Monthly water situation report: East Anglia

1 Summary - December 2024

The month began wet with rainfall on several of the first eight days. The rivers responded well, reflecting the low soil moisture deficits. The final two thirds of the months were much drier, and river flows have generally receded. River baseflows and groundwater levels are generally healthy for the time of year.

1.1 Rainfall

Rainfall in December was close to the long-term average across East Anglia. South Essex was the exception, with lower totals there. The month began wet, with typically 30 mm to 50 mm across the north and west of the Area from the 4th to the 8th December. Significant rainfall followed on the 18th December, particularly in Norfolk. There were then no notable rainfall events across the Area for the rest of the month. Overall, across the last three months the total rainfall has also been close to the long-term average. Cumulative totals over the past 12 months remain high, with most months in 2024 having had average or higher rainfall.

1.2 Soil moisture deficit and recharge

The soil moisture deficit at the end of December was slightly lower than the long-term average. The deficit had reduced rapidly during September in response to the high rainfall totals then. With broadly average rainfall and declining evapotranspiration rates throughout autumn and early winter since then the deficit has continued to decline.

1.3 River flows

The rivers in the west of East Anglia responded with high flows to the rainfall in the first third of the month, following on from wet conditions near the end of November. Flows have then been receding for the final three weeks of December. The baseflows to which they've receded are however higher than they were before those rainfall events. The baseflow-dominated rivers of North Norfolk have also seen marked rises in baseflow during the month.

1.4 Groundwater levels

Groundwater levels in most monitoring boreholes are rising in line with the typical seasonal trend. As levels were quite high through the summer, levels have remained generally above average for the time of year going into the winter.

1.5 Reservoir stocks

Reservoir storage in the public water supply reservoirs is currently at levels which give no particular cause for concern for this time of year. Winter-fill farm reservoirs also have generally reasonable prospects for filling this winter.

1.6 Forward look

1.6.1 Probabilistic ensemble projections for river flows at key sites

The ensemble predictions are giving no cause for concern, in line with the current conditions.

1.6.2 Probabilistic ensemble projections for groundwater levels in key aquifers

The ensemble predictions are giving no cause for concern, in line with the current conditions.

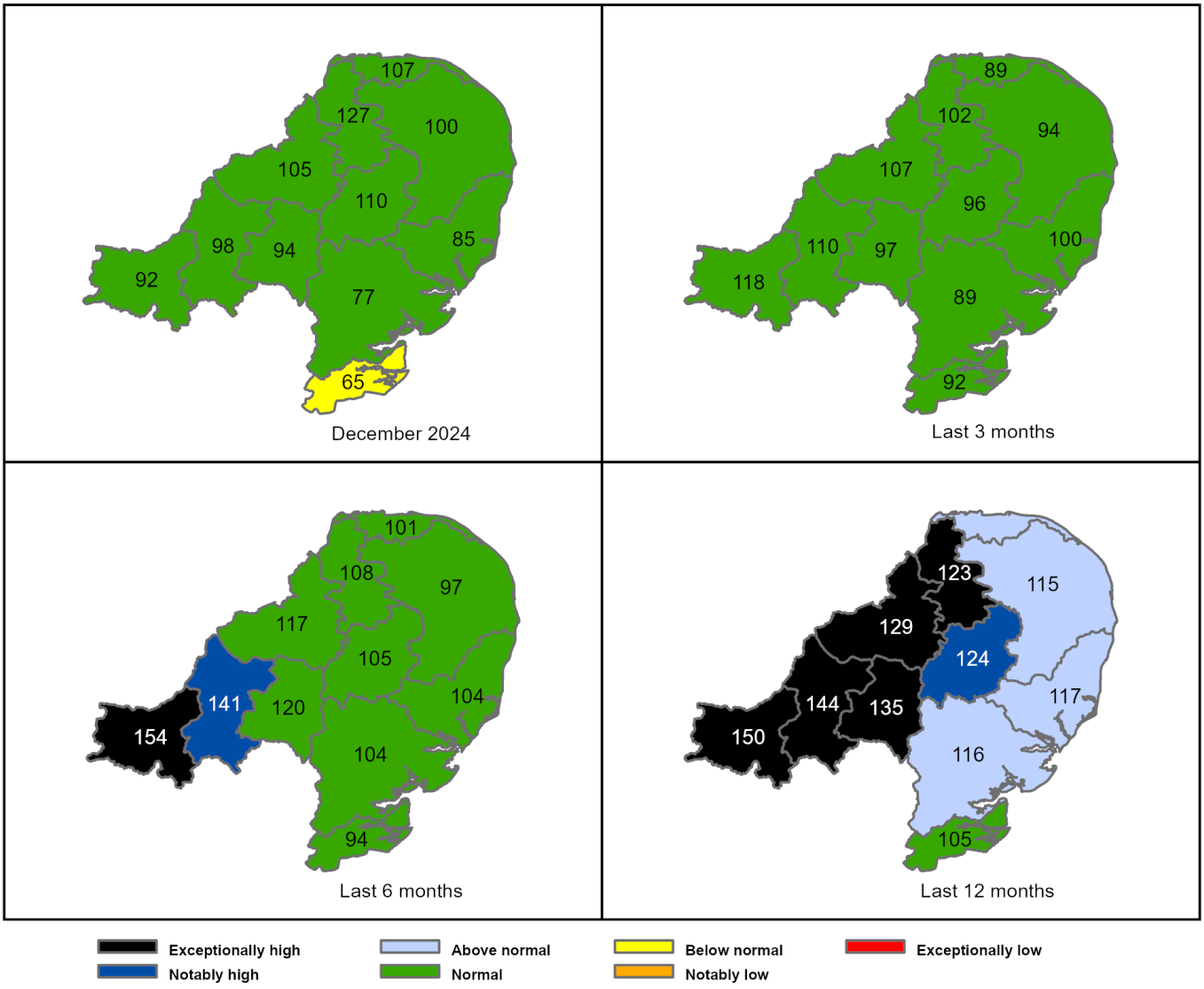
Author: Hydrology Team, hydrology-ean-and-lna@environment-agency.gov.uk

Contact Details: 03708 506 506

2 Rainfall

2.1 Rainfall map

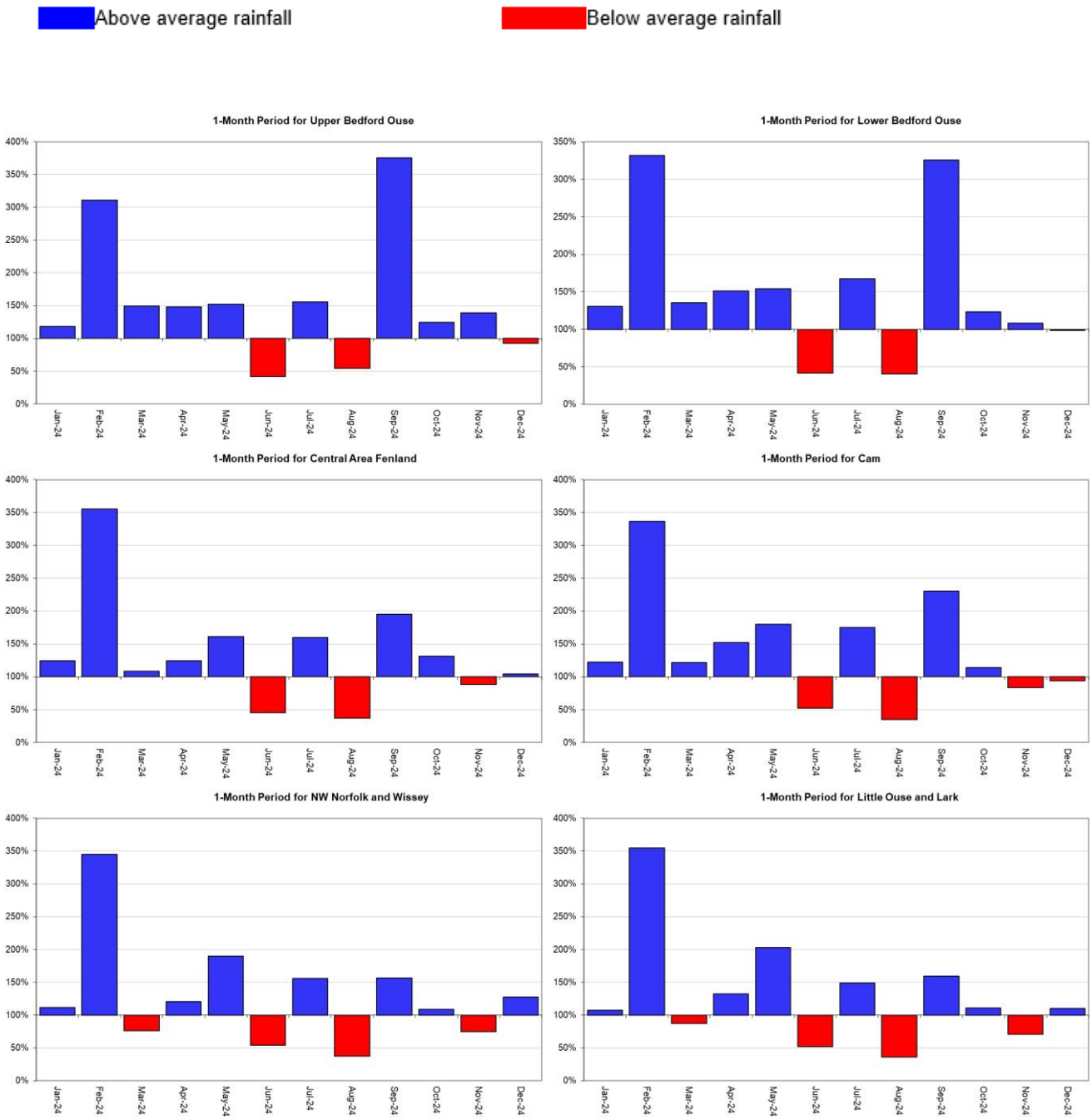
Figure 2.1: Total rainfall for hydrological areas across East Anglia, expressed as a percentage of long term average rainfall for the current month (up to 31 December 2024), the last 3 months, the last 6 months, and the last 12 months. Category classes are based on an analysis of respective historic totals. Table available in the appendices with detailed information.

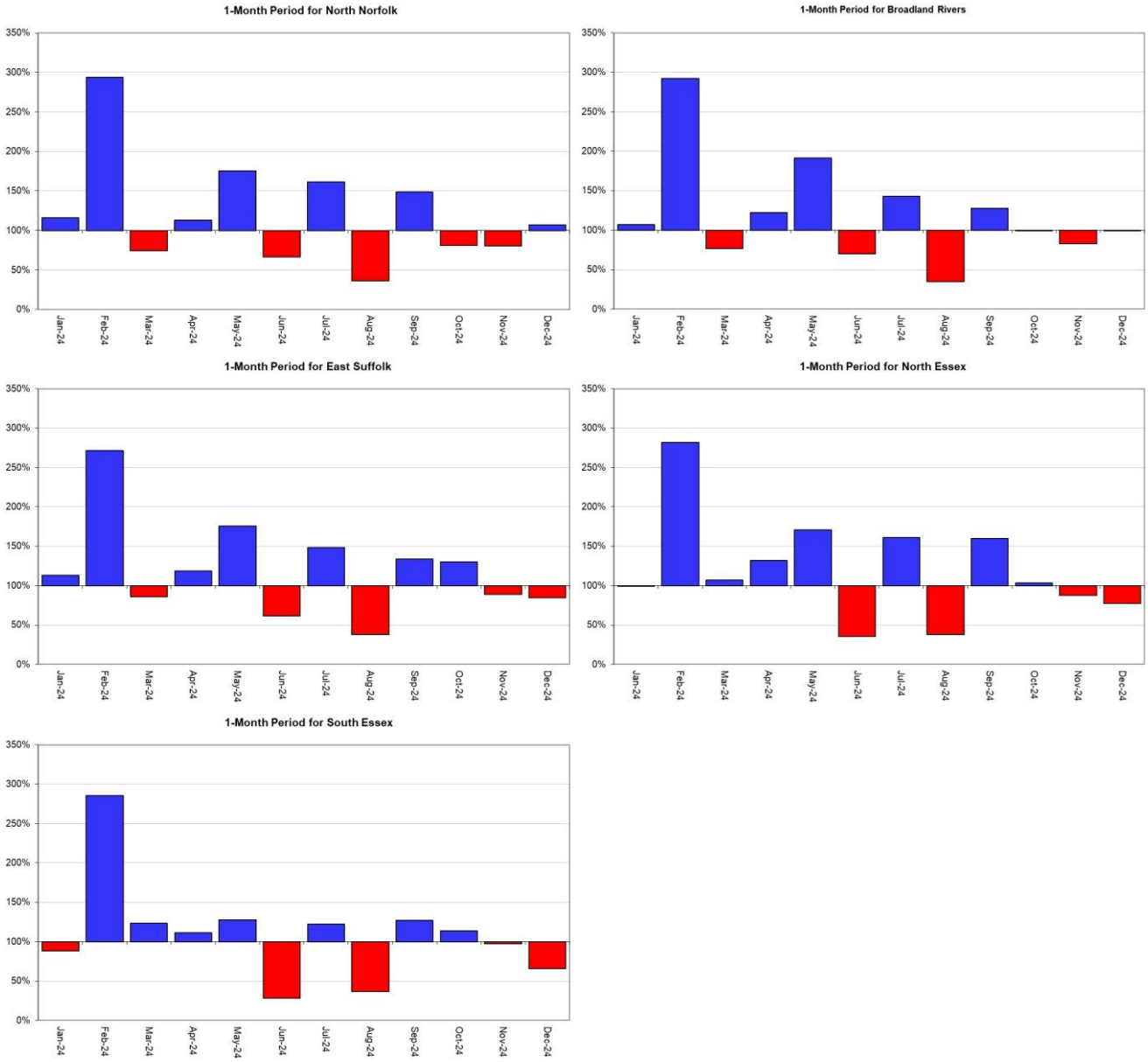


HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2025). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved.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

2.2 Rainfall charts

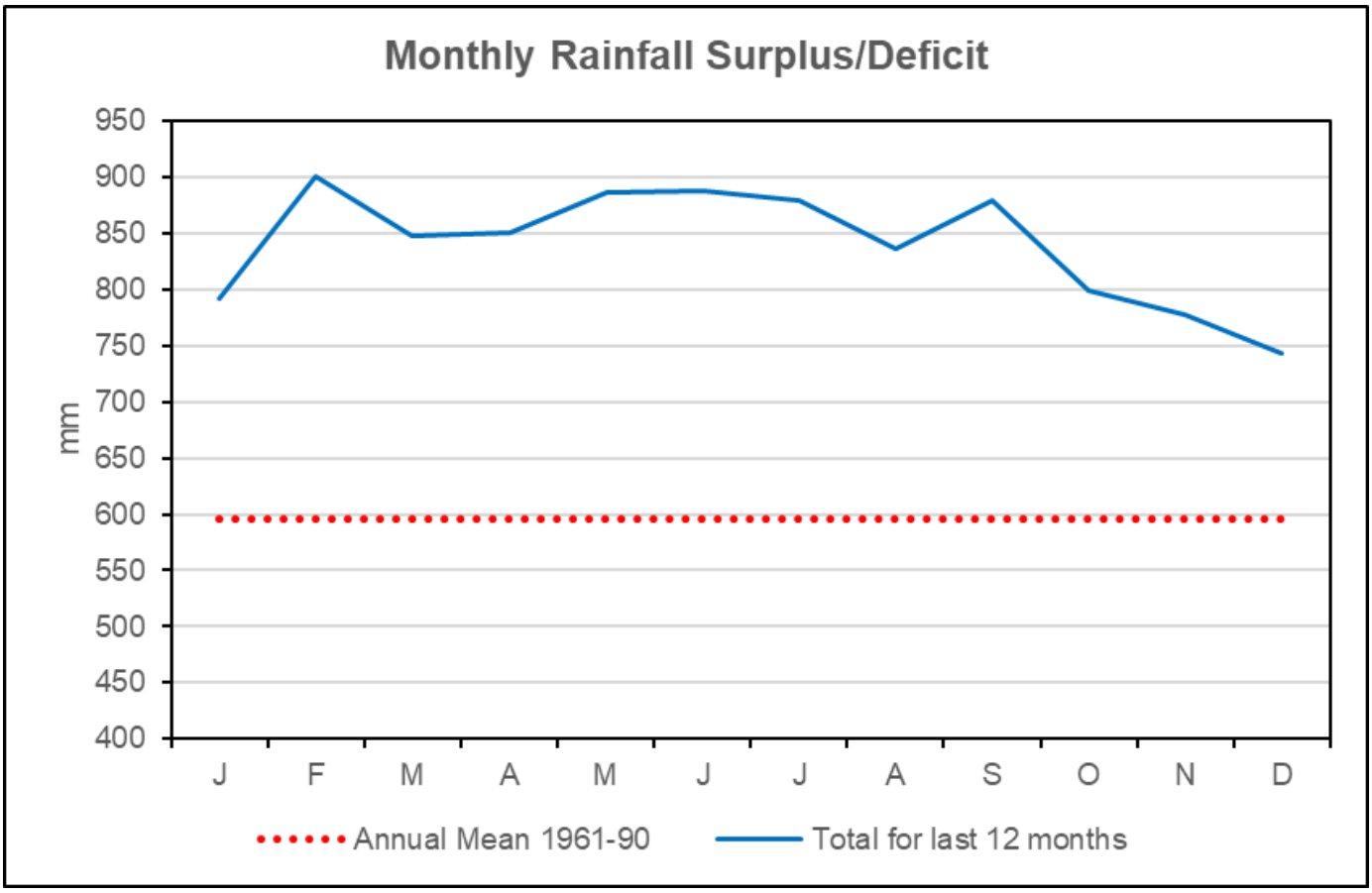
Figure 2.2: Monthly rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average for each region and for England.





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

2.3 Monthly rainfall surplus deficit chart



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

3 Soil moisture deficit

3.1 Soil moisture deficit map

Figure 3.1: Soil moisture deficit values for 31 December 2024. Values based on the weekly MORECS data for real land use.

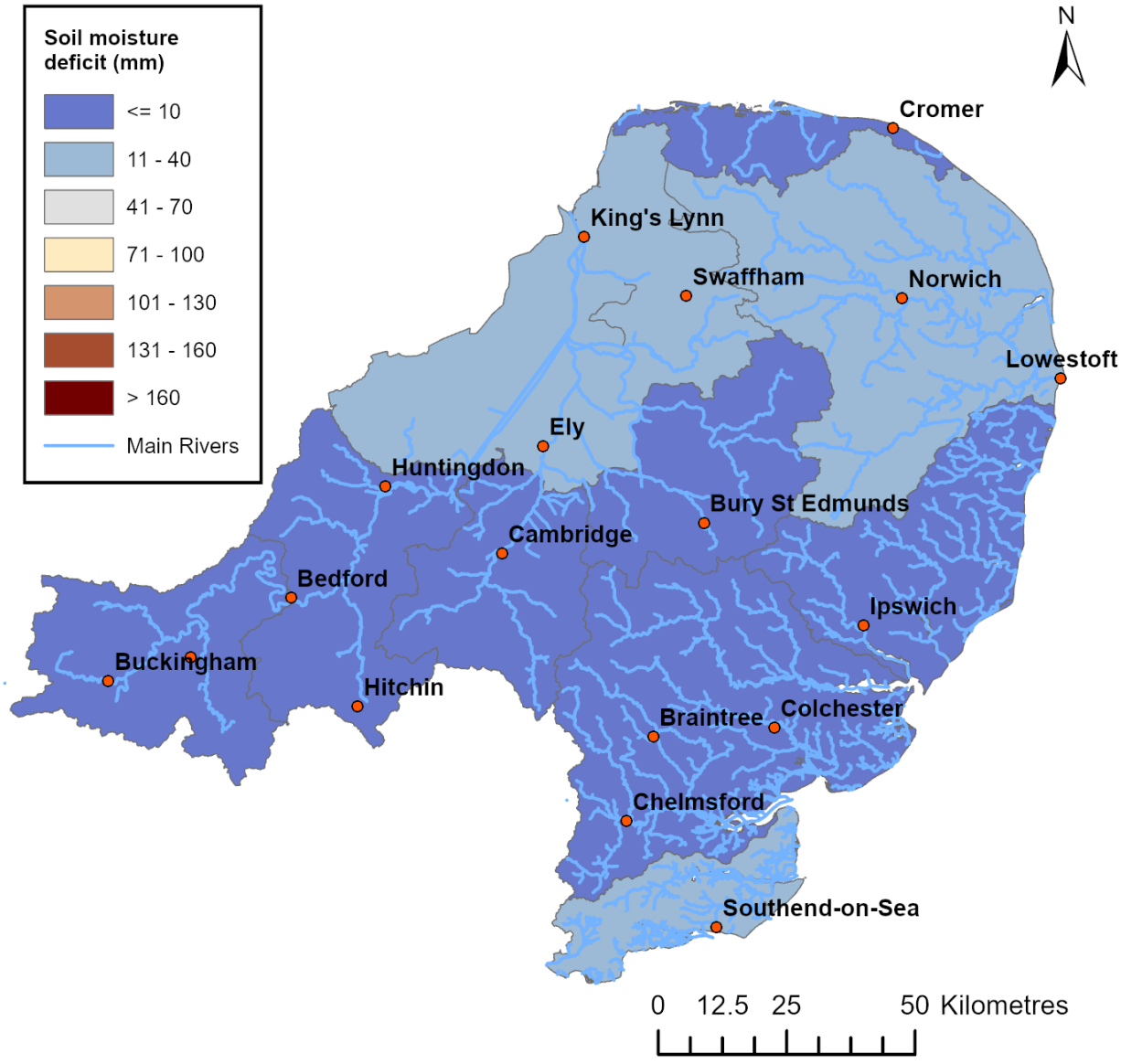
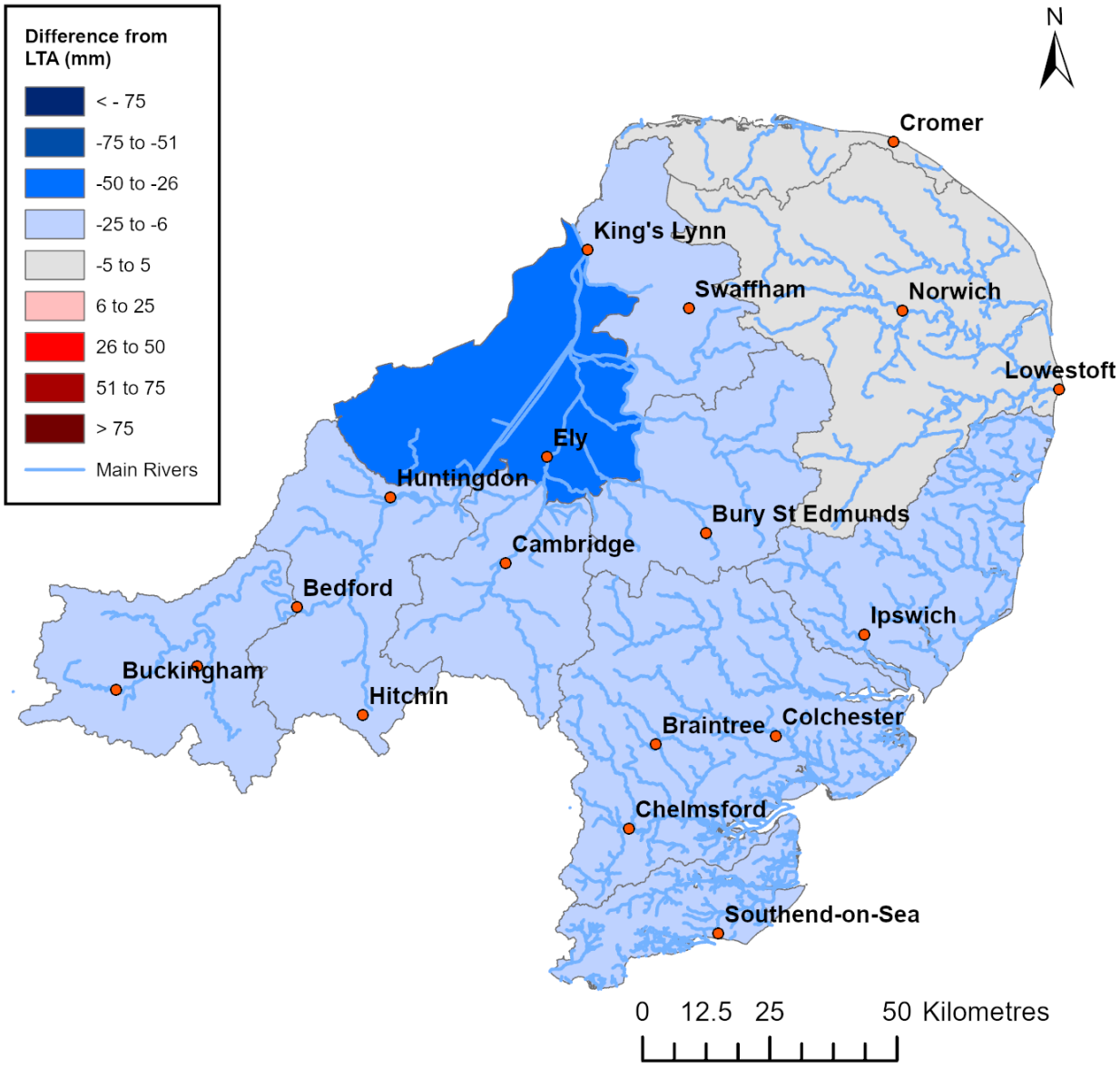
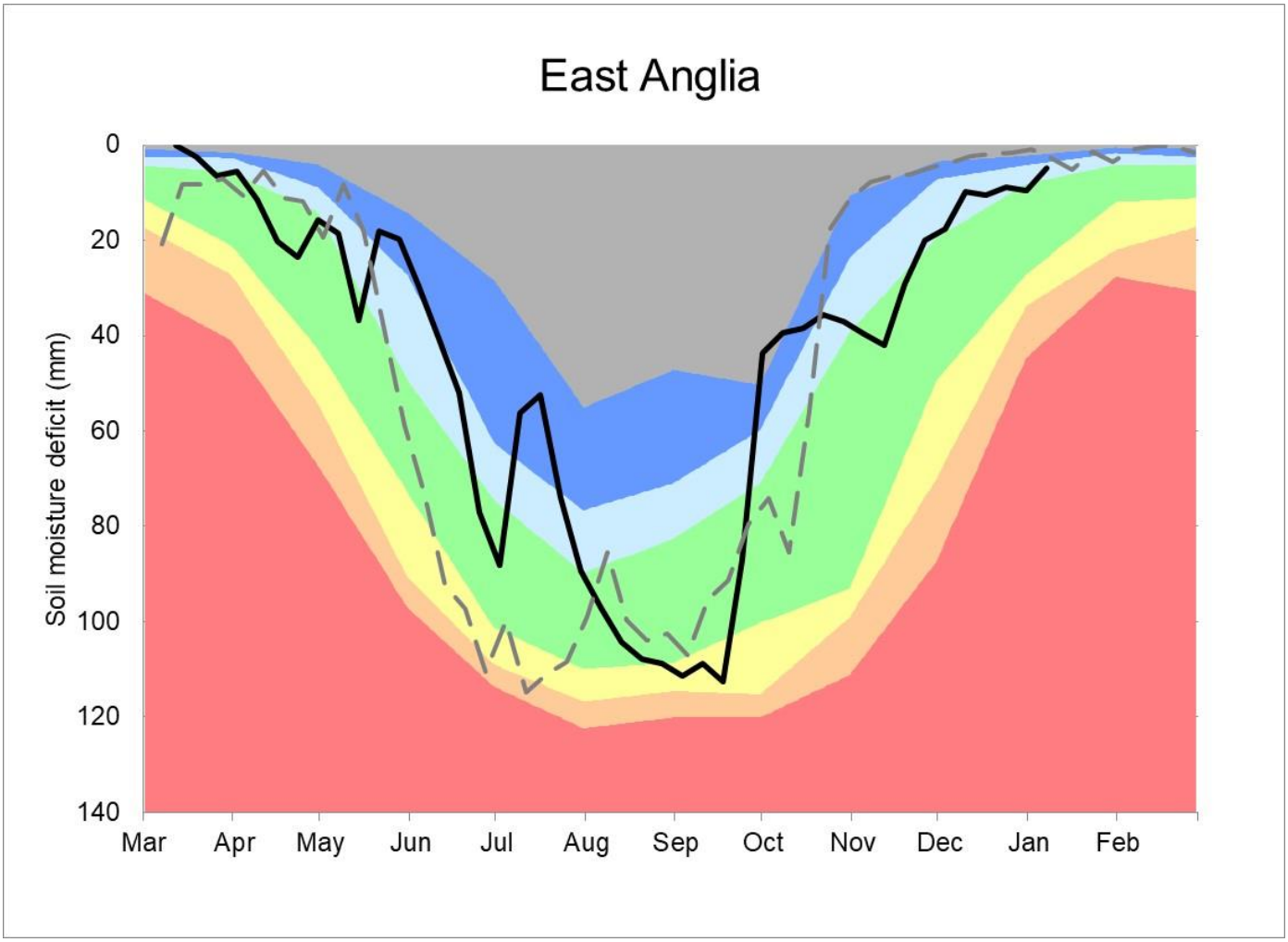


Figure 3.2: Soil moisture deficit difference from long-term average values for 31 December 2024. Values based on the weekly MORECS data for real land use.



3.2 Soil moisture deficit charts

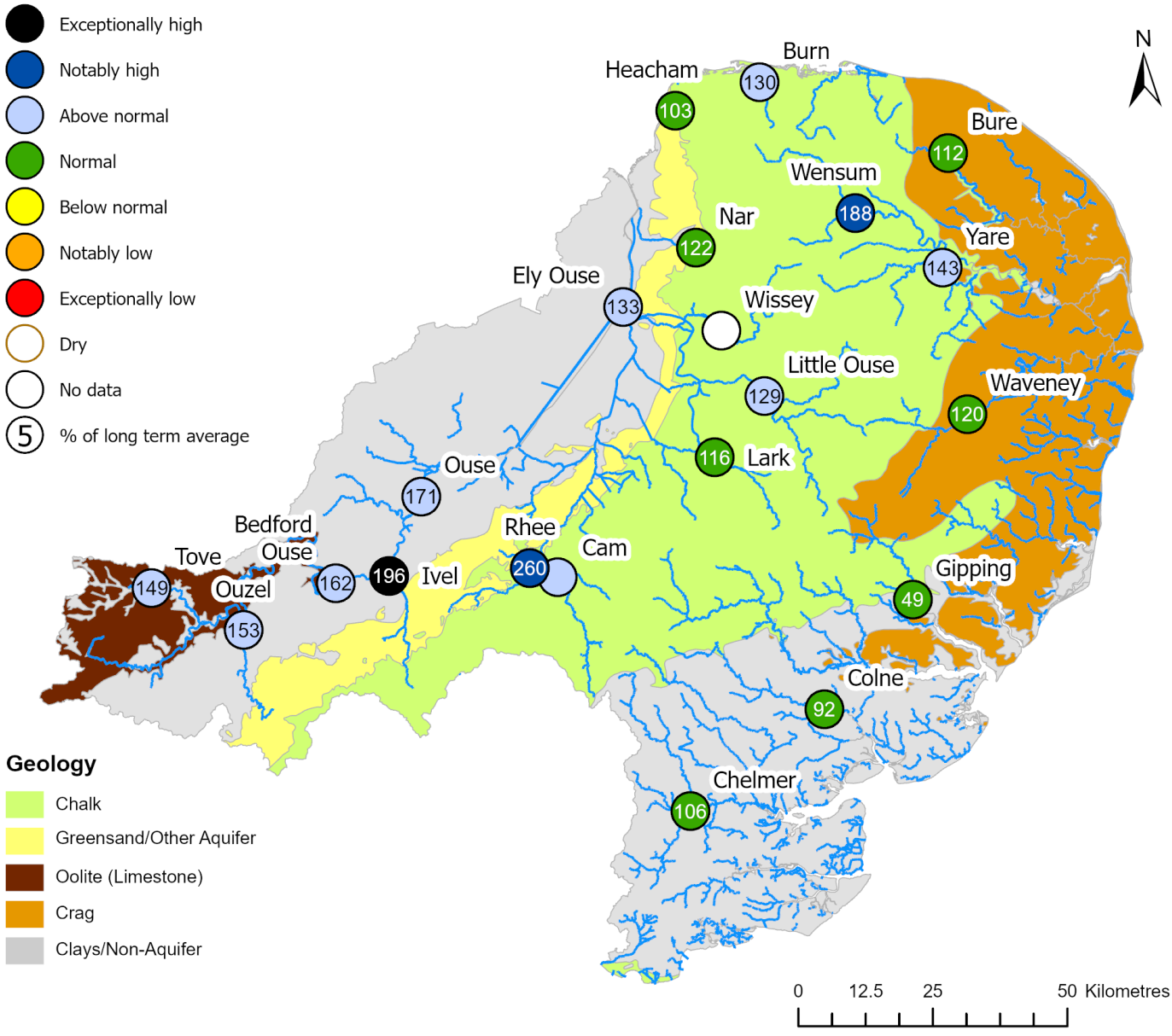
Figure 3.3: Latest soil moisture deficit compared to an analysis of historic 1961 to 1990 long term data set. Weekly MORECS data for real land use.



4 River flows

4.1 River flows map

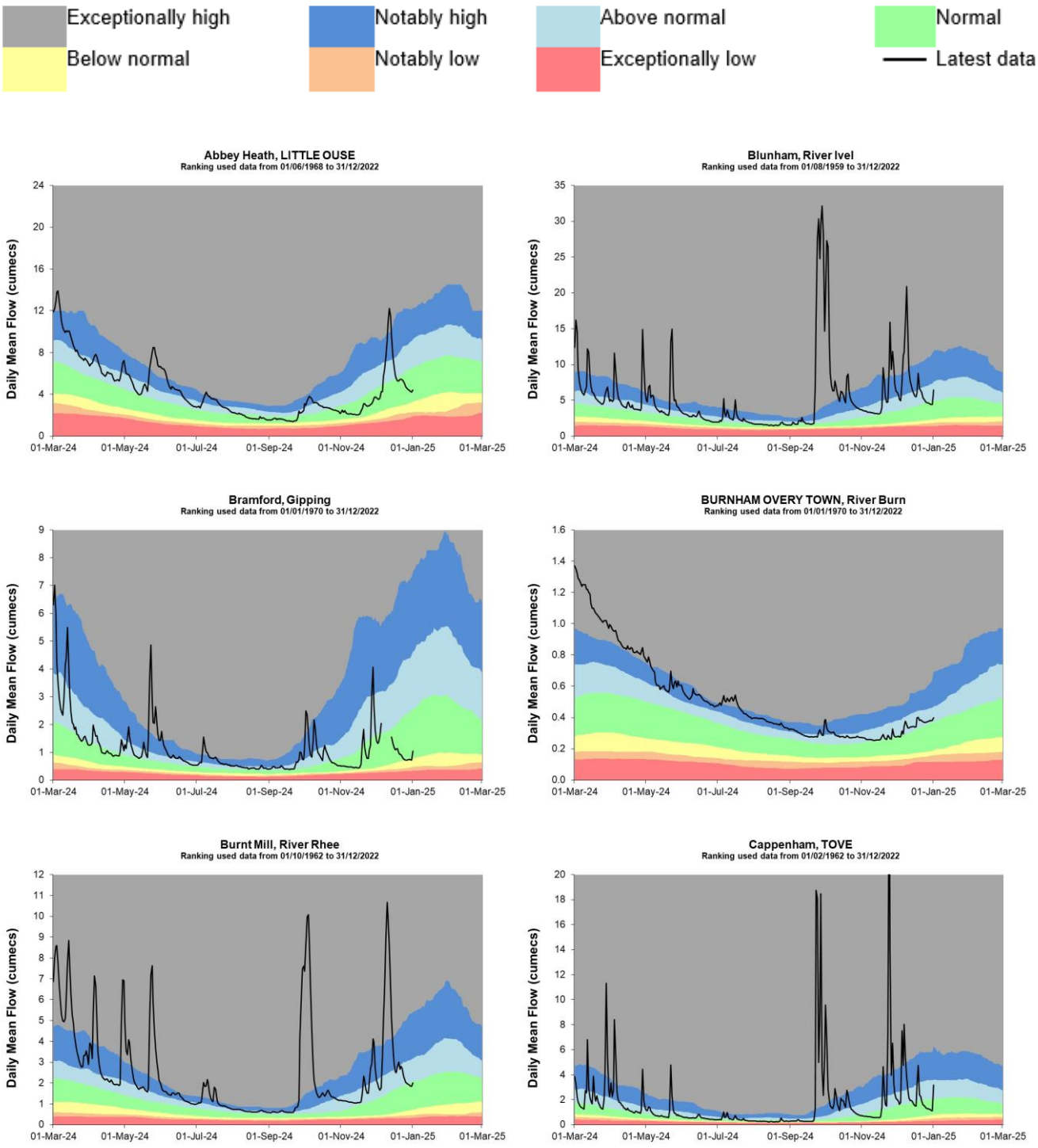
Figure 4.1: Monthly mean river flow for indicator sites for December 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic December monthly means Table available in the appendices with detailed information.



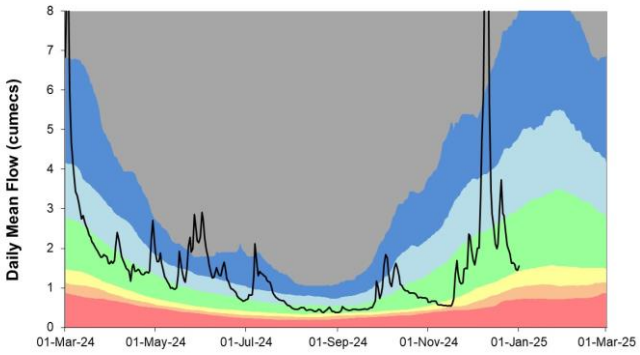
(Source: Environment Agency). Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, 100024198, 2025.

4.2 River flow charts

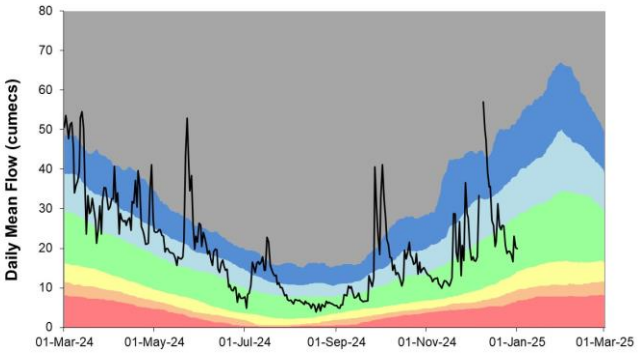
Figure 4.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



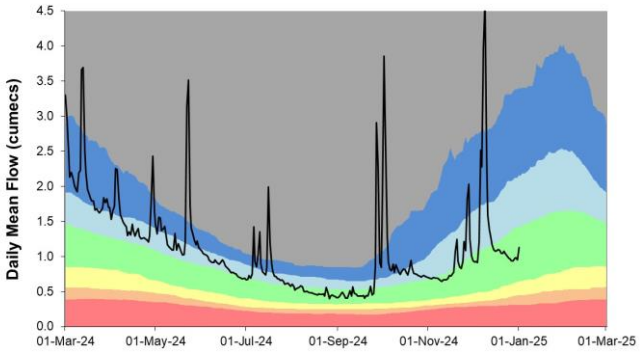
COLNEY, River Yare
Ranking used data from 01/01/1970 to 31/12/2022



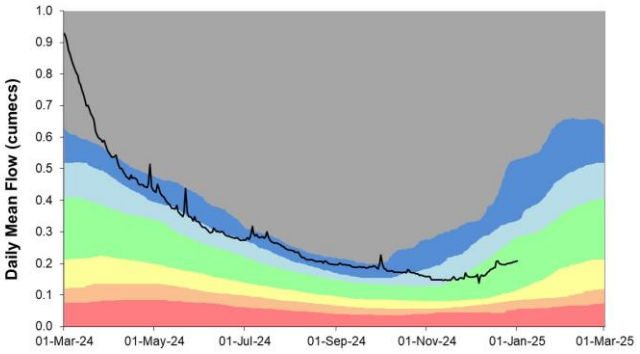
Denver, ELY OUSE
Ranking used data from 01/11/1971 to 31/12/2022



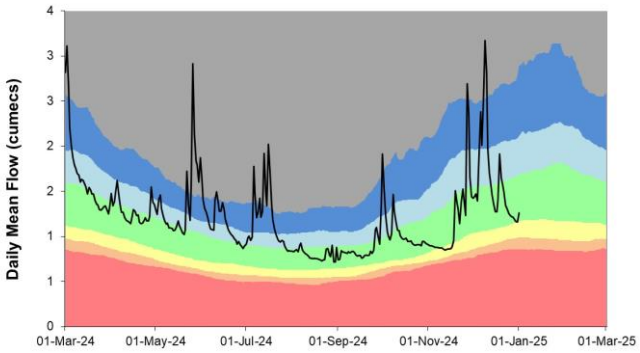
Dernford, CAM
Ranking used data from 21/02/1949 to 23/12/2022



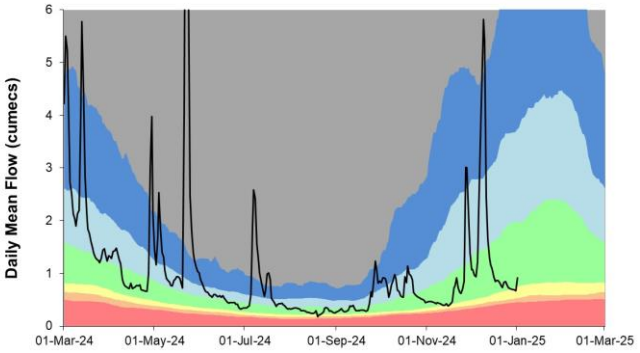
Heacham, HEACHAM
Ranking used data from 01/11/1965 to 31/12/2022



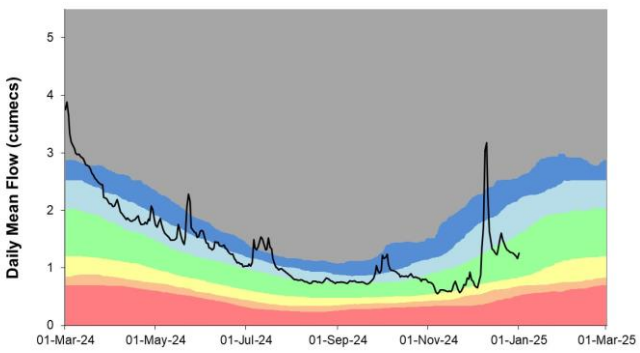
Ingworth, Bure
Ranking used data from 01/01/1970 to 31/12/2022



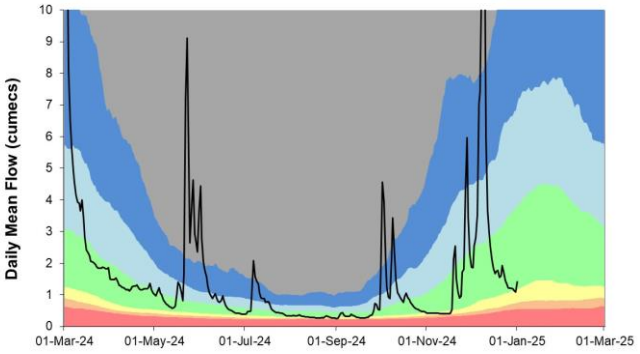
Lexden, Colne
Ranking used data from 01/01/1970 to 31/12/2022

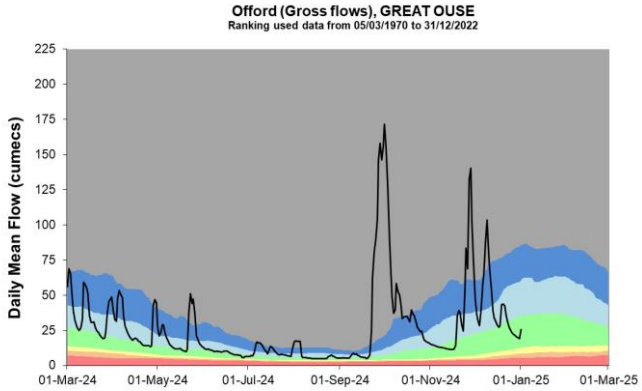


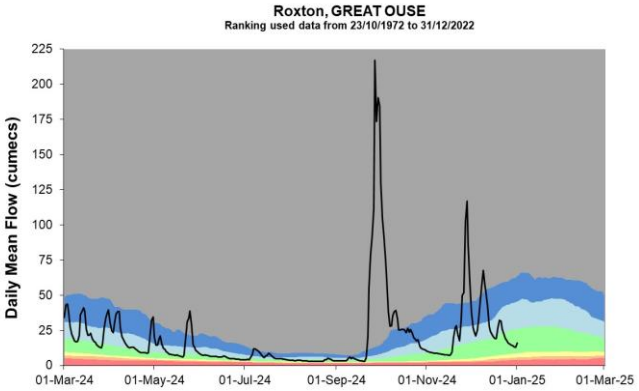
Marham, River Nar
Ranking used data from 01/09/1953 to 31/12/2022

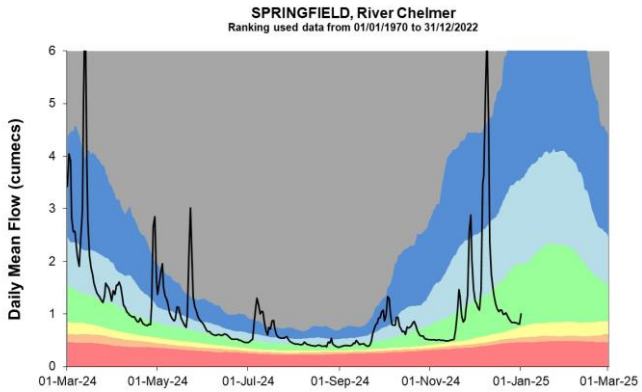


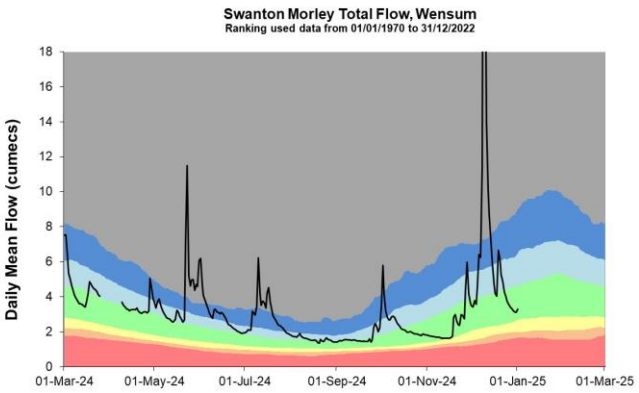
Needham Weir Total, Waveney
Ranking used data from 01/01/1970 to 31/12/2022

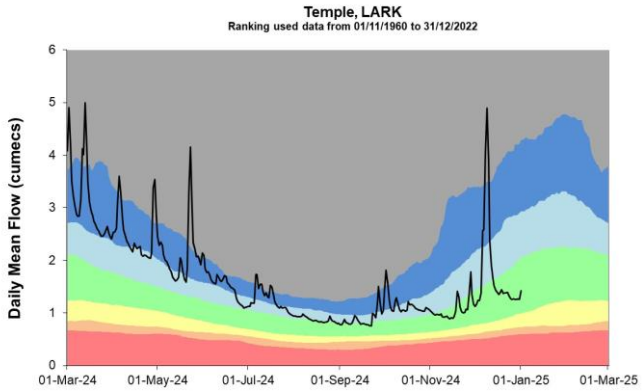


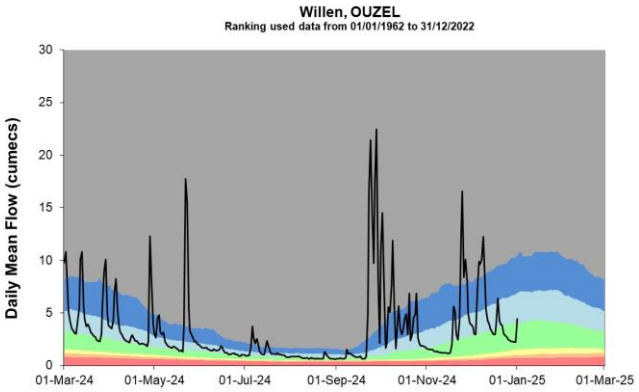










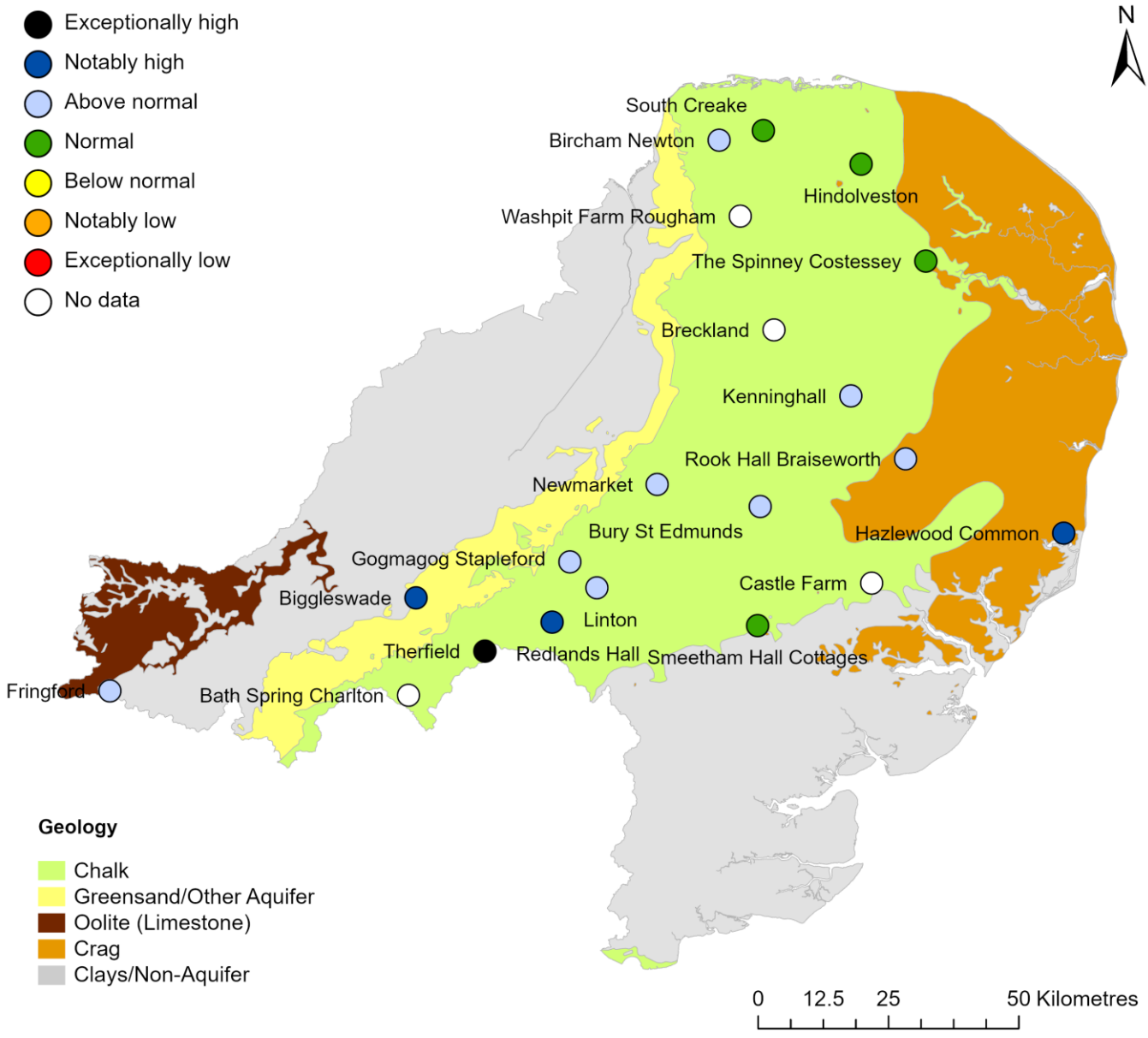


Source: Environment Agency.

5 Groundwater levels

5.1 Groundwater levels map

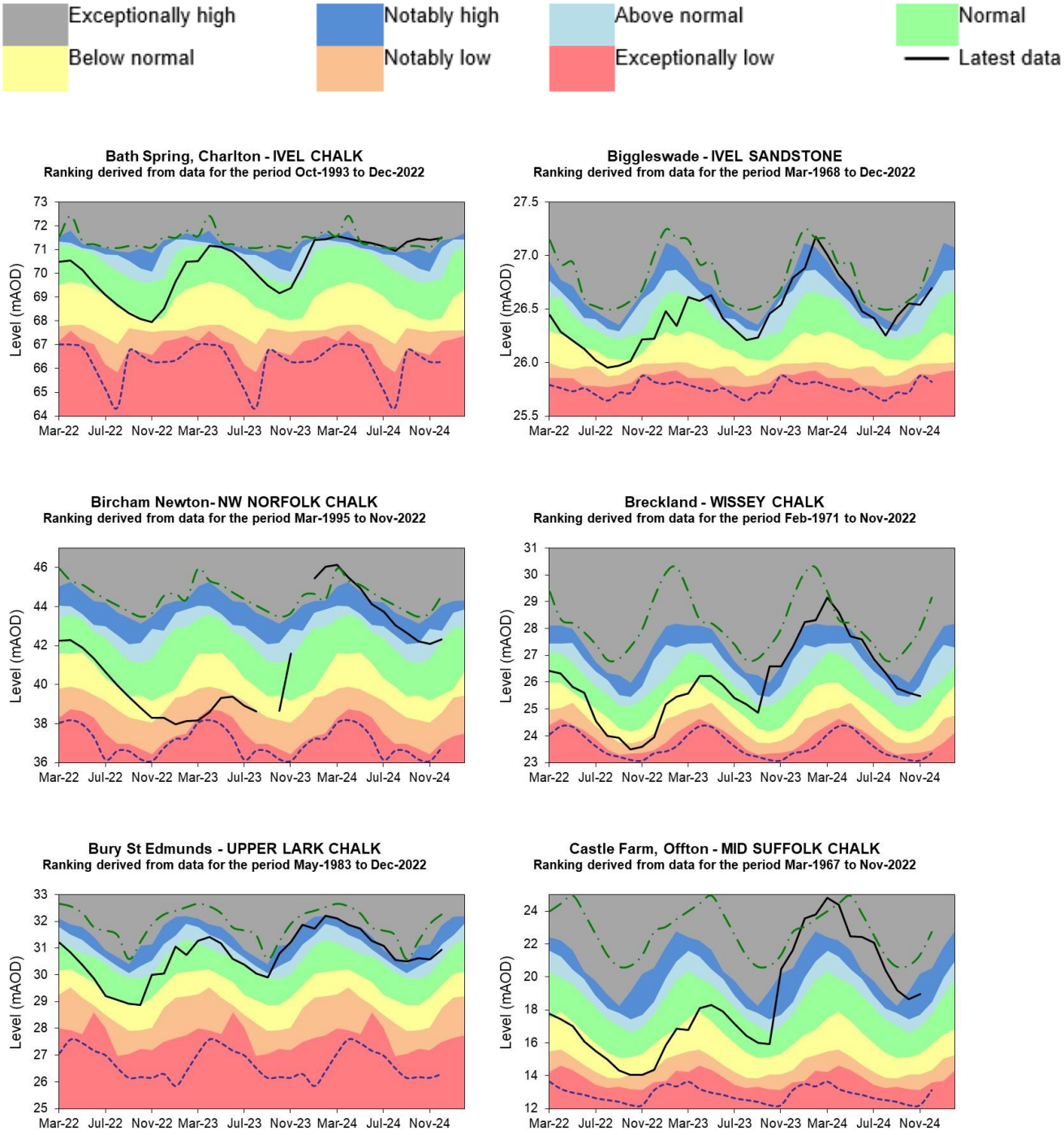
Figure 5.1: Groundwater levels for indicator sites at the end of December 2024, classed relative to an analysis of respective historic December levels. Table available in the appendices with detailed information.



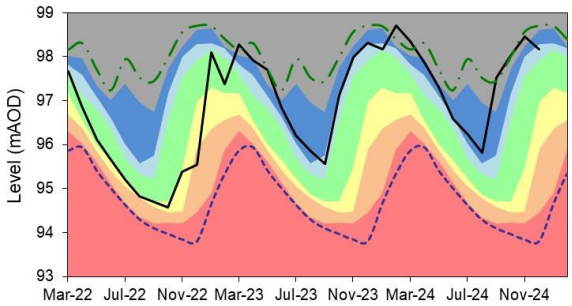
(Source: Environment Agency). Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, 100024198, 2025.

5.2 Groundwater level charts

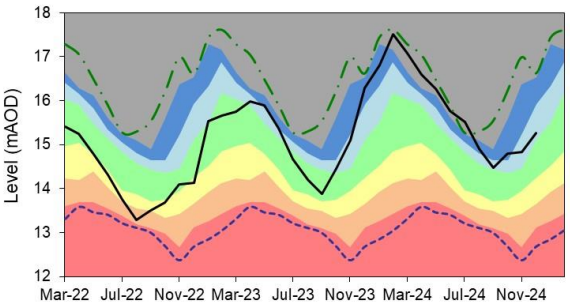
Figure 5.2: End of month groundwater levels at index groundwater level sites for major aquifers. 22 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.



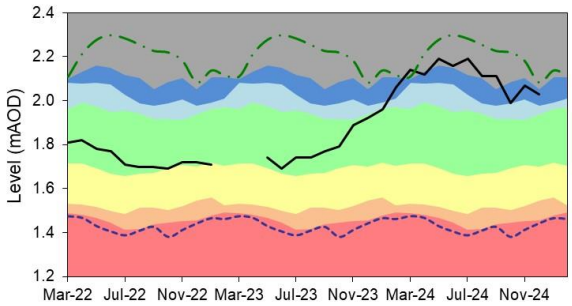
Fringford - GREAT OOLITE
Ranking derived from data for the period Sep-1980 to Dec-2022



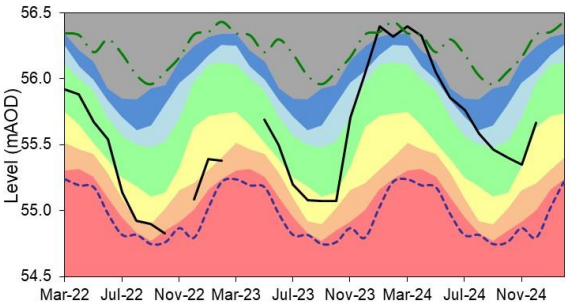
Gog Magog, Stapleford - CAM CHALK
Ranking derived from data for the period Jan-1980 to Dec-2022



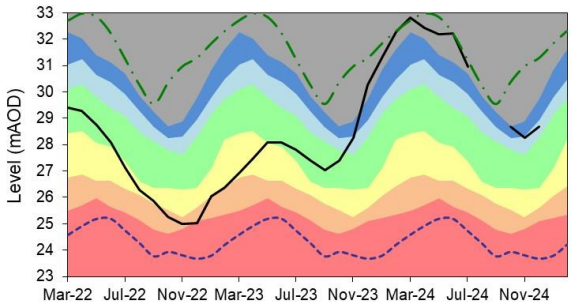
Hazlewood Common - SUFFOLK CRAG
Ranking derived from data for the period Oct-1988 to Nov-2022



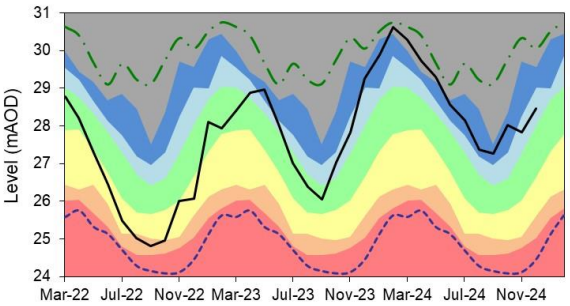
Hindolveston - NORFOLK CHALK
Ranking derived from data for the period Sep-1984 to Nov-2022



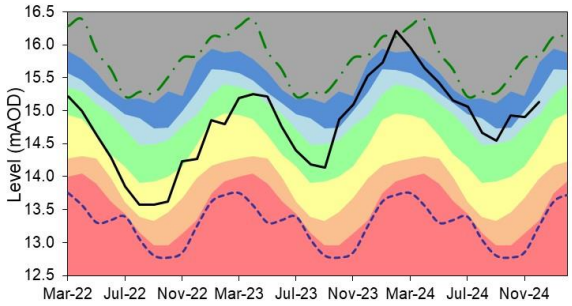
Kenninghall - LITTLE OUSE CHALK
Ranking derived from data for the period Aug-1973 to Dec-2022



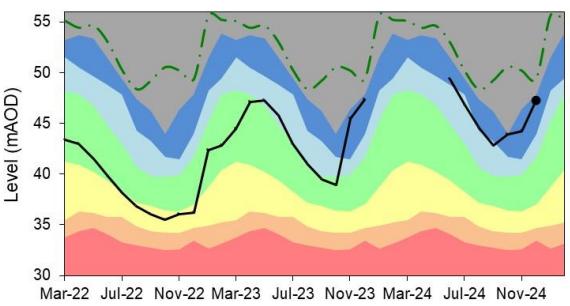
Linton- CAM CHALK
Ranking derived from data for the period Jan-1980 to Dec-2022

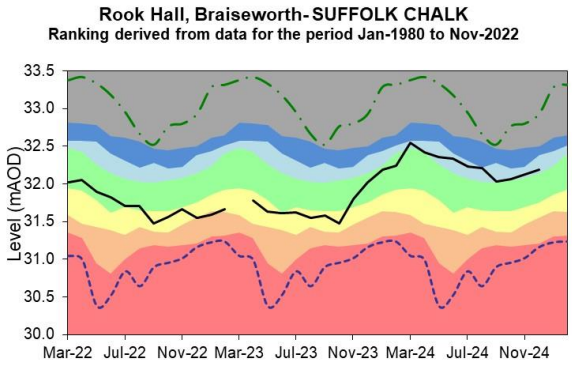


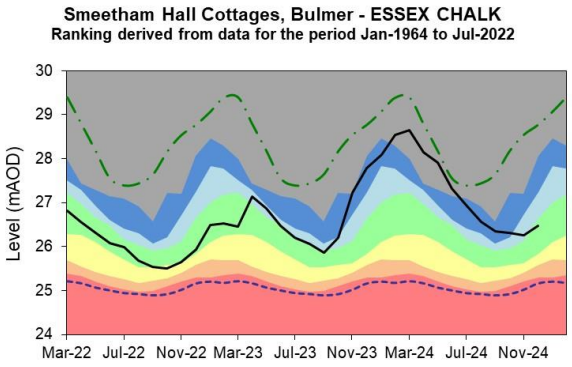
Newmarket - SNAIL CHALK
Ranking derived from data for the period Feb-1983 to Dec-2022

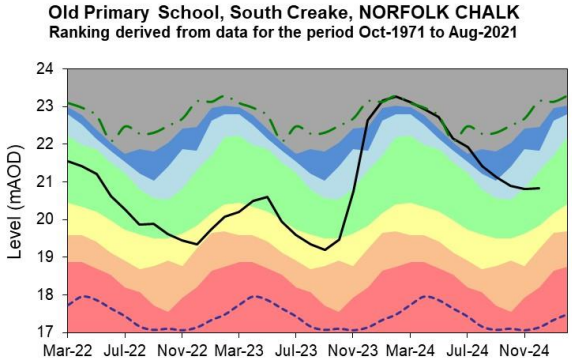


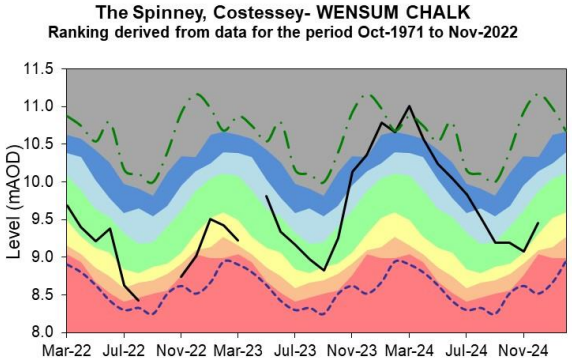
Redlands Hall, Ickleton - CAM CHALK
Ranking derived from data for the period Aug-1963 to Dec-2022

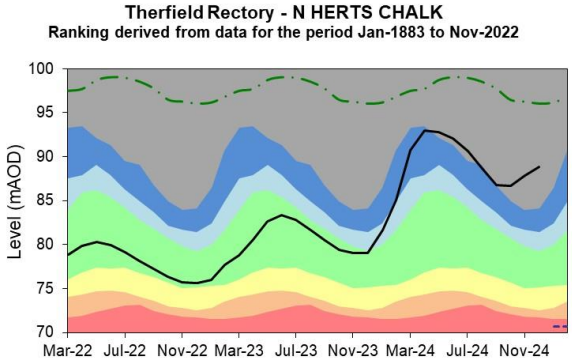


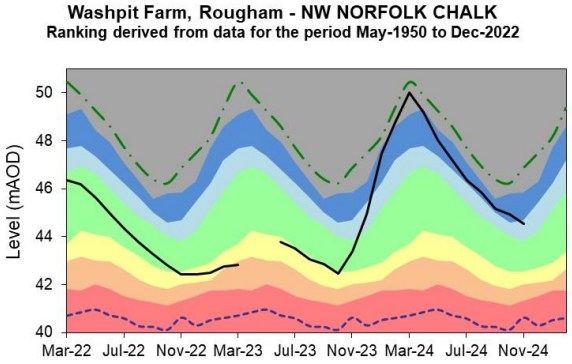








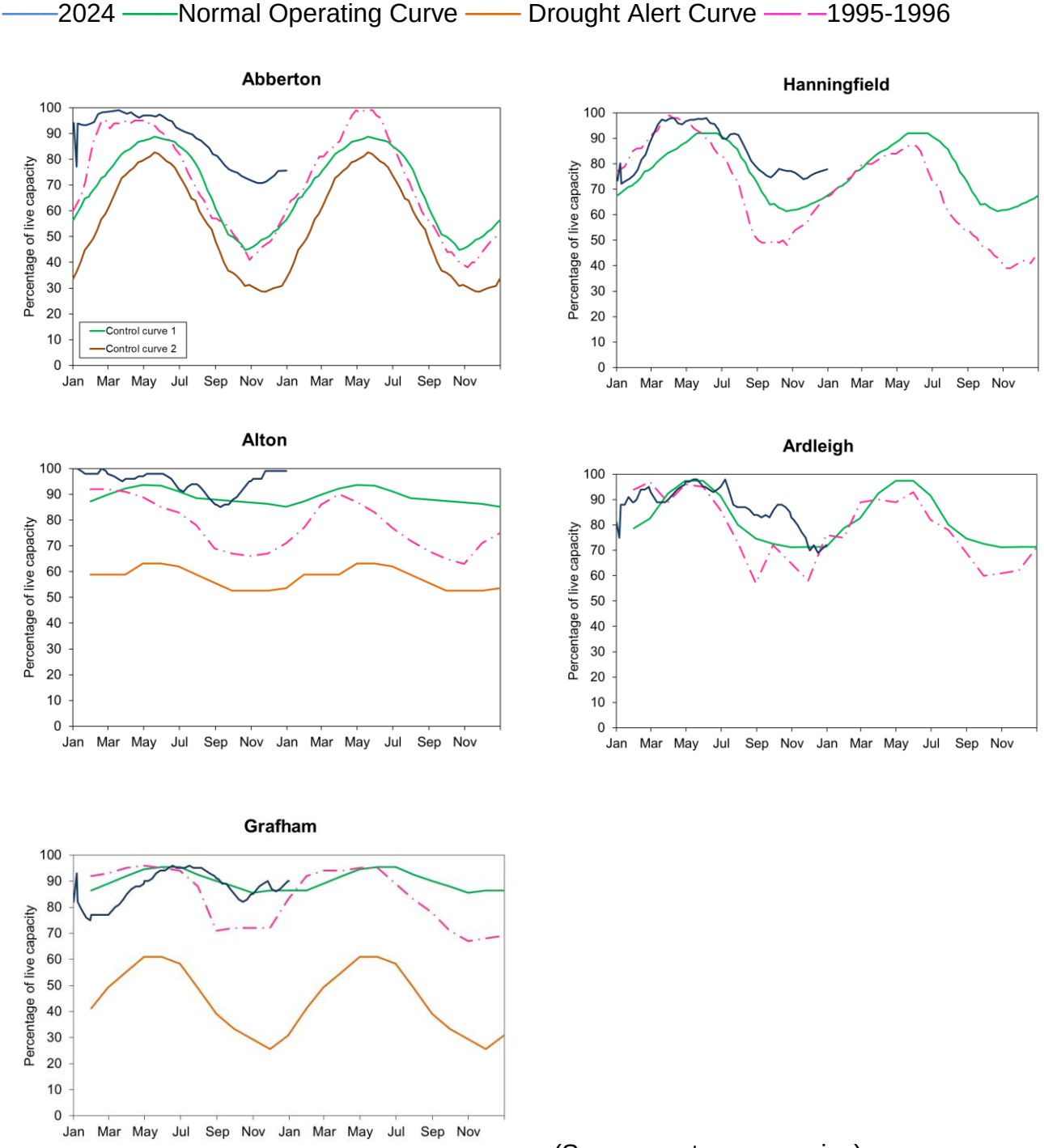




Source: Environment Agency, 2025.

6 Reservoir stocks

Figure 6.1: End of month regional reservoir stocks compared to the normal operating curve, drought curve and dry 1995-1996 stocks. Note: Historic records of individual reservoirs and reservoir groups making up the regional values vary in length.

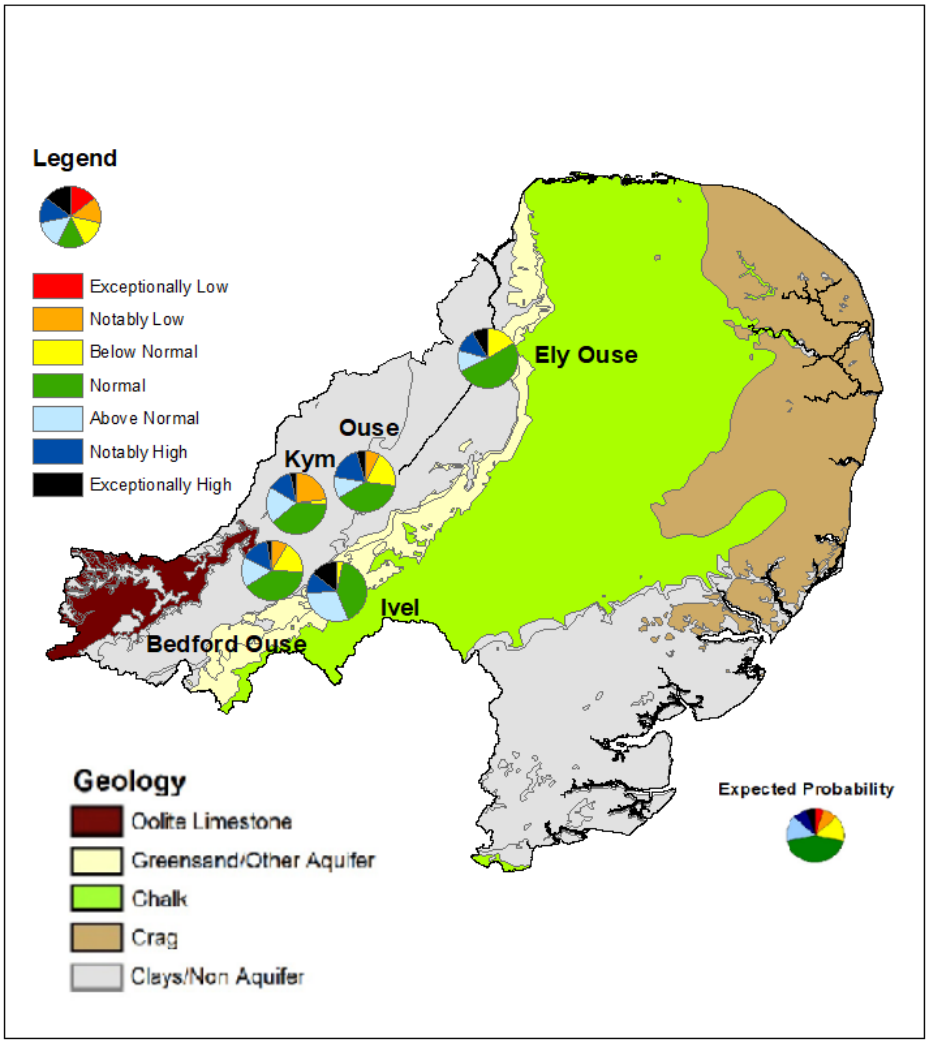


(Source: water companies).

7 Forward look

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

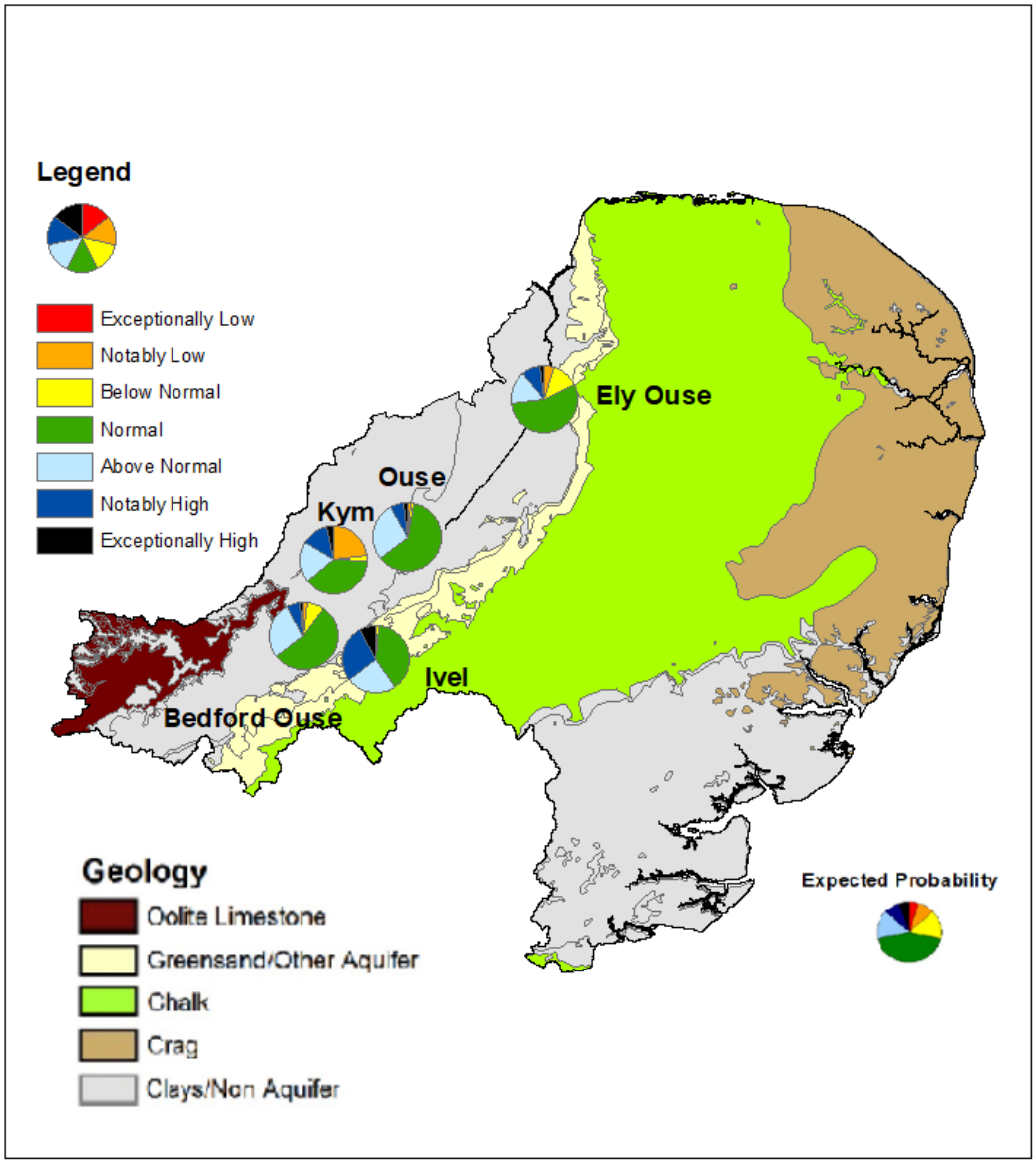
Table available in the appendices with detailed information. Exceptionally high or low levels are those which would typically occur 5% of the time within the historic record. Notably high or low levels are those which would typically occur 8% of the time. Above normal or below normal levels are those which would typically occur 15% of the time. Normal levels are those which would typically occur 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 September 2025

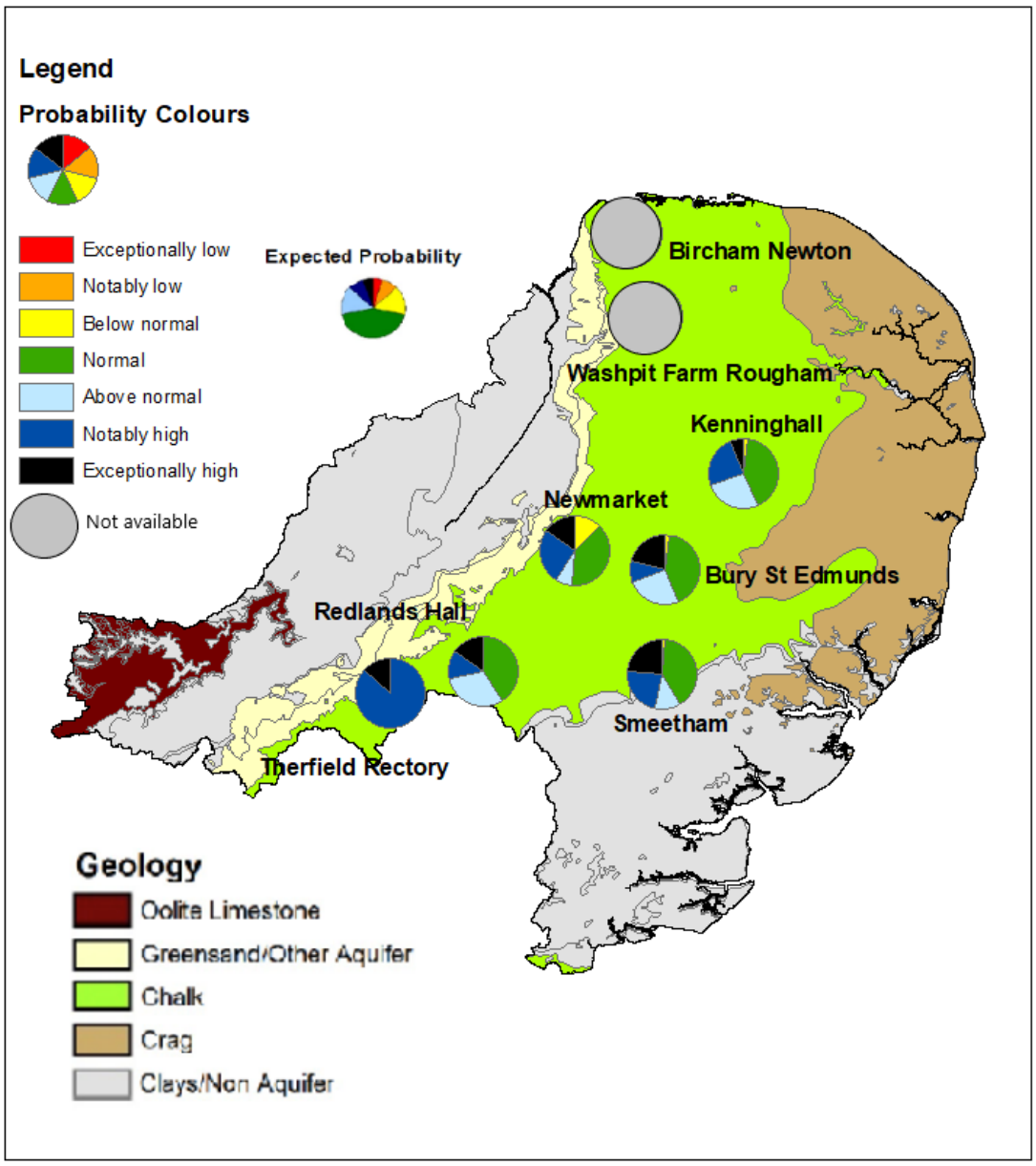
Table available in the appendices with detailed information. Exceptionally high or low levels are those which would typically occur 5% of the time within the historic record. Notably high or low levels are those which would typically occur 8% of the time. Above normal or below normal levels are those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

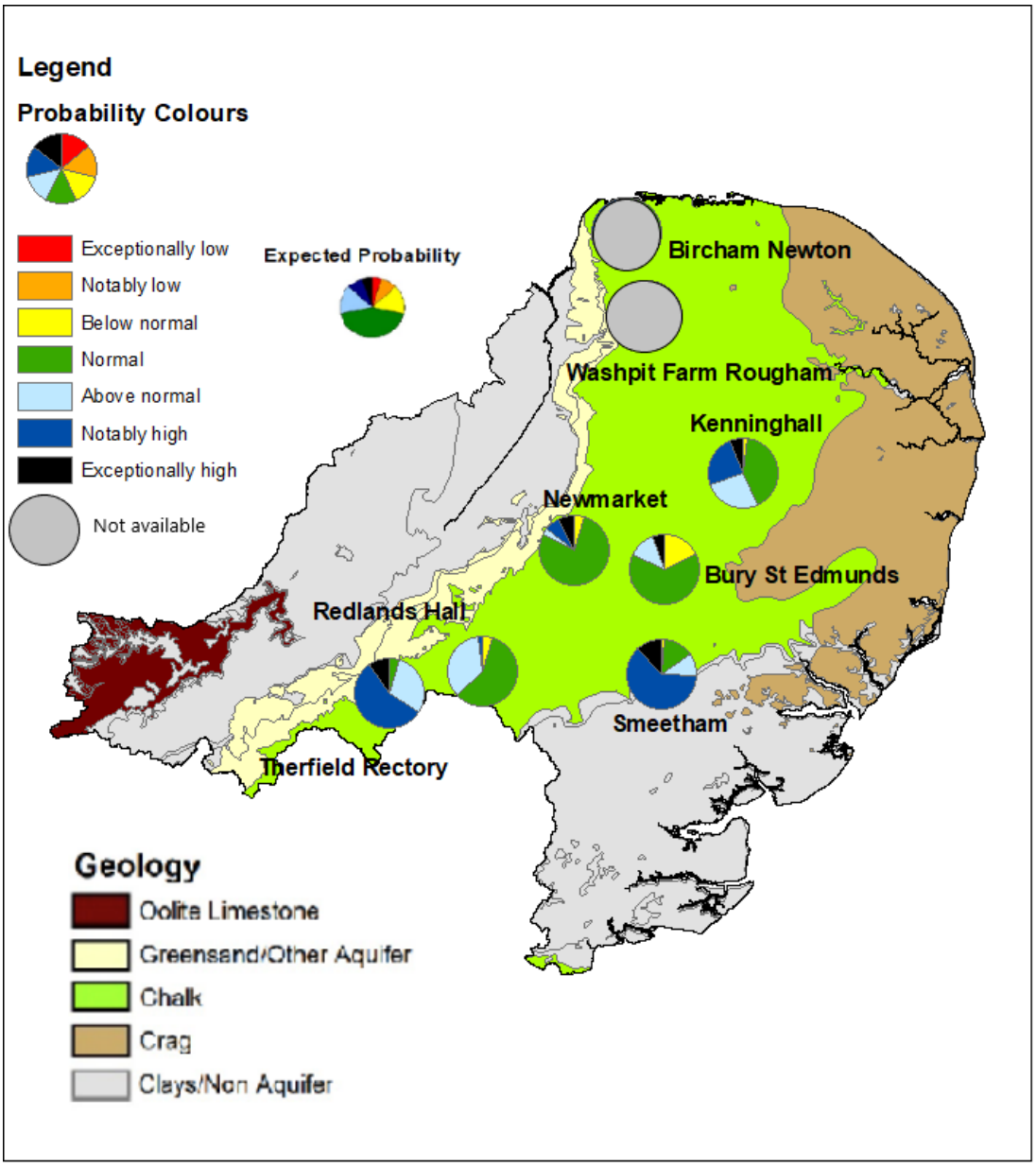
Table available in the appendices with detailed information. Exceptionally high or low levels are those which would typically occur 5% of the time within the historic record. Notably high or low levels are those which would typically occur 8% of the time. Above normal or below normal levels are those 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) Geological map reproduced with kind permission from UK Groundwater Forum, BGS © NERC. Crown copyright. All rights reserved. Environment Agency, 100026380, 2025

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	Dec 2024 rainfall % of long term average 1961 to 1990	Dec 2024 band	Oct 2024 to December cumulative band	Jul 2024 to December cumulative band	Jan 2024 to December cumulative band
Broadland Rivers	100	Normal	Normal	Normal	Above normal
Cam	94	Normal	Normal	Normal	Exceptionally high
Central Area Fenland	105	Normal	Normal	Normal	Exceptionally high
East Suffolk	85	Normal	Normal	Normal	Above normal
Little Ouse And Lark	110	Normal	Normal	Normal	Notably high
Lower Bedford Ouse	98	Normal	Normal	Notably high	Exceptionally high
North Essex	77	Normal	Normal	Normal	Above normal
North Norfolk	107	Normal	Normal	Normal	Above normal
Nw Norfolk And Wissey	127	Normal	Normal	Normal	Exceptionally high
South Essex	66	Below Normal	Normal	Normal	Normal
Upper Bedford Ouse	92	Normal	Normal	Exceptionally high	Exceptionally high

9.2 River flows table

Site name	River	Catchment	Dec 2024 band	Nov 2024 band
Abbey Heath	Little Ouse	Little Ouse	Above normal	Normal
Blunham	Ivel	Ivel	Exceptionally high	Notably high
Bramford	Gipping	Gipping	Normal	Normal
Burnham Overy	Burn	Burn	Above normal	Above normal
Burnt Mill	Rhee	Rhee	Notably high	Above normal
Cappenham	Tove	Tove	Above normal	Notably high
Colney	Yare	Yare	Above normal	Normal
Denver	Ely Ouse	Cutoff and Renew Channel	Above normal	Normal
Dernford	Cam	Cam	Above normal	Normal
Heacham	Heacham	Heacham	Normal	Above normal
Ingworth	Bure	Bure	Normal	Normal
Lexden	Colne	Colne Essex	Normal	Normal
Marham	Nar	Nar	Normal	Normal
Needham Weir Total	Waveney (lower)	Waveney	Normal	Normal

Northwold Total	Wissey	Wissey		
Offord (gross Flows)	Great Ouse	Ouse Beds	Above normal	Above normal
Roxton	Great Ouse	Ivel	Above normal	Above normal
Springfield	Chelmer	Chelmer Upper	Normal	Normal
Swanton Morley Total	Wensum	Wensum	Notably high	Normal
Temple	Lark	Lark	Normal	Normal
Willen	Ouzel	Ouzel	Above normal	Above normal

9.3 Groundwater table

Site name	Aquifer	End of Dec 2024 band	End of Nov 2024 band
Biggleswade	Ivel Woburn Sands	Notably high	Above normal
Bircham Newton	North West Norfolk Chalk	Above normal	Above normal
Breckland	Wissey Chalk		Above normal
Bury St Edmunds	Upper Lark Chalk	Above normal	Notably high
Castle Farm, Offton	East Suffolk Chalk		Notably high
Gog Magog, Stapleford	Cam Chalk	Above normal	Above normal
Hazlewood Common	East Suffolk Crag	Notably high	Notably high
Hindolveston	Norfolk Chalk	Normal	Normal
Kenninghall	Little Ouse Chalk	Above normal	Above normal
Linton	Cam Chalk	Above normal	Above normal
Newmarket	Snail Chalk	Above normal	Above normal
Old Primary School, South Creake	North Norfolk Chalk	Normal	Normal

Redlands Hall, Ickleton	Cam Chalk	Notably high	Notably high
Rook Hall, Braiseworth	East Suffolk Chalk	Above normal	Above normal
Smeetham Hall Cottages, Bulmer	North Essex Chalk	Normal	Above normal
The Spinney, Costessey	Wensum Chalk	Normal	Normal
Washpit Farm, Rougham	North West Norfolk Chalk		Above normal
Therfield Rectory	Upper Lee Chalk	Exceptionally high	Exceptionally high
Fringford P.s.	Upper Bedford Ouse Oolitic Limestone (great)	Above normal	Exceptionally high

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	Bedford Ouse	Kym	Ivel	Ouse	Ely Ouse
Exceptionally low	0	0	0	0	0
Notably low	8	23	0	8	0
Below normal	18	3	3	19	16
Normal	40	39	40	39	52
Above normal	16	19	31	11	11
Notably high	15	13	11	18	11
Exceptionally high	3	3	15	5	9

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

Percentage of pie chart for each band

Site	Bedford Ouse	Kym	Ivel	Ouse	Ely Ouse
Exceptionally low	0	0	0	0	0
Notably low	2	23	0	2	5
Below normal	8	3	2	2	14
Normal	55	39	39	61	55
Above normal	27	19	24	27	16
Notably high	6	13	27	6	9
Exceptionally high	2	3	8	2	2

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

Percentage of pie chart for each band

Site	Therfield Rectory	Redlands Hall	Newmarket	Kenninghall	Bury St Edmunds	Smeetham
Exceptionally low	0.0	0.0	0.0	0.0	0.0	0.0
Notably low	0.0	0.0	0.0	0.0	0.0	0.0
Below normal	0.0	0.0	12.8	2.0	2.6	1.7
Normal	0.0	40.7	38.5	40.8	41.0	39.7
Above normal	0.0	30.5	7.7	26.5	25.6	12.1
Notably high	86.9	13.6	25.6	24.5	10.3	22.4
Exceptionally high	13.1	15.3	15.4	6.1	20.5	24.1

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

Percentage of pie chart for each band

Site	Therfield Rectory	Redlands Hall	Newmarket	Bury St Edmunds	Smeetham
Exceptionally low	0.0	0.0	0.0	0.0	0.0
Notably low	0.0	0.0	0.0	0.0	0.0
Below normal	0.0	5.1	4.9	17.9	1.7
Normal	4.9	57.6	78.0	64.1	13.8
Above normal	29.5	35.6	2.4	12.8	10.3
Notably high	55.7	1.7	7.3	0.0	62.1
Exceptionally high	9.8	0.0	7.3	5.1	12.1