

Monthly water situation report: Thames Area

1 Summary - November 2024

In November Thames area received 92mm of rainfall, 137% on the long term average (LTA). While total rainfall was normal for the time of year, two-thirds of the month's rain fell over 3 days (23, 24, 26 November). River flows increased at 7 of our key indicator sites. Banbury recorded the third highest November flow since 1967, Bourne End (Hedsor) recorded the second highest flow since 1964, and Marlborough recorded its fourth highest flow since 1972. Groundwater levels increased at the majority of our indicator sites, while all but one are notably high or exceptionally high. Reservoir levels decreased in November, however they are still above average for the time of year. There were 52 flood alerts, and 37 flood warnings issued on rivers during November.

1.1 Rainfall

In November, Thames area received 92mm of rainfall, which was 137% of the LTA. There was an east-west split, with all the areal units in the west of Thames area receiving above normal rainfall, while the east of Thames area received normal rainfall for the time of year. Normal rainfall was received for the month, however two-thirds of the rain fell over 3 days; 23, 24, and 26 November. Total accumulated rainfall over the past 12 months remains exceptionally high across the entire area.

1.2 Soil moisture deficit and recharge

With the continued rain, soils remained saturated. In November, soil moisture deficits were 0 or 1mm across all of Thames area, which is below the long term average of 38mm. This meant that the effective rainfall was 71mm which was 275% of what would be expected for November.

1.3 River flows

Monthly mean flows increased at 7 of our key indicator sites, while 8 decreased. However, all were above normal or higher, with 2; Banbury on the Cherwell, and Bourne End (Hedsor) on the Wye, recording exceptionally high flow for the time of year. Banbury recorded its third highest November flow since 1967, Bourne End (Hedsor) recorded the second highest flow since 1964, and Marlborough recorded its fourth highest flow since 1972. Due to the majority of the November's rain falling at the end of the month, just under half of our indicator rivers had exceptionally high daily mean flows by month end.

1.4 Groundwater levels

Groundwater levels at all our indicator sites increased on last month, except for Jackaments Bottom in the Inferior Oolites, which slightly decreased but remained above normal for the time of year. Six sites, just over half, recorded exceptionally high levels, while all the rest but one (Jackaments Bottom) were notably high. Groundwater levels of the Chalk aquifer at Stonor remained exceptionally high for the tenth month in a row.

1.5 Reservoir stocks

Reservoir stocks continued to decline in the Lower Thames reservoir reservoirs and ended the month at 82.1%, compared to 86.9% at the end of October. Stocks in Farmoor reservoir also decreased slightly from 90.9% to 90.2% during November. However, both are above average for the time of year.

1.6 Environmental impact

During November, there were 52 flood alerts, and 37 flood warnings issued in Thames area. At the end of the month, 0 abstraction licences were being constrained in the area to protect water resources and the environment.

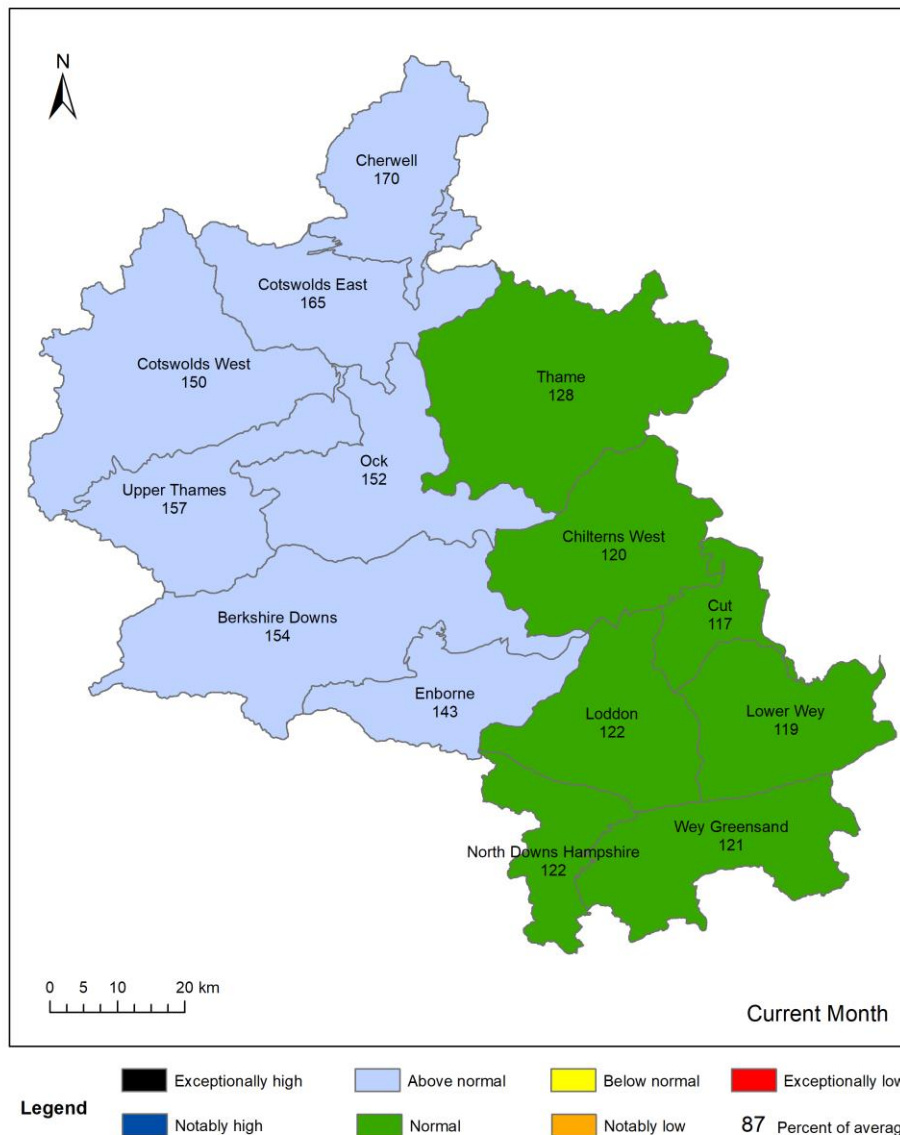
Author: Thames Area Groundwater Resources and Hydrology, enquiriesWT@environment-agency.gov.uk

Contact Details: 030708 506 506

2 Rainfall

2.1 Rainfall map

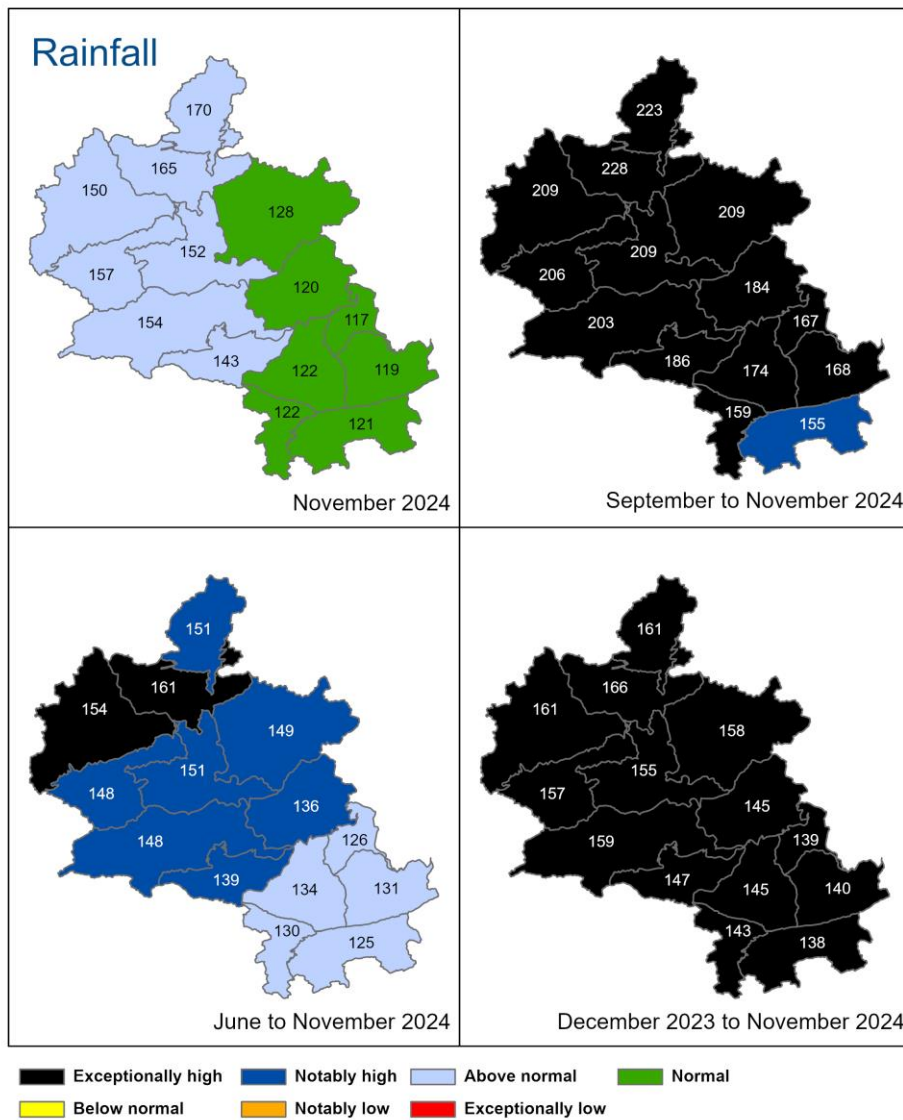
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 30 November 2024), classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



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

2.2 Rainfall map (2)

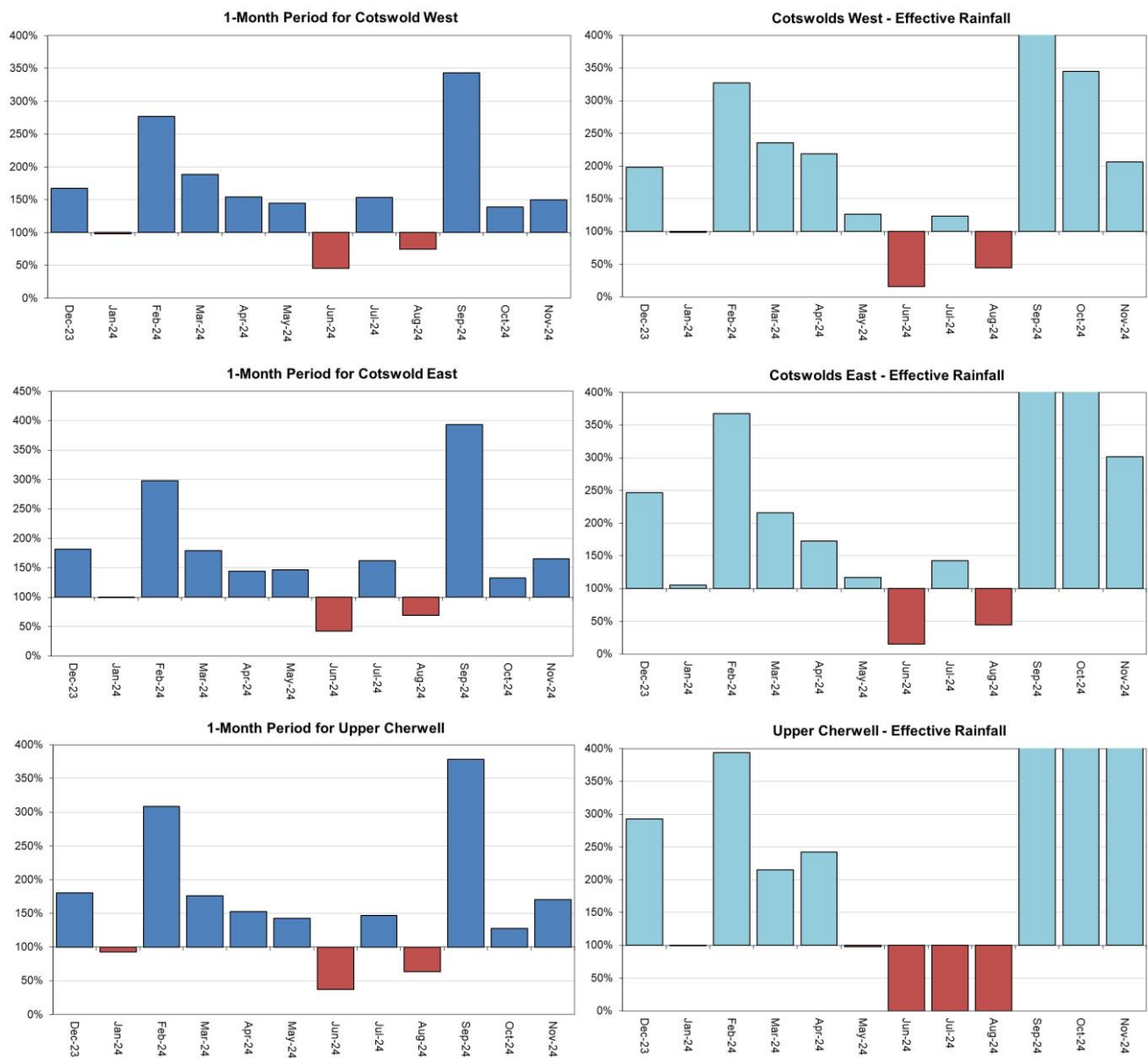
Figure 2.2: Total rainfall for hydrological areas for the current month (up to 30 November 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



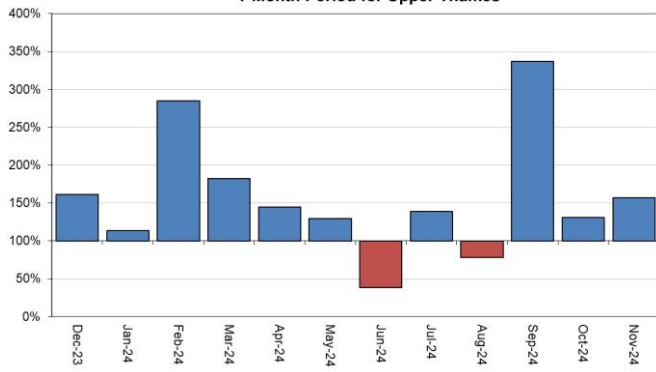
HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2024). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved.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

2.3 Rainfall charts

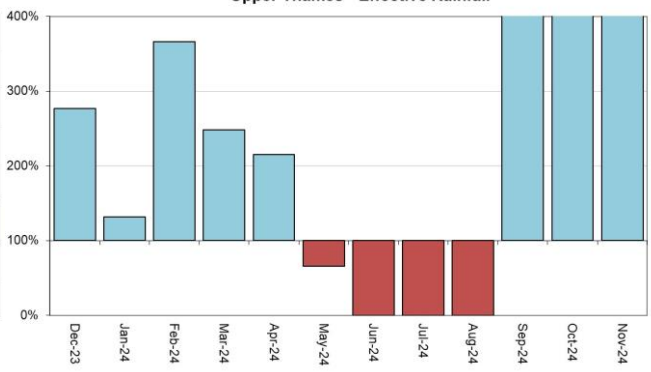
Figure 2.3: Monthly rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average for each areal unit.



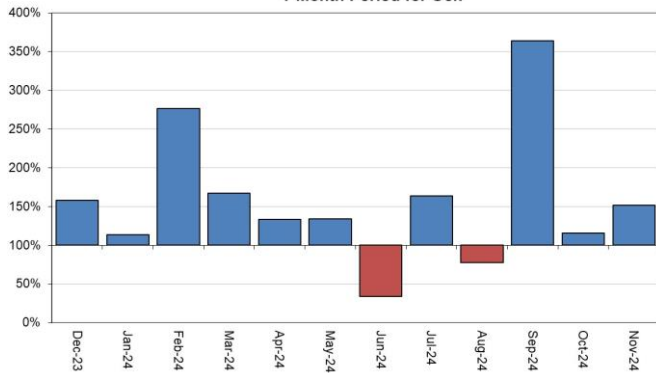
1-Month Period for Upper Thames



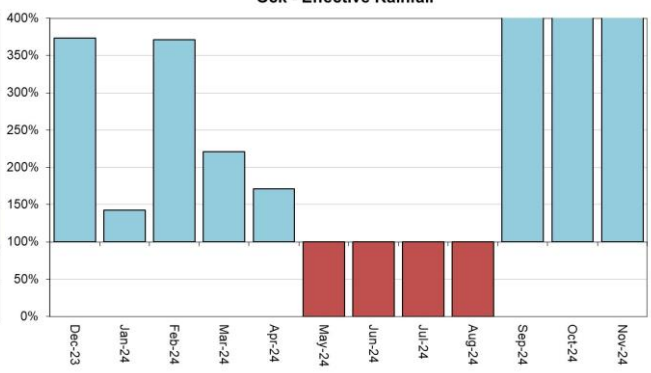
Upper Thames - Effective Rainfall



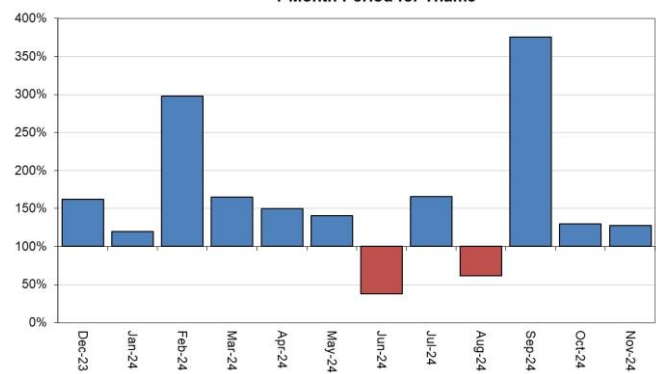
1-Month Period for Ock



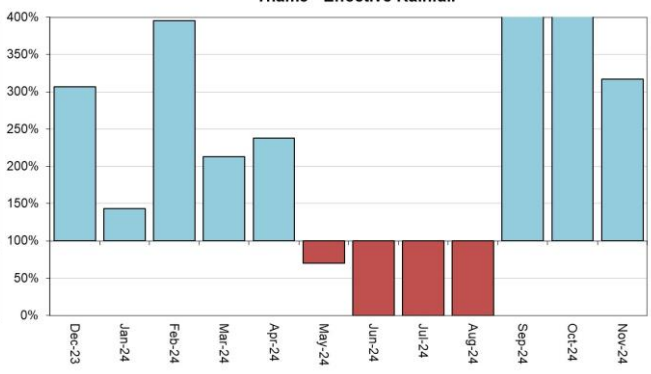
Ock - Effective Rainfall



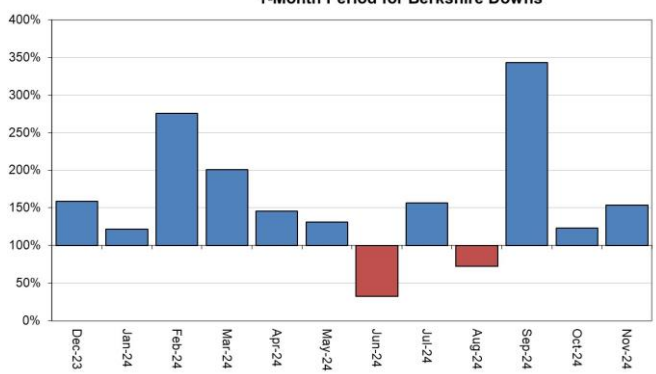
1-Month Period for Thame



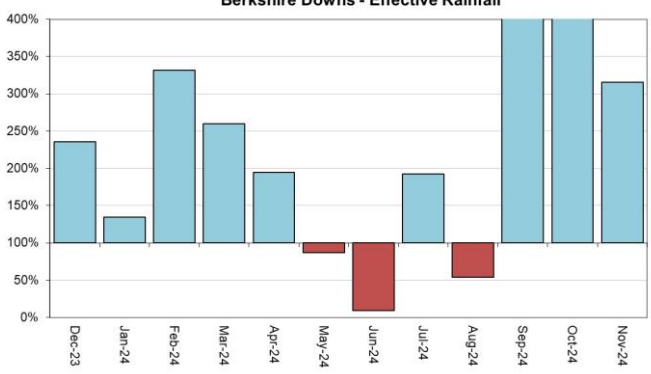
Thame - Effective Rainfall



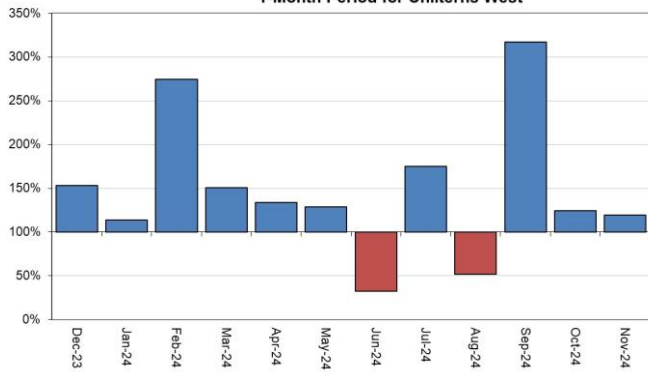
1-Month Period for Berkshire Downs



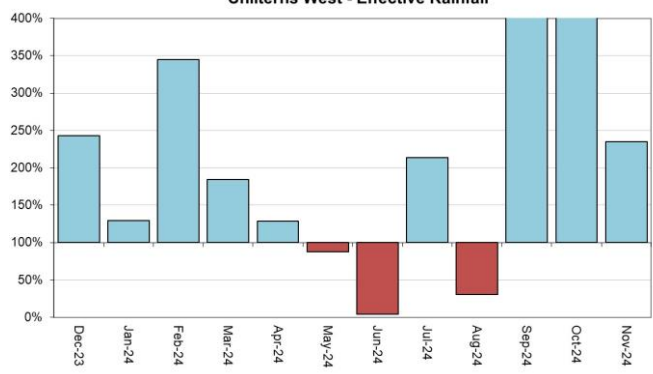
Berkshire Downs - Effective Rainfall



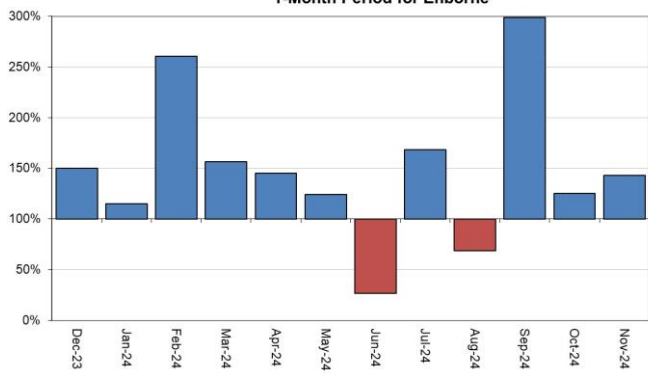
1-Month Period for Chilterns West



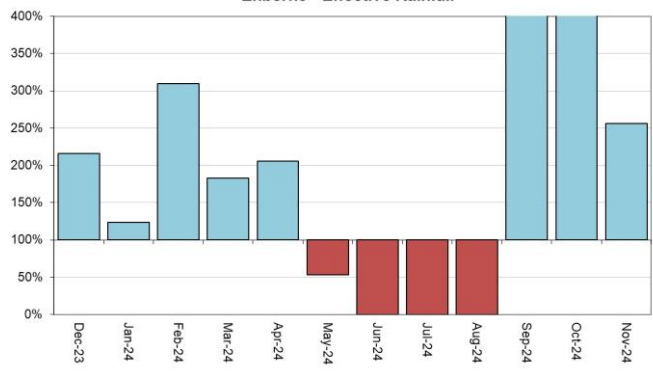
Chilterns West - Effective Rainfall



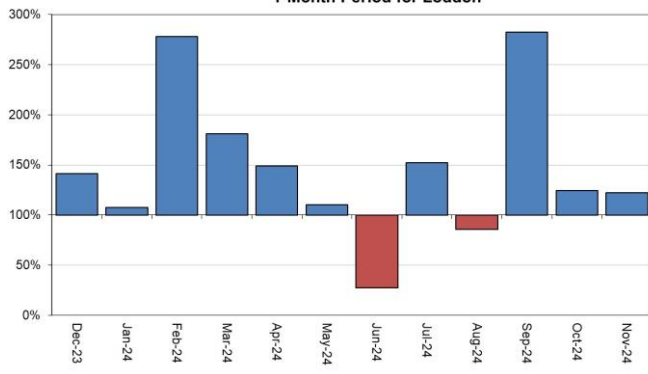
1-Month Period for Enborne



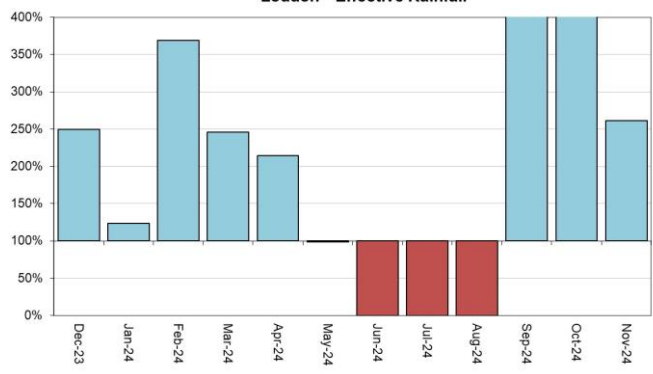
Enborne - Effective Rainfall



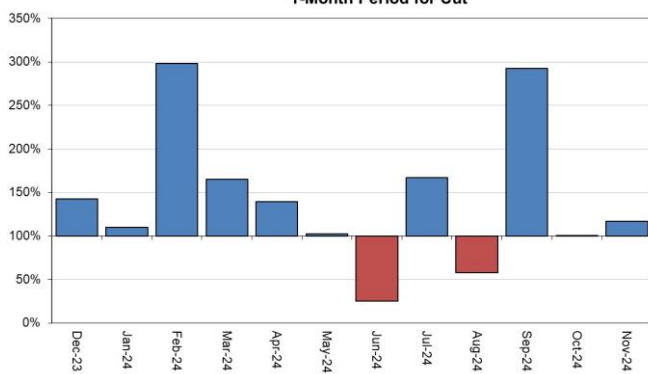
1-Month Period for Loddon



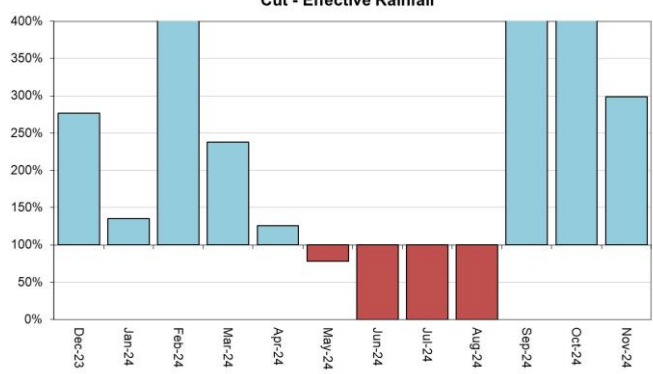
Loddon - Effective Rainfall

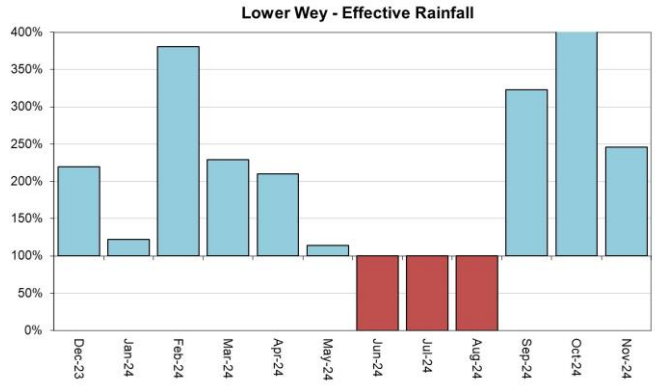
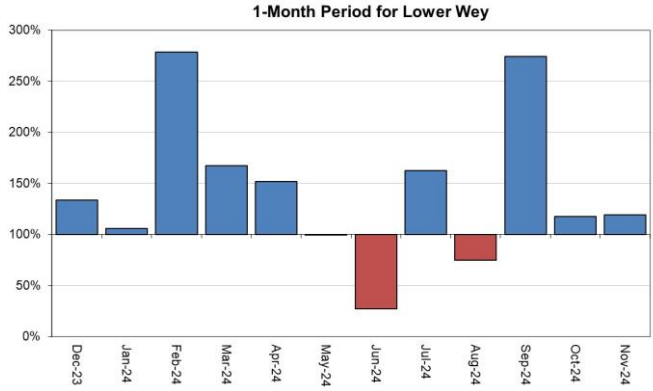
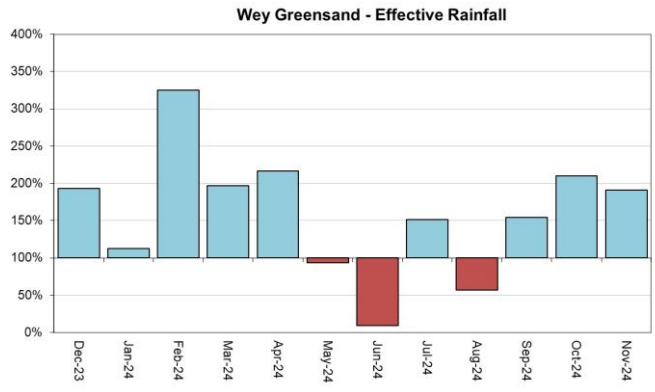
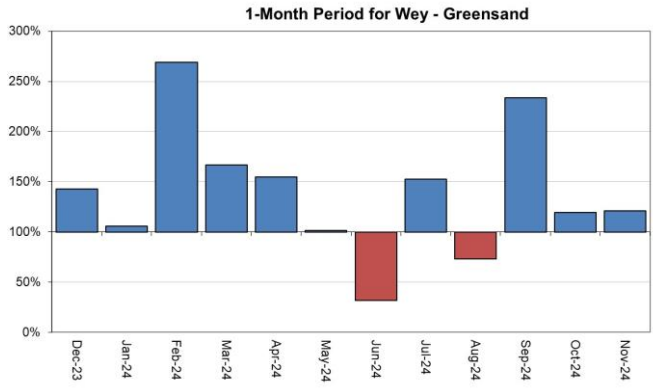
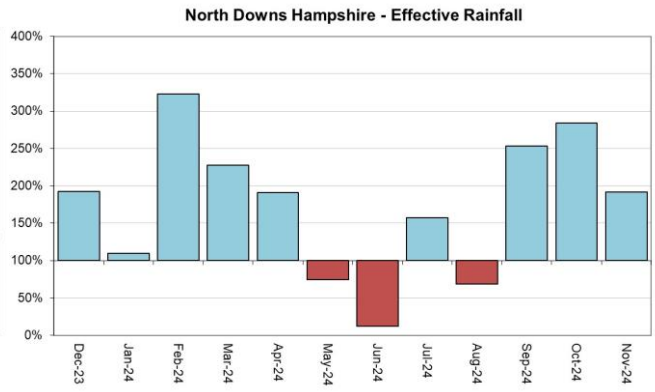
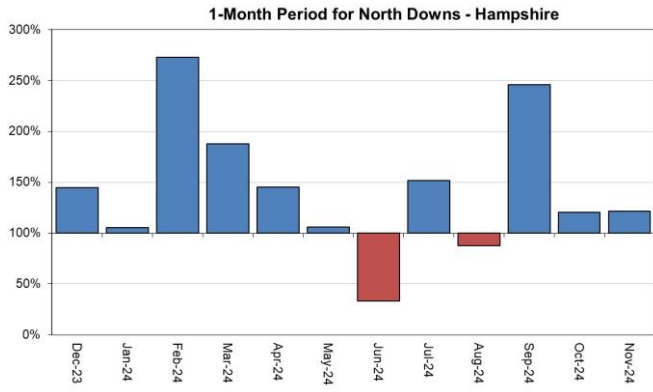


1-Month Period for Cut



Cut - Effective Rainfall





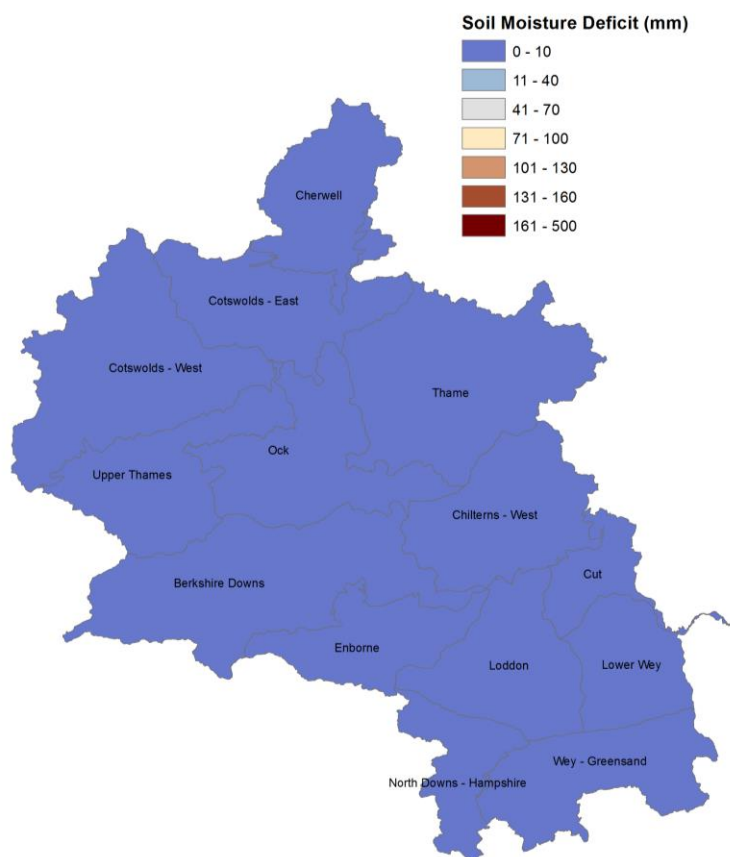
HadUK rainfall data. (Source: Met Office. Crown copyright, 2024).

EA effective rainfall data (Source: EA Soil Moisture Model)

3 Soil moisture deficit

3.1 Soil moisture deficit map

Figure 3.1: Soil moisture deficits for the week ending 30 November 2024. Shows the areal SMD estimate in millimetres.

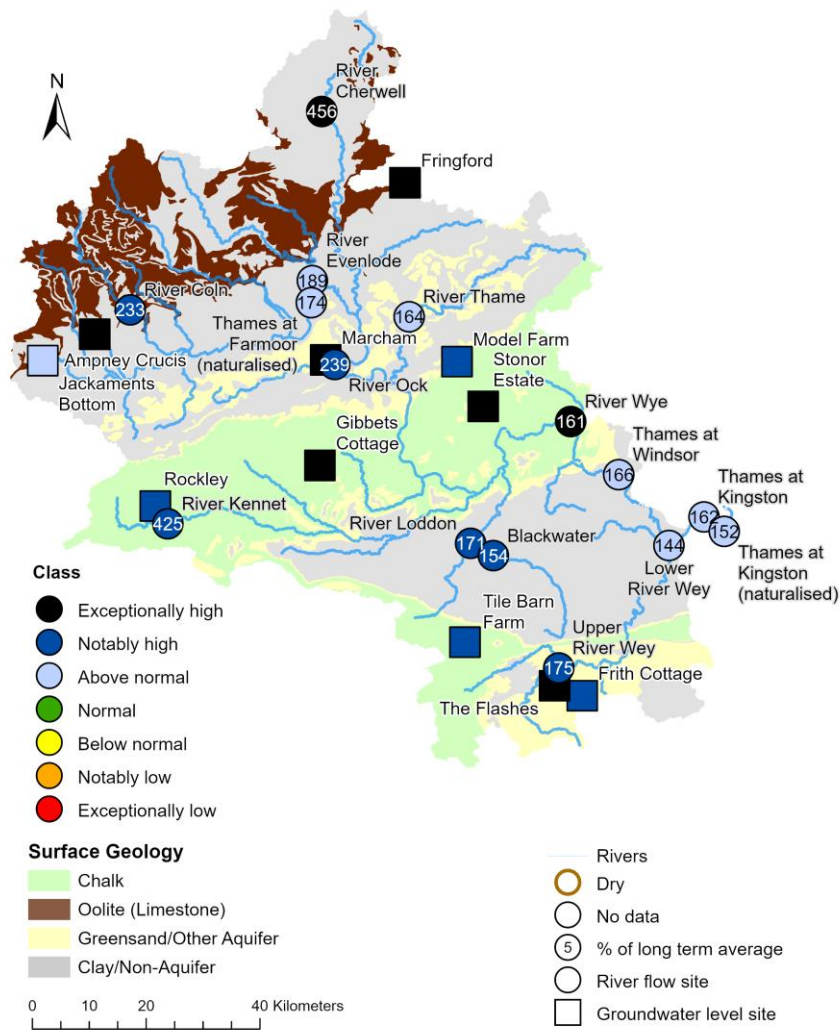


(Source: Met Office. Crown copyright, 2024). All rights reserved. Environment Agency, 100024198, 2024.

4 River Flow and Groundwater Status

4.1 River flow and groundwater level map

Figure 4.1: Monthly mean river flow for indicator sites and end of month groundwater levels for indicator sites for November 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic November means.

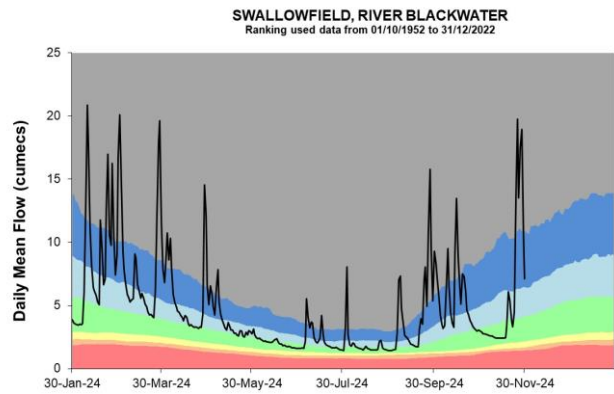
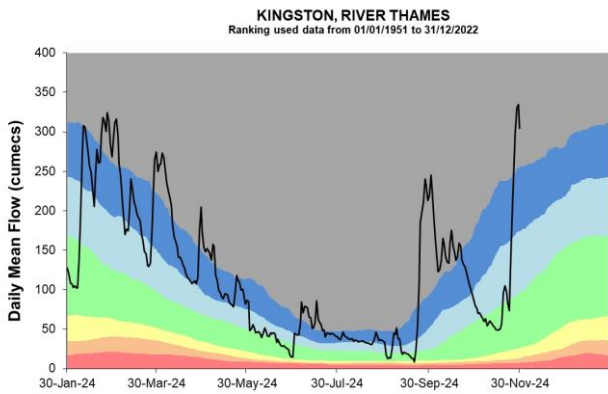
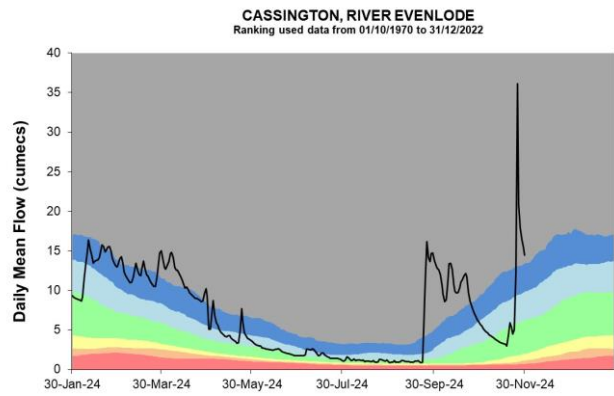
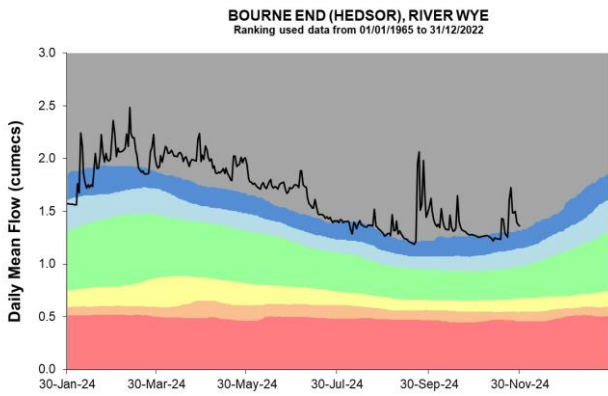
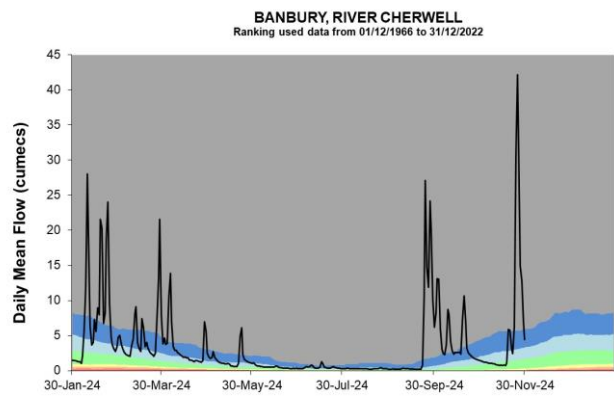
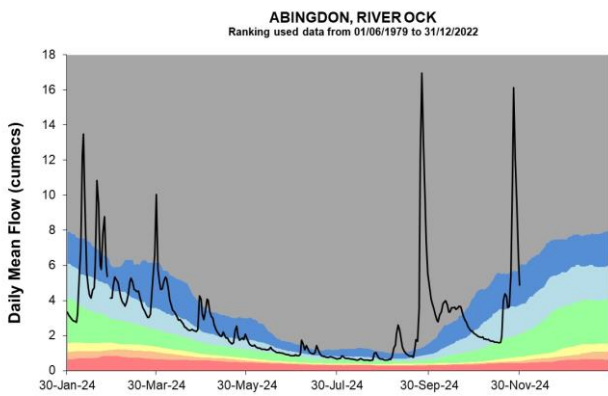
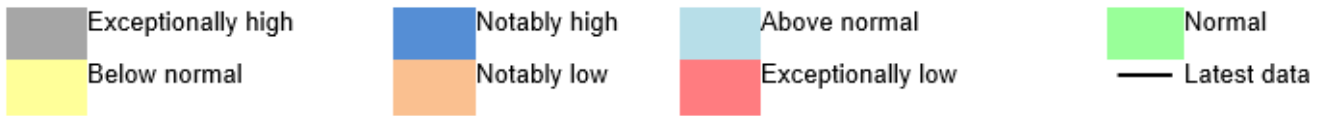


(Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

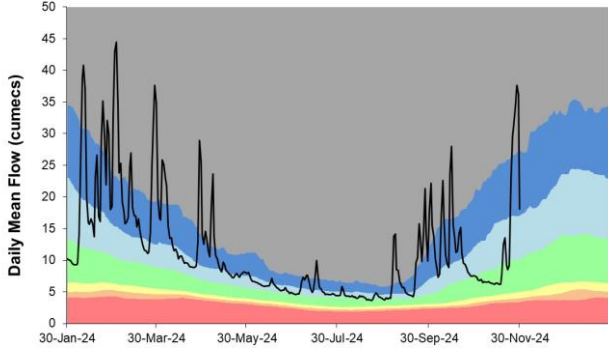
5 River flows

5.1 River flow charts

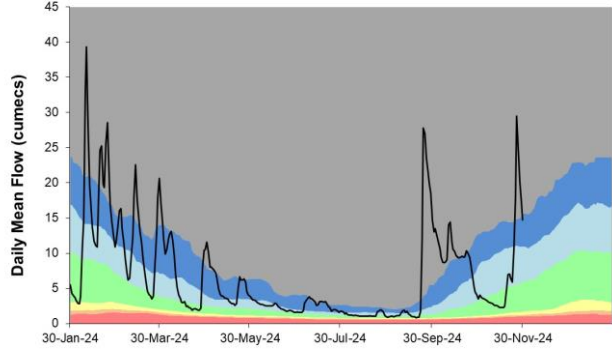
Figure 5.1: Daily mean river flows for indicator sites compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



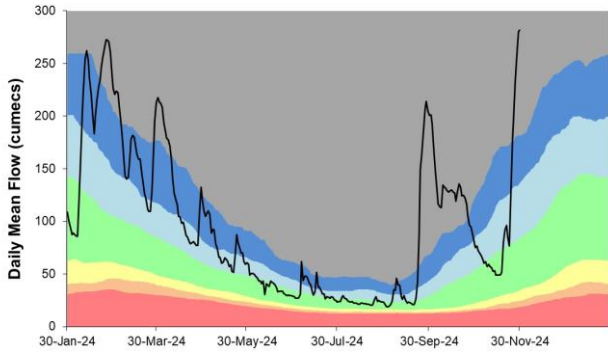
WEYBRIDGE, RIVER WEY
Ranking used data from 01/04/1979 to 31/12/2022



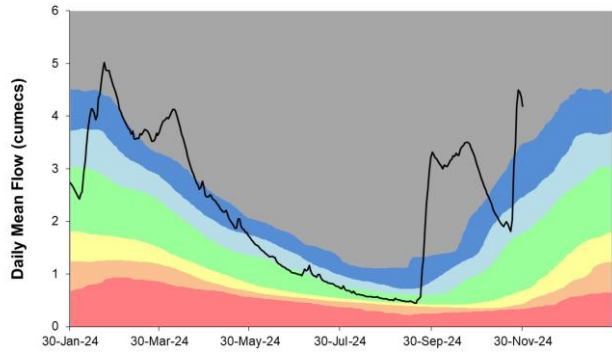
WHEATLEY, RIVER THAME
Ranking used data from 01/01/1990 to 31/12/2022



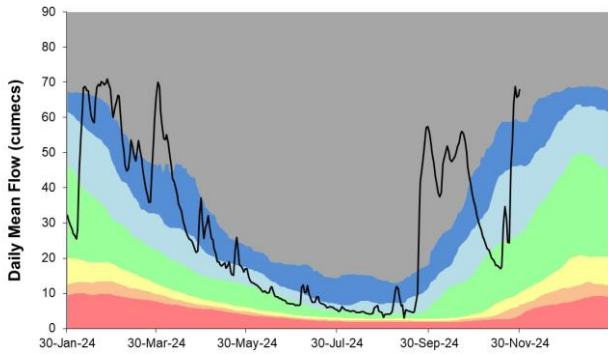
WINDSOR, RIVER THAMES
Ranking used data from 01/08/1979 to 31/12/2022



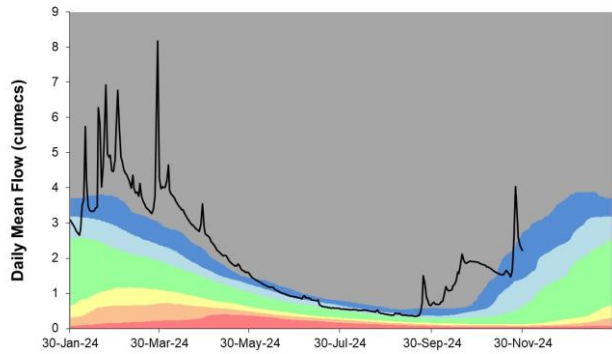
BIBURY, RIVER COLN
Ranking used data from 01/10/1963 to 31/12/2022

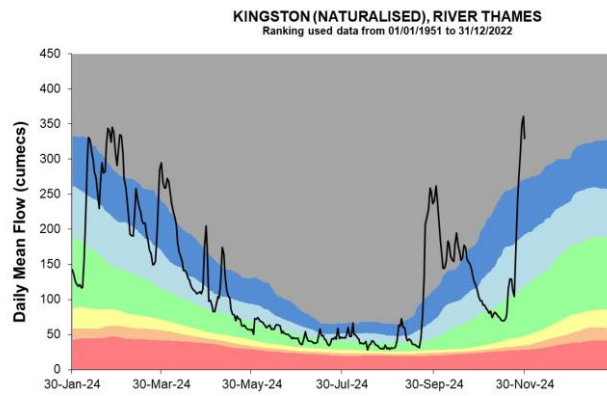
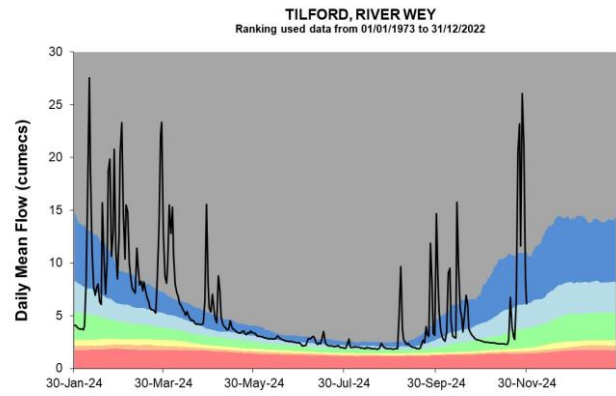
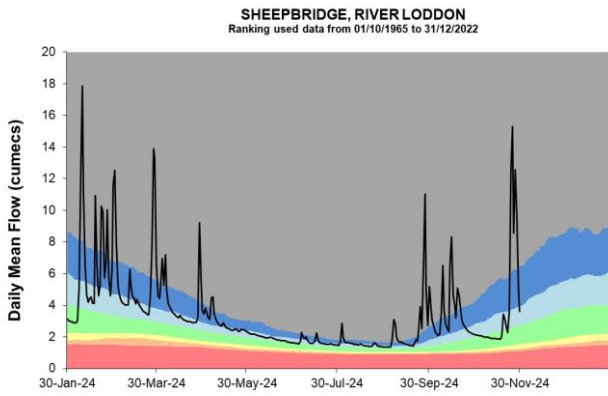


FARMOOR (NATURALISED), RIVER THAMES
Ranking used data from 01/10/1992 to 31/12/2022



MARLBOROUGH, RIVER KENNET
Ranking used data from 01/02/1972 to 31/12/2022



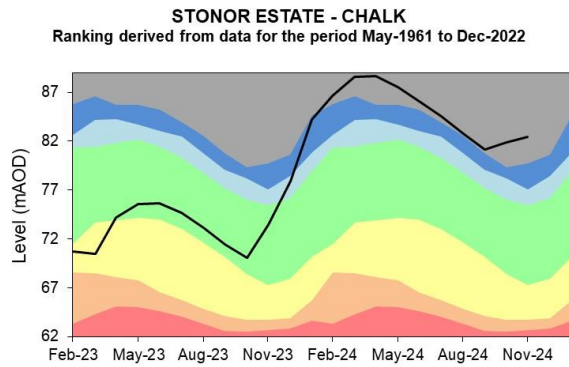
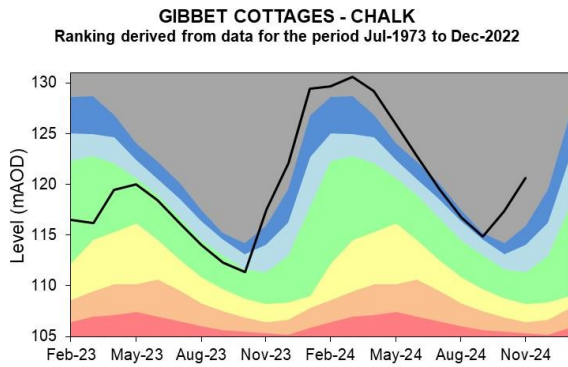
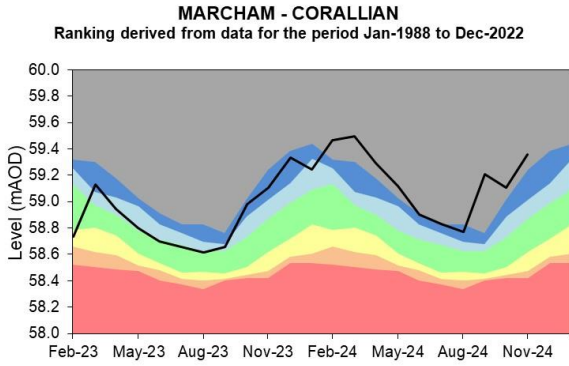
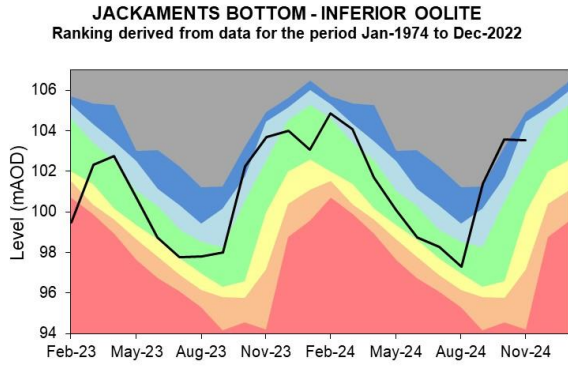
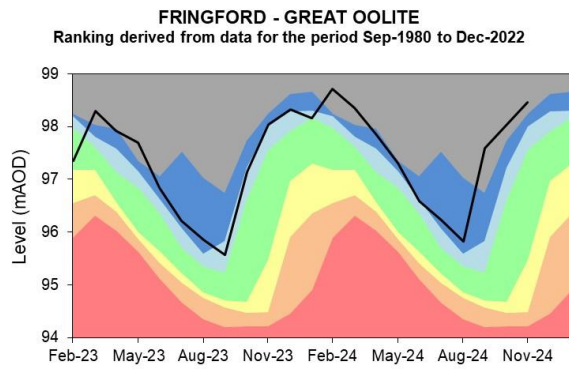
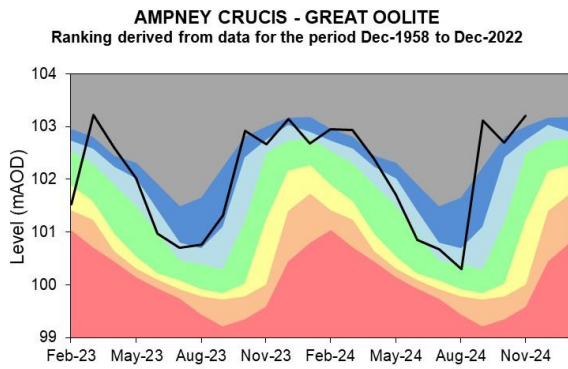
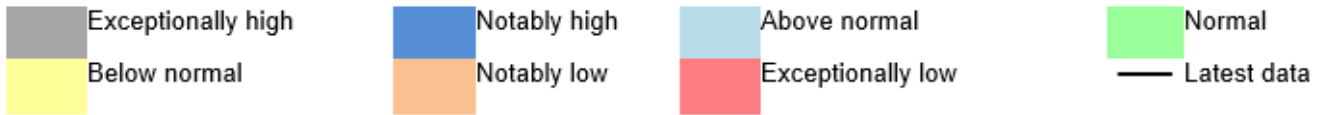


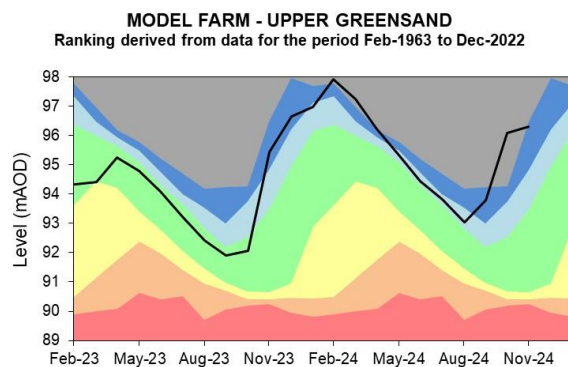
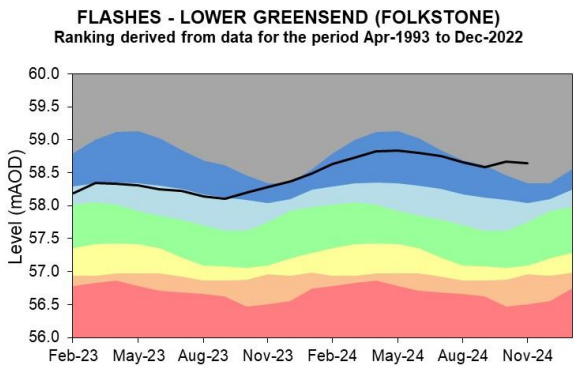
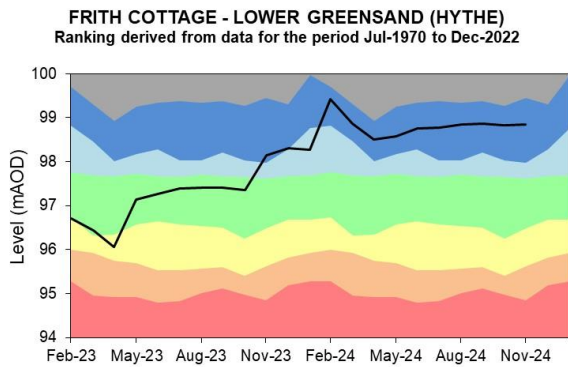
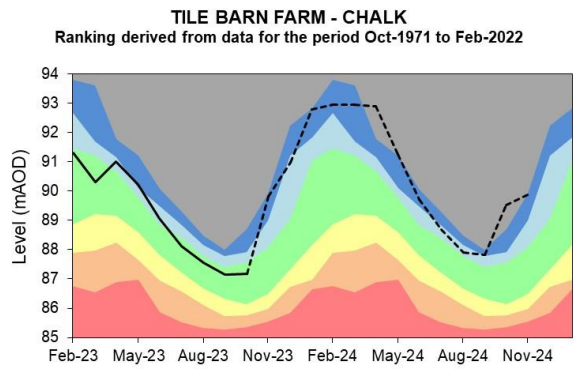
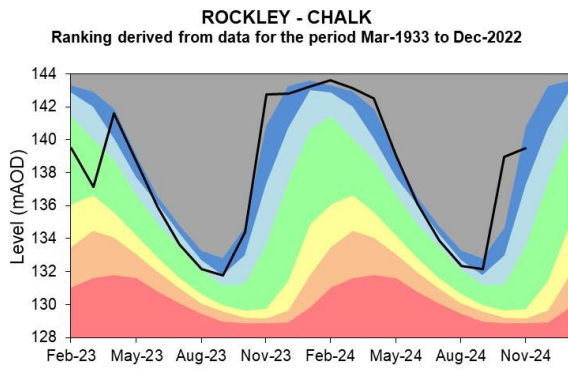
Source: Environment Agency.

6 Groundwater levels

6.1 Groundwater level charts

Figure 6.1: End of month groundwater levels for indicator sites, compared to an analysis of historic end of month levels, and long term maximum and minimum levels.



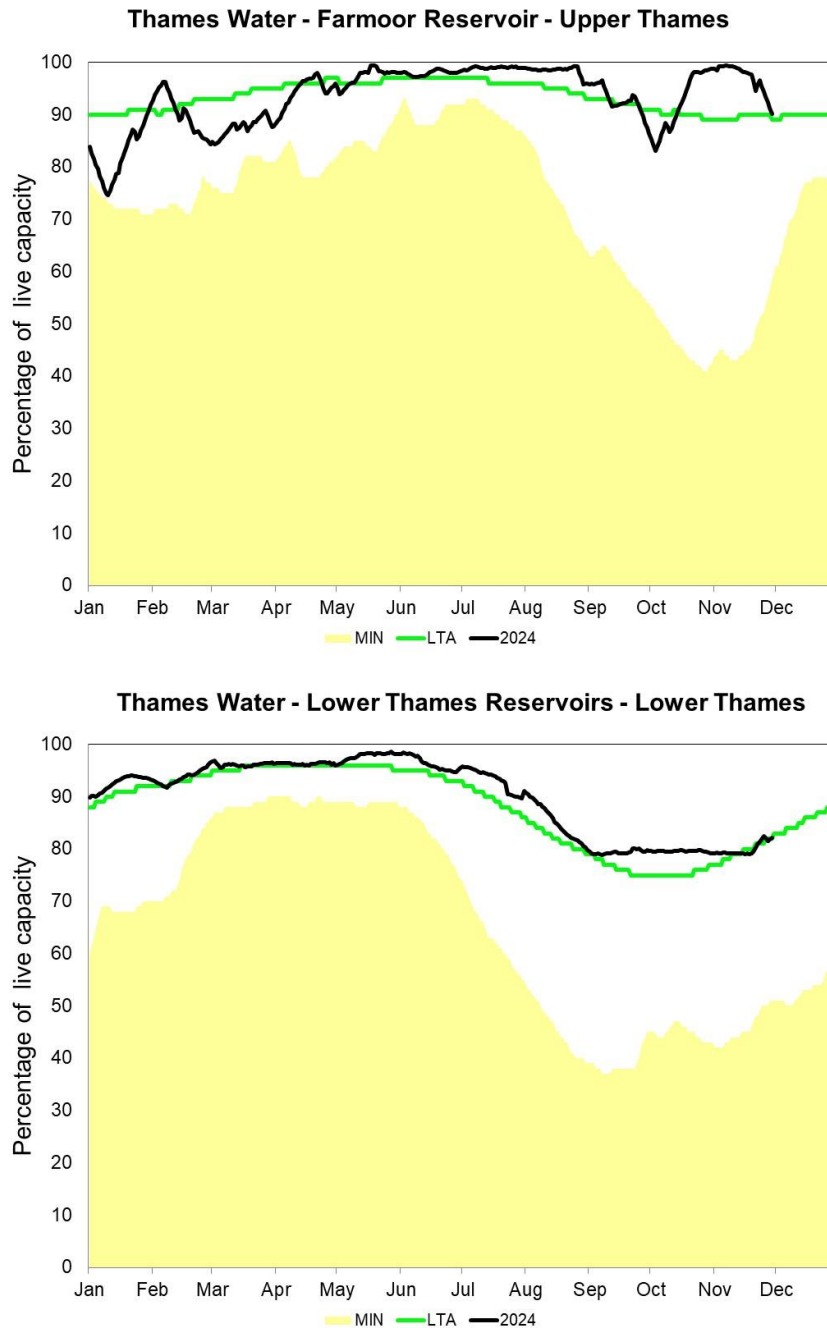


*Tile Barn Farm data has been estimated from two local sites since April 2022. A replacement is planned

Source: Environment Agency, 2024.

7 Reservoir stocks

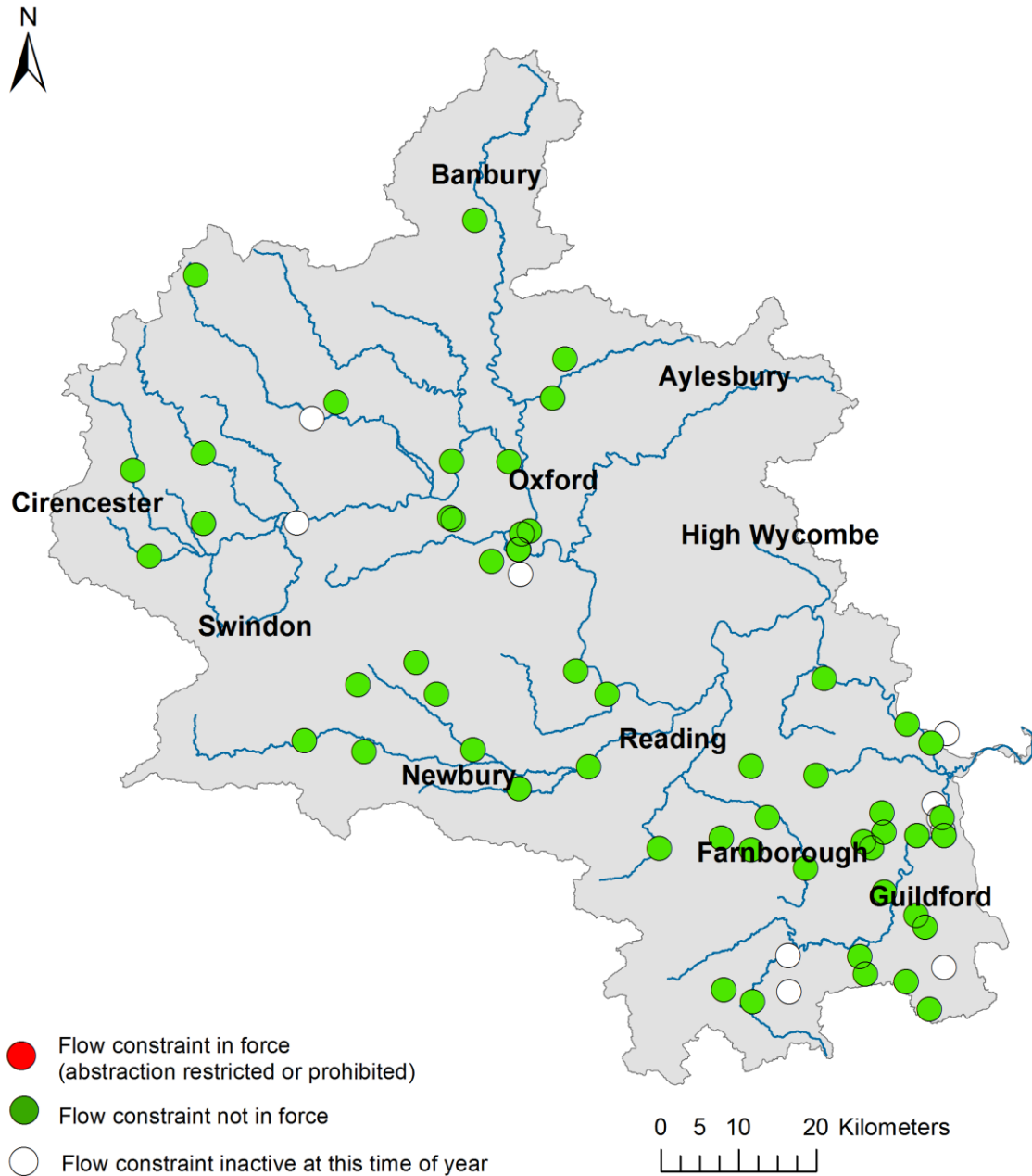
Figure 7.1: End of month regional reservoir stocks compared to minimum and average stocks.



(Source: water companies).

8 Flow Constraints

8.1 Figure 8.1: End of month flow constraints in Thames Area.



8.2 Summary of flow constraints

Week ending	03/11/24	10/11/24	17/11/24	24/11/24
	1	5	5	0

9 Summary of rainfall, effective rainfall and soil moisture deficit

9.1 Rainfall and effective rainfall

Area	Rainfall (mm) 30 day Total	Rainfall (mm) November LTA	Rainfall (mm) % LTA	Effective Rainfall (mm) 30 day total	Effective Rainfall (mm) November LTA	Effective Rainfall (mm) % LTA
Cotswolds - West	107	71	150	85	41	207
Cotswolds - East	102	62	165	80	27	301
Berkshire Downs	111	72	155	90	29	316
Chilterns - West	81	68	119	60	25	235
North Downs - Hampshire	105	86	121	85	44	192
Wey - Greensand	100	83	121	82	43	191
Upper Thames	97	61	158	74	16	461
Cherwell	99	58	171	78	17	457
Thame	73	57	128	52	16	317
Loddon	80	66	122	58	22	261
Lower Wey	75	63	118	54	22	246
Ock	83	55	152	61	10	641
Enborne	100	71	141	79	31	256
Cut	71	61	117	49	16	298
Thames Area	92	67	137	71	26	275

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

EA effective rainfall data (Source: EA Soil Moisture Model)

9.2 Soil moisture deficit

Area	SMD (mm) Day 30	SMD (mm) LTA
Cotswolds - West	0	17
Cotswolds - East	0	28
Berkshire Downs	0	40
Chilterns - West	0	44
North Downs - Hampshire	0	31
Wey - Greensand	0	31
Upper Thames	1	45
Cherwell	0	37
Thame	0	45
Loddon	0	42
Lower Wey	1	38
Ock	1	57
Enborne	0	33
Cut	1	48
Thames Area	0	38

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

EA effective rainfall data (Source: EA Soil Moisture Model)

9.3 Winter rainfall and effective rainfall

Winter period: 01/10/2024 to 30/11/2024						
Area	Rainfall (mm) Total	Rainfall (mm) LTA	Rainfall (mm) % LTA	Effective Rainfall (mm) Total	Effective Rainfall (mm) LTA	Effective Rainfall (mm) % LTA
Cotswolds - West	204	142	144	158	62	253
Cotswolds - East	182	122	149	136	40	336
Berkshire Downs	194	139	139	149	43	346
Chilterns - West	162	133	121	116	39	298
North Downs - Hampshire	202	167	121	152	68	224
Wey - Greensand	194	162	120	132	67	198
Upper Thames	175	121	144	127	20	624
Cherwell	173	116	149	128	24	533
Thame	147	114	129	101	22	459
Loddon	159	129	123	112	30	369
Lower Wey	149	126	118	100	31	318
Ock	146	110	133	100	13	793
Enborne	184	138	133	137	41	336
Cut	132	122	108	78	22	355
Thames Area	172	131	130	123	37	330

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

EA effective rainfall data (Source: EA Soil Moisture Model)

10 Glossary

10.1 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).

10.2 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.

11 Appendices

11.1 Rainfall table

Hydrological area	Nov 2024 rainfall % of long term average 1961 to 1990	Nov 2024 band	Sep 2024 to November cumulative band	Jun 2024 to November cumulative band	Dec 2023 to November cumulative band
Berkshire Downs	154	Above Normal	Exceptionally high	Notably high	Exceptionally high
Chilterns West	120	Normal	Exceptionally high	Notably high	Exceptionally high
Cotswold East	165	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Cotswold West	150	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Cut	117	Normal	Exceptionally high	Above normal	Exceptionally high
Enborne	143	Above Normal	Exceptionally high	Notably high	Exceptionally high
Loddon	122	Normal	Exceptionally high	Above normal	Exceptionally high
Lower Wey	119	Normal	Exceptionally high	Above normal	Exceptionally high
North Downs - Hampshire	122	Normal	Exceptionally high	Above normal	Exceptionally high
Ock	152	Above Normal	Exceptionally high	Notably high	Exceptionally high

Thame	128	Normal	Exceptionally high	Notably high	Exceptionally high
Upper Cherwell	170	Above Normal	Exceptionally high	Notably high	Exceptionally high
Upper Thames	157	Above Normal	Exceptionally high	Notably high	Exceptionally high
Wey - Greensand	121	Normal	Notably high	Above normal	Exceptionally high

11.2 River flows table

Site name	River	Catchment	Nov 2024 band	Oct 2024 band
Abingdon	River Ock	Ock	Notably high	Exceptionally high
Banbury	River Cherwell	Cherwell Upper	Exceptionally high	Exceptionally high
Bibury	River Coln	Cotswolds West	Notably high	Exceptionally high
Bourne End (Hedsor)	River Wye	Wye Bucks	Exceptionally high	Exceptionally high
Cassington	River Evenlode	Evenlode	Above normal	Exceptionally high
Farmoor (naturalised)	River Thames	Thames	Above normal	Exceptionally high
Kingston	River Thames	Thames North Bank	Above normal	Exceptionally high
Marlborough	River Kennet	Kennet	Notably high	Exceptionally high
Sheepbridge	River Loddon	Loddon	Notably high	Exceptionally high
Swallowfield	River Blackwater	Loddon	Notably high	Notably high
Tilford	River Wey	Wey Addleston Bourne	Notably high	Notably high
Weybridge	River Wey	Wey Addleston Bourne	Above normal	Notably high
Wheatley	River Thame	Thame	Above normal	Exceptionally high

Windsor	River Thames	Thames	Above normal	Exceptionally high
Kingston (naturalised)	River Thames	Thames North Bank	Above normal	Exceptionally high

11.3 Groundwater table

Site name	Aquifer	End of Nov 2024 band	End of Oct 2024 band
Ampney Crucis OBH	Burford Oolitic Limestone (great)	Exceptionally high	Notably high
Frith Cottage	Godalming Lower Greensand	Notably high	Notably high
Gibbet Cottages OBH	Berkshire Downs Chalk	Exceptionally high	Exceptionally high
Jackaments Bottom OBH	Burford Oolitic Limestone (inferior)	Above normal	Exceptionally high
Marcham OBH	Shrivenham Corallian	Exceptionally high	Exceptionally high
Model Farm	Chiltern Upper Greensand	Notably high	Exceptionally high
Rockley OBH	Berkshire Downs Chalk	Notably high	Exceptionally high
Stonor Estate	South-west Chilterns Chalk	Exceptionally high	Exceptionally high
The Flashes OBH	Godalming Lower Greensand	Exceptionally high	Exceptionally high
Tile Barn Farm	Basingstoke Chalk	Notably high	Exceptionally high
Fringford P.S.	Upper Bedford Ouse Oolitic Limestone (great)	Exceptionally high	Exceptionally high