of normal to above normal rainfall for this time of year.

Three-month rainfall totals showed normal levels in almost all of the hydrological areas, except for the Upper Welland and Nene catchment, which were classified as above normal. The six-month and twelve-month long-term rainfall maps reflect a north-south trend, with higher totals received in the south compared to the north.

1.2 Soil moisture deficit and recharge

Due to the normal to above normal levels of rainfall and cooler temperatures associated with this time of year, SMD decreased in all hydrological areas. On average, SMD for the area decreased from 4mm at the end of December to 1.3mm by the end of January. This figure is within the notably low range for the time of year. The SMD difference-to-LTA (mm) map shows all hydrological areas are in the -25mm to -6mm category, indicating that they are slightly wetter than normal for the time of year.

1.3 River flows

Monthly mean river flows ranged from 121% to 208% of their long-term averages, and from normal to notably high classification. In most sites river flow responded in line with the amount of rainfall received in January. Three of the 12 sites were considered to be notably high, eight at above normal level while the remaining site (Wansford) was classified as normal for the time of year.

1.4 Groundwater levels

Following the above normal levels of rainfall and notable low SMD across the area in January, groundwater levels remained normal or higher at all sites with data. With the exception of Leasingham Exploratory, the groundwater level trends showed a slight increase at all monitoring sites with data. The groundwater level at Leasingham Exploratory is relatively unchanged from end of December to end of January but has dropped from above normal levels to normal levels for the time of year. During January, Leasingham Exploratory did peak at exceptionally high levels following the heavy rain at the start of the month but by the end of January levels were starting to decline.

1.5 Reservoir stocks

With the exception of Covenham, reservoirs in the area ended the month above their normal operating curves. The level at Covenham was 4% below target in January, however levels are not alarmingly low and are on the way up towards the normal operational curve.

1.6 Environmental impact

During January, there were 36 flood alerts, and 40 flood warnings issued. All transfer schemes remained off throughout January. No licence cessations were issued.

1.7 Forward look

1.7.1 Probabilistic ensemble projections for river flows at key sites

March 2025: All sites are showing a slightly increased probability of greater than normal flows with none of the modelled rainfall scenarios showing exceptionally low level.

June 2025: The two Nene sites are showing increased probabilities of normal flows. North Brook is showing a reduced probability of extreme flows (both high and low).

1.7.2 Probabilistic ensemble projections for groundwater levels in key aquifers

March 2025: All sites are showing an increased probability of groundwater levels being normal or higher with none of the modelled rainfall scenarios showing exceptionally low levels.

September 2025: All sites are showing a reduced probability of exceptionally/notably low levels.

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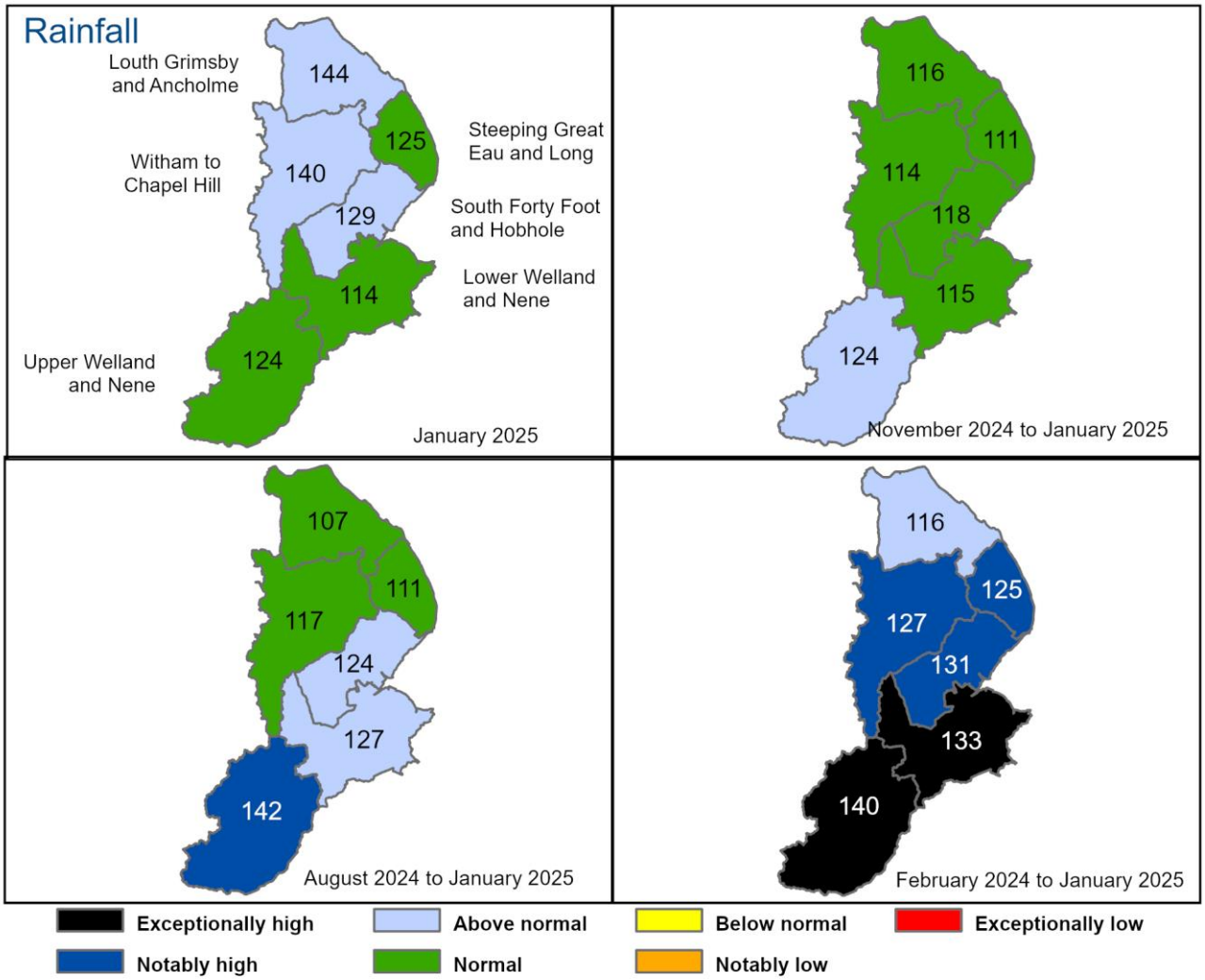
2 Rainfall

2.1 Rainfall map

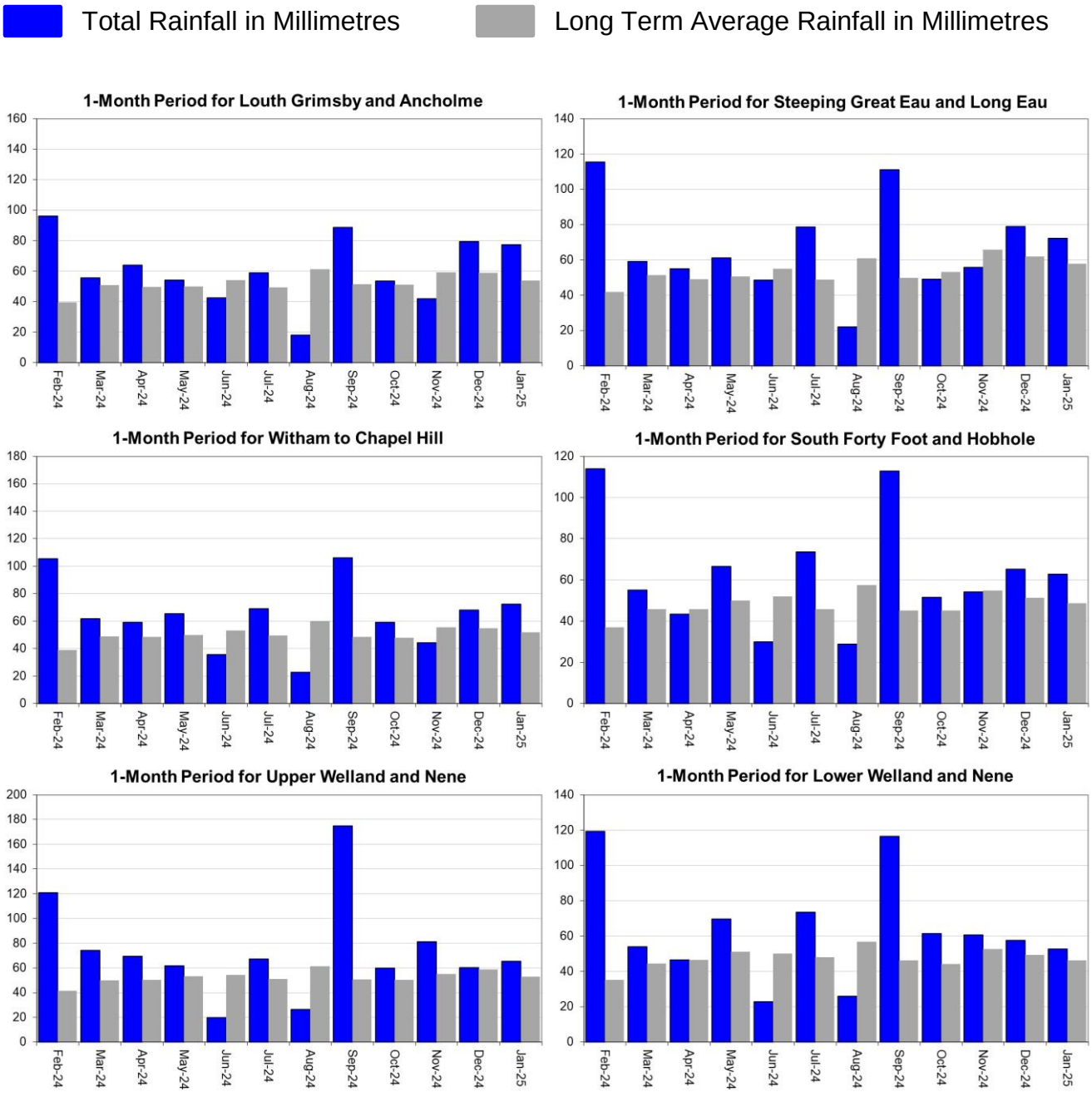
Figure 2.1: Total rainfall for hydrological areas across Lincolnshire and Northamptonshire, expressed as a percentage of long term average rainfall for the current month (up to 31 January 2025), the last 3 months, the last 6 months, and the last 12 months. Category classes are based on an analysis of 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 12 months as a percentage of the 1961 to 1990 long term average for each region and for England.

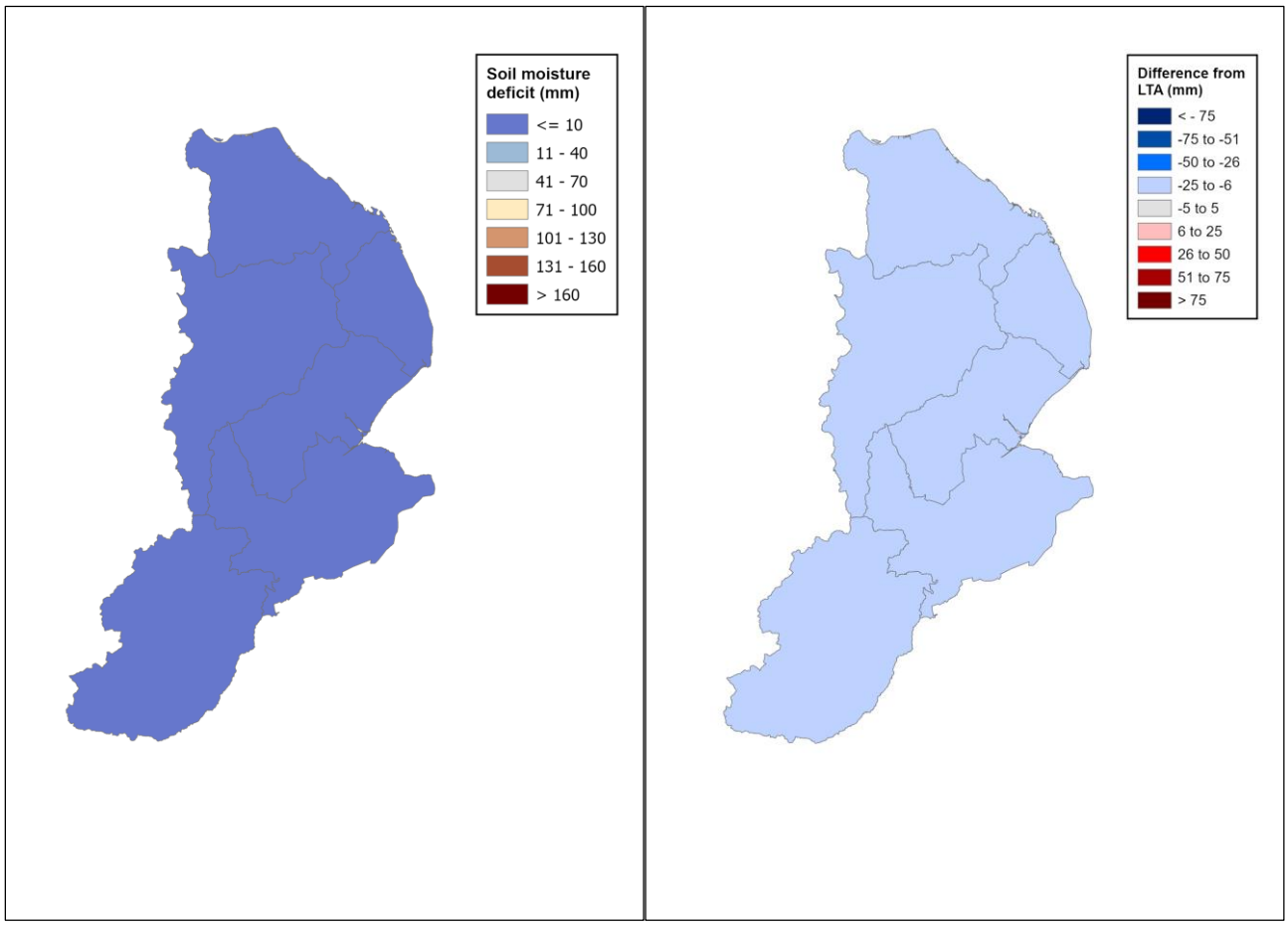


HadUK rainfall data. (Source: Met Office. Crown copyright, 2025).

3 Soil moisture deficit

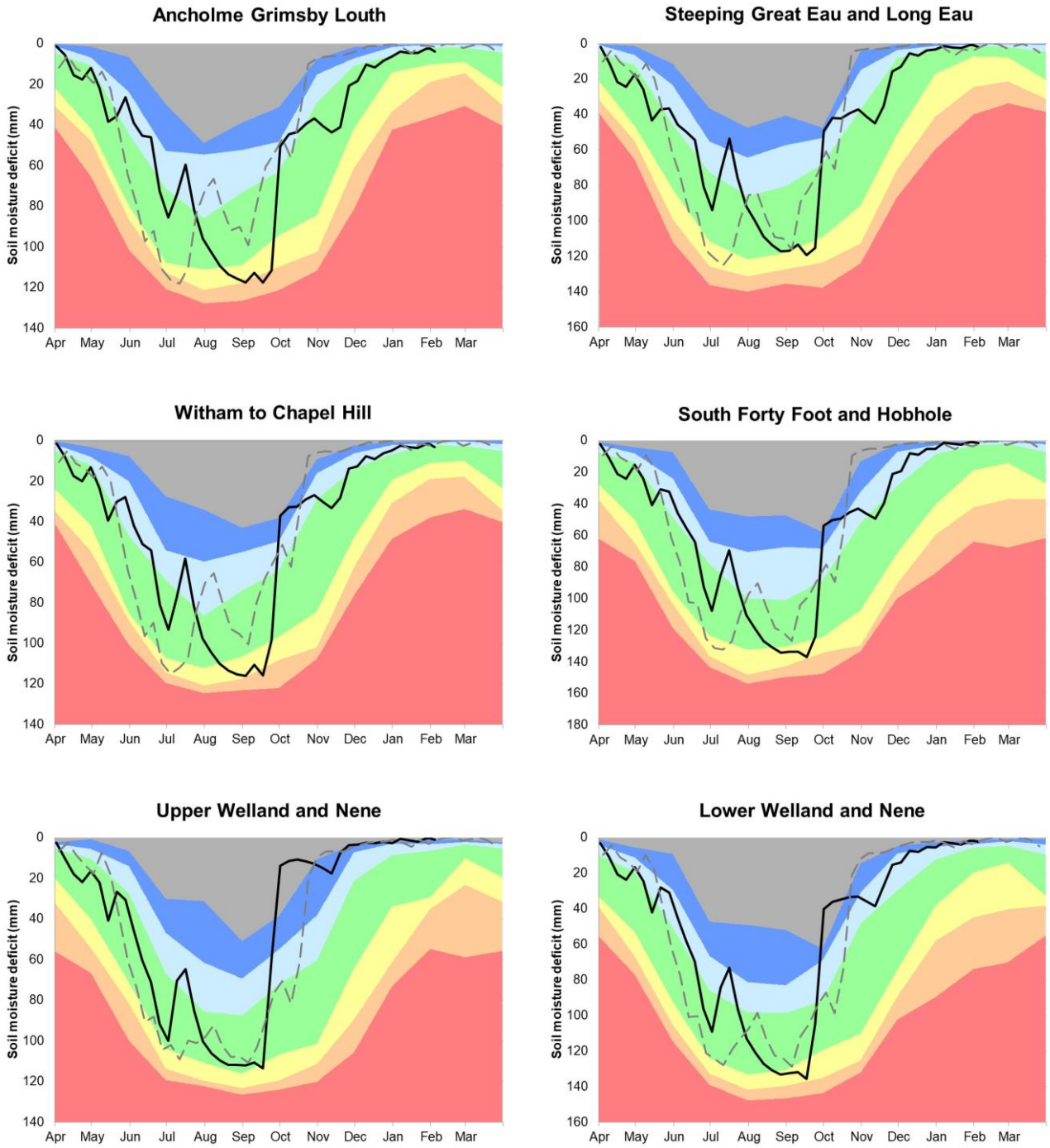
3.1 Soil moisture deficit map

Figure 3.1:Left map shows Soil moisture deficits for weeks ending 31 January 2025. Right map 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.



3.2 Soil moisture deficit charts

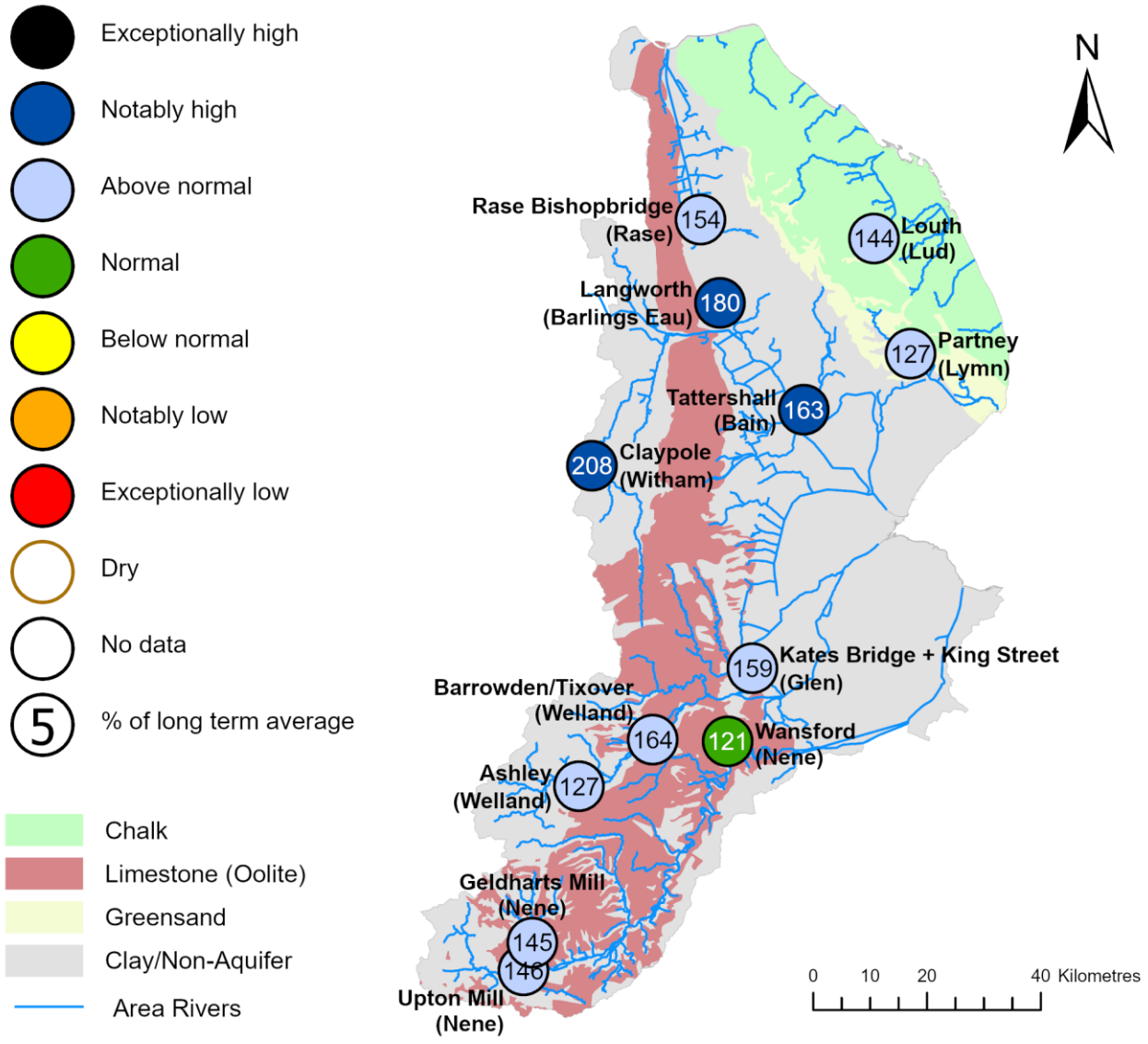
Figure 3.2: Latest soil moisture deficit compared to previous year, maximum, minimum, and 1961 to 1990 long term average. Weekly MORECS data for real land use.



4 River flows

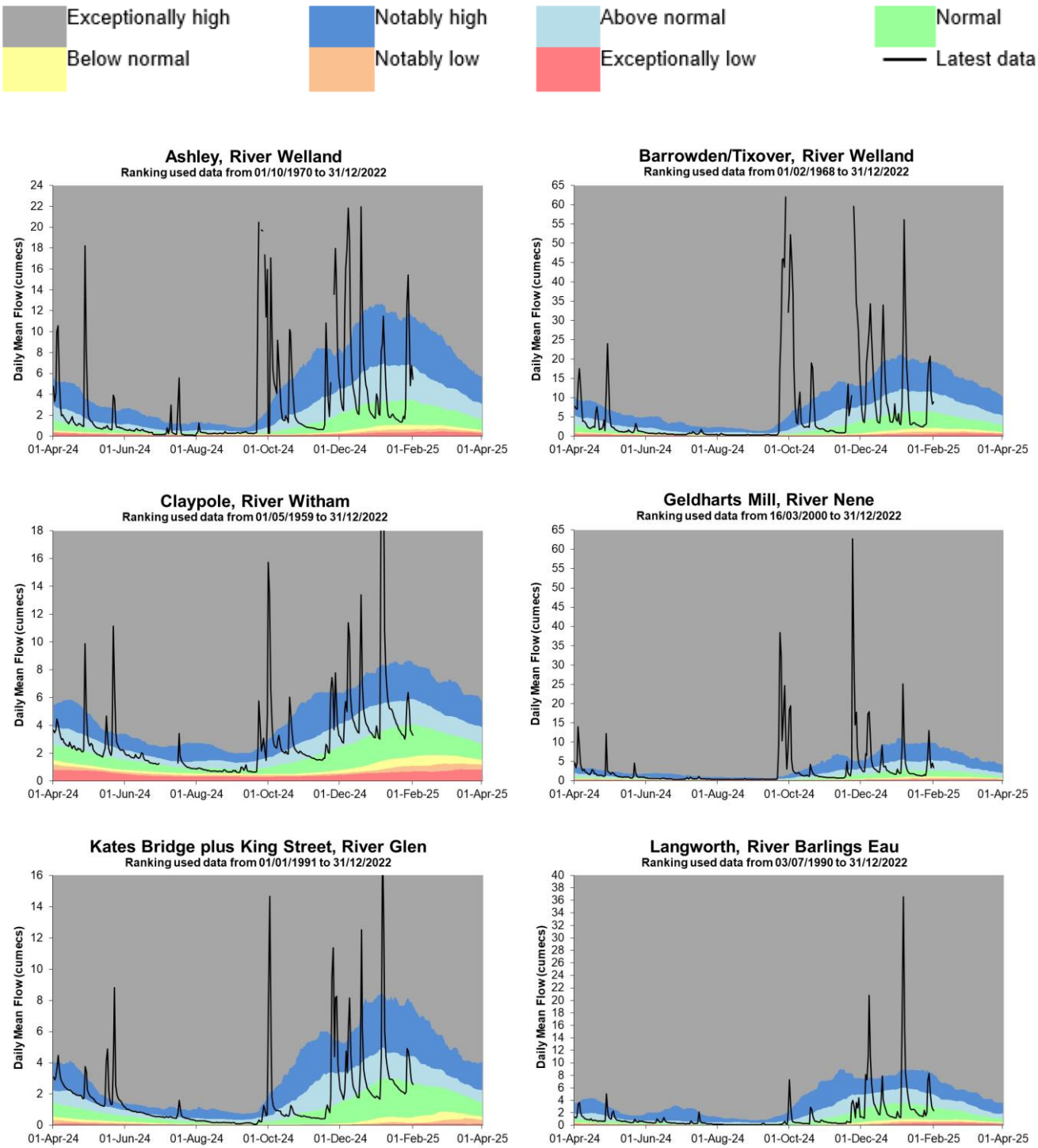
4.1 River flows map

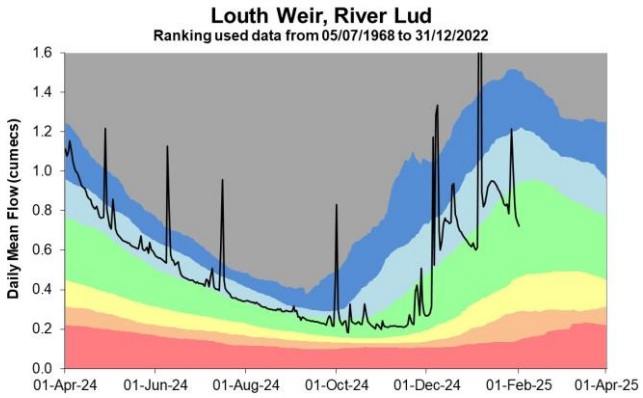
Figure 4.1: Monthly mean river flow for indicator sites for January 2025, expressed as a percentage of the respective long term average and classed relative to an analysis of historic January monthly means Table available in the appendices with detailed information.

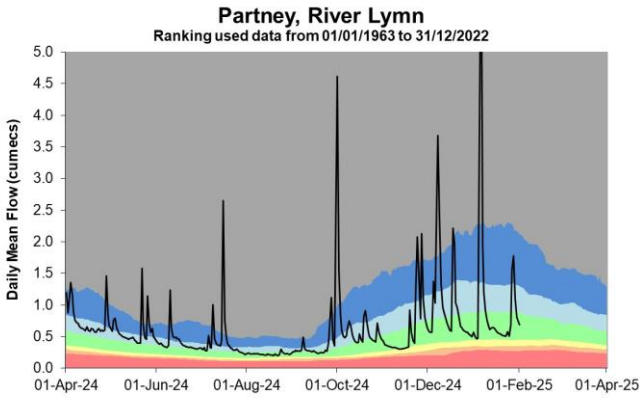


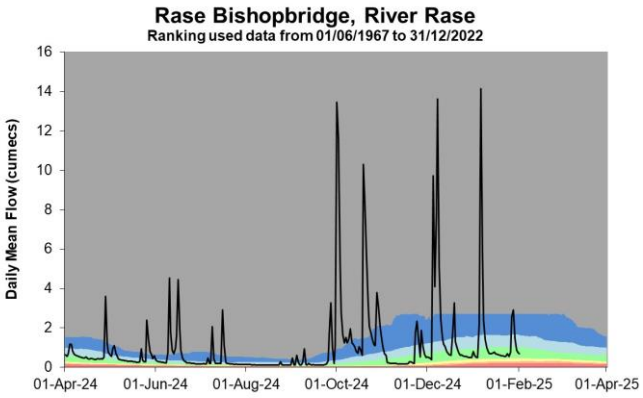
4.2 River flow charts

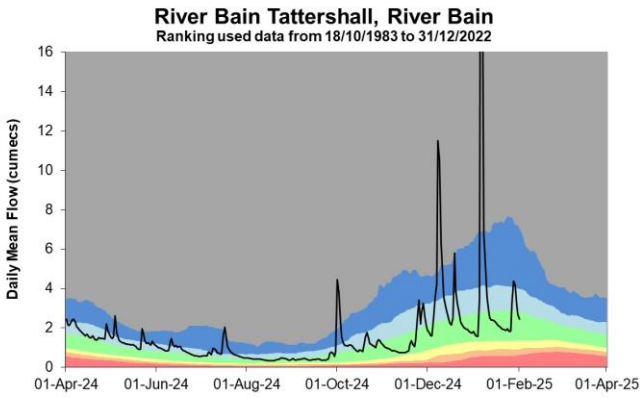
Figure 4.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.

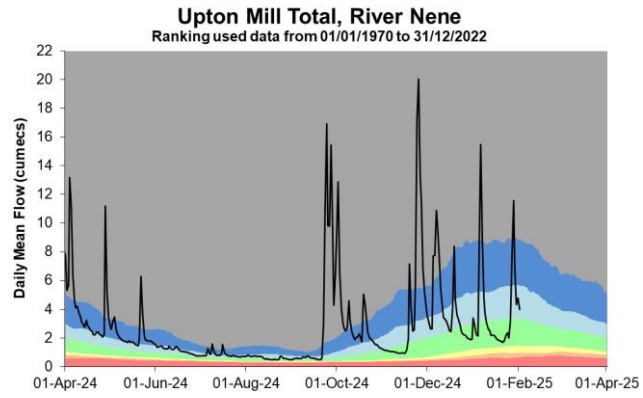


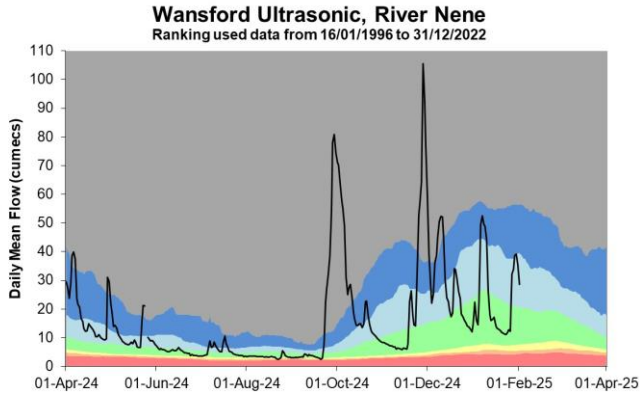










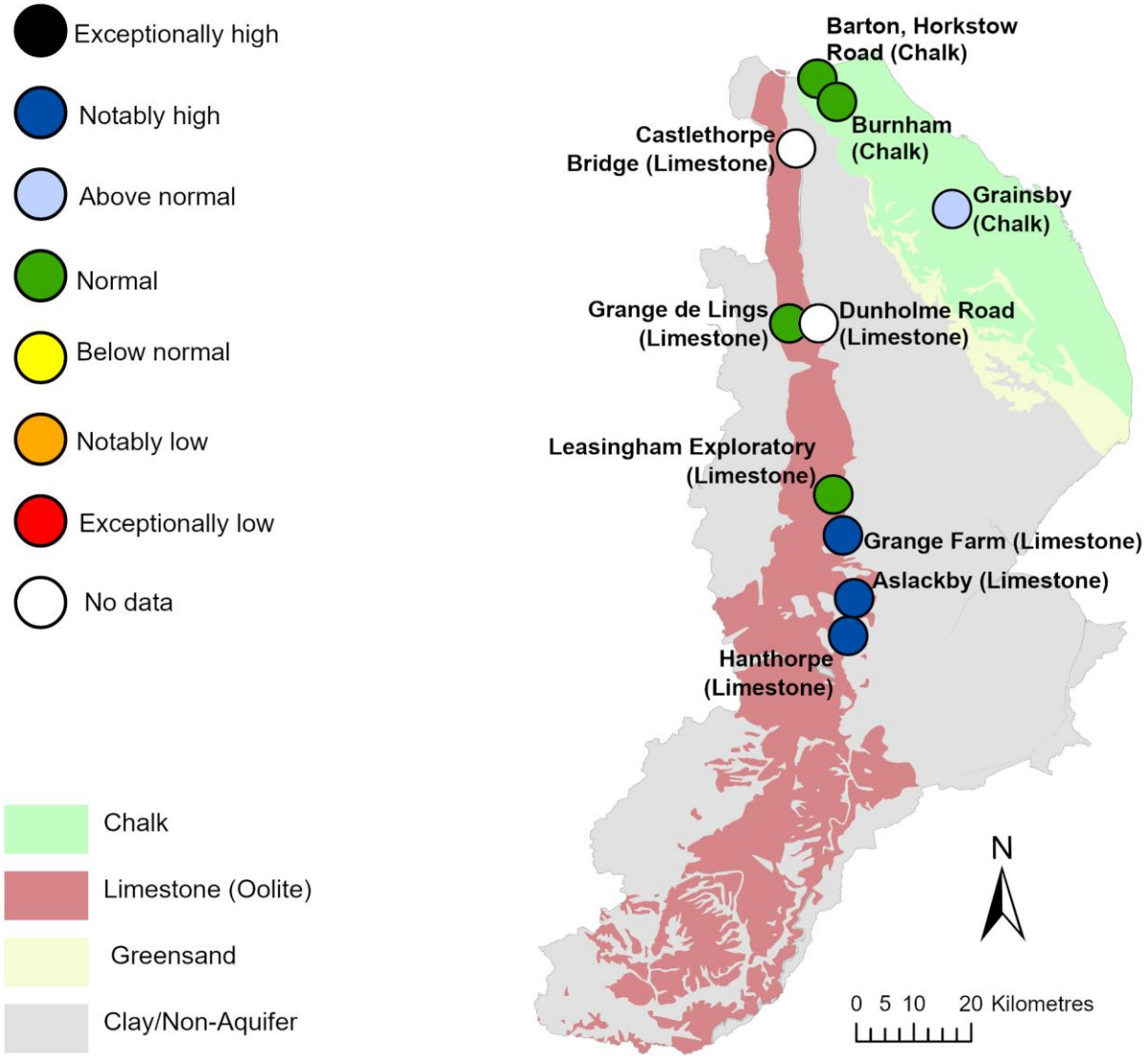


Source: Environment Agency.

5 Groundwater levels

5.1 Groundwater levels map

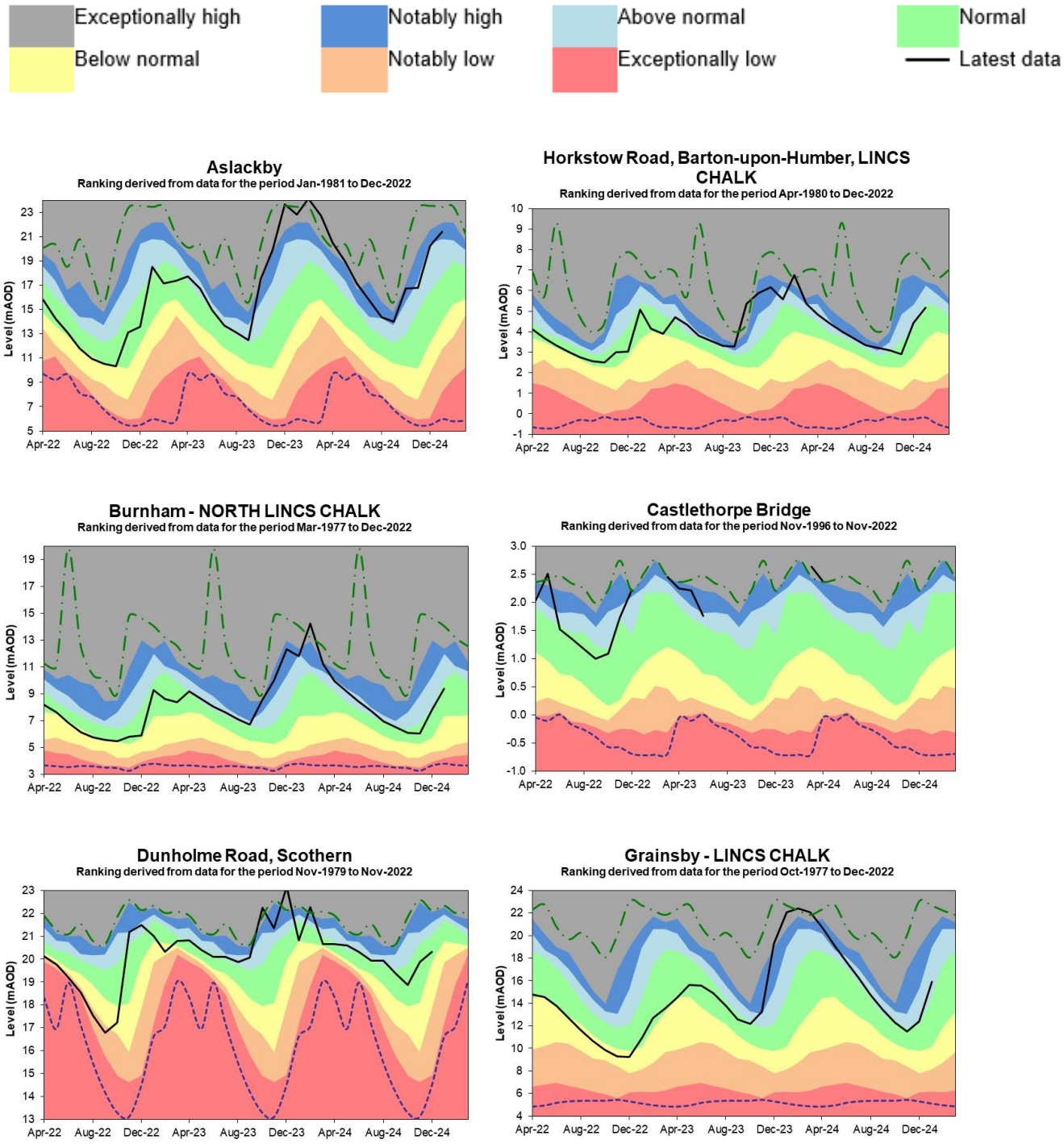
Figure 5.1: Groundwater levels for indicator sites at the end of January 2025, classed relative to an analysis of respective historic January levels. Table available in the appendices with detailed information.

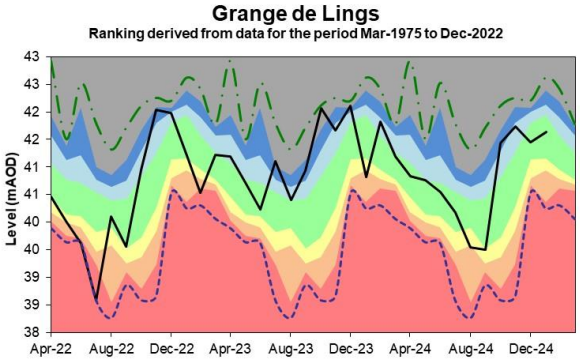


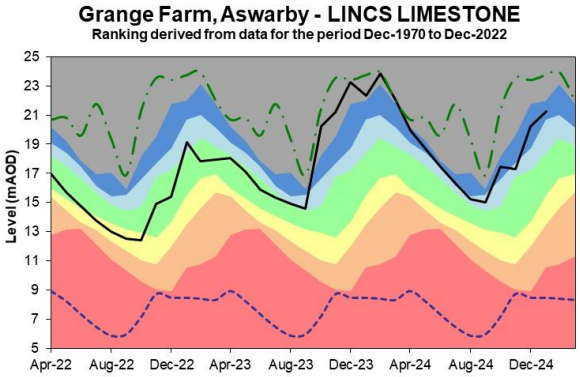
(Source: Environment Agency). Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, 100024198, 2025.

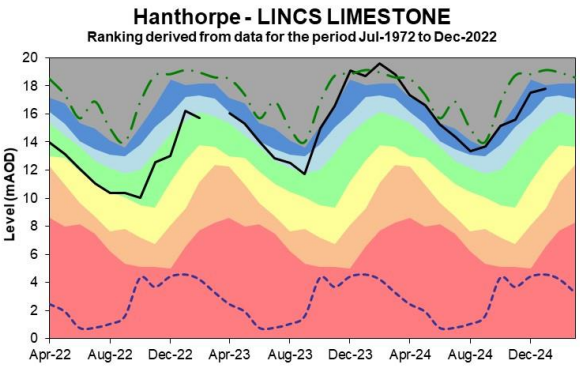
5.2 Groundwater level charts

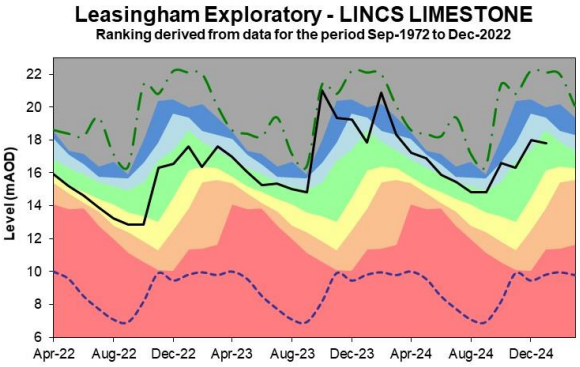
Figure 5.2: End of month groundwater levels at index groundwater level sites for major aquifers. 22 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.











Source: Environment Agency, 2025.

6 Reservoir stocks

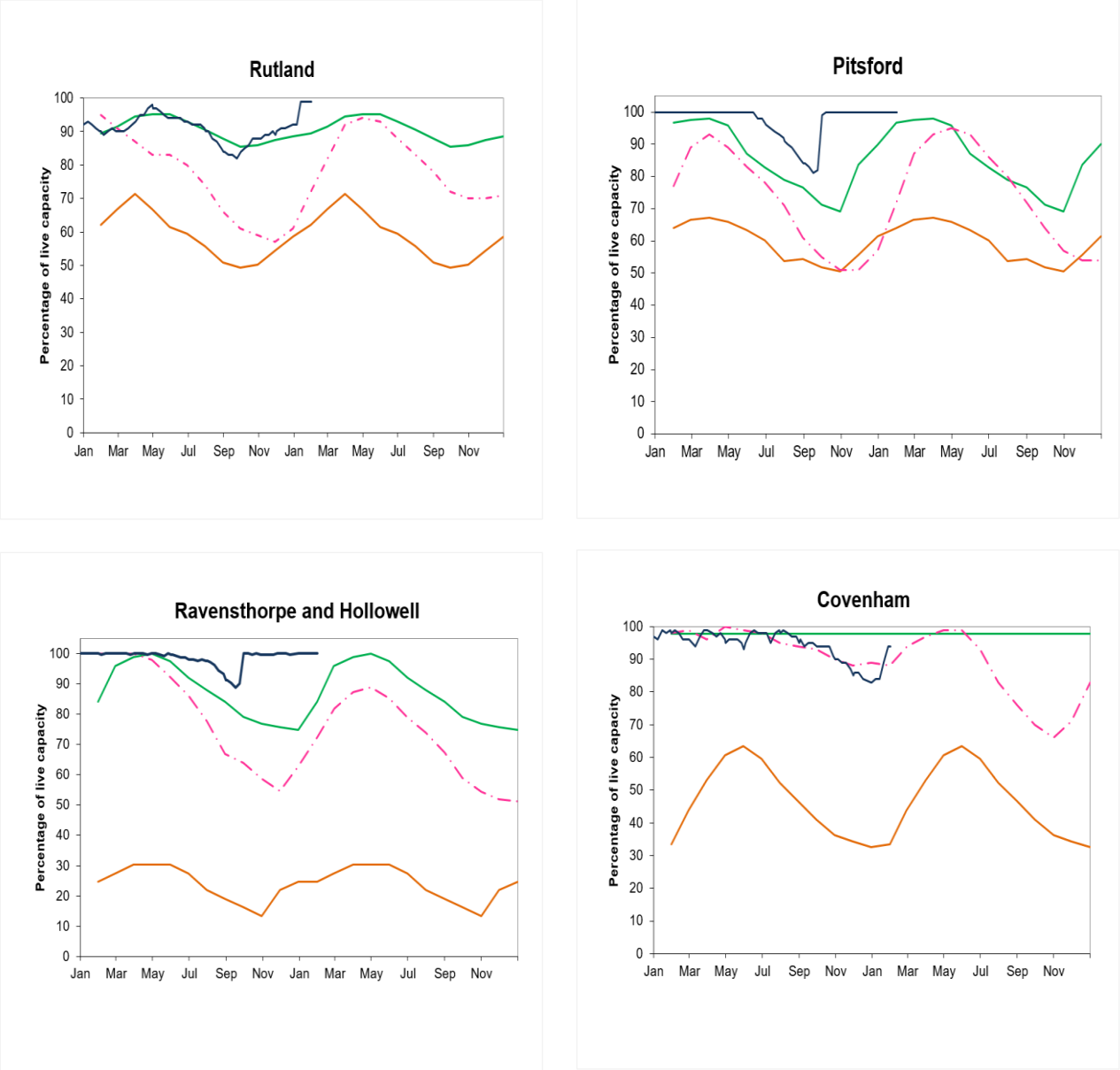


Figure 6.1: End of month regional reservoir stocks compared to the normal operating curve

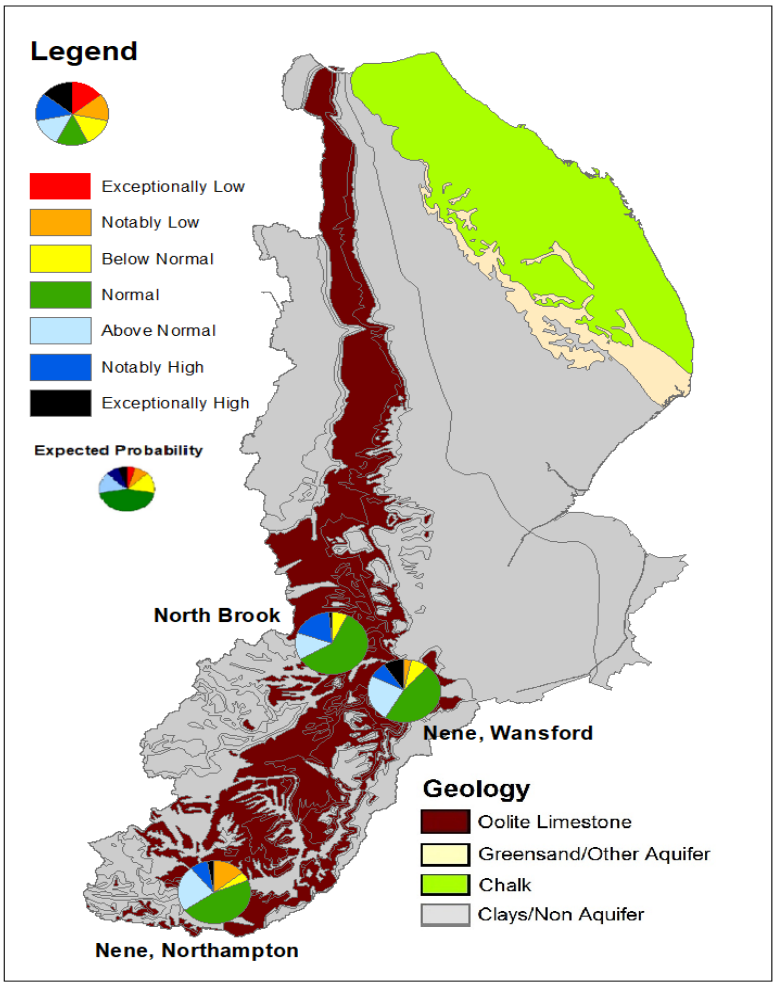
2024-2025 Normal Operating Curve Drought Alert Curve 1995-1996

(Source: water companies).

7 Forward Look

7.1 Probabilistic ensemble projection of river flows at key sites in December 2024

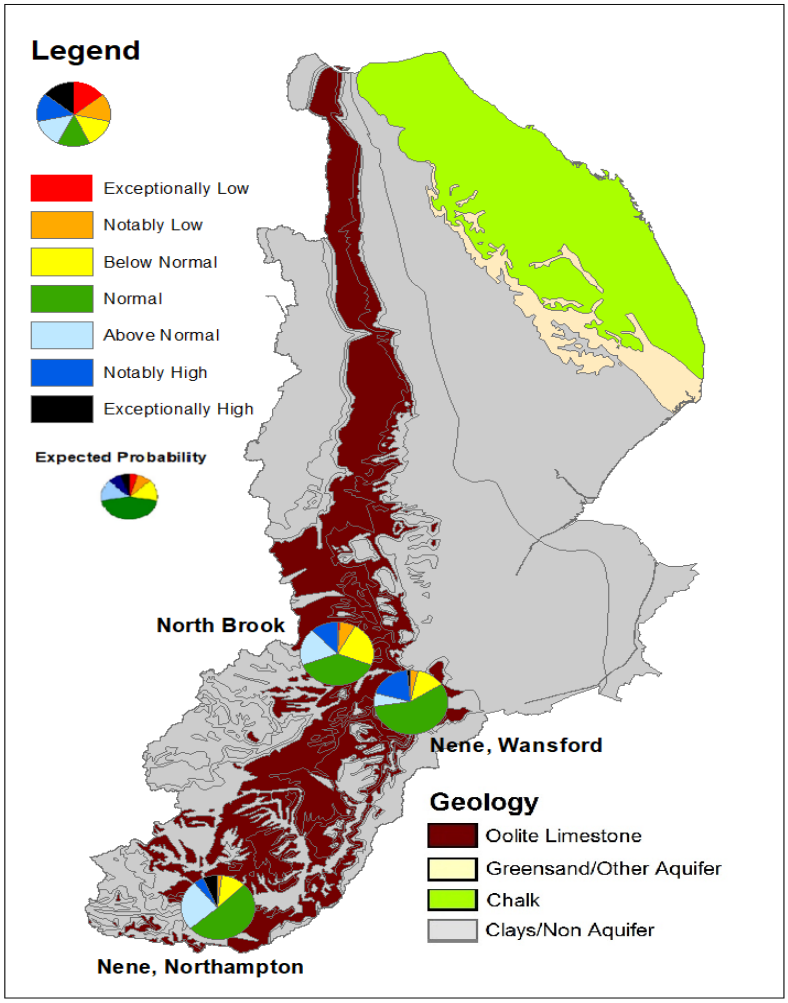
Table available in the appendices with detailed information. Exceptionally high or low levels are those which would typically occur 5% of the time within the historic record. Notably high or low levels are those which would typically occur 8% of the time. Above normal or below normal levels are those which would typically occur 15% of the time. Normal levels are those which would typicall occur 44% of the time within the historic record.



Pie charts indicate probability, based on climatology, of the surface water flow at each site being, for example, exceptionally low for the time of year. (Source: Centre for Ecology and Hydrology, Environment Agency) Geological map reproduced with kind permission from UK Groundwater Forum, BGS © NERC. Crown copyright. All rights reserved. Environment Agency, 100026380, 2025.

7.2 Probabilistic ensemble projection of river flows at key sites in March 2025

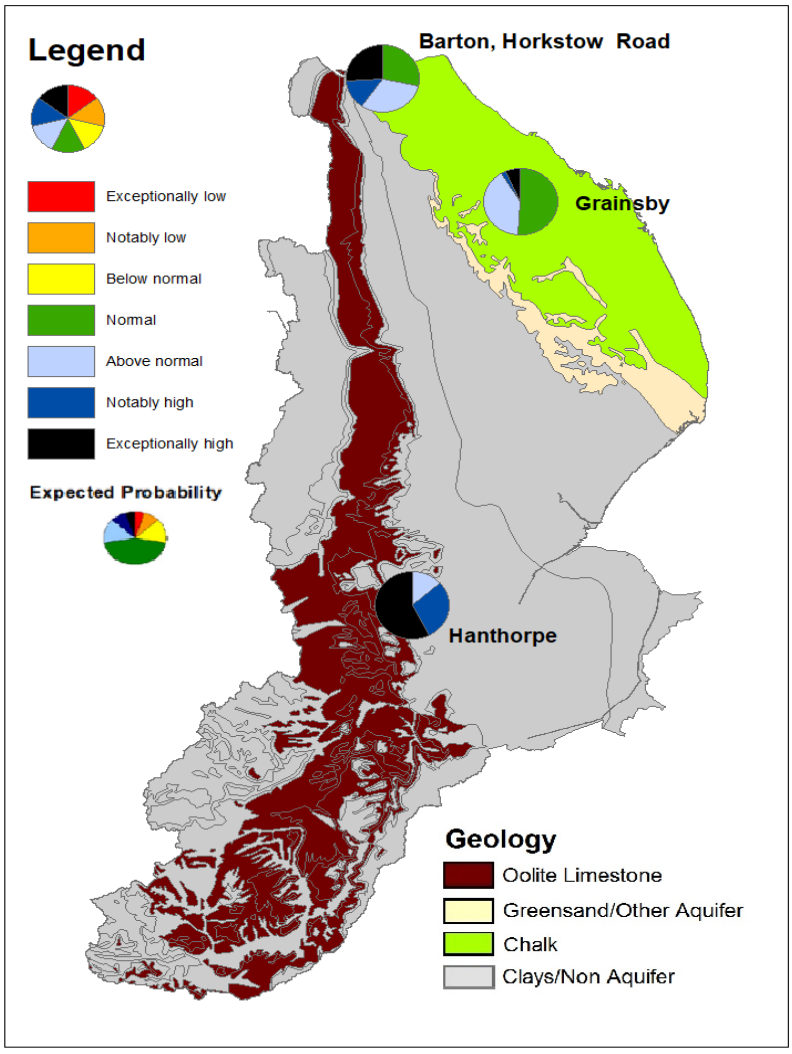
Table available in the appendices with detailed information. Exceptionally high or low levels are those which would typically occur 5% of the time within the historic record. Notably high or low levels are those which would typically occur 8% of the time. Above normal or below normal levels are those which would typically occur 15% of the time. Normal levels are those which would typically occur 4% of the time within the historic record.



Pie charts indicate probability, based on climatology, of the surface water flow at each site being, for example, exceptionally low for the time of year. (Source: Centre for Ecology and Hydrology, Environment Agency) Geological map reproduced with kind permission from UK Groundwater Forum, BGS © NERC. Crown copyright. All rights reserved. Environment Agency, 100026380, 2025

7.3 Probabilistic ensemble projection of groundwater levels at key sites in March 2025

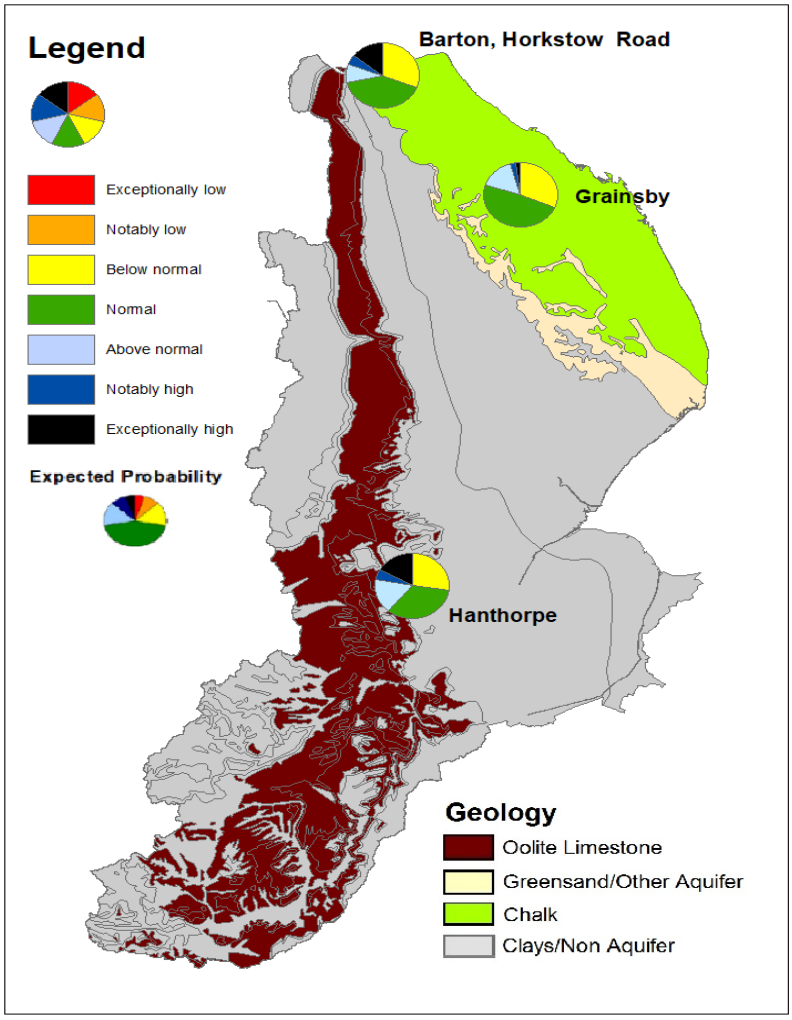
Table available in the appendices with detailed information. Exceptionally high or low levels are those which would typically occur 5% of the time within the historic record. Notably high or low levels are those which would typically occur 8% of the time. Above normal or below normal levels are those which would typically occur 15% of the time. Normal levels are those which would typically occur 44% of the time within the historic record.



Pie charts indicate probability, based on climatology, of the groundwater level at each site being, for example, exceptionally low for the time of year. (Source: Environment Agency)

7.4 Probabilistic ensemble projection of groundwater levels at key sites in September 2025

Table available in the appendices with detailed information. Exceptionally high or low levels are those which would typically occur 5% of the time within the historic record. Notably high or low levels are those which would typically occur 8% of the time. Above normal or below normal levels are those which would typically occur 15% of the time. Normal levels are those which would typically occur 44% of the time within the historic record.



Pie charts indicate probability, based on climatology, of the groundwater level at each site being, for example, exceptionally low for the time of year. (Source: Environment Agency)

8 Glossary

8.1 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).

8.2 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.

9 Appendices

9.1 Rainfall table

Hydrological area	Jan 2025 rainfall % of long term average 1961 to 1990	Jan 2025 band	Nov 2024 to January cumulative band	Aug 2024 to January cumulative band	Feb 2024 to January cumulative band
Louth Grimsby And Ancholme	144	Above Normal	Normal	Normal	Above normal
Lower Welland And Nene	114	Normal	Normal	Above normal	Exceptionally high
South Forty Foot And Hobhole	129	Above Normal	Normal	Above normal	Notably high
Steeping Great Eau And Long Eau	125	Normal	Normal	Normal	Notably high
Upper Welland And Nene	124	Normal	Above normal	Notably high	Exceptionally high
Witham To Chapel Hill	140	Above Normal	Normal	Normal	Notably high

9.2 River flows table

Site name	River	Catchment	Jan 2025 band	Dec 2024 band
Ashley	Welland Mkt.harb-rockinghm	Welland Rockingham	Above normal	Notably high
Barrowden/tixover	Welland (rockingham To Stamford)	Welland Stamford	Above normal	Notably high
Claypole	Upper Witham	Witham Bargate Upper	Notably high	Notably high
Geldharts Mill	Nene (brampton Branch)	Nene Brampton Bridge	Above normal	Above normal
Kates Bridge Plus King Street	Glen (an)	Welland and Glen	Above normal	Above normal
Langworth	Barlings Eau	Barlings Eau	Notably high	Above normal
Louth Weir	Lud	Louth Canal	Above normal	Above normal
Partney	Lymn & Steeping	Lymn Steeping	Above normal	Above normal
Rase Bishopbridge	Ancholme	Ancholme W Mid	Above normal	Notably high
River Bain Tattershall	Bain	Bain	Notably high	Above normal

Upton Mill Total	Nene (kislingbury Branch)	Nene Kislingbry Bridge	Above normal	Notably high
Wansford Combined	Nene (wollaston To Wansford)	Nene Wansford	Normal	Above normal

9.3 Groundwater table

Site name	Aquifer	End of Jan 2025 band	End of Dec 2024 band
Aslackby	Limestone (cornbrash Formation)	Notably high	Above normal
Barton-upon-humber	Grimsby Ancholme Louth Chalk	Normal	Above normal
Burnham	Grimsby Ancholme Louth Chalk	Normal	Normal
Castlethorpe Bridge	Grimsby Ancholme Louth Limestone		
Dunholme Road, Scothern	Grimsby Ancholme Louth Limestone		Normal
Grainsby	Grimsby Ancholme Louth Chalk	Above normal	Above normal
Grange De Lings	Grimsby Ancholme Louth Limestone	Normal	Normal
Grange Farm, Aswarby	Limestone (mudstone - Peterborough Member)	Notably high	Notably high

Hanthorpe	Limestone (cornbrash Formation)	Notably high	Notably high
Leasingham Exploratory	Limestone (rutland Formation)	Normal	Above normal

9.4 Ensemble projections tables

9.4.1 Probabilistic ensemble projection of river flows at key sites in March 2025

Percentage of pie chart for each band

Site	Nene Nton	Nene Wansford	North Brook
Exceptionally low	0.0	0.0	0.0
Notably low	14.3	3.2	0.0
Below normal	4.8	7.9	6.9
Normal	46.0	47.6	59.7
Above normal	23.8	23.8	13.9
Notably high	7.9	7.9	18.1
Exceptionally high	3.2	9.5	1.4

9.4.2 Probabilistic ensemble projection of river flows at key sites in June 2025

Percentage of pie chart for each band

Site	Nene Nton	Nene Wansford	North Brook
Exceptionally low	0.0	0.0	1.3
Notably low	1.6	3.2	6.7
Below normal	11.1	12.7	22.7
Normal	50.8	57.1	38.7
Above normal	25.4	6.3	18.7
Notably high	4.8	19.0	12.0
Exceptionally high	6.3	1.6	0.0

9.4.3 Probabilistic ensemble projection of groundwater levels at key sites in March 2025

Percentage of pie chart for each band

Site	Grainsby	Hanthorpe	Horkstow
Exceptionally low	0.0	0.0	0.0
Notably low	0.0	0.0	0.0
Below normal	0.0	0.0	0.0
Normal	51.1	0.0	28.6
Above normal	40.0	13.6	31.0
Notably high	2.2	28.8	14.3
Exceptionally high	6.7	57.6	26.2

9.4.4 Probabilistic ensemble projection of groundwater levels at key sites in September 2025

Percentage of pie chart for each band

Site	Grainsby	Hanthorpe	Horkstow
Exceptionally low	0.0	0.0	0.0
Notably low	0.0	0.0	0.0
Below normal	31.1	27.1	31.0
Normal	48.9	33.9	40.5
Above normal	15.6	16.9	9.5
Notably high	2.2	5.1	4.8
Exceptionally high	2.2	16.9	14.3