Monthly water situation report: Hertfordshire and North London Area

1 Summary - August 2024

Overall, August was considerably drier than most months within the last year in the Hertfordshire and North London area. August recorded 40% of the long term average rainfall, sending soil moisture deficits above the long term average. As a result, river flows in urban catchments were low for the time of year, with three indicator sites in the exceptionally low band. Despite this, flows in chalk catchments remained high for the time of year, still being supported by relatively high groundwater. August saw a decline in groundwater levels but six indicator sites still recorded end of month levels in the exceptionally high band.

1.1 Rainfall

Compared to most other months in the past year, August was dry for the Hertfordshire and North London area ("the Area"), receiving just 40% of the monthly long term average (LTA) rainfall for the month. In the North London areal unit, rainfall was in the below normal band, while the four other units were in the notably low band. The wettest day of the month was 24 August, with 14.5mm of rainfall recorded at Hatfield Heath (Roding) and 12.9mm recorded at Mill Green (Lee Chalk). In total, there were 20 dry days during August (under 0.2mm of rain recorded). Over the summer period (April to August), the Area has received 277mm of rainfall (107% of the LTA).

1.2 Soil moisture deficit and recharge

The lower than average rainfall during August meant that soil moisture deficits in the Area ended the month above the LTA. Across the clay and urban-dominated rainfall units, there was no effective rainfall during the month, while in the two chalk-dominated units (Chilterns East Colne and Lee Chalk), a small amount of effective rainfall was received. The effective rainfall received in chalk catchments in the Area was below the LTA for August.

1.3 River flows

August saw a continued decline of chalk river baseflows in the Area. There were also no storms large enough to cause any significant flow peaks during the month. The most notable flow peak occurred on 24 August, in response to the rainfall on that day – this flow peak was mostly recorded in urban catchments. Despite this small peak, the low rainfall received during August meant three of the four indicator sites in Greater London recorded monthly flows in the exceptionally low band. Flows at Monks Park (River Brent) and Cranford Park (River Crane) were at their lowest August levels on record (records start in 1979 and 1978 respectively). Contrastingly, river flows in chalk catchments remained high for the time of year, still supported by a delayed decline in groundwater levels. In the Colne catchment, Denham Lodge (River Misbourne) and Colney Street (River Ver) recorded their second highest August flows on record (records start in 1984 and 1956 respectively). In the Upper Lee catchment, flows at Howe

Green (River Lee) were at its third highest August level on record, while Panshanger (River Mimram) was at its second highest August level on record (records start in 1959 and 1952 respectively). Five flood alerts were issued during the month, all of which were in urban catchments on 1 August in response to heavy rainfall on 31 July. No flood warnings were issued in August.

1.4 Groundwater levels

During August, groundwater levels declined across the Area but remained at a high level for the time of year. Six indicator sites recorded end of month groundwater levels in the exceptionally high band, while three other sites were in the notably high band. In the Mid-Chilterns Chalk, Amersham Road and Wapseys Wood were at their second highest monthly levels on record for August (records start in 1991 and 1988 respectively). In the Upper Lee Chalk, Hixham Hall recorded its second highest groundwater level on record for August (records start in 1964).

1.5 Reservoir stocks

During August, reservoir stocks in the Lee Valley reservoirs decreased slightly from 98% to 96% of live capacity. In the Lower Thames reservoirs, the water level decreased from 91% to 80% of live capacity. Reservoir stocks in both groups ended the month above the LTA.

1.6 Environmental impact

Most of the sources of chalk rivers in the Colne catchment moved downstream of their locations in July.

- The River Ver started flowing just below Markyate
- The source of the River Gade moved downstream of Hudnall.
- The source of the River Bulbourne moved slightly further down but was still just above Dudswell village.
- The source of the River Chess moved to just upstream of Chesham.
- The River Misbourne was flowing continuosly from Mobwell pond.

Most of the chalk river sources in the Upper Lee catchment also moved downstream compared to July.

- The River Mimram started flowing upstream of Whitwell.
- The River Beane started flowing downstream of Cromer.
- The source of the River Rib moved to just above Buntingford.
- The source of the River Ash (Herts) was upstream of Hadham Ford.
- The River Stort started flowing at Stansted Springs, a considerable distance downstream from where it was last month.

To protect the environment, during August a number of abstraction licence flow constraints were in force. This ranged between 2 and 8 per week, out of a maximum of 35.

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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 August 2024), classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.

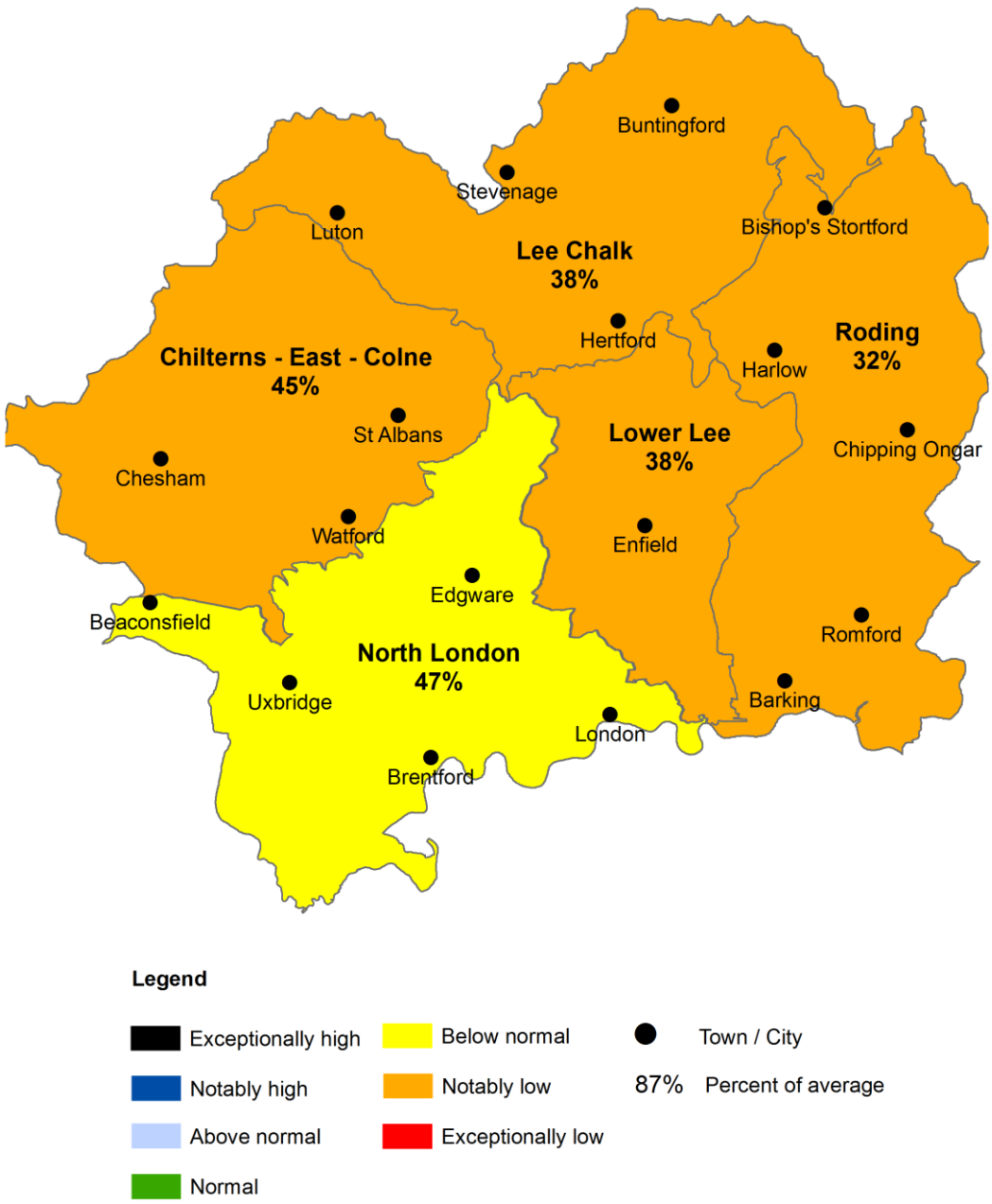
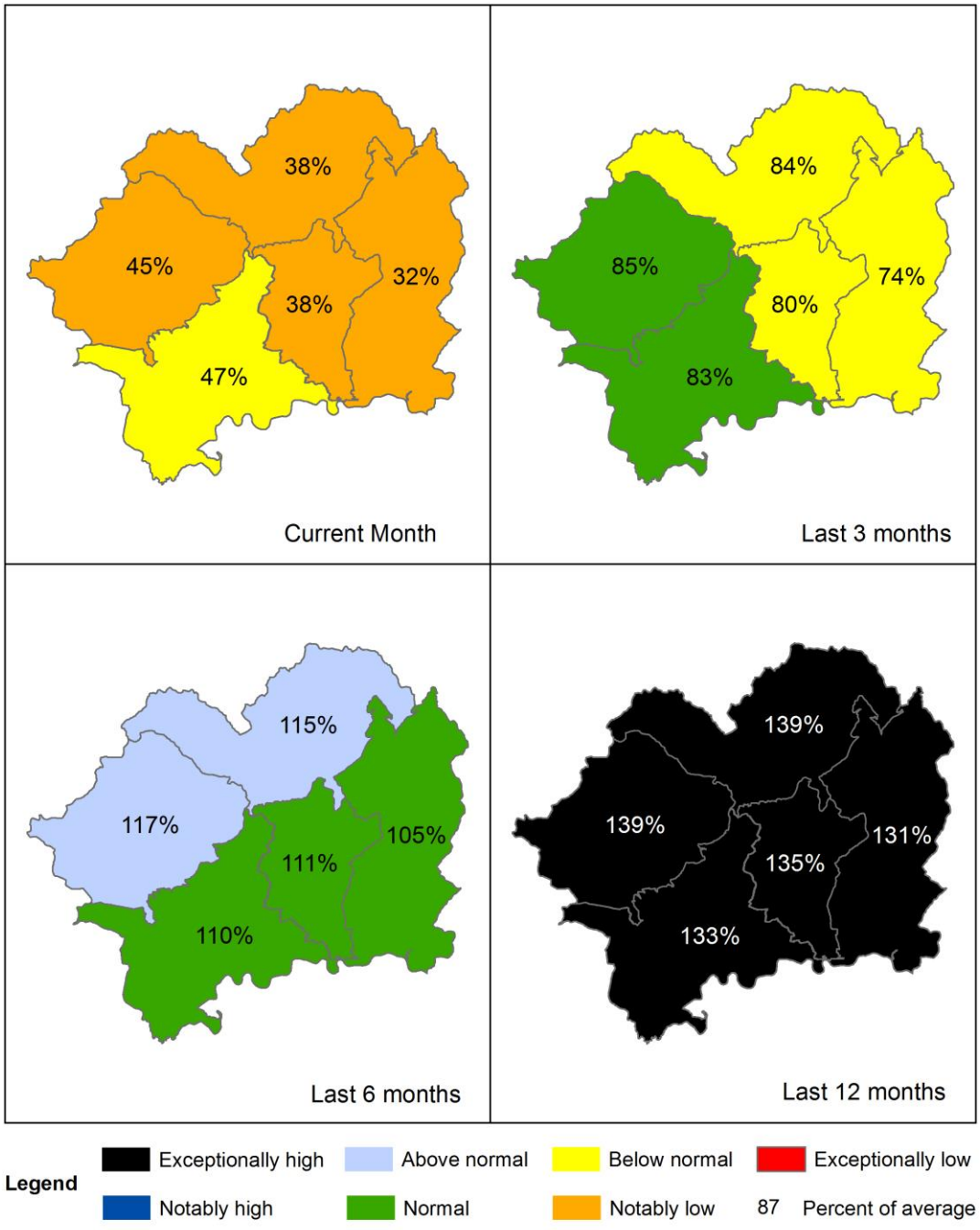


Figure 2.2: Total rainfall for hydrological areas for the current month (up to 31 August 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.

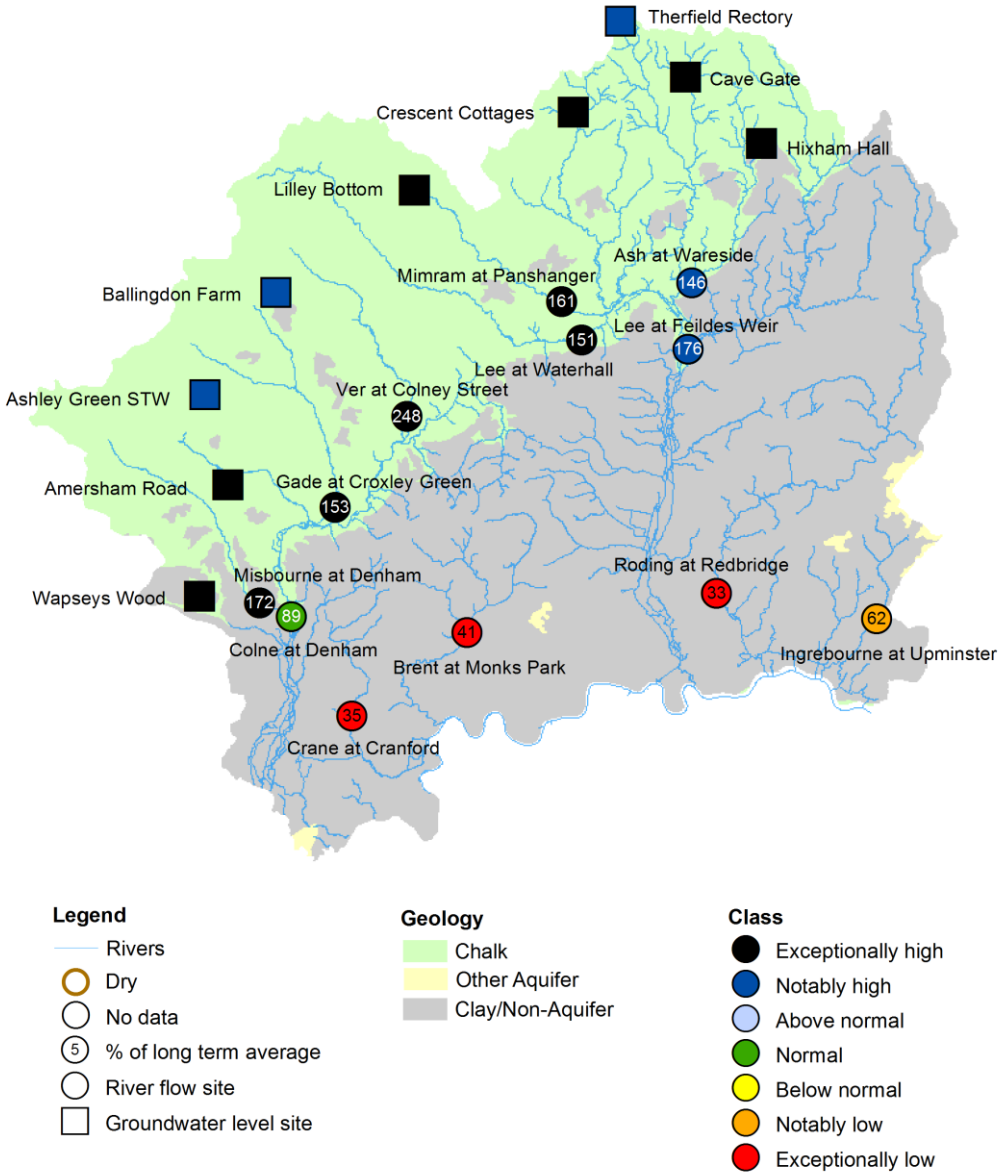


HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2024). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved.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

3 River flows and Groundwater levels

3.1 River flows and Groundwater level map

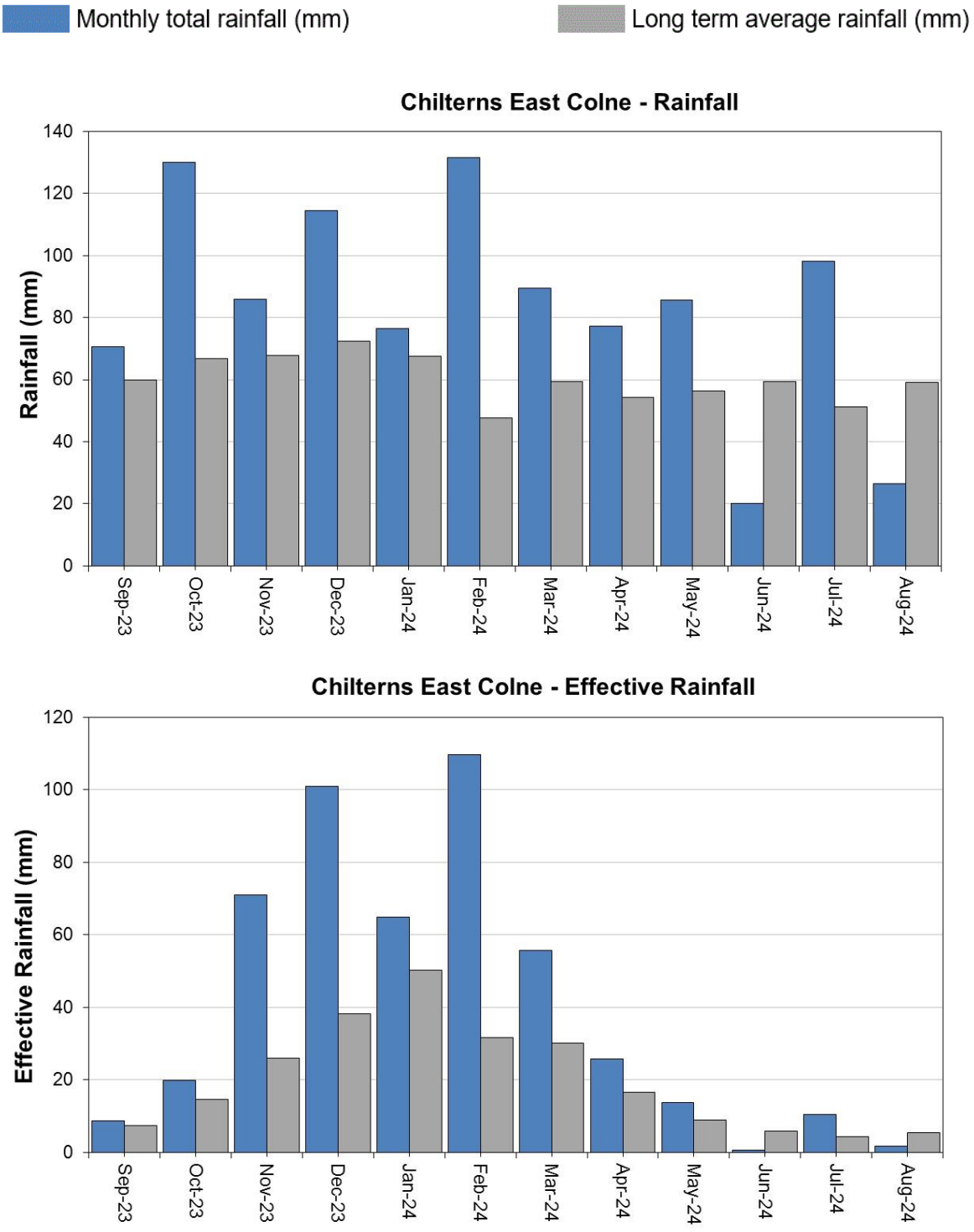
Figure 3.1: Monthly mean river flow and groundwater levels at our indicator sites for August 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic August monthly means. Table available in the appendices with detailed information.



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.

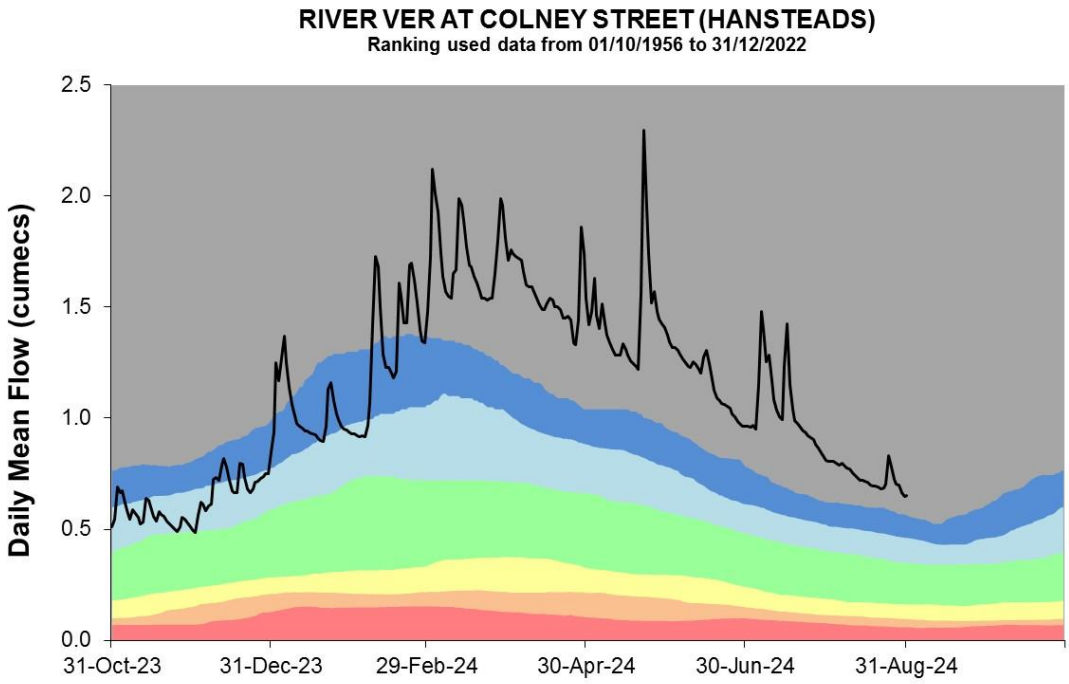


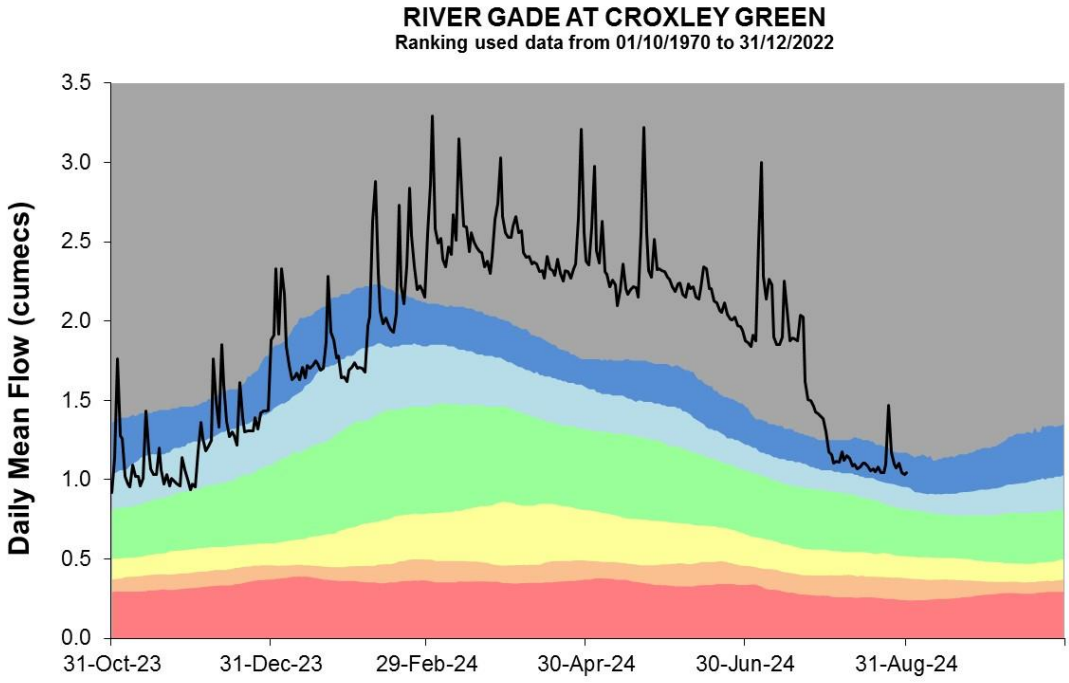
HadUK rainfall data (Source: Met Office. Crown copyright, 2024)

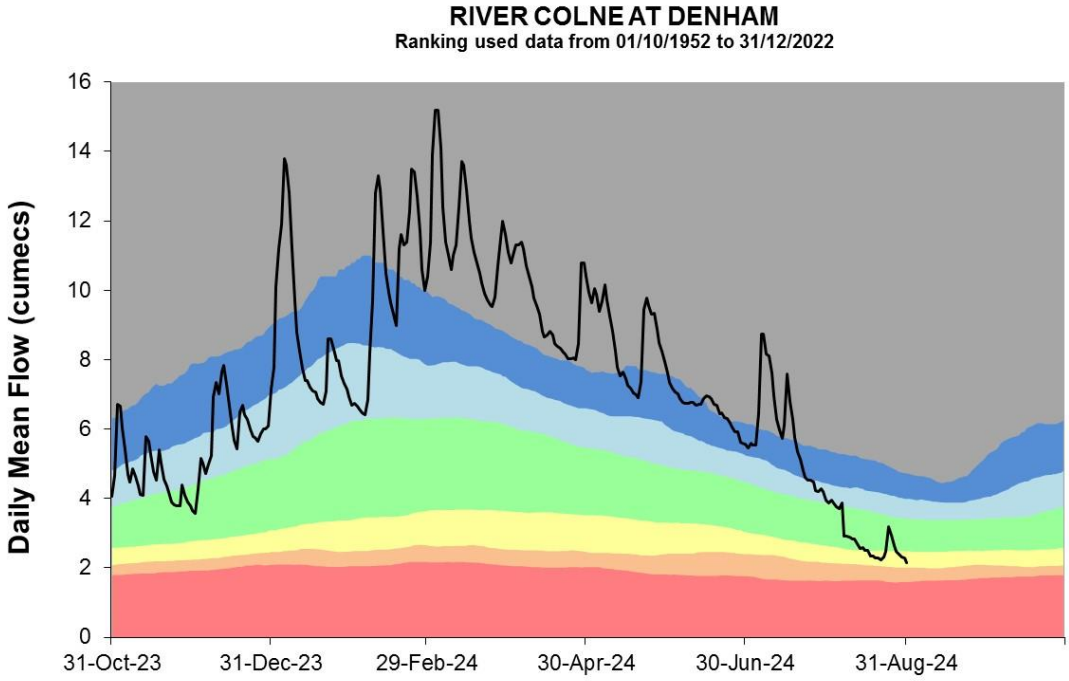
EA Soil Moisture Model effective rainfall data (Source: Environment Agency, 2024)

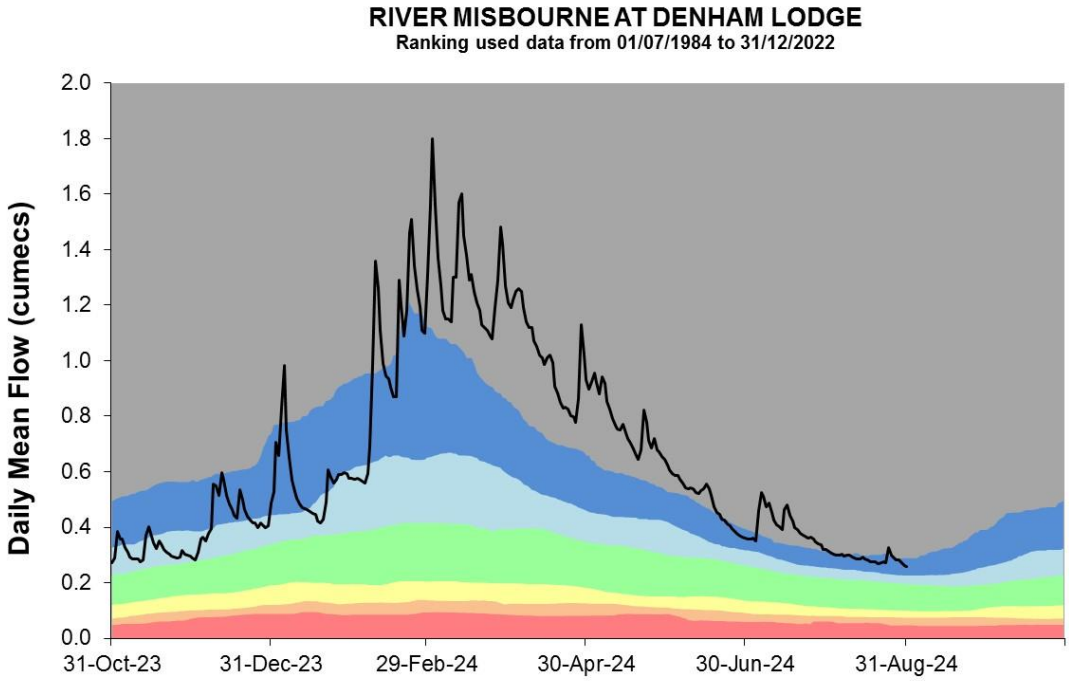
4.2 Colne River flow charts

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.





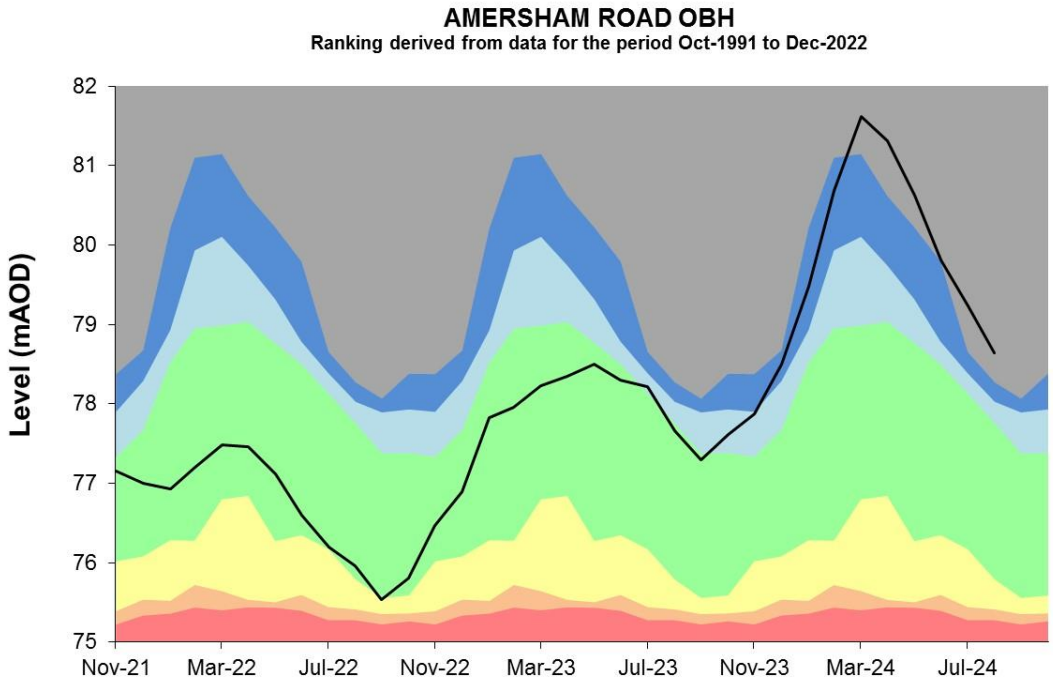


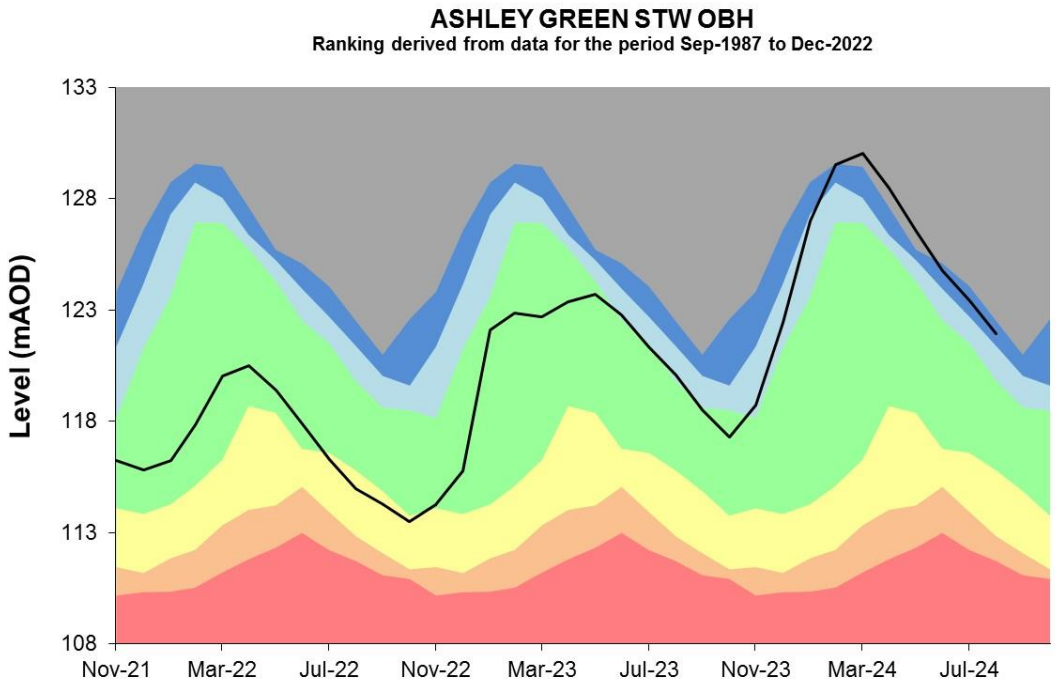


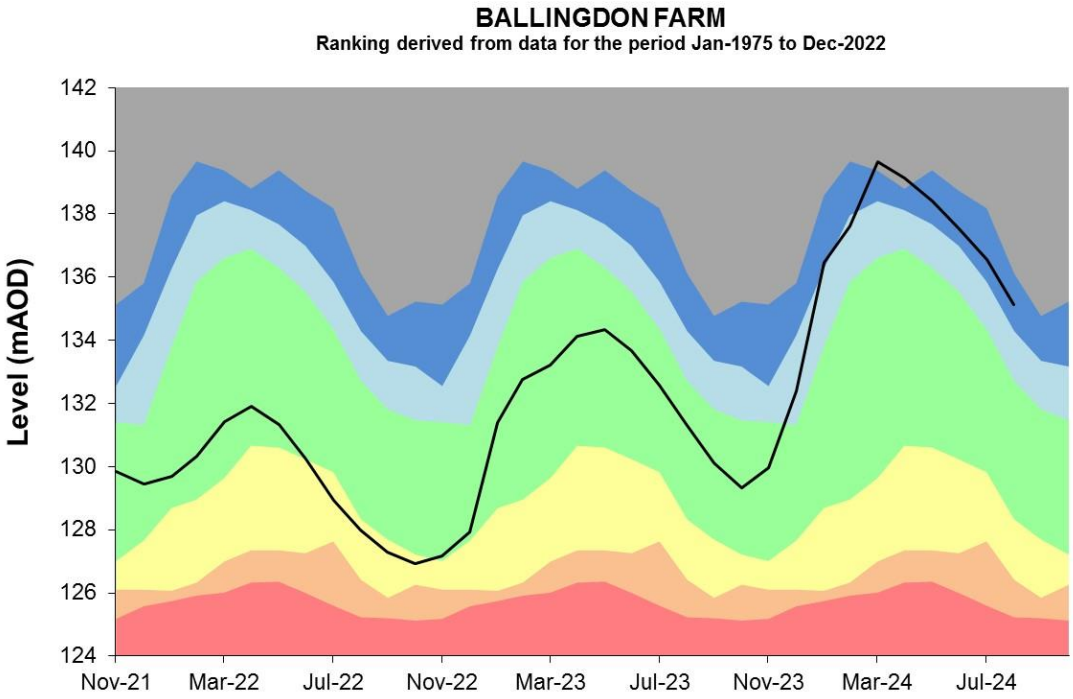
Source: Environment Agency, 2024

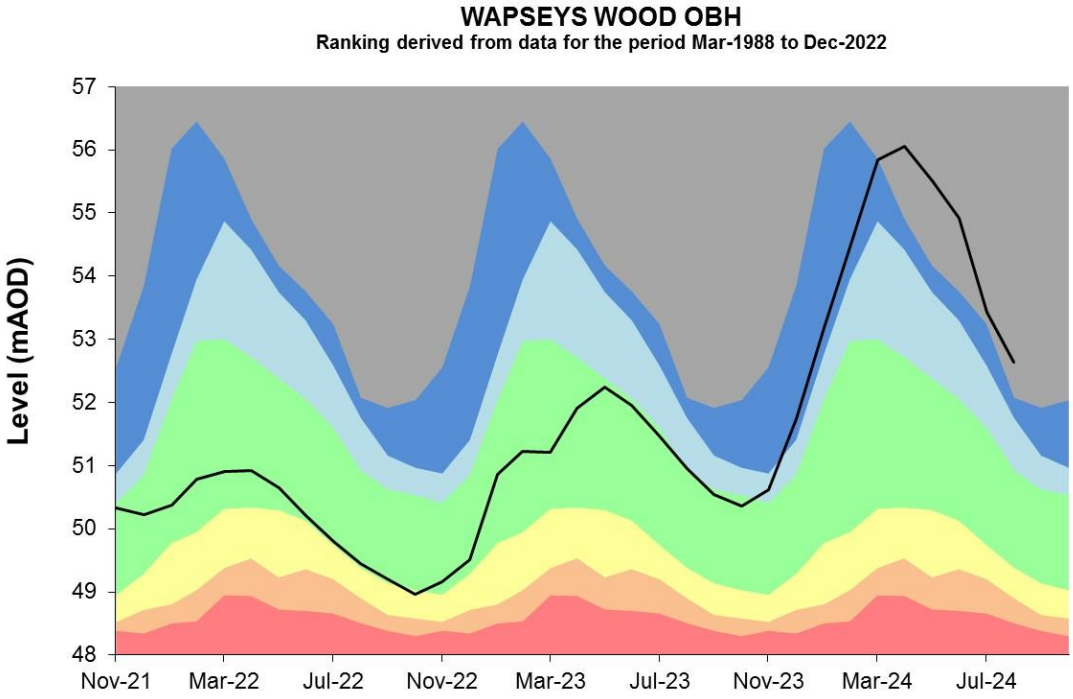
4.3 Colne Groundwater level charts

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.







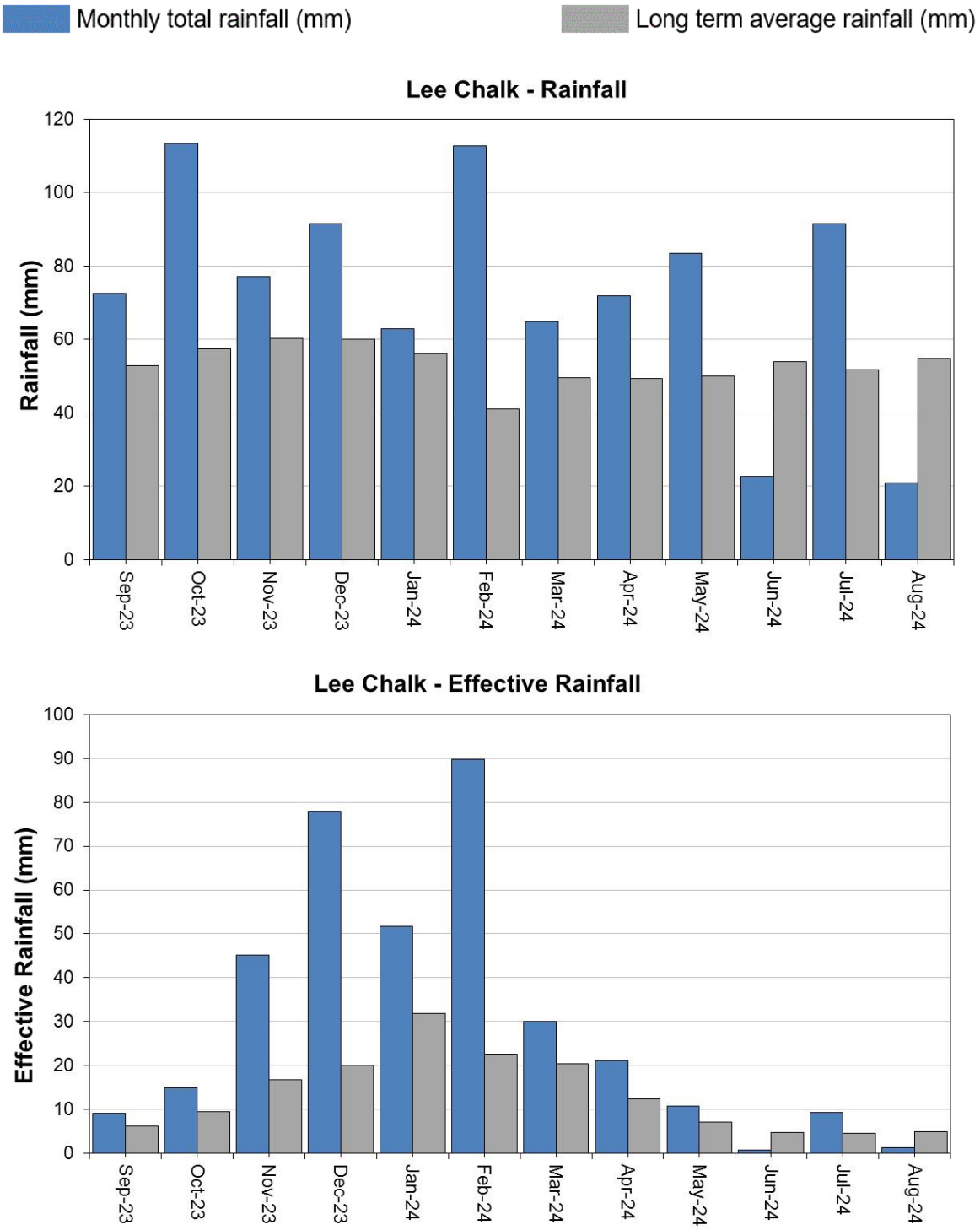


Source: Environment Agency, 2024

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.

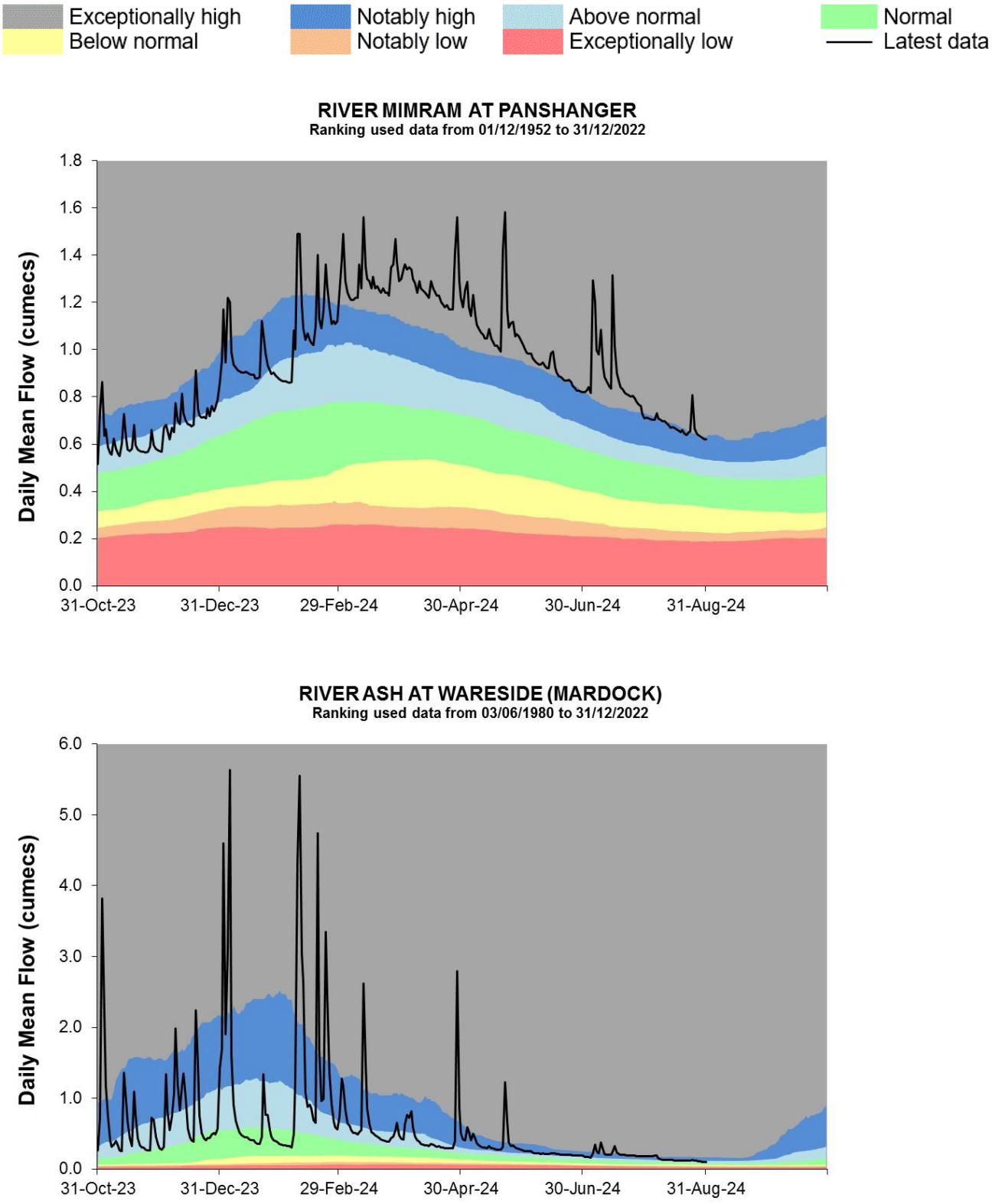


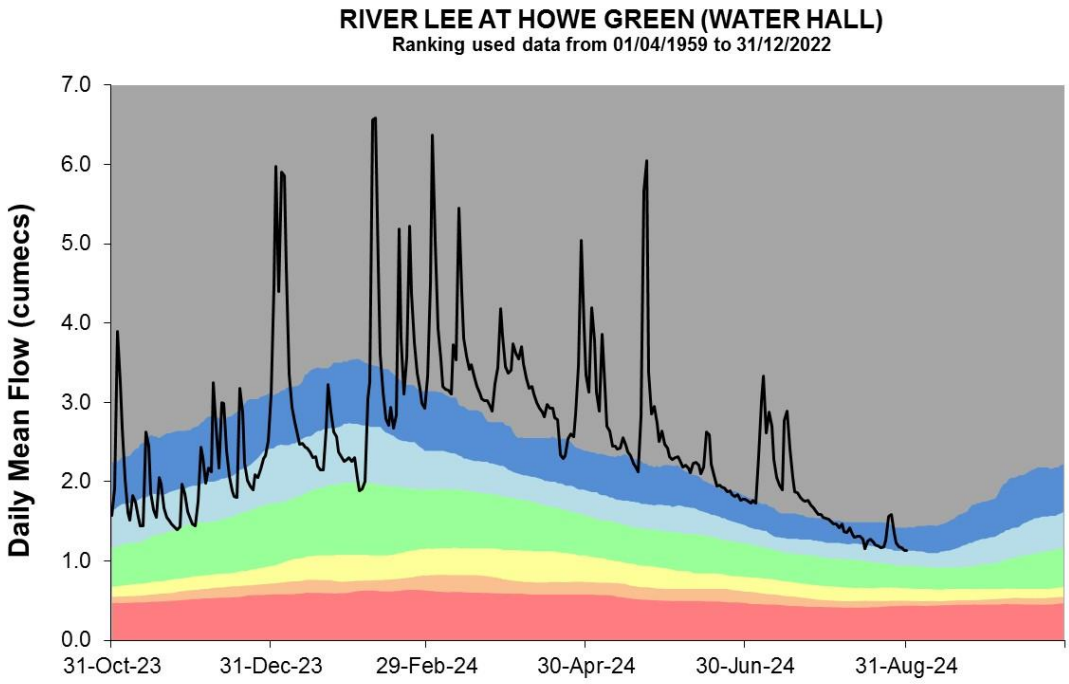
HadUK rainfall data (Source: Met Office. Crown copyright, 2024)

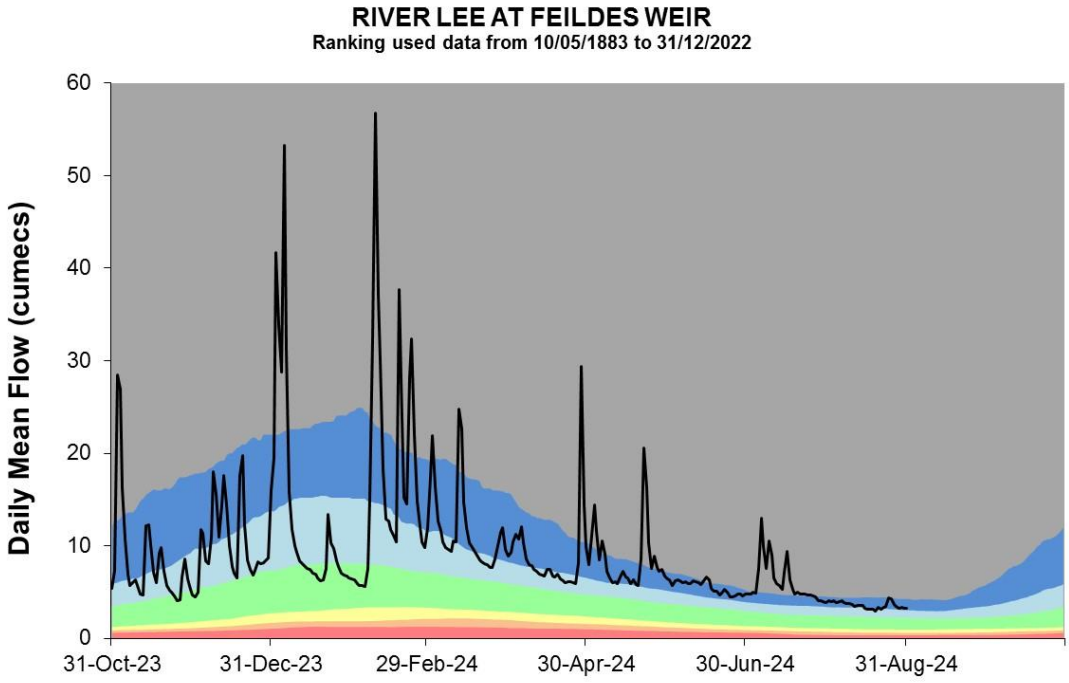
EA Soil Moisture Model effective rainfall data (Source: Environment Agency, 2024)

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.



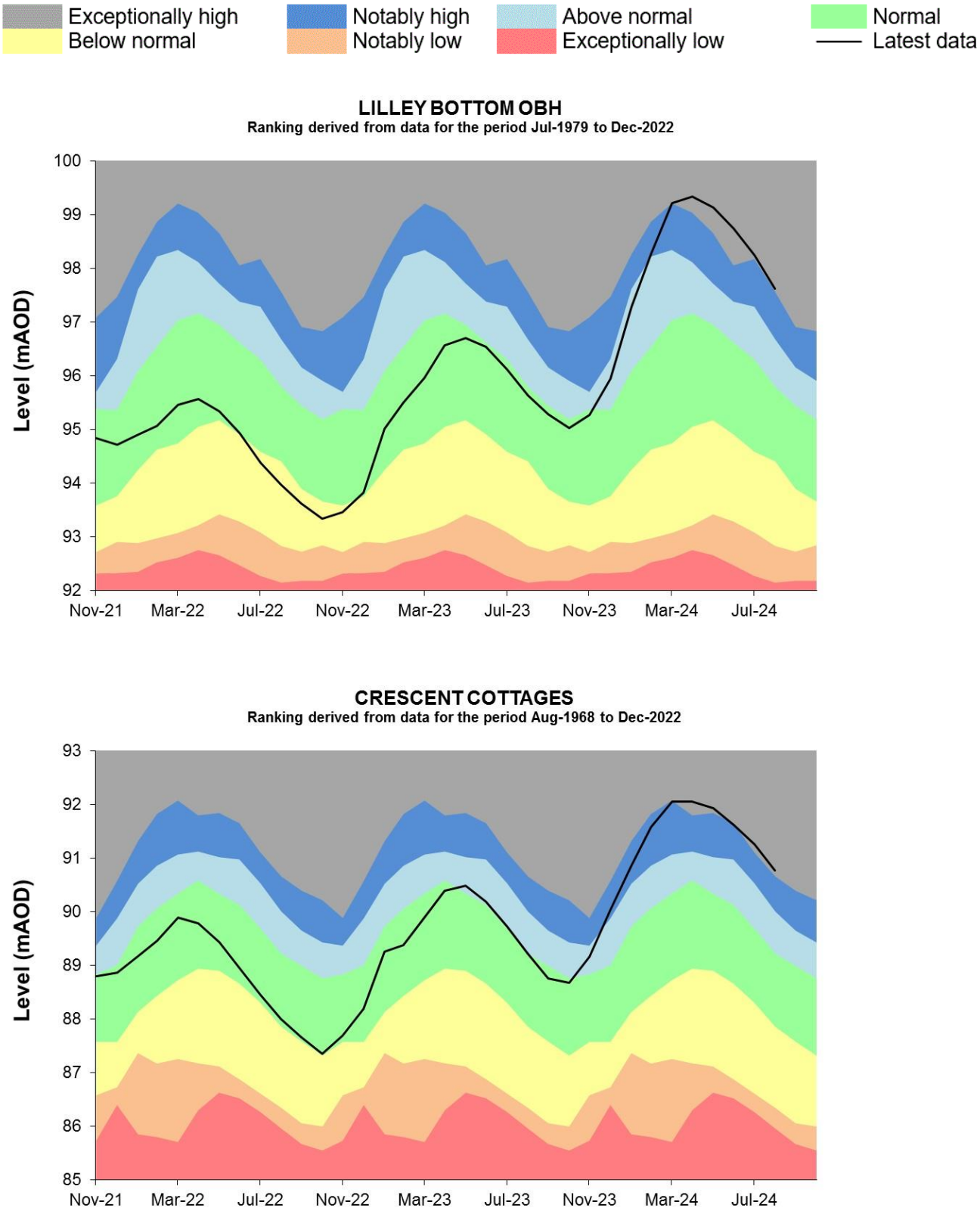




Source: Environment Agency, 2024

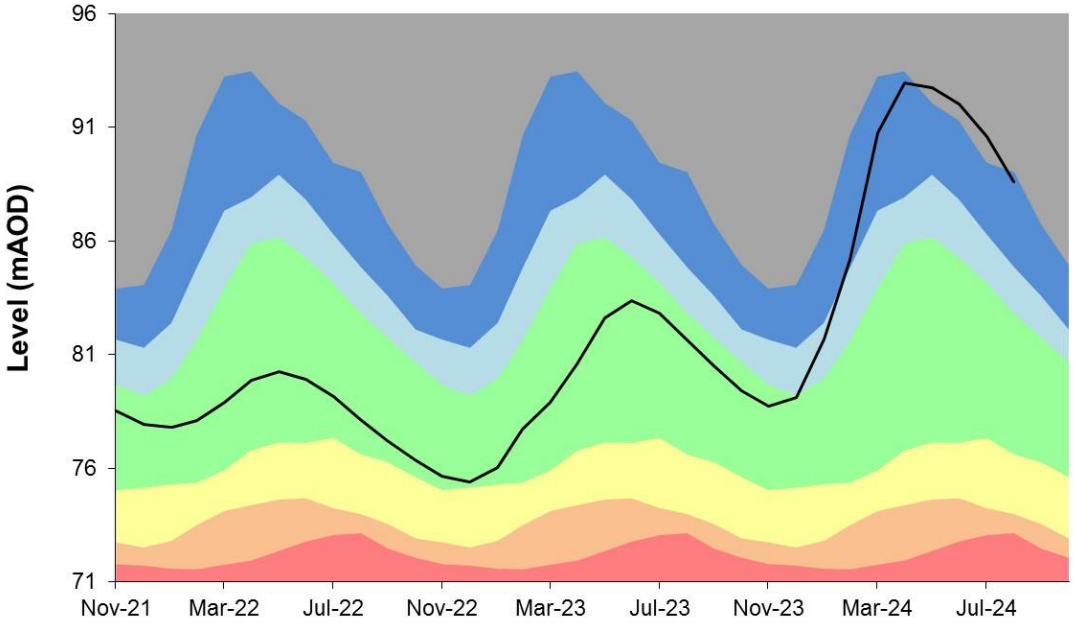
5.3 Upper Lee Groundwater level charts

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.



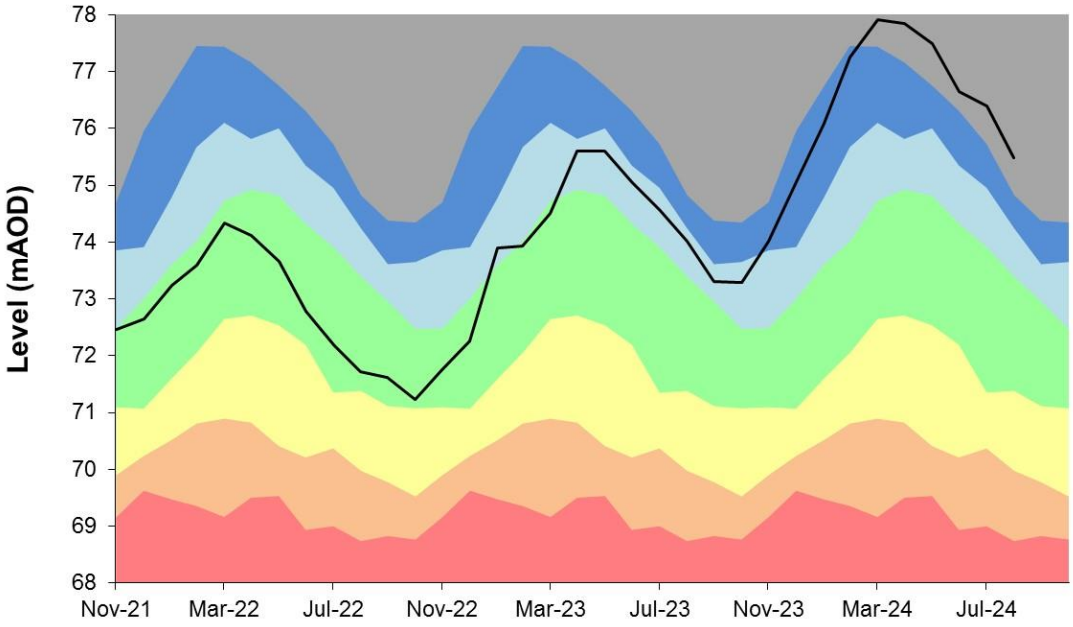
THERFIELD RECTORY

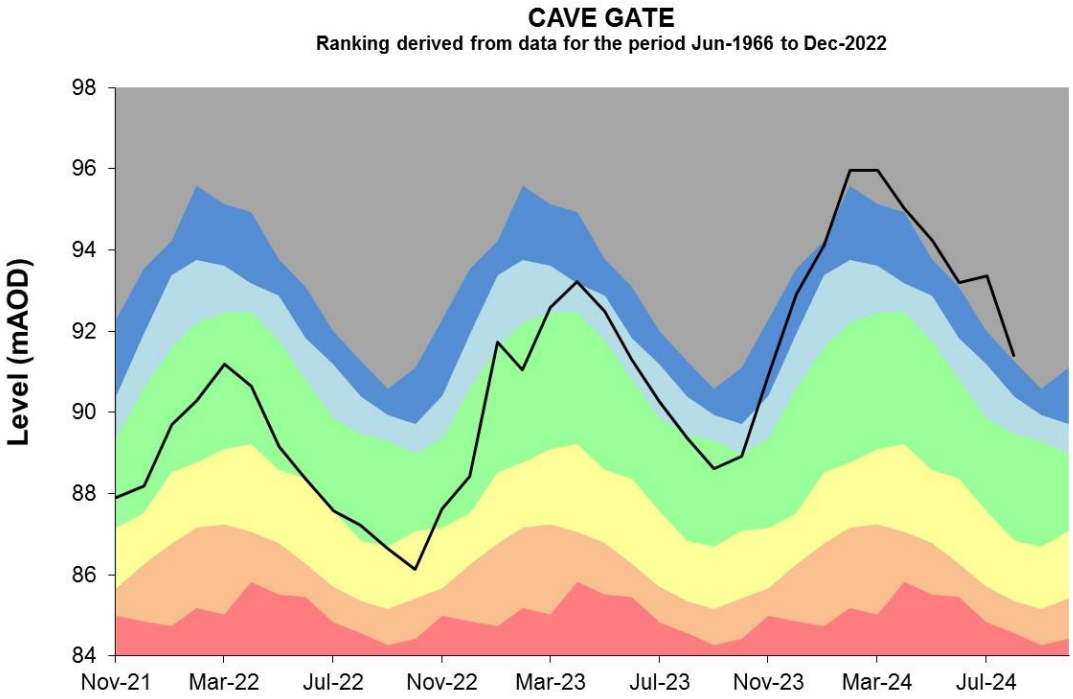
Ranking derived from data for the period Jan-1883 to Dec-2022



HIXHAM HALL

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



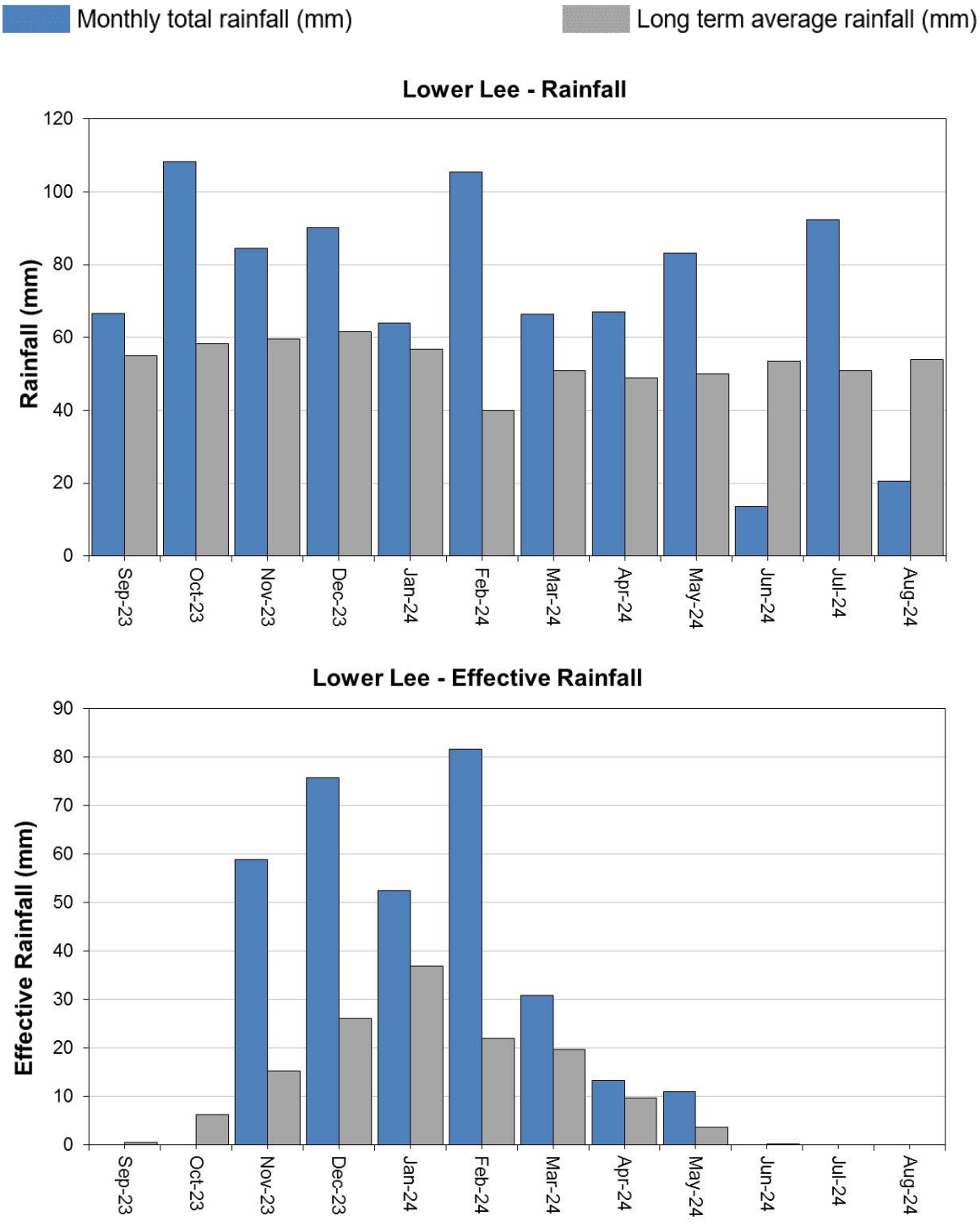


Source: Environment Agency, 2024

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.

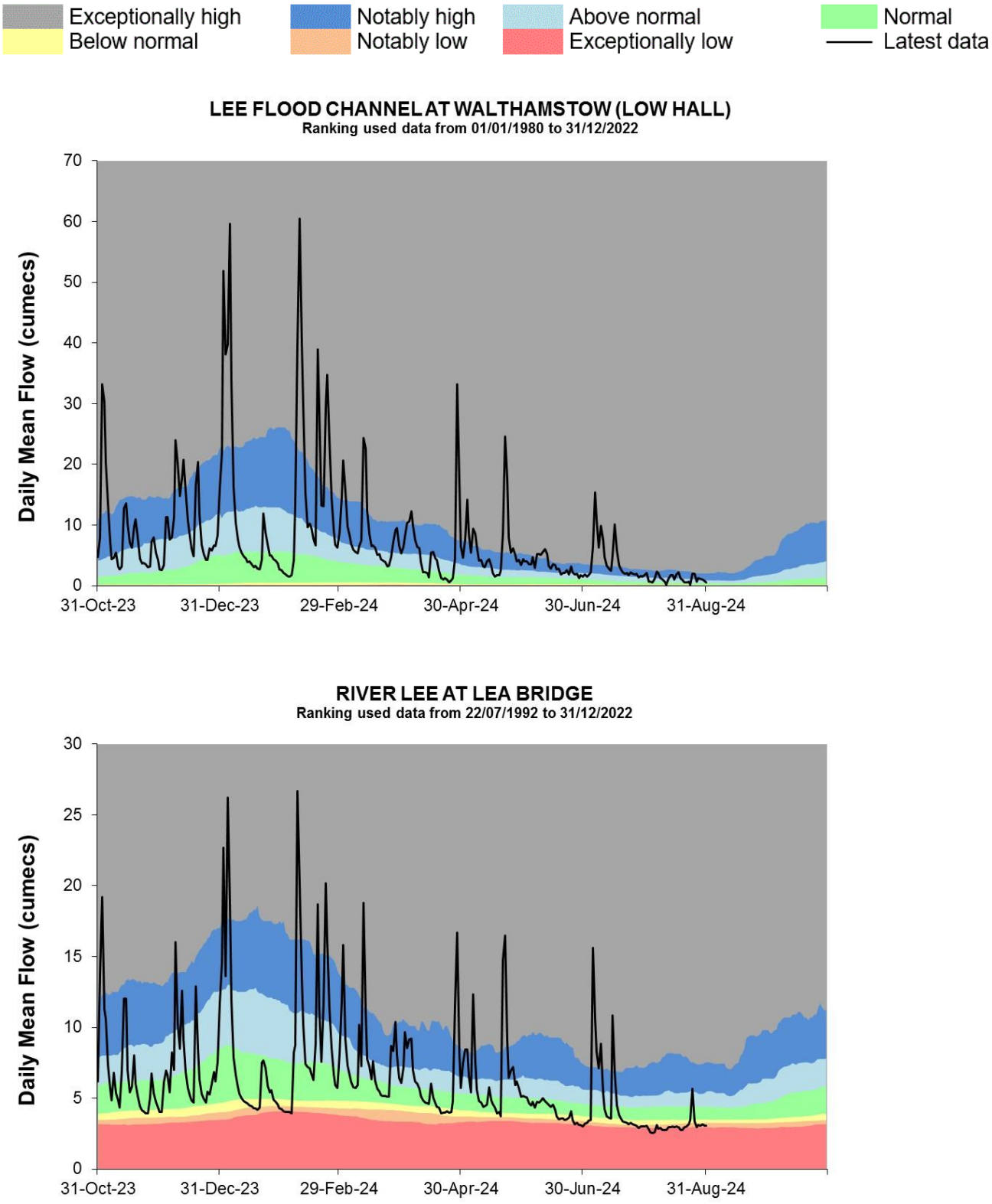


HadUK rainfall data (Source: Met Office. Crown copyright, 2024)

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.

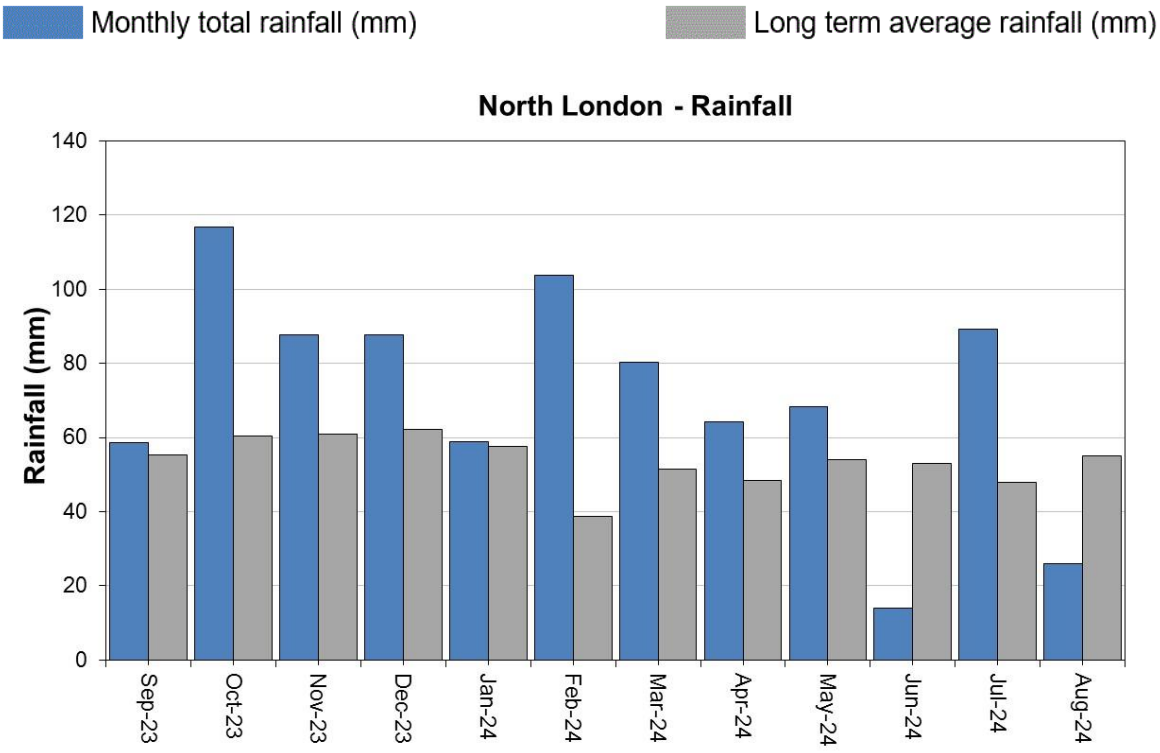


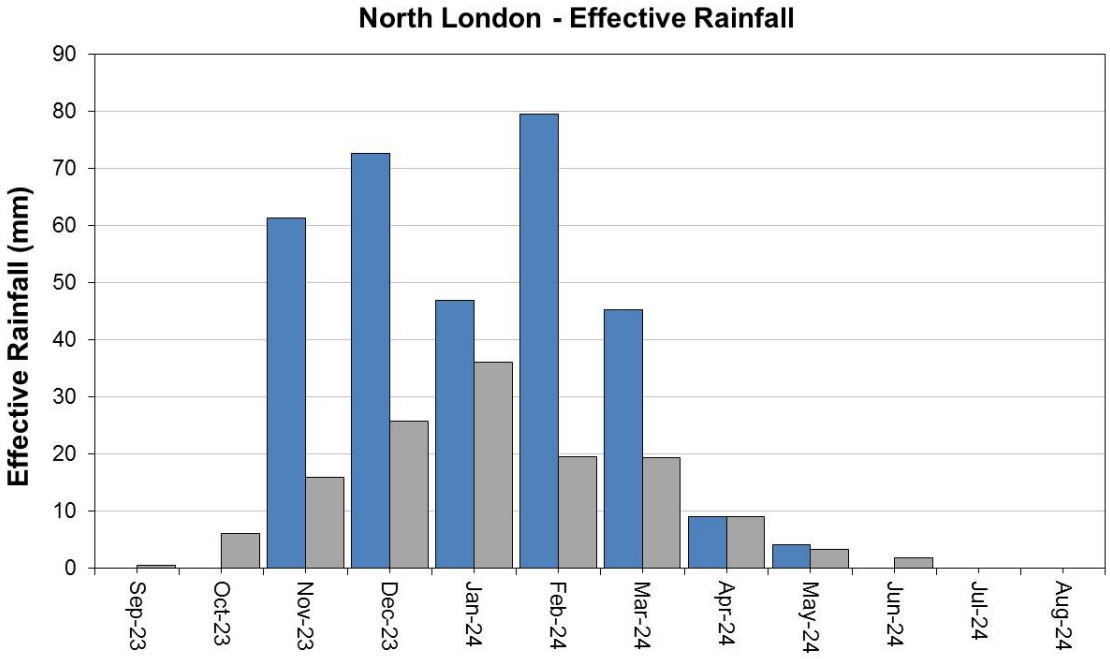
Source: Environment Agency, 2024

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.



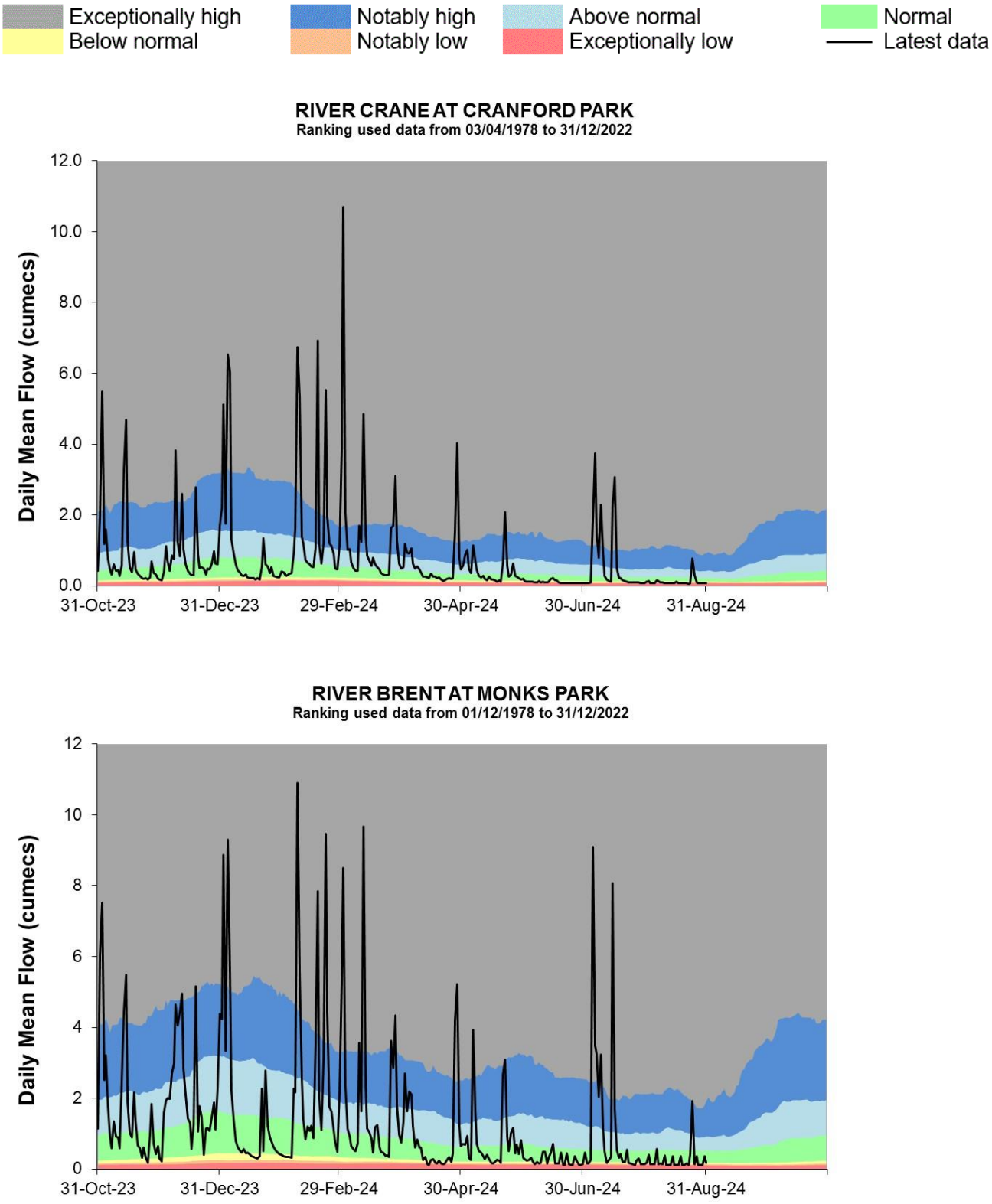


HadUK rainfall data (Source: Met Office. Crown copyright, 2024)

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.

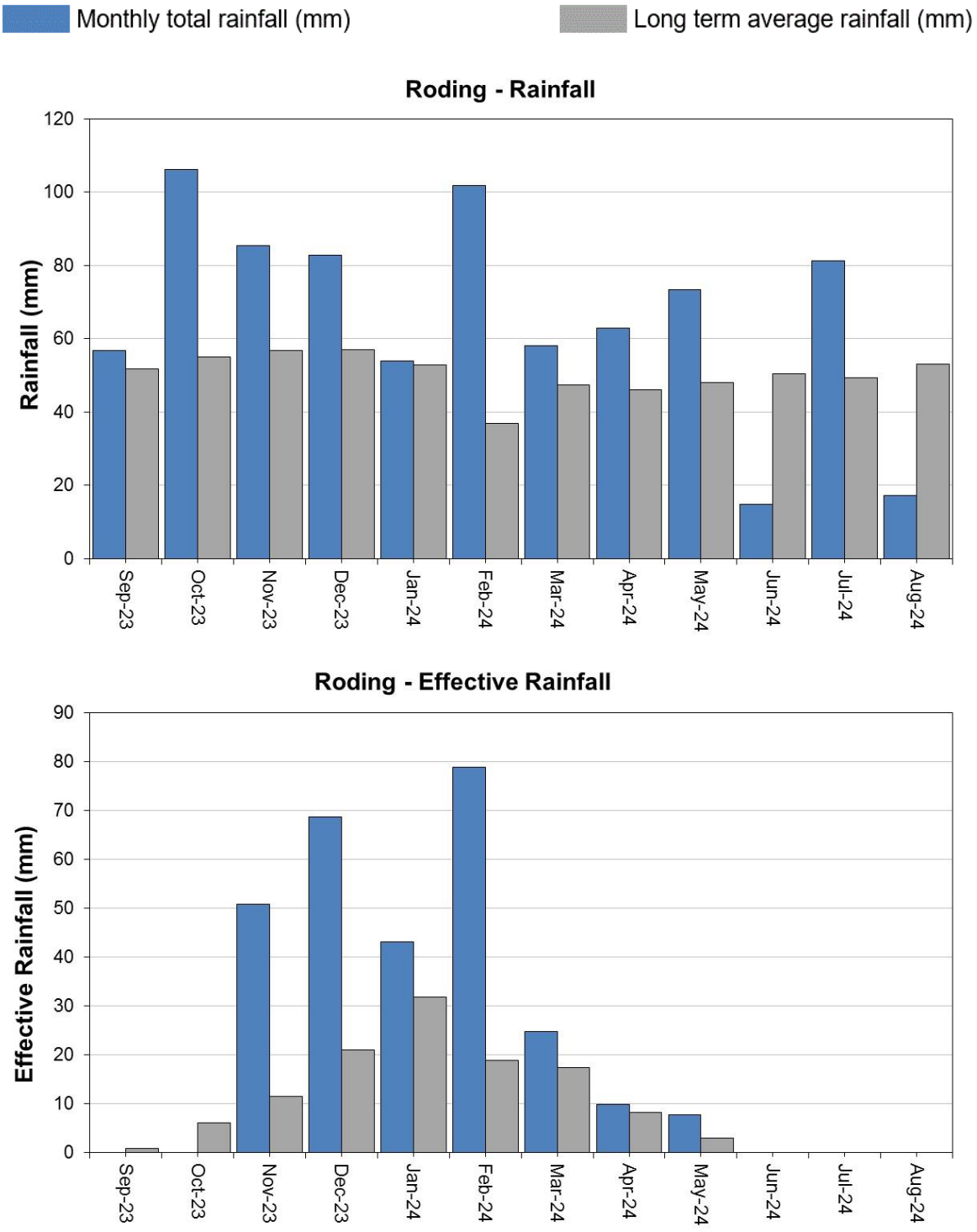


Source: Environment Agency, 2024

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.

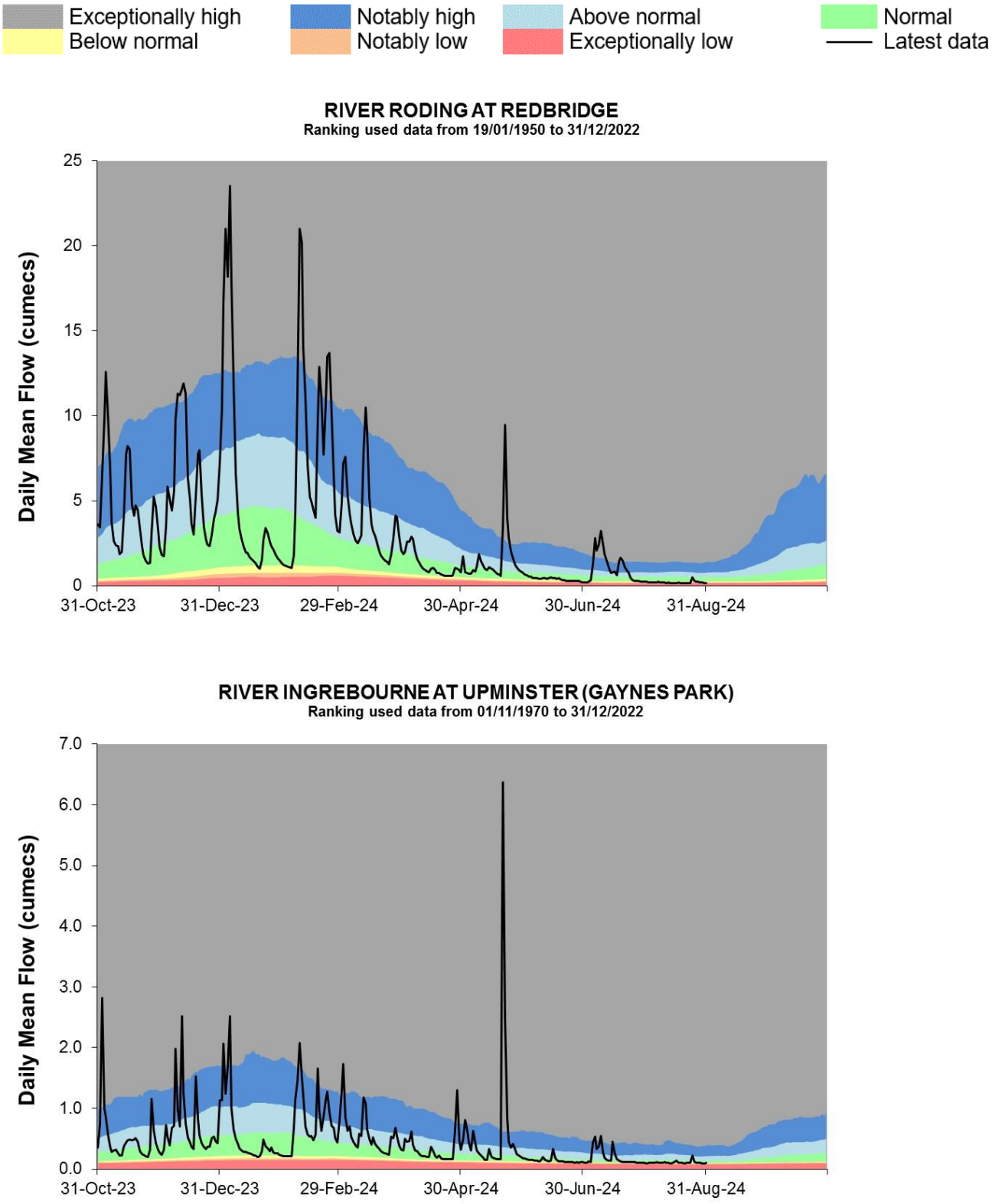


HadUK rainfall data (Source: Met Office. Crown copyright, 2024)

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

8.2 Roding River flow charts

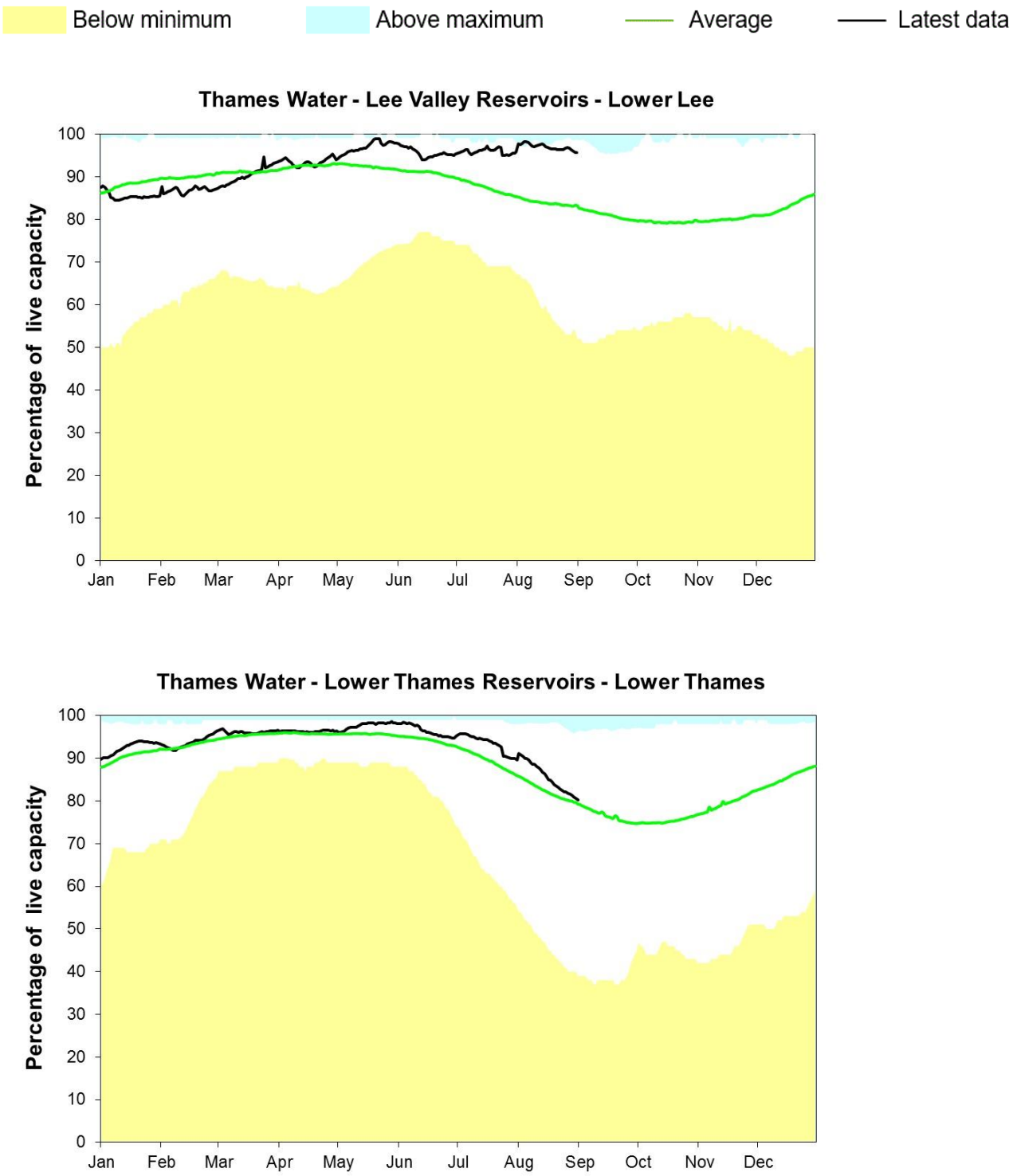
Figure 8.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



Source: Environment Agency, 2024

9 Reservoir stocks

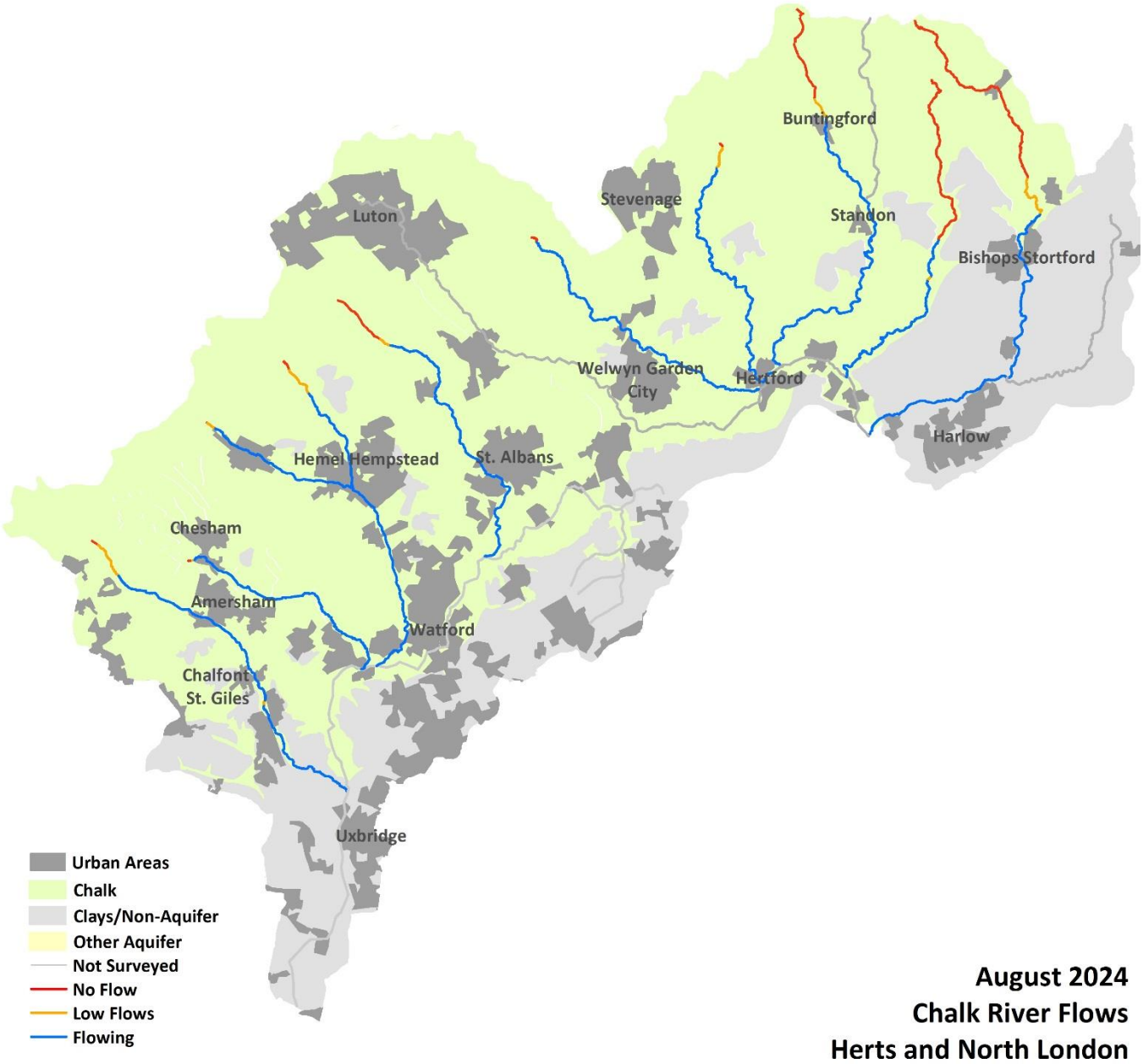
Figure 9.1: End of month reservoir stocks for the Lower Thames reservoir group and the Lee Valley reservoir group compared to long term maximum, minimum and average stocks. Note: Historic records of individual reservoirs and reservoir groups making up the regional values vary in length.



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	Aug 2024 total rainfall in mm	Aug 2024 rainfall long term average 1961 to 1990	Aug 2024 rainfall % of long term average 1961 to 1990	Summer Apr 2024 to Aug 2024 total rainfall in mm	Summer Apr 2024 to Aug 2024 rainfall % of long term average 1961 to 1990
Chilterns East Colne	26	59	45	307	110
Lee Chalk	21	55	38	290	112
Lower Lee	20	54	38	276	108
North London	26	55	47	261	102
Roding	17	53	32	250	101
Herts and North London total	22	55	40	277	107

12.2 Rainfall banding table

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

12.3 Effective Rainfall table

Hydrological area	Aug 2024 total effective rainfall in mm	Aug 2024 effective rainfall long term average 1961 to 1990 in mm	Aug 2024 effective rainfall % of long term average 1961 to 1990	Summer Apr 2024 to Aug 2024 total effective rainfall in mm	Summer Apr 2024 to Aug 2024 effective rainfall % of long term average 1961 to 1990
Chilterns East Colne	2	6	29	52	127
Lee Chalk	1	5	26	43	127
Lower Lee	0	0	0	24	181
North London	0	0	0	13	92
Roding	0	0	0	17	157
Herts and North London total	1	2	28	30	132

12.4 Soil Moisture Deficit table

Hydrological area	Aug 2024 end of month Soil Moisture Deficit in mm	Aug 2024 end of month Soil Moisture Deficit long term average 1961 to 1990 in mm	Jul 2024 end of month Soil Moisture Deficit in mm	Jul 2024 end of month Soil Moisture Deficit long term average 1961 to 1990 in mm
Chilterns East Colne	94	92	76	84
Lee Chalk	98	100	80	91
Lower Lee	101	95	88	88
North London	106	99	88	91
Roding	104	96	85	89
Herts and North London total	101	96	82	89

12.5 River flows table

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

12.6 Groundwater table

Site name	Aquifer	Aug 2024 band	Jul 2024 band
Ashley Green	Mid-Chilterns Chalk	Notably high	Notably high
Ballingdon Farm	Mid-Chilterns Chalk	Notably high	Notably high
Amersham Road	Mid-Chilterns Chalk	Exceptionally high	Exceptionally high
Wapseys Wood	Mid-Chilterns Chalk	Exceptionally 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	Notably high	Exceptionally high

12.7 Abstraction licence flow constraints

Number of flow constraints in force between 5 and 11 August 2024	Number of flow constraints in force between 12 and 18 August 2024	Number of flow constraints in force between 19 and 25 August 2024	Number of flow constraints in force between 26 and 31 August 2024
2	3	8	4