

Monthly water situation report: Hertfordshire and North London Area

1 Summary - November 2024

The Hertfordshire and North London area recorded 61mm of rainfall in November, which was 99% of the Long Term Average. River base flows varied from normal to exceptionally high, with some sites reaching record November levels. Groundwater levels remained in the exceptionally high band at most indicator sites, with Lilley Bottom and Crescent Cottages recording their highest November levels since records began.

1.1 Rainfall

The Hertfordshire and North London area “the Area” recorded 61mm of rainfall in November, which was 99% of the Long Term Average (LTA). All five areal rainfall units remained in the normal band, consistent with October’s conditions. The month was characterised by dry conditions in the first half, with significantly more rainfall in the second half. The highest rainfall occurred on 26 November, with 26mm falling at Wanstead (Roding). During November, there were a total of 14 dry days (less than 0.2mm of rain). For the water year to the end of November (October – November), rainfall totals were normal with 100% of the LTA.

1.2 Soil moisture deficit and recharge

Soil moisture deficits (SMDs) decreased from October across the Area and remained well below the LTA for November. All areal rainfall units, except the Roding, received effective rainfall far greater than the LTA. The Roding experienced no effective rainfall both during October and November.

1.3 River flows

River base flows decreased during November and monitoring sites displayed a varied picture of flow conditions. Five sites recorded monthly mean flows in the normal band, one site was in the above normal band, three were in the notably high band, and three were in the exceptionally high band. Notably, Colney Street (River Ver) and Panshanger (River Mimram) reached their highest recorded November monthly mean flows since monitoring began in 1956 and 1952 respectively.

After the heavy rainfall on 26 November, the heightened river conditions led to 8 flood alerts being issued across the region on 27 November, including:

- The Lower Lee tributaries
- The Lower River Lee from Hoddeson to Canning Town
- The River Ingrebourne at Harold Park and Hornchurch
- The Middle River Roding
- Two on the Upper River Colne and Radlett Brook

- Two on the Colne Brook at Iver and Colnbrook

A single flood warning was issued for the Ching Brook in Waltham Forest.

1.4 Groundwater levels

Groundwater levels in November remained high across the Area with most sites seeing little change or increasing slightly. Of the nine indicator boreholes monitored, seven recorded exceptionally high levels, while two were in the notably high band.

Two boreholes reached their highest November levels since records began; Lilley Bottom with records beginning in 1979 and Crescent Cottages with records beginning in 1968.

Several other boreholes approached historic peaks:

- Cave Gate was at its second highest level since 2001 (records began 1966)
- Ballingdon Farm was at its second highest level since 1987 (records began 1975)
- Amersham Road was at its second highest since 2001 (records began 1991)
- Wapseys Wood was at its third highest level since 2001 (records began 1988)

1.5 Reservoir stocks

The Lower Thames reservoir increased from 79% to 82%, matching the LTA. The Lee reservoir remained stable at 94%, which was higher than the LTA.

1.6 Environmental impact

In the Colne catchment, most of the chalk river sources moved upstream from their locations in October.

- The River Ver started flowing above Markyate
- The River Gade started flowing at Hudnall Corner
- The River Bulbourne was flowing upstream of Dudswell village
- The source of the River Chess stayed upstream of Chesham
- The River Misbourne flowed continuously from Mobwell pond

Most of the chalk river sources in the Upper Lee moved upstream compared to October.

- The River Mimram started flowing at Lilley Bottom Road
- The River Beane started flowing above Cromer
- The source of the River Rib flowed continuously from upstream of Hay Green
- The River Ash (Herts) flowed continuously from upstream of Brent Pelham
- The River Stort started flowing above Langley Lower Green

To protect the environment, during November a number of abstraction license flow constraints were in force. This ranged between 11 and 22, out of a maximum of 49.

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2 Rainfall

2.1 Rainfall map

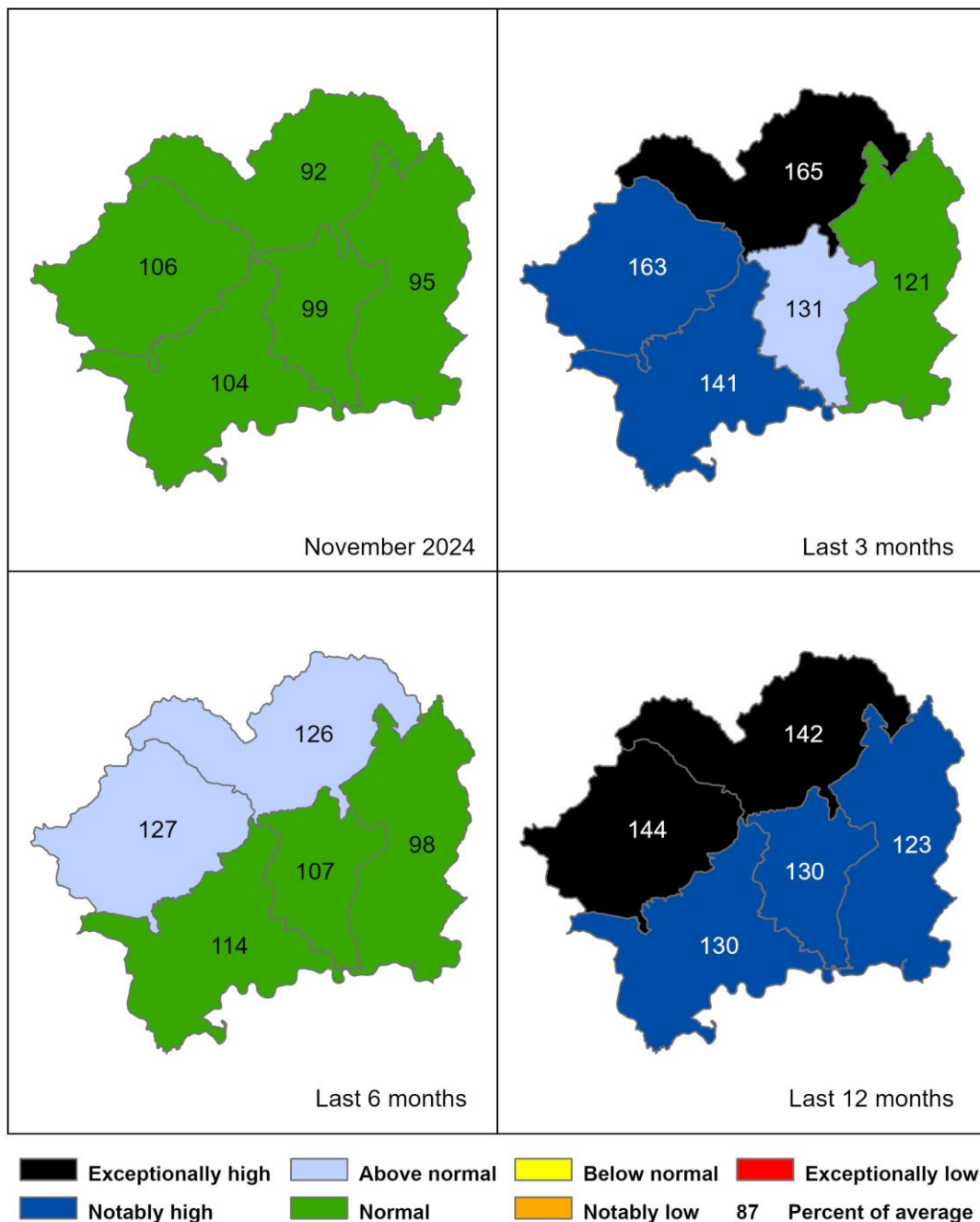
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 30 November 2024), classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



Legend

Exceptionally high	Below normal	Town / City
Notably high	Notably low	87% Percent of average
Above normal	Exceptionally low	
Normal		

Figure 2.2: Total rainfall for hydrological areas for the current month (up to 30 November 2024), 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.

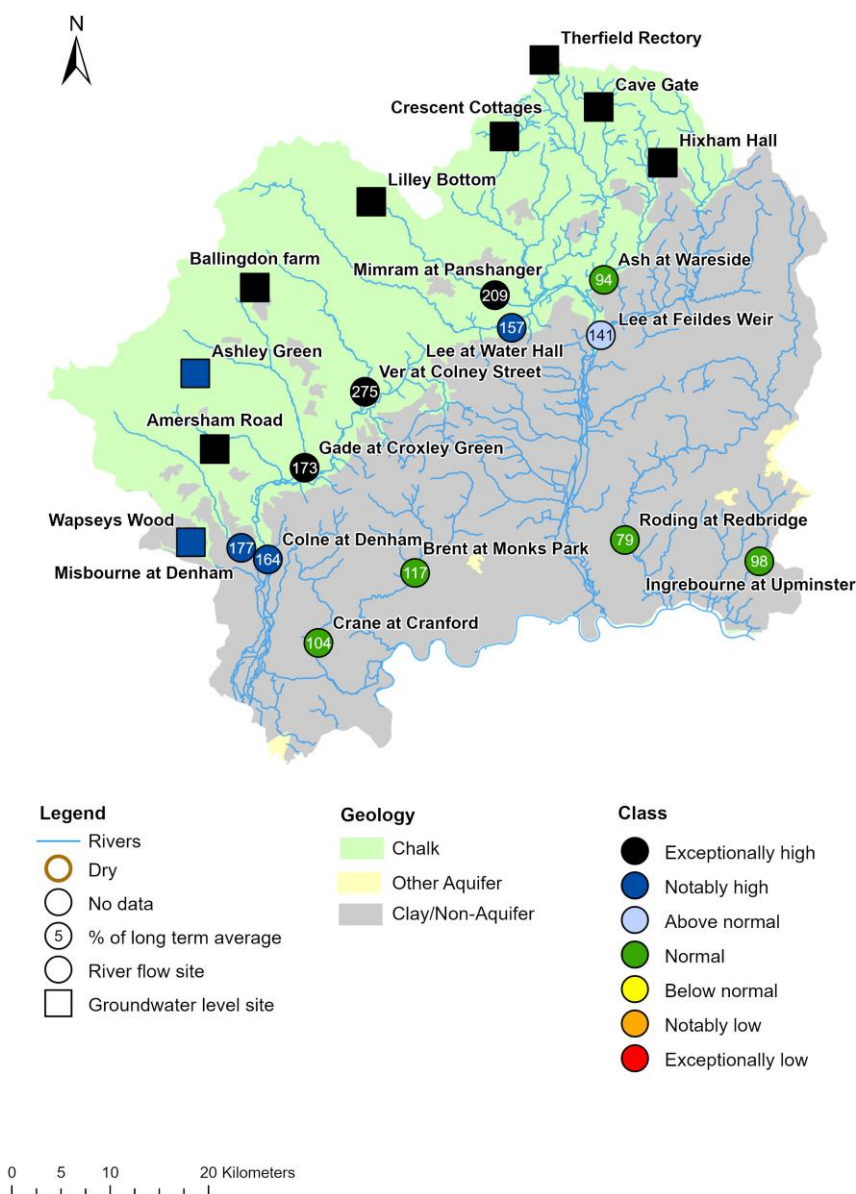


HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2024). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

3 River flows and Groundwater levels

3.1 River flows and Groundwater level map

Figure 3.1: Monthly mean river flow and groundwater levels at our indicator sites for November 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic November monthly means. Table available in the appendices with detailed information.



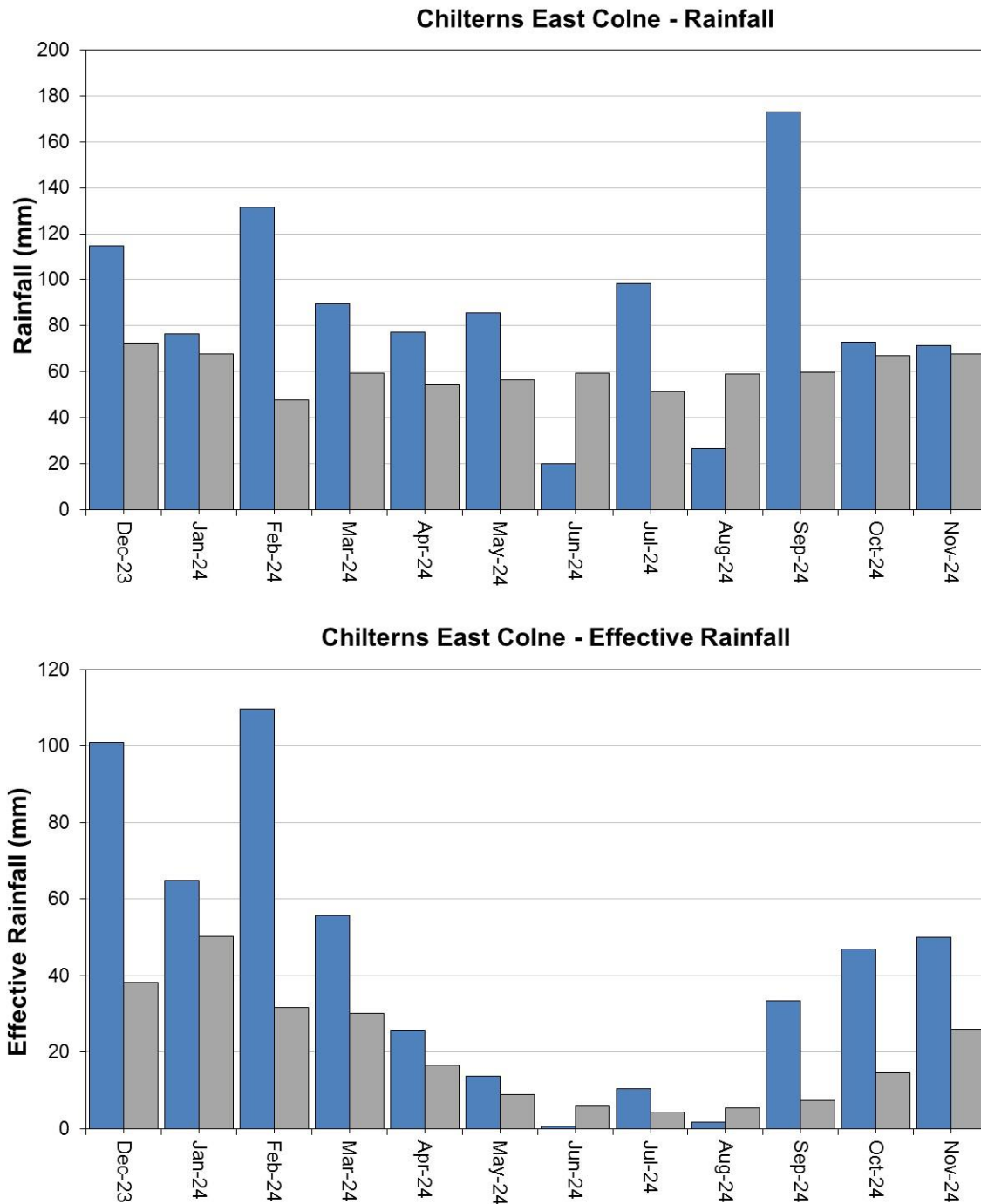
(Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100024198, 2024. Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

4 Colne Catchment

4.1 Colne Rainfall and effective rainfall charts

Figure 4.1: Monthly rainfall and effective rainfall totals for the past 24 months compared to the 1961 to 1990 long term average for the Colne.

Monthly total rainfall (mm) Long term average rainfall (mm)



HadUK rainfall data (Source: Met Office. Crown copyright, 2024)

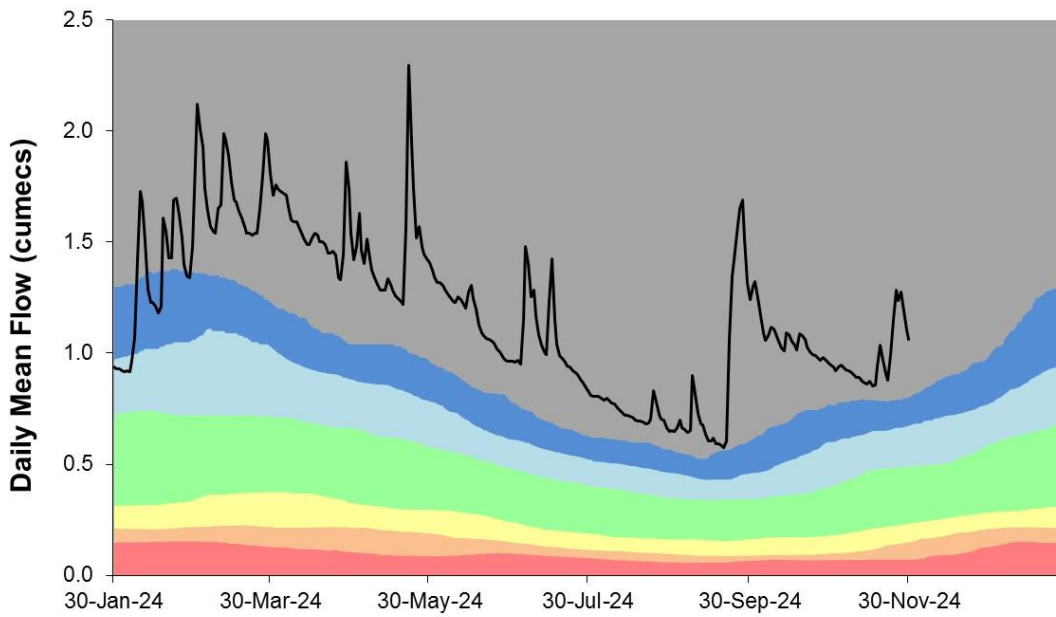
EA Soil Moisture Model effective rainfall data (Source: Environment Agency, 2024)

4.2 Colne River flow charts

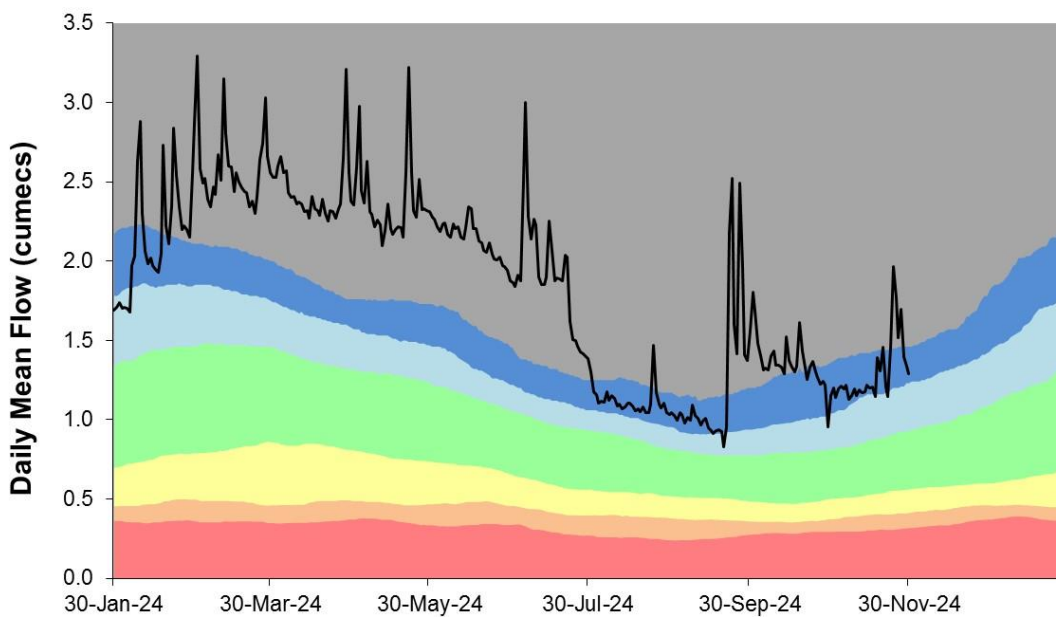
Figure 4.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



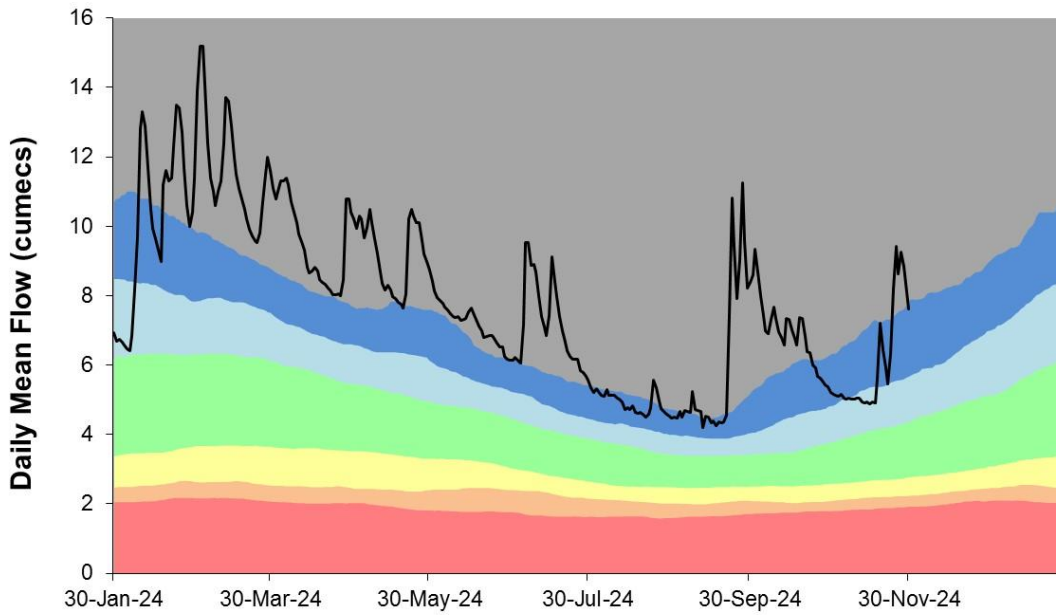
RIVER VER AT COLNEY STREET (HANSTEADS)
 Ranking used data from 01/10/1956 to 31/12/2022



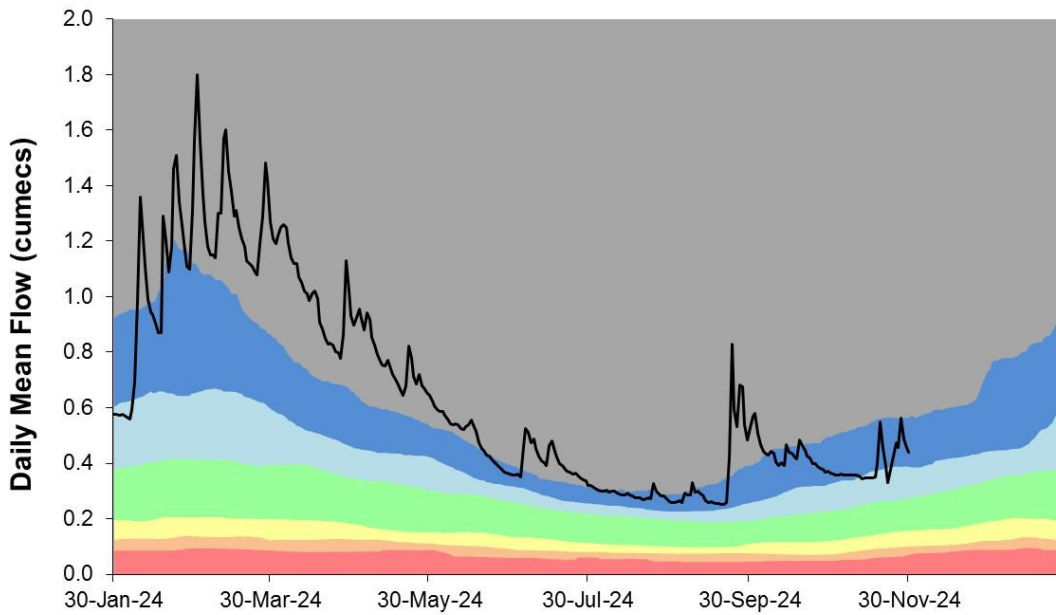
RIVER GADE AT CROXLEY GREEN
 Ranking used data from 01/10/1970 to 31/12/2022



RIVER COLNE AT DENHAM
Ranking used data from 01/10/1952 to 31/12/2022



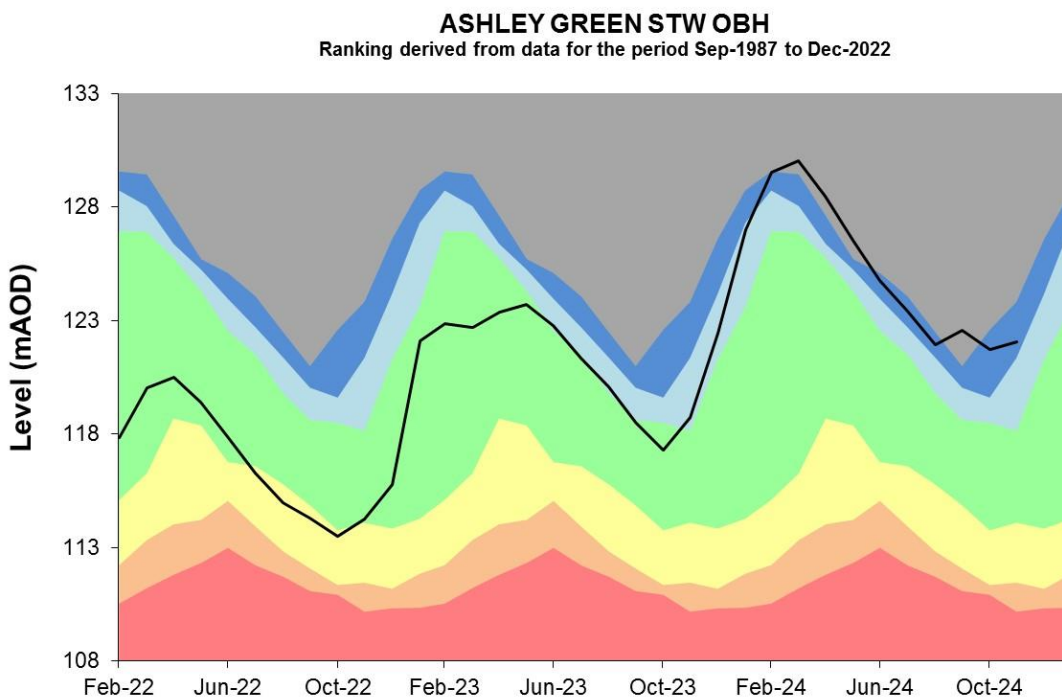
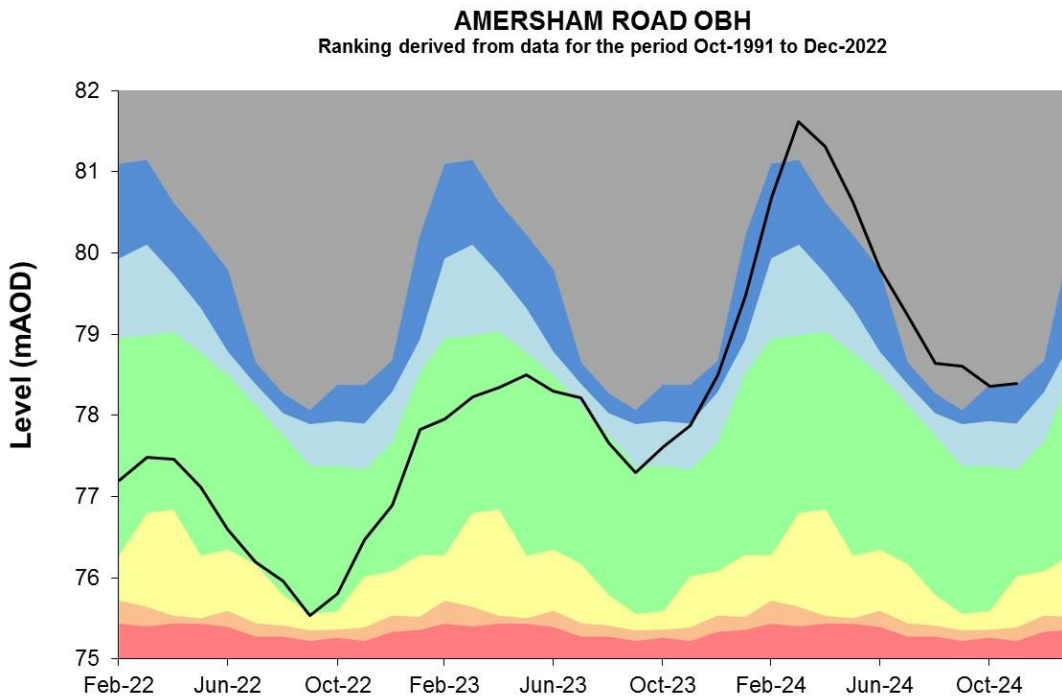
RIVER MISBOURNE AT DENHAM LODGE
Ranking used data from 01/07/1984 to 31/12/2022



Source: Environment Agency, 2024

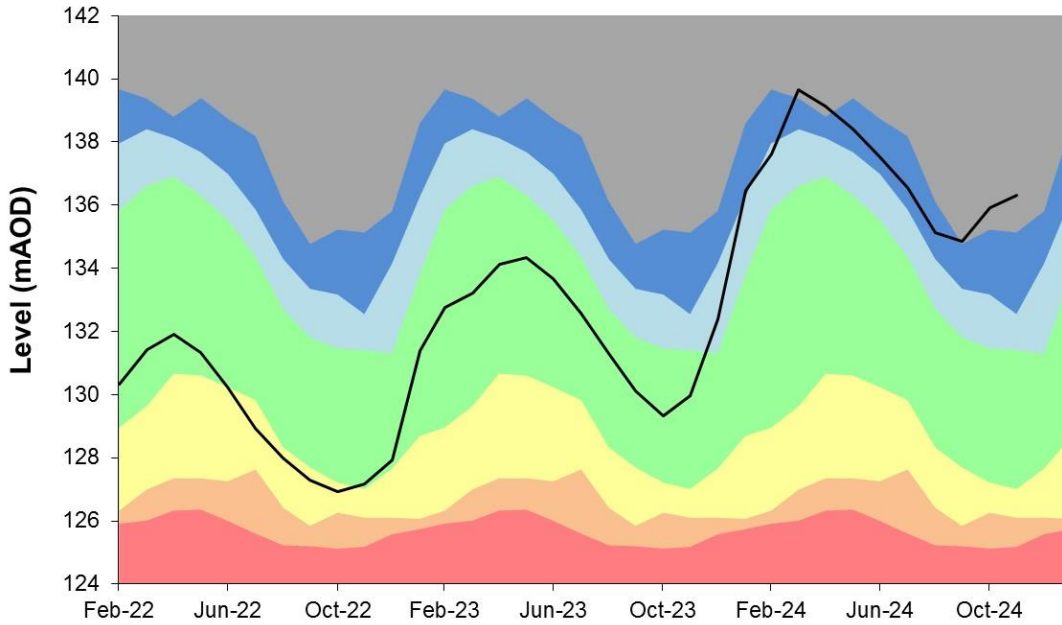
4.3 Colne Groundwater level charts

Figure 4.3: 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.



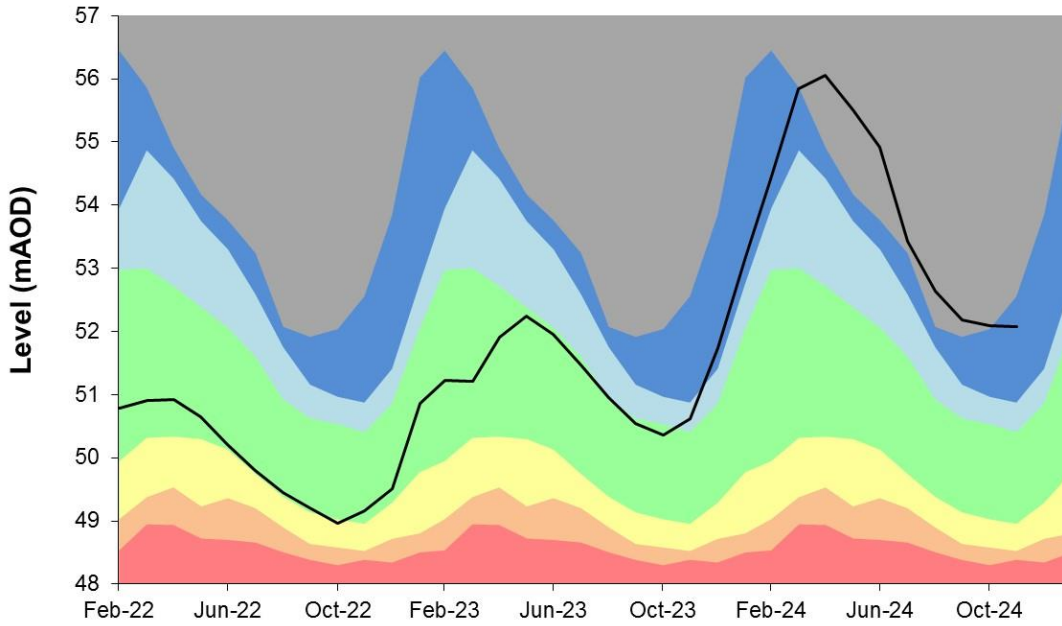
BALLINGDON FARM

Ranking derived from data for the period Jan-1975 to Dec-2022



WAPSEYS WOOD OBH

Ranking derived from data for the period Mar-1988 to Dec-2022



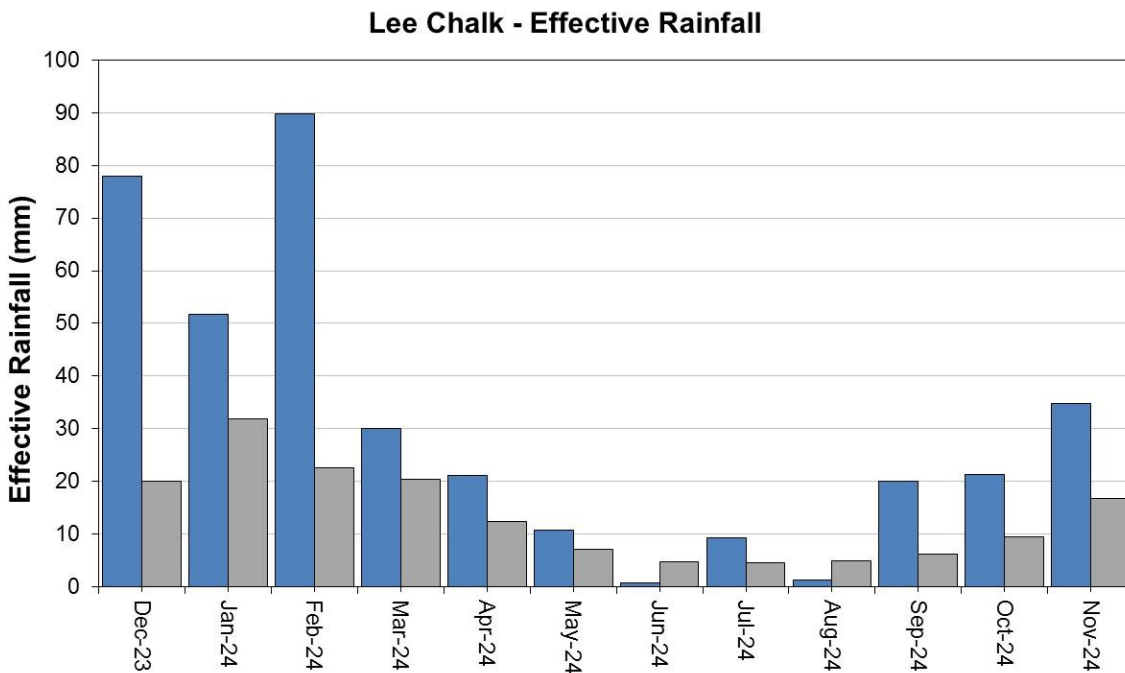
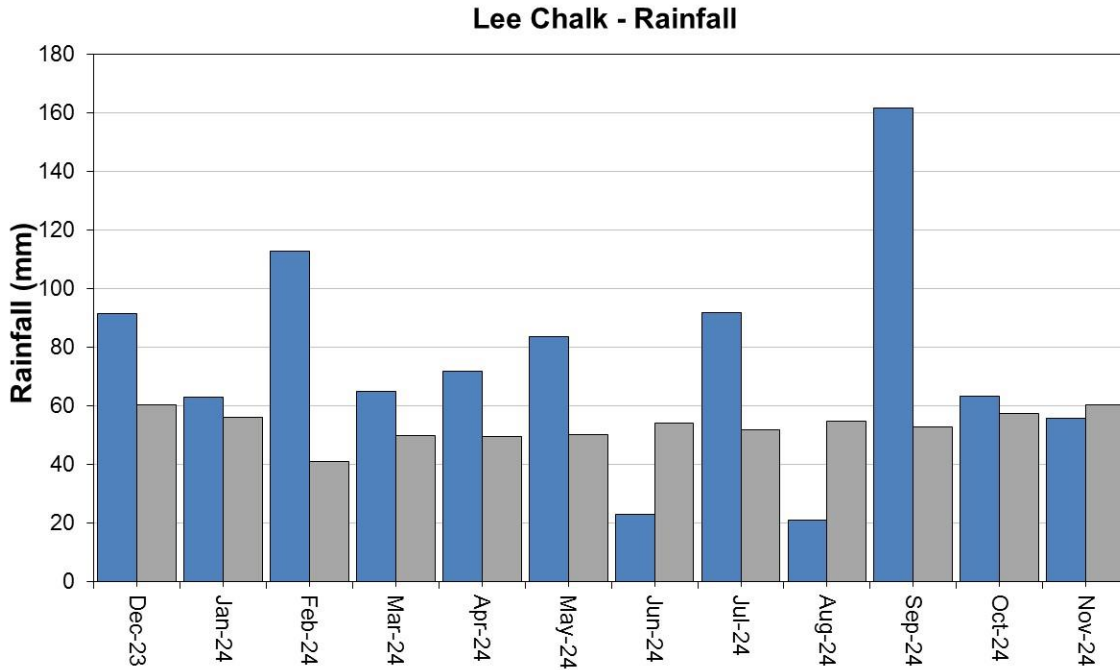
Source: Environment Agency, 2024

5 Upper Lee Catchment

5.1 Upper Lee Rainfall and Effective rainfall charts

Figure 5.1: Monthly rainfall and effective rainfall totals for the past 24 months compared to the 1961 to 1990 long term average for each region and for England.

Monthly total rainfall (mm) Long term average rainfall (mm)



HadUK rainfall data (Source: Met Office. Crown copyright, 2024)

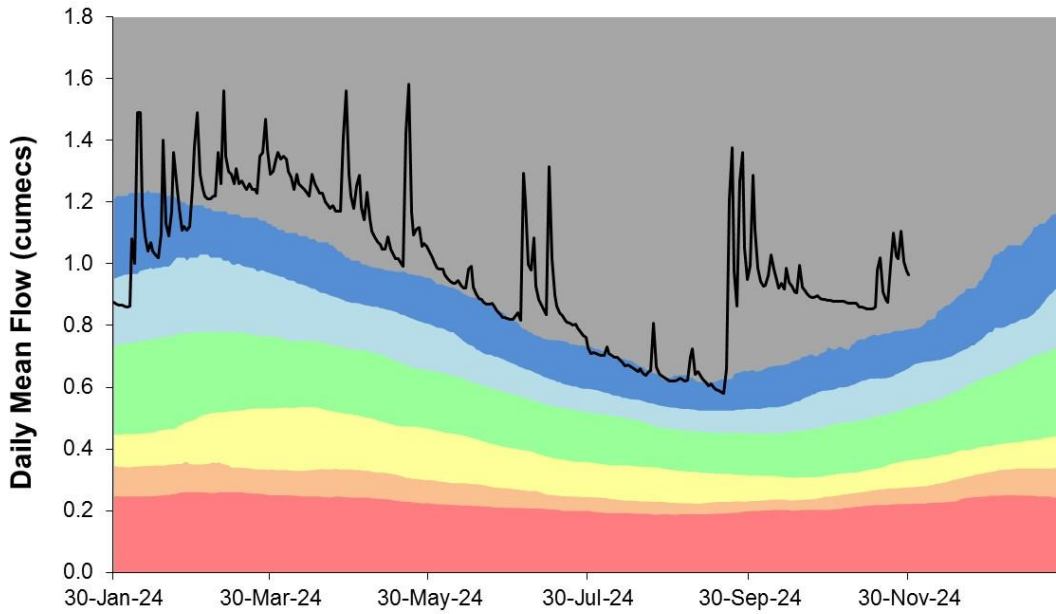
EA Soil Moisture Model effective rainfall data (Source: Environment Agency, 2024)

5.2 Upper Lee River flow charts

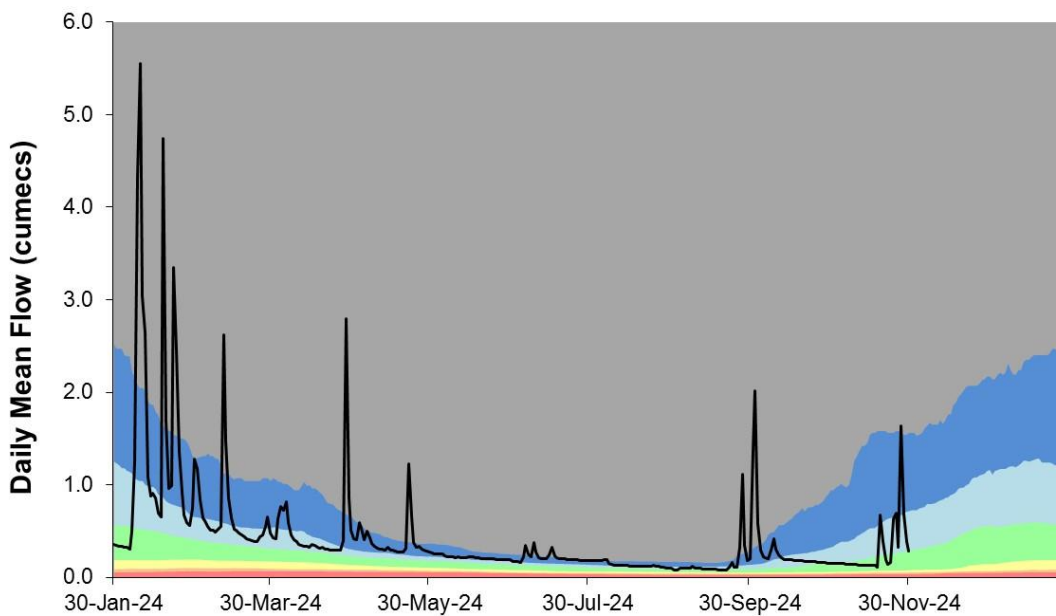
Figure 5.2 Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



RIVER MIMRAM AT PANSHANGER
 Ranking used data from 01/12/1952 to 31/12/2022

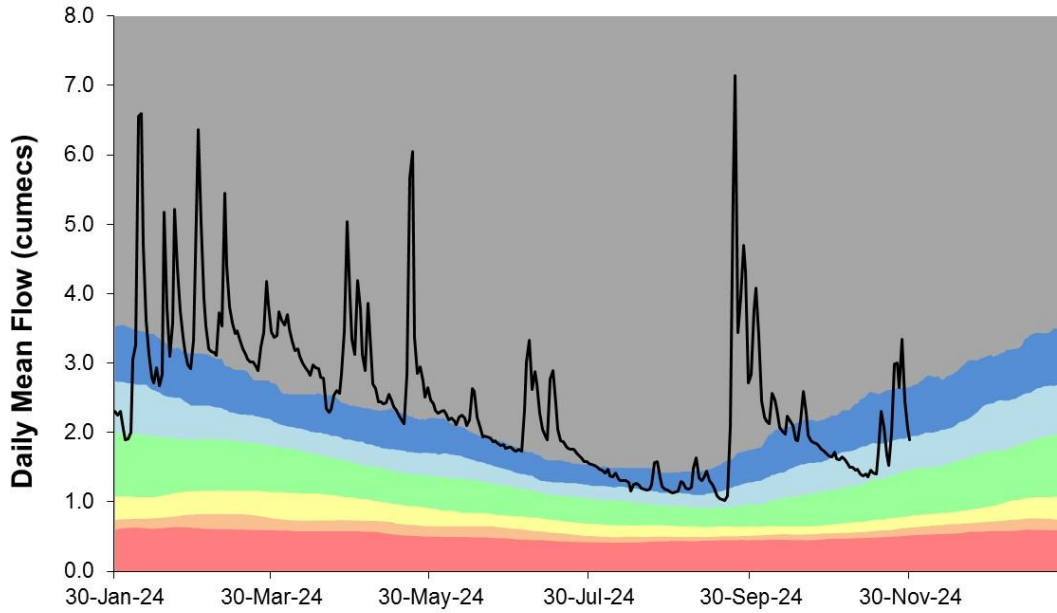


RIVER ASH AT WARESIDE (MARDOCK)
 Ranking used data from 03/06/1980 to 31/12/2022



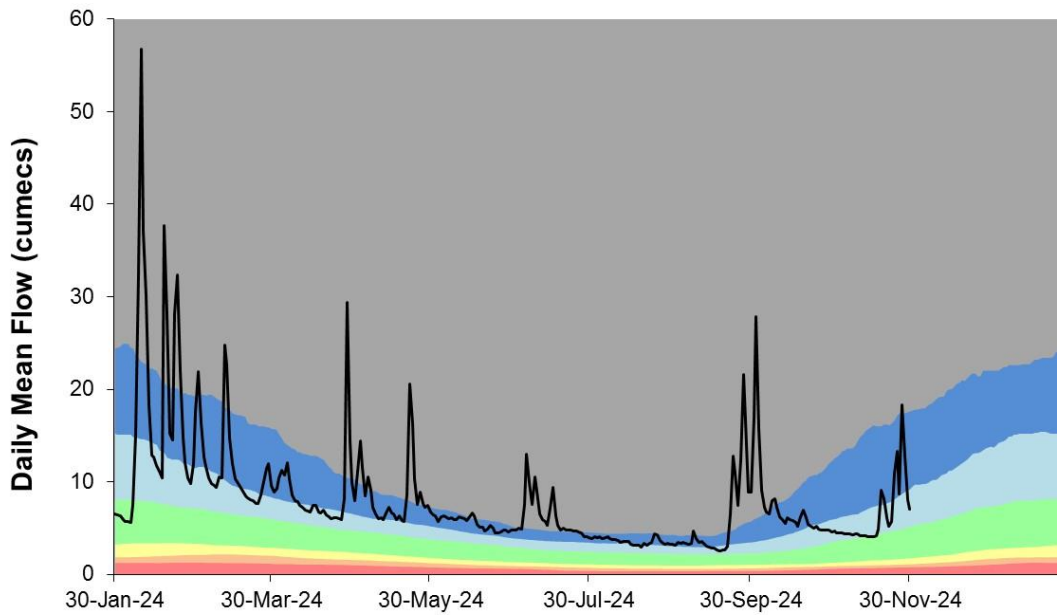
RIVER LEE AT HOWE GREEN (WATER HALL)

Ranking used data from 01/04/1959 to 31/12/2022



RIVER LEE AT FEILDES WEIR

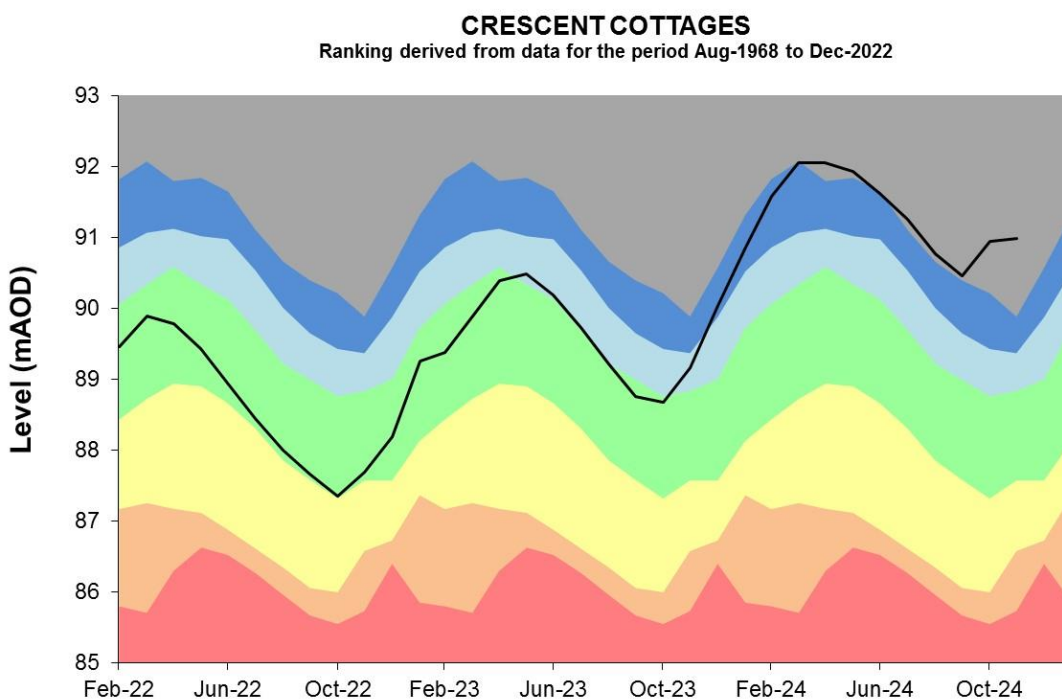
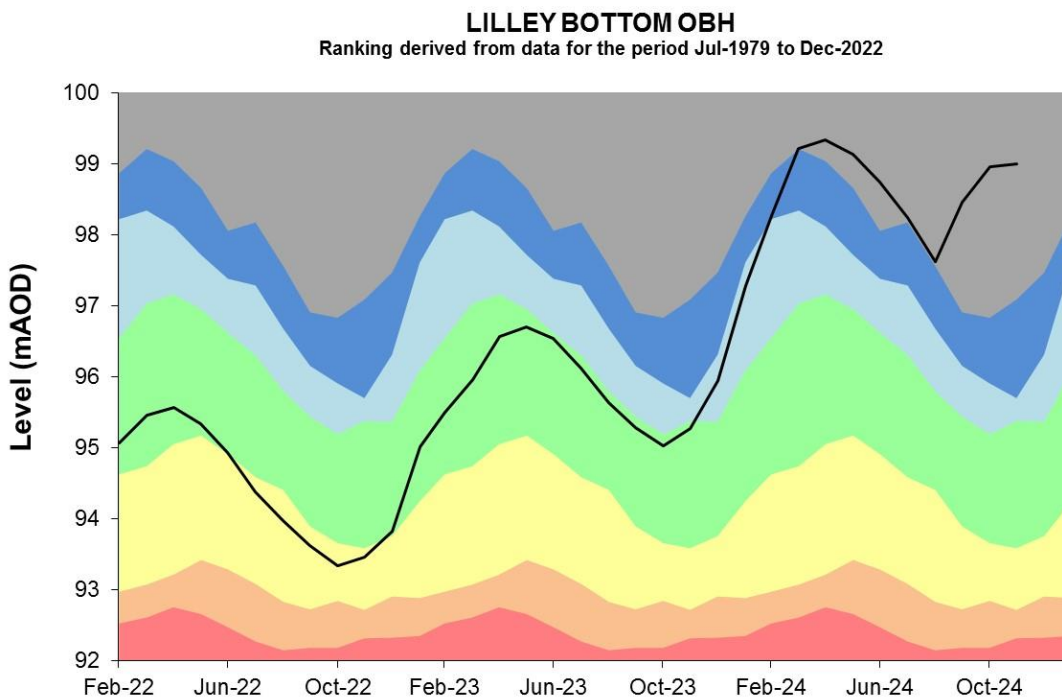
Ranking used data from 10/05/1883 to 31/12/2022



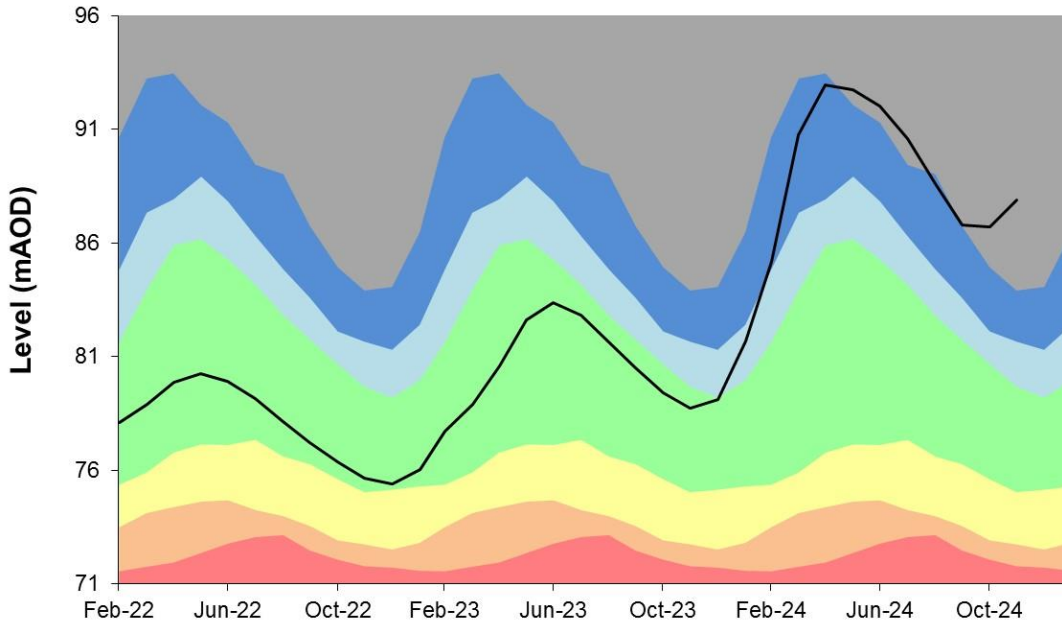
Source: Environment Agency, 2024

5.3 Upper Lee Groundwater level charts

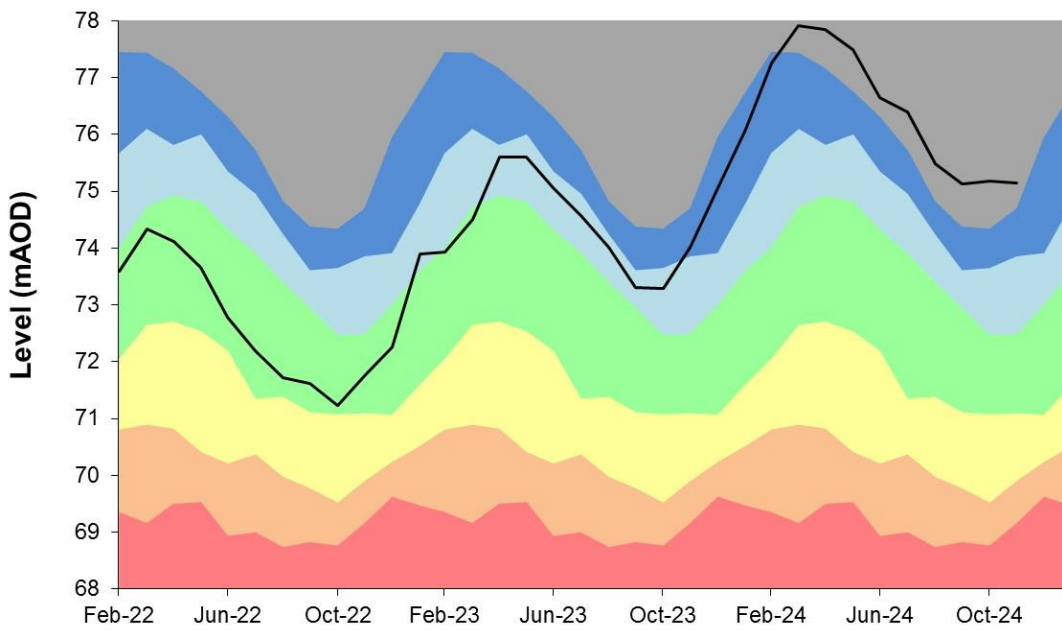
Figure 5.3: End of month groundwater levels at index groundwater level sites for major aquifers. 22 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.



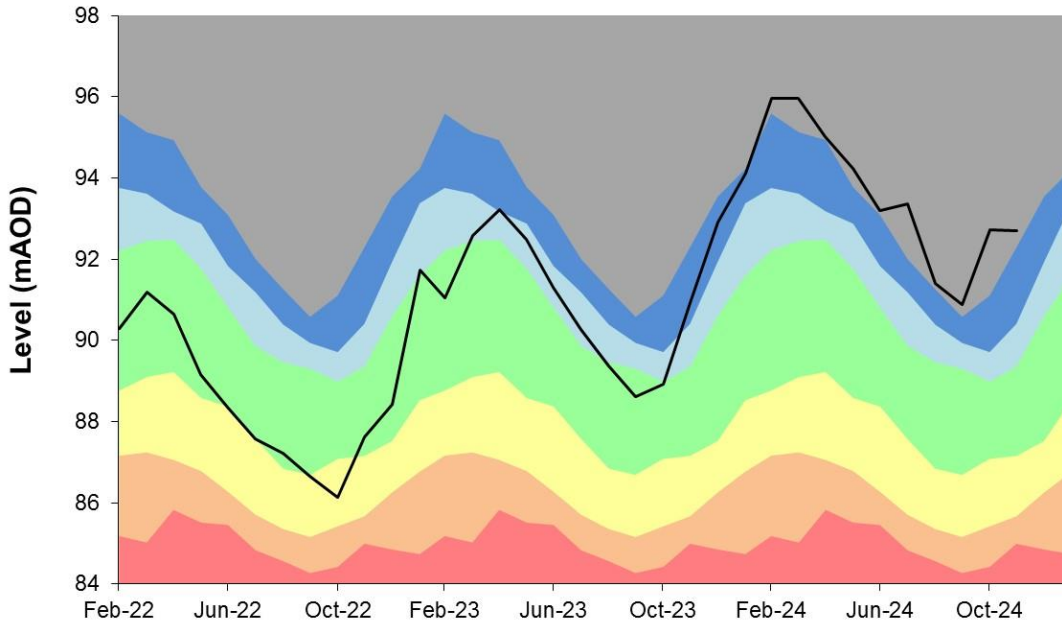
THERFIELD RECTORY
Ranking derived from data for the period Jan-1883 to Dec-2022



HIXHAM HALL
Ranking derived from data for the period Jun-1964 to Dec-2022



CAVE GATE
Ranking derived from data for the period Jun-1966 to Dec-2022



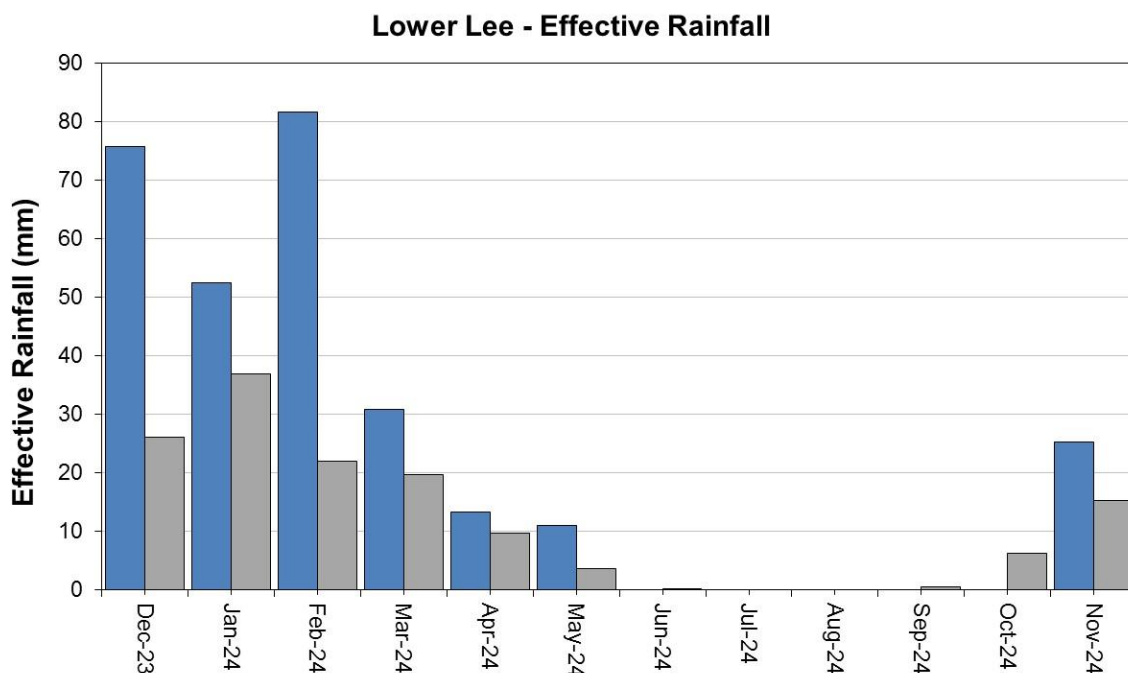
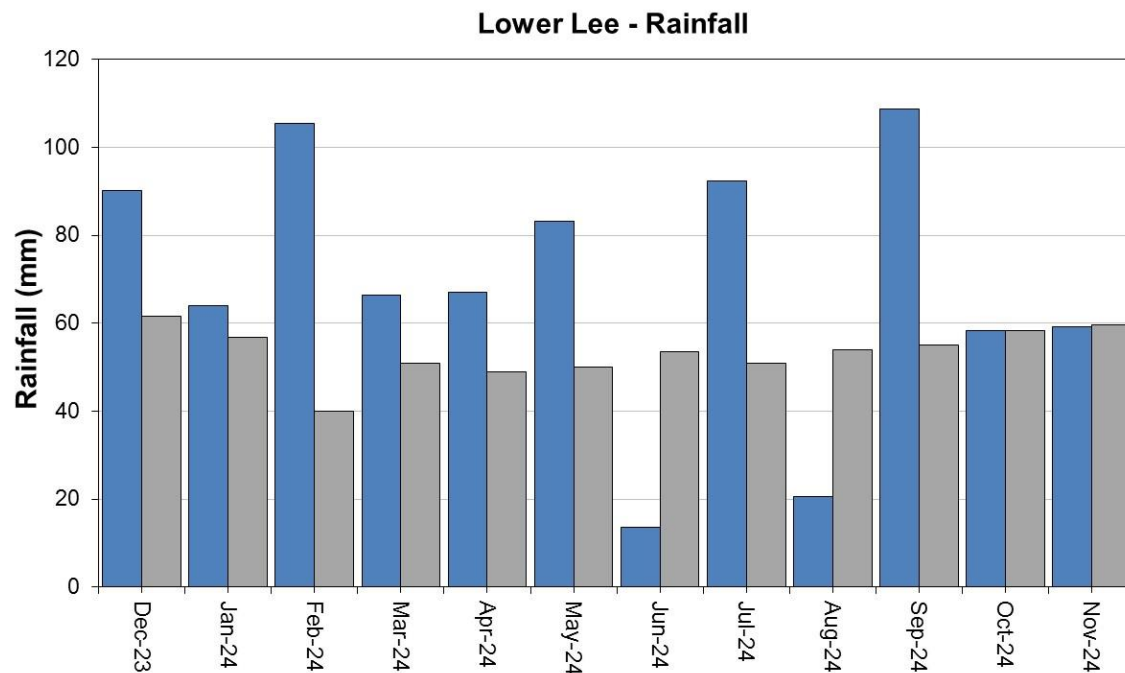
Source: Environment Agency, 2024

6 Lower Lee Catchment

6.1 Lower Lee Rainfall and Effective Rainfall charts

Figure 6.1: Monthly rainfall and effective rainfall totals for the past 24 months as a percentage of the 1961 to 1990 long term average for the Lower Lee.

■ Monthly total rainfall (mm) ■ Long term average rainfall (mm)

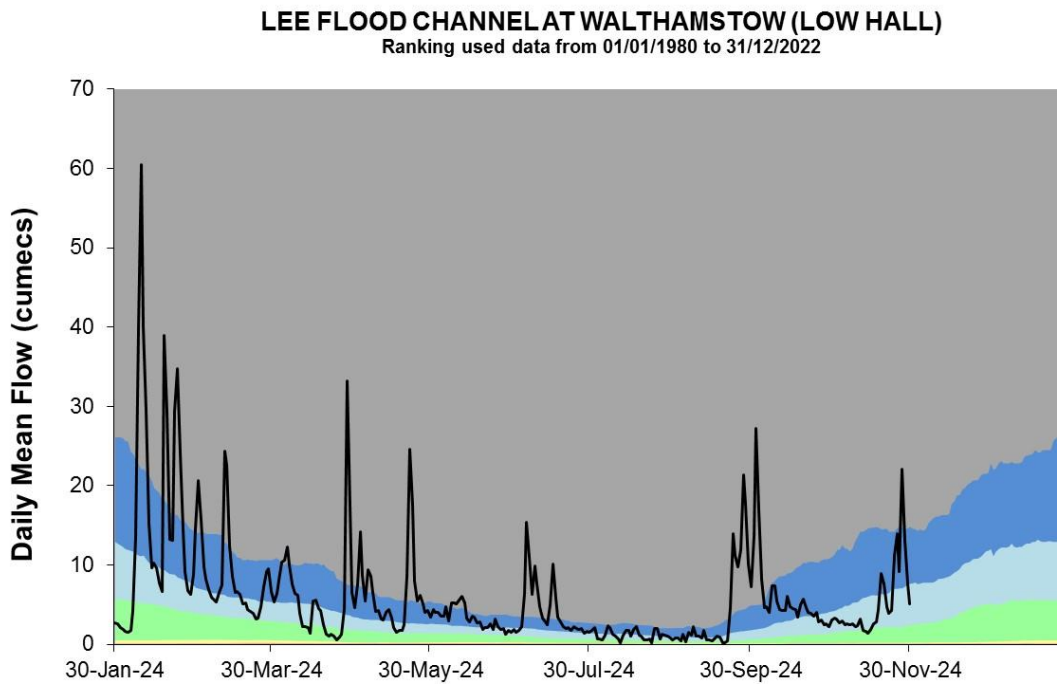


HadUK rainfall data (Source: Met Office. Crown copyright, 2024)

EA Soil Moisture Model effective rainfall data (Source: Environment Agency, 2024)

6.2 Lower Lee River flow charts

Figure 6.2: 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.



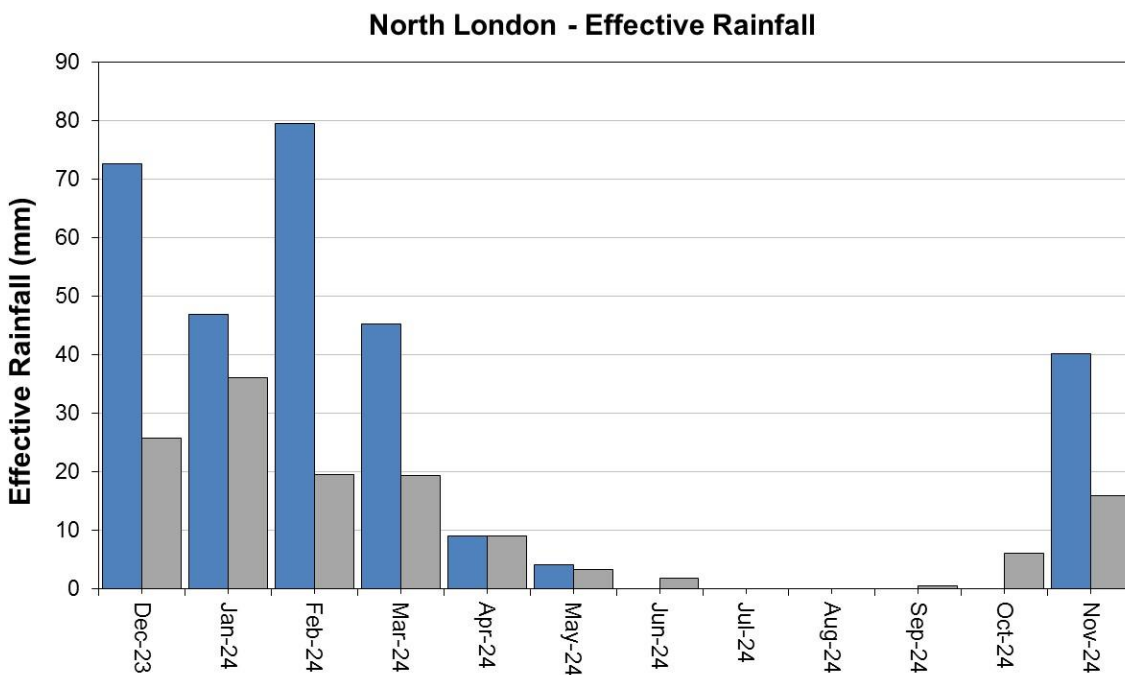
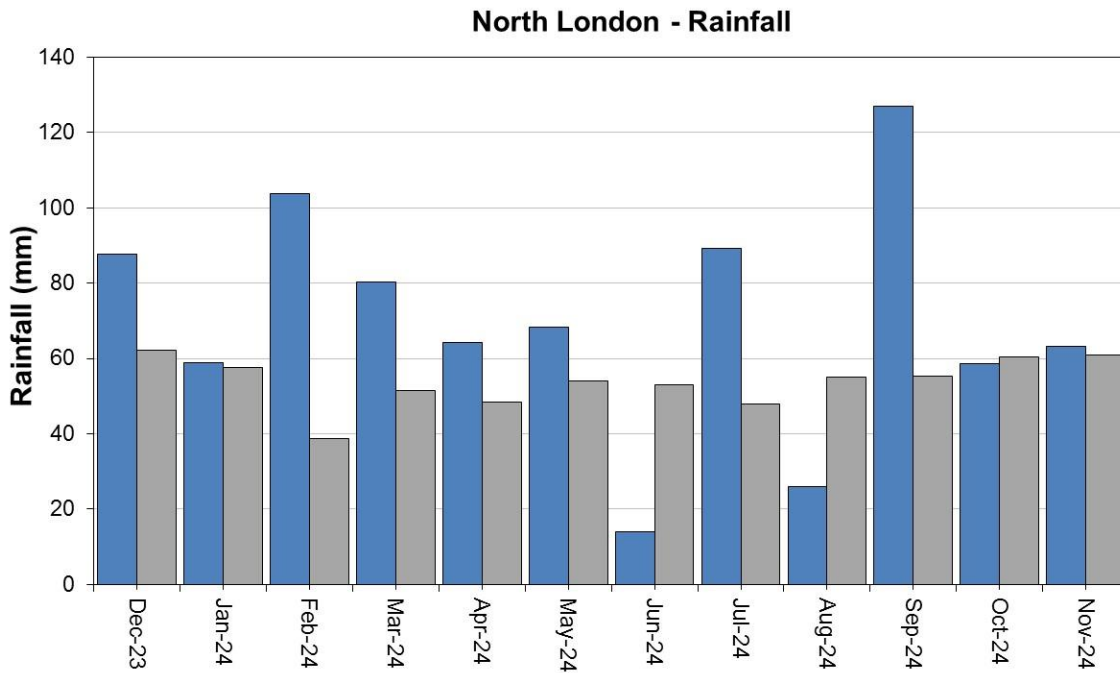
Source: Environment Agency, 2024

7 North London Catchment

7.1 North London Rainfall and Effective Rainfall charts

Figure 7.1: Monthly rainfall and effective rainfall totals for the past 24 months compared to the 1961 to 1990 long term average for each region and for England.

■ Monthly total rainfall (mm) ■ Long term average rainfall (mm)



HadUK rainfall data (Source: Met Office. Crown copyright, 2024)

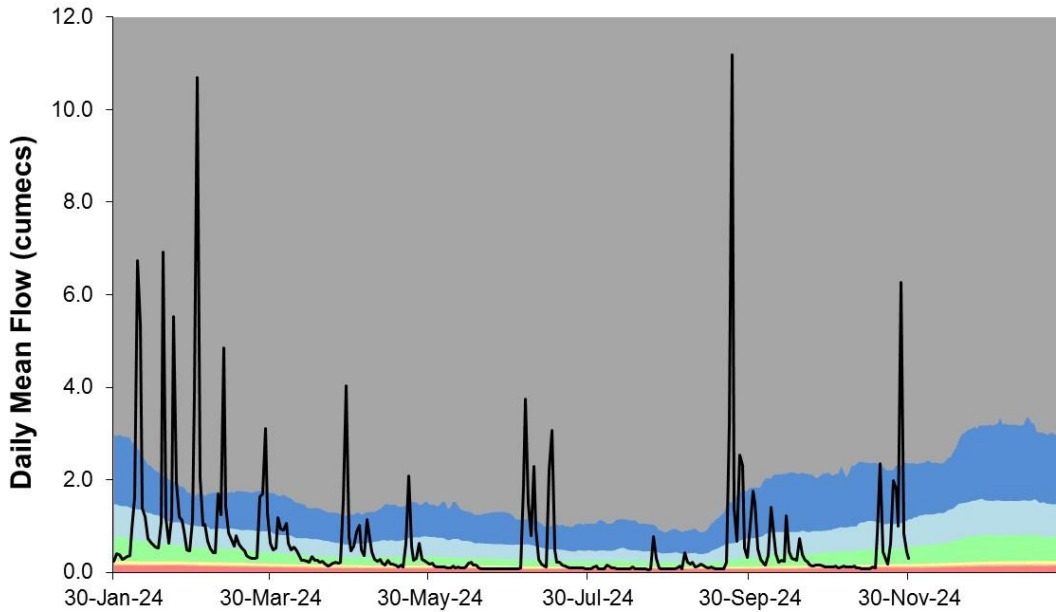
EA Soil Moisture Model effective rainfall data (Source: Environment Agency, 2024)

7.2 North London River flow charts

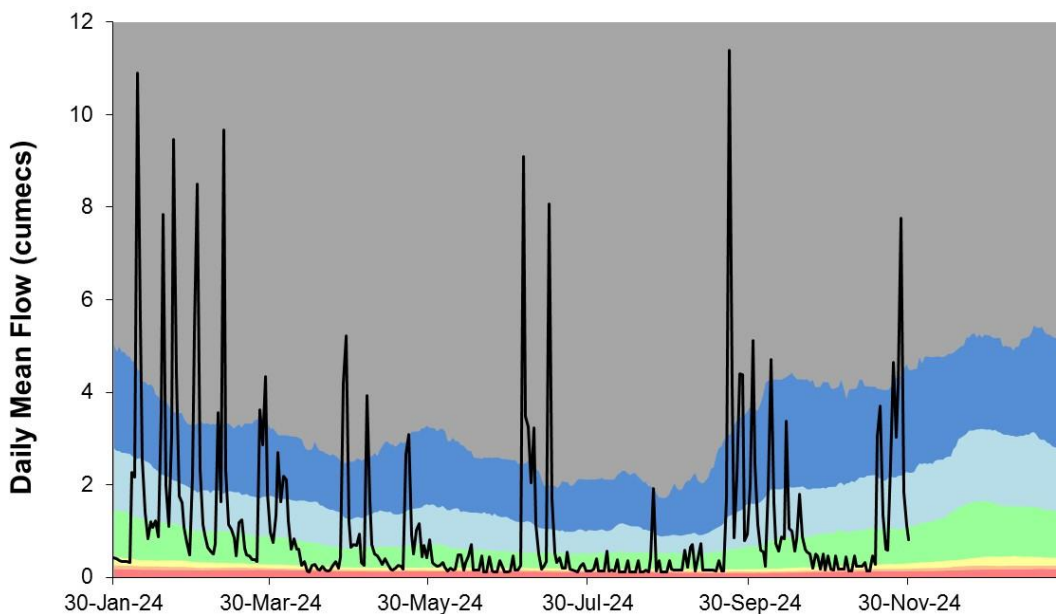
Figure 7.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



RIVER CRANE AT CRANFORD PARK
Ranking used data from 03/04/1978 to 31/12/2022



RIVER BRENT AT MONKS PARK
Ranking used data from 01/12/1978 to 31/12/2022



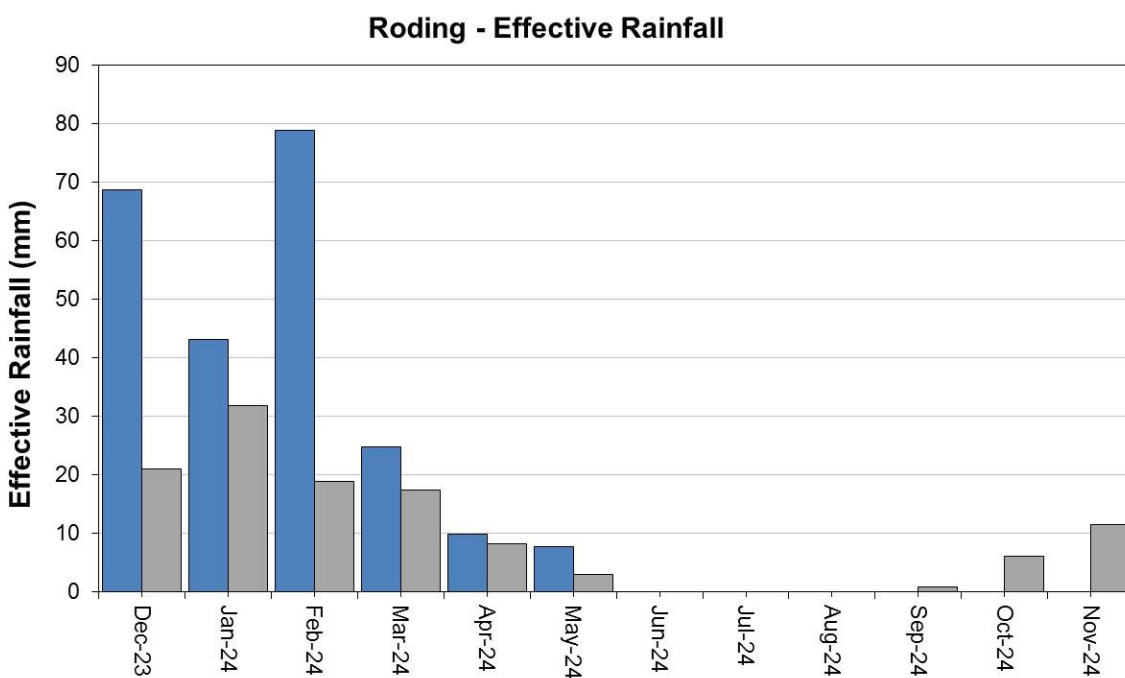
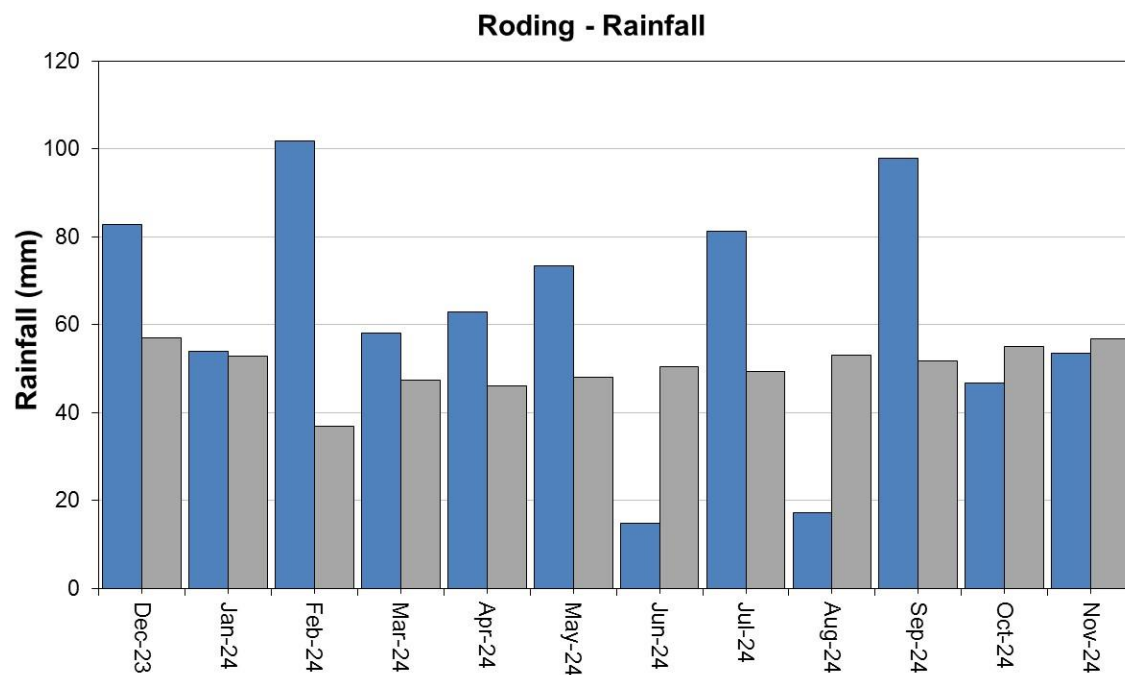
Source: Environment Agency, 2024

8 Roding Catchment

8.1 Roding Rainfall and Recharge chart

Figure 8.1: Monthly rainfall and recharge totals for the past 24 months compared to the 1961 to 1990 long term average for each region and for England.

Monthly total rainfall (mm) Long term average rainfall (mm)

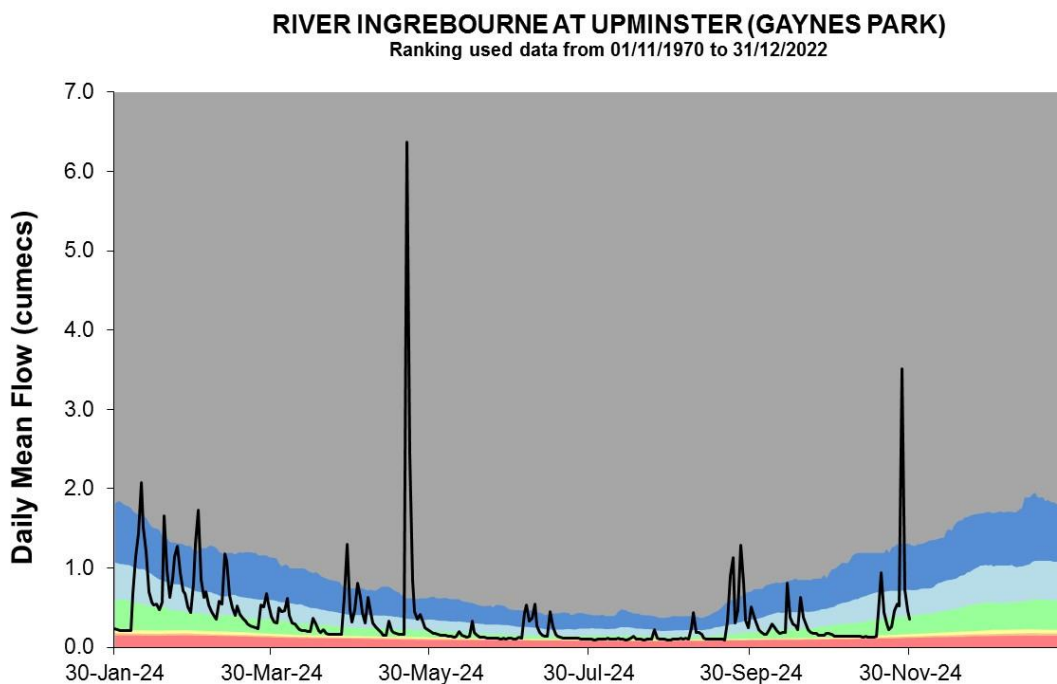
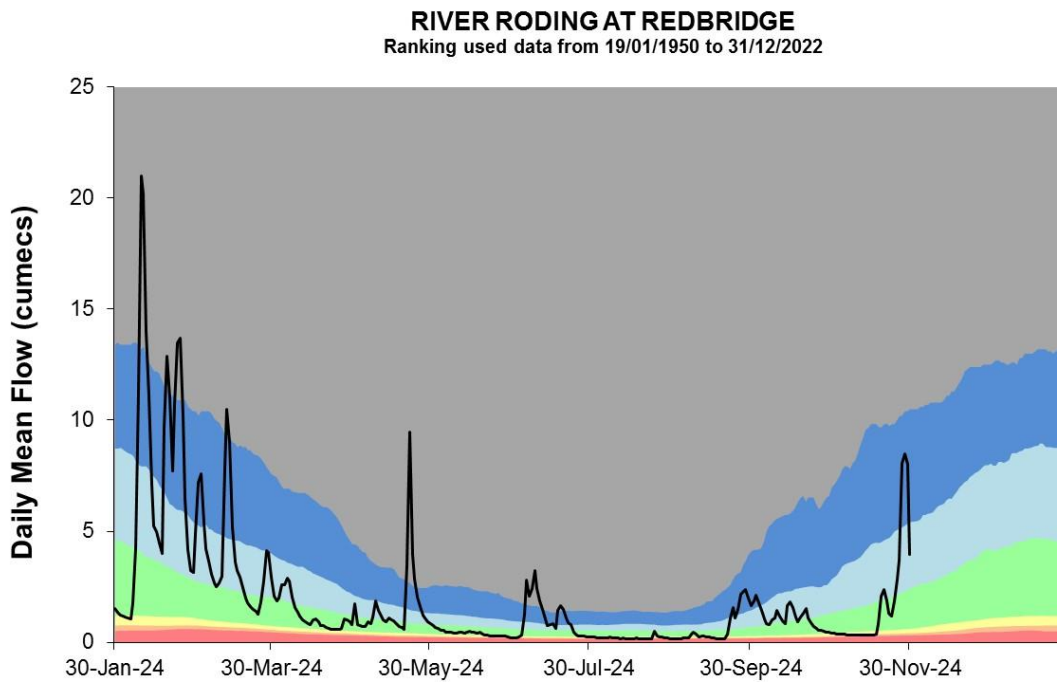


HadUK rainfall data (Source: Met Office. Crown copyright, 2024)

EA Soil Moisture Model effective rainfall data (Source: Environment Agency, 2024)

8.2 Roding River flow charts

Figure 8.2: 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.

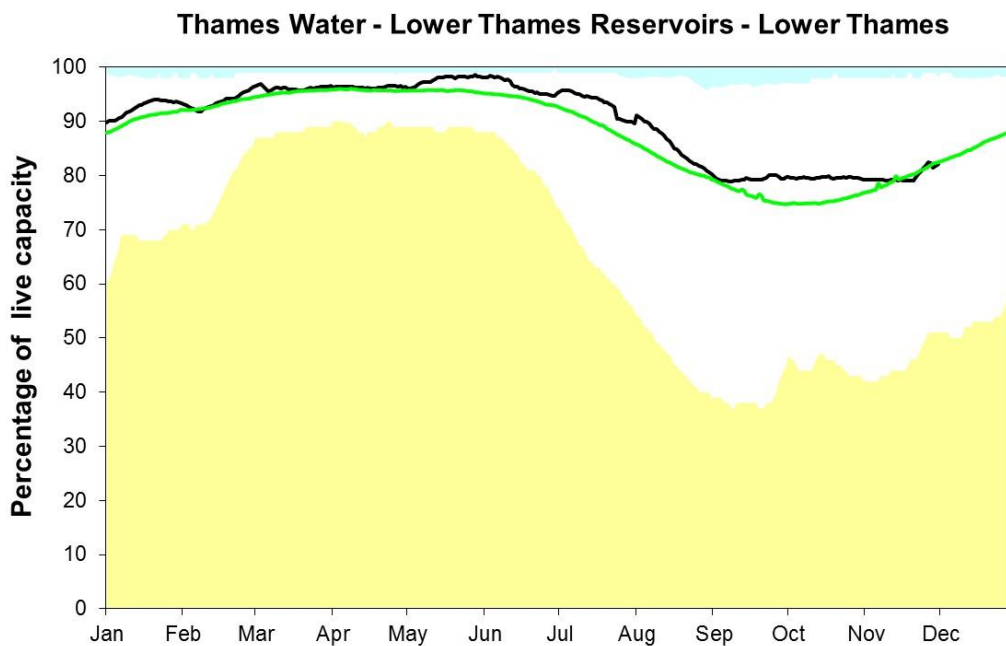
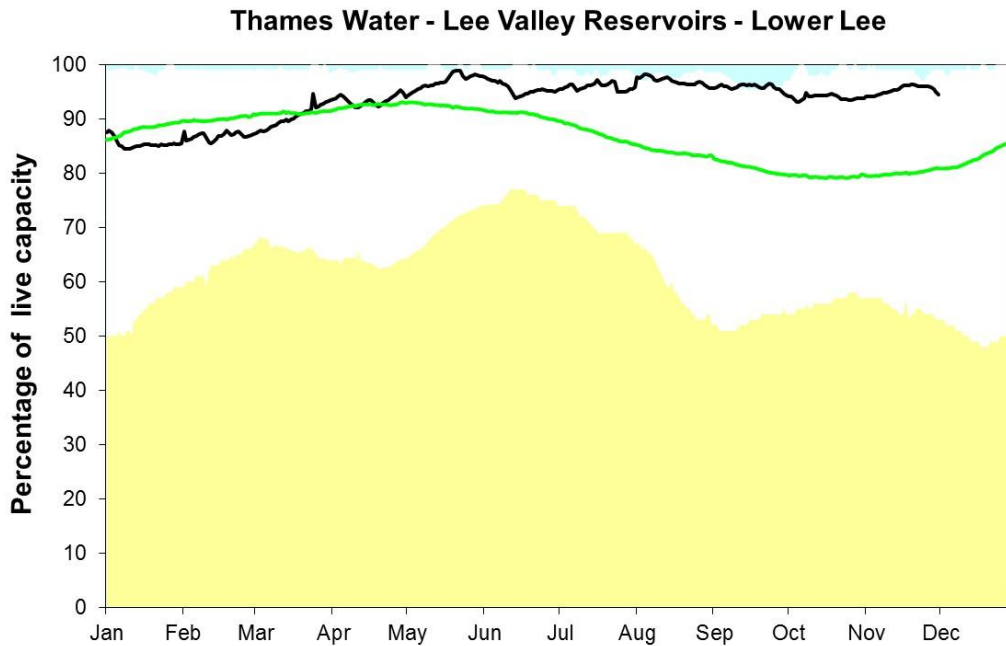


Source: Environment Agency, 2024

9 Reservoir stocks

Figure 9.1: End of month reservoir stocks for the Lower Thames reservoir group and the Lee Valley reservoir group 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.

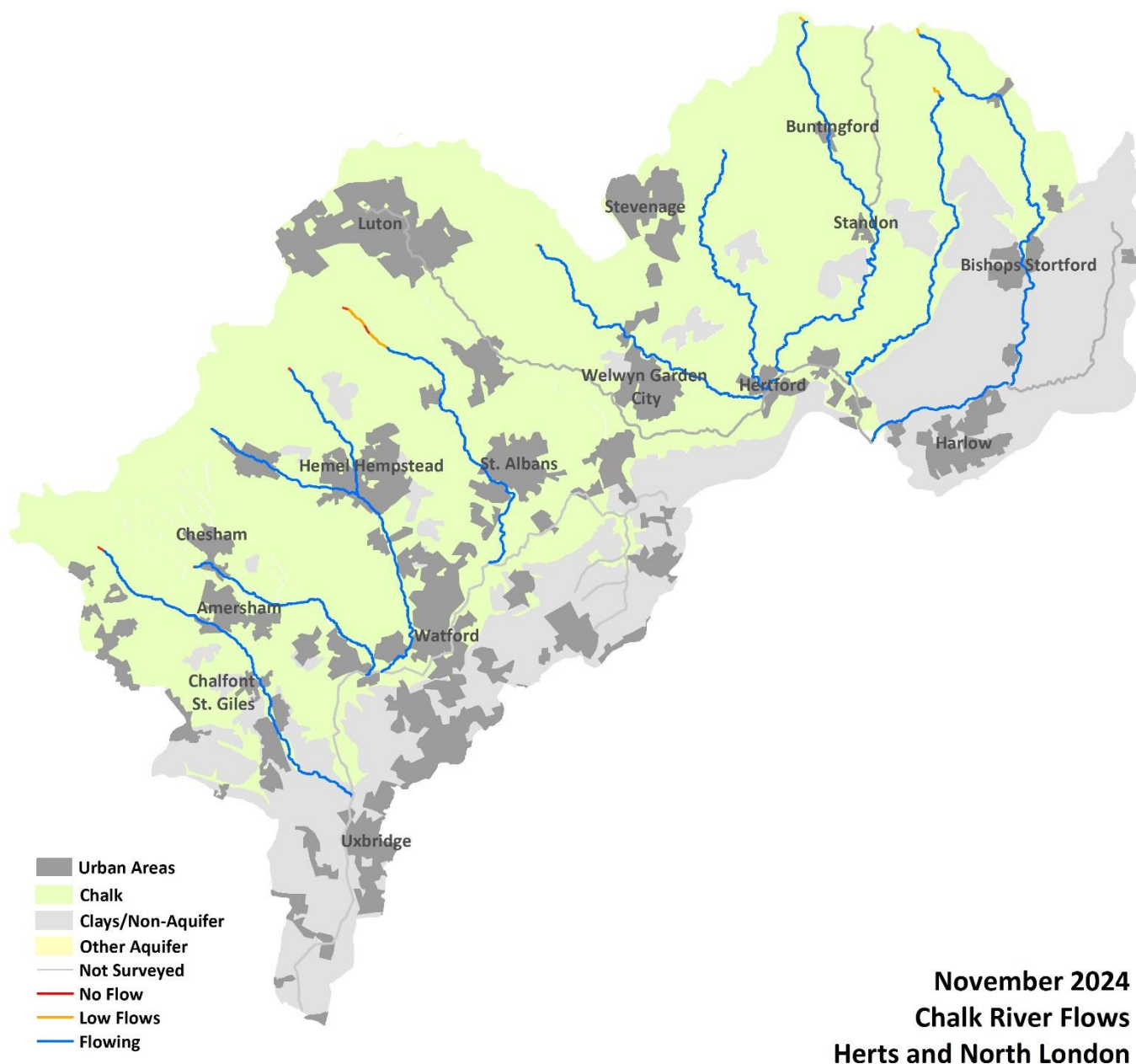
Below minimum
 Above maximum
 Average
 Latest data



Source: water companies, 2024

10 Chalk Rivers

Figure 10.1: Length of Chalk Rivers surveyed during the month and categorised as: Flowing, Low Flows, No Flow or Not Surveyed.



Source: Environment Agency, 2024

11 Glossary

11.1 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).

11.2 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.

12 Appendices

12.1 Rainfall table

Hydrological area	Nov 2024 total rainfall in mm	Nov 2024 rainfall long term average 1961 to 1990	Nov 2024 rainfall % of long term average 1961 to 1990	Winter Oct 2024 to Nov 2024 total rainfall in mm	Winter Oct 2024 to Nov 2024 rainfall % of long term average 1961 to 1990
Chilterns East Colne	72	68	106	144	107
Lee Chalk	56	60	92	119	101
Lower Lee	59	60	99	117	100
North London	63	61	104	121	100
Roding	54	57	95	100	90
Herts and North London total	61	61	99	120	100

12.2 Rainfall banding table

Hydrological area	Nov 2024 band	Sep 2024 to Nov 2024 cumulative band	Jun 2024 to Nov 2024 cumulative band	Dec 2023 to Nov 2024 cumulative band
Chilterns East Colne	Normal	Notably high	Above normal	Exceptionally high
Lee Chalk	Normal	Exceptionally high	Above normal	Exceptionally high
Lower Lee	Normal	Above normal	Normal	Notably high
North London	Normal	Notably high	Normal	Notably high
Roding	Normal	Normal	Normal	Notably high

12.3 Effective Rainfall table

Hydrological area	Nov 2024 total effective rainfall in mm	Nov 2024 effective rainfall long term average 1961 to 1990 in mm	Nov 2024 effective rainfall % of long term average 1961 to 1990	Winter Oct 2024 to Nov 2024 total effective rainfall in mm	Winter Oct 2024 to Nov 2024 effective rainfall % of long term average 1961 to 1990
Chilterns East Colne	50	26	192	97	240
Lee Chalk	35	17	207	56	213
Lower Lee	25	15	166	25	118
North London	40	16	254	40	184
Roding	0	11	0	0	0
Herts and North London total	30	17	176	44	171

12.4 Soil Moisture Deficit table

Hydrological area	Nov 2024 end of month Soil Moisture Deficit in mm	Nov 2024 end of month Soil Moisture Deficit long term average 1961 to 1990 in mm	Oct 2024 end of month Soil Moisture Deficit in mm	Oct 2024 end of month Soil Moisture Deficit long term average 1961 to 1990 in mm
Chilterns East Colne	0	44	6	71
Lee Chalk	1	64	6	88
Lower Lee	1	48	7	73
North London	1	49	7	76
Roding	7	53	44	79
Herts and North London total	2	52	16	77

12.5 River flows table

Site name	River	Catchment	Nov 2024 band	Oct 2024 band
Colney Street (Hansteads)	Ver	Colne	Exceptionally high	Exceptionally high
Croxley Green	Gade	Colne	Exceptionally high	Exceptionally high
Denham Lodge	Misbourne	Colne	Notably high	Notably high
Denham Colne	Colne	Colne	Notably high	Exceptionally high
Howe Green (Water Hall)	Lee	Upper Lee	Notably high	Exceptionally high
Panshanger	Mimram	Upper Lee	Exceptionally high	Exceptionally high
Wareside (Mardock)	Ash	Upper Lee	Normal	Above normal
Feildes Weir (naturalised)	Lee	Upper Lee	Above normal	Notably high
Brent (Monks Park)	Brent	North London	Normal	Normal
Cranford (Cranford Park)	Crane	North London	Normal	Normal
Redbridge	Roding	Roding, Beam and Ingrebourne	Normal	Normal
Upminster (Gaynes Park)	Ingrebourne	Roding, Beam and Ingrebourne	Normal	Normal

12.6 Groundwater table

Site name	Aquifer	Nov 2024 band	Oct 2024 band
Ashley Green	Mid-Chilterns Chalk	Notably high	Notably high
Ballingdon Farm	Mid-Chilterns Chalk	Exceptionally high	Exceptionally high
Amersham Road	Mid-Chilterns Chalk	Exceptionally high	Notably high
Wapseys Wood	Mid-Chilterns Chalk	Notably high	Exceptionally high
Lilley Bottom	Upper Lee Chalk	Exceptionally high	Exceptionally high
Crescent Cottages	Upper Lee Chalk	Exceptionally high	Exceptionally high
Cave Gate	Upper Lee Chalk	Exceptionally high	Exceptionally high
Hixham Hall	Upper Lee Chalk	Exceptionally high	Exceptionally high
Therfield Rectory	Upper Lee Chalk	Exceptionally high	Exceptionally high

12.7 Abstraction licence flow constraints

Number of flow constraints in force between 1 and 4 November 2024	Number of flow constraints in force between 4 and 11 November 2024	Number of flow constraints in force between 11 and 18 November 2024	Number of flow constraints in force between 18 and 25 November 2024
19	22	19	11