

Monthly water situation report: Thames Area

1 Summary - August 2024

Thames area received 42mm of rainfall in August, 71% of the long term average (LTA). Most of the area's areal units received normal rainfall, though the 5 northeastern areal units received below normal rainfall. Soil moisture deficits (SMD's) increased slightly from last month to 92mm across the area and ended the month slightly higher than the LTA (87mm). Monthly mean river flows at all our indicator sites were normal or above, with the River Wye at Bourne End the only site to record exceptionally high flow. At the end of the month, levels at the majority of our groundwater sites continued their expected seasonal decline, and levels were normal or above for the time of year.

1.1 Rainfall

August was drier than typical, with Thames area receiving 42mm of rainfall for the month, 71% of the LTA. There was a geographic distribution of rainfall across the area, with normal rainfall in the southwestern areal units and below normal rainfall for the 5 northeastern units. Total accumulated rainfall for the past 3 months was below normal or normal for all areal units and rainfall remains exceptionally high across the entire area over the past 12 months.

1.2 Soil moisture deficit and recharge

SMD's increased slightly in August, ending the month at 94mm for the area, slightly higher than the LTA (87mm). SMD's were generally lower in the north of the area and higher in the south. Due to the month's low rainfall and high evapotranspiration, effective rainfall in August was low.

1.3 River flows

Monthly mean river flows at most of our indicator sites were normal or above normal in August despite low rainfall, due to high rainfall in July. Almost all sites continued their usual seasonal decline. Many of the groundwater fed rivers (i.e. River Blackwater, River Wey, River Wye) were still supported by the continued contribution of groundwater baseflow resulting from the exceptionally wet winter. The River Wye at Bourne End was the only site in August with an exceptionally high flow.

1.4 Groundwater levels

Except for the Lower Greensand aquifer at Frith Cottage, whose level remained largely unchanged, all our groundwater sites continued their expected seasonal declines, though their levels were still normal or above, following the exceptionally wet winter. These were largely in the same banding as last month, with only the Inferior Oolite aquifer at Marcham moving from

exceptionally high to notably high and the Great Oolite aquifer at Ampney Crucis moving from above normal to normal. The Chalk aquifer at Stonor Estate was the only site to remain at an exceptionally high level for the time of year for the seventh month in a row.

1.5 Reservoir stocks

Reservoir capacity at Farmoor was steady for most of August, starting the month at 99%, before declining slightly to end the month at 96%, above the LTA. Capacity at the Lower Thames reservoirs decreased steadily over August from 91% at the beginning to 80% at the end on the month, remaining above the LTA for the time of year.

1.6 Environmental impact

There were 3 flood alerts issued across Thames area during August. At the end of August, 11 abstraction licences were being constrained in Thames area to protect water resources and the environment.

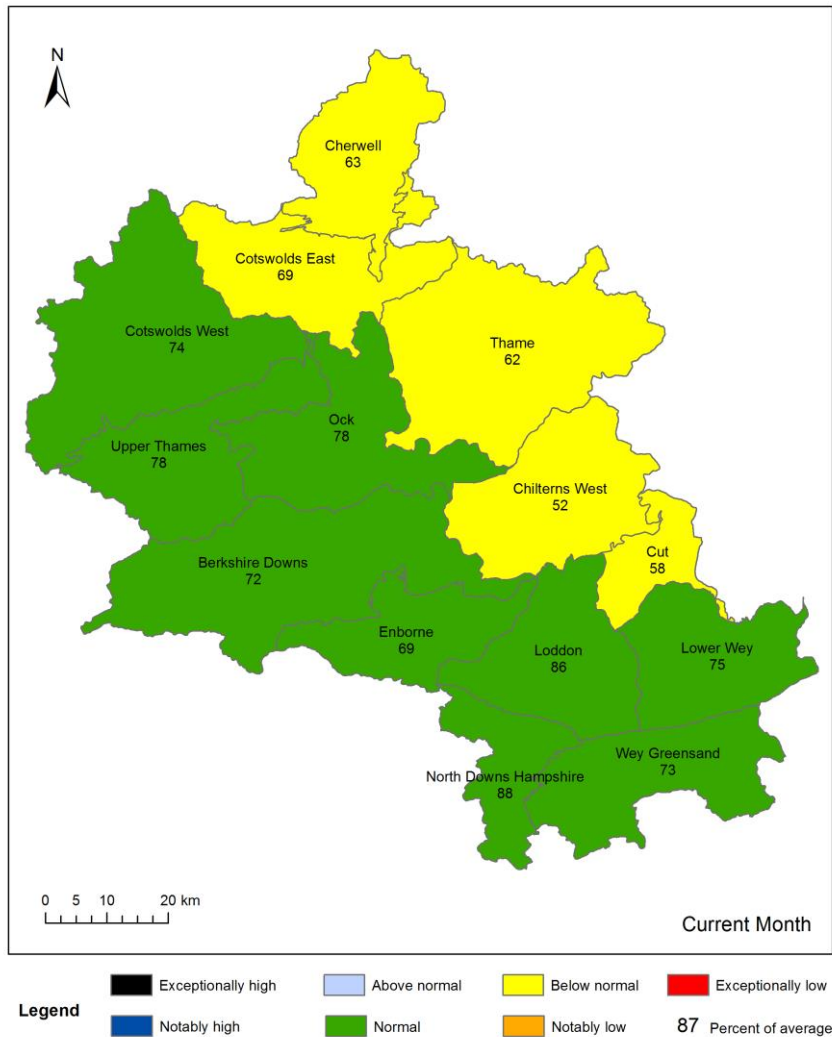
Author: Thames Area Groundwater Resources and Hydrology, enquiriesWT@environment-agency.gov.uk

Contact Details: 030708 506 506

2 Rainfall

2.1 Rainfall map

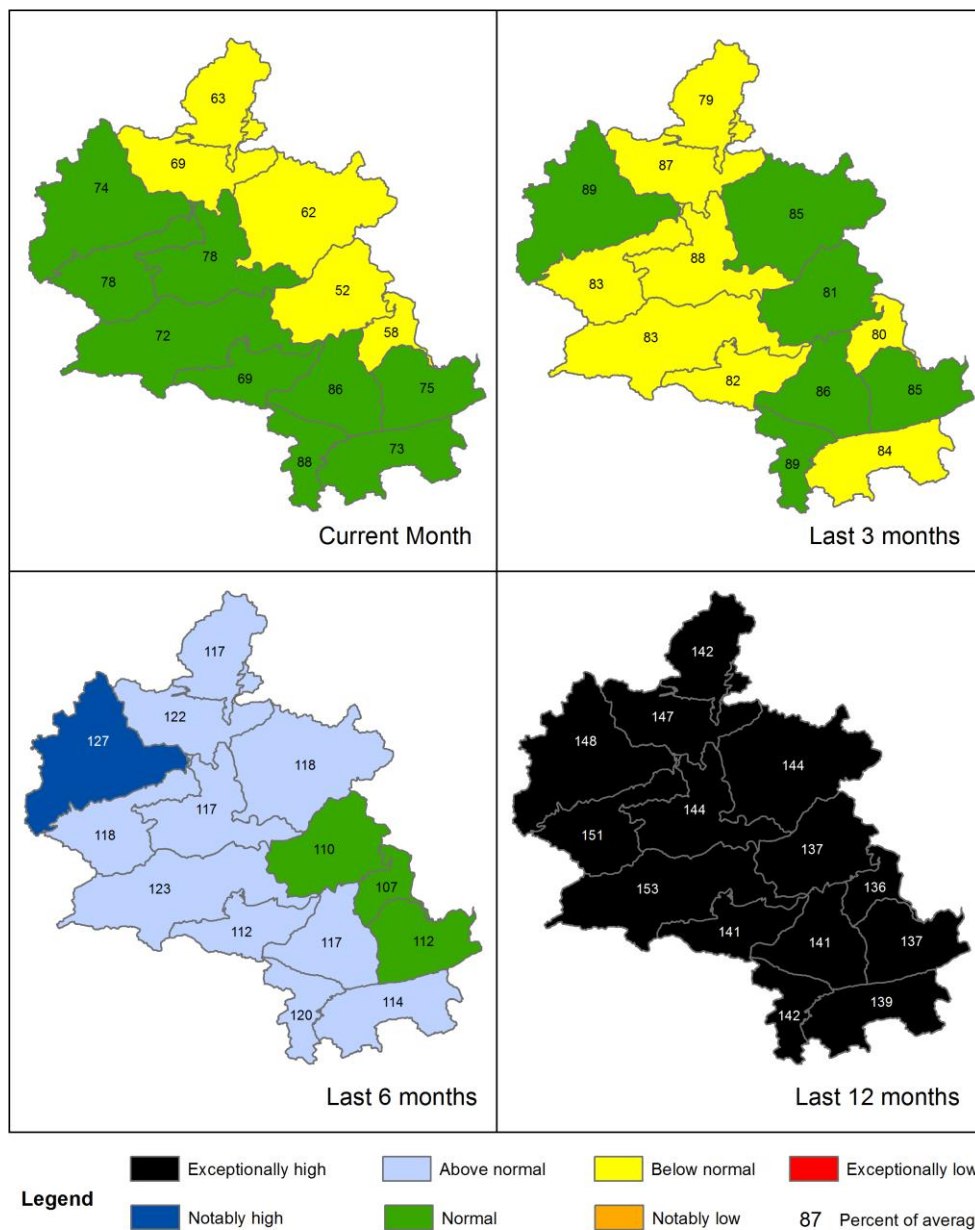
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 31 August 2024), classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



Rainfall data for 2023, 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 2023, 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)

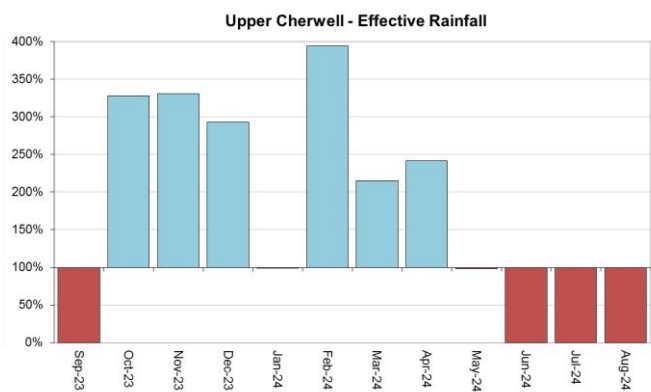
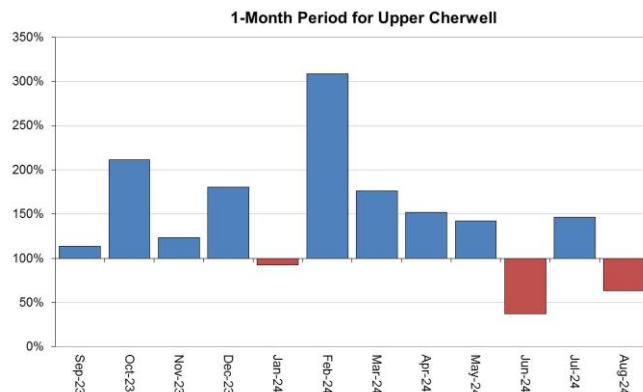
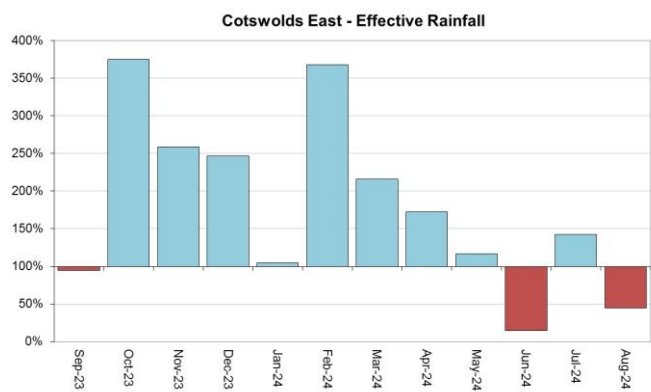
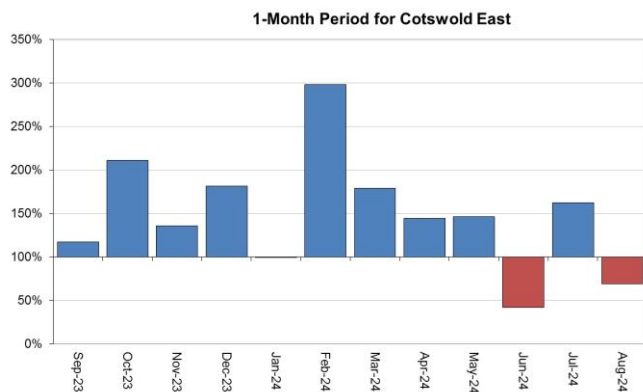
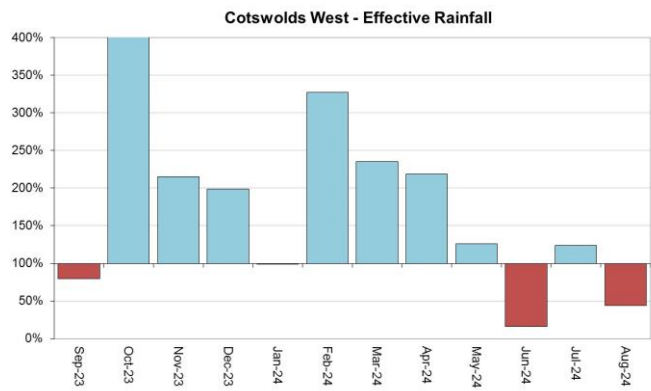
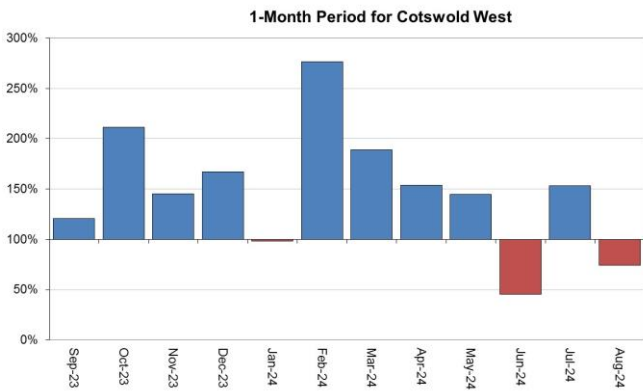
Figure 2.2: Total rainfall for hydrological areas for the current month (up to 31 August 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



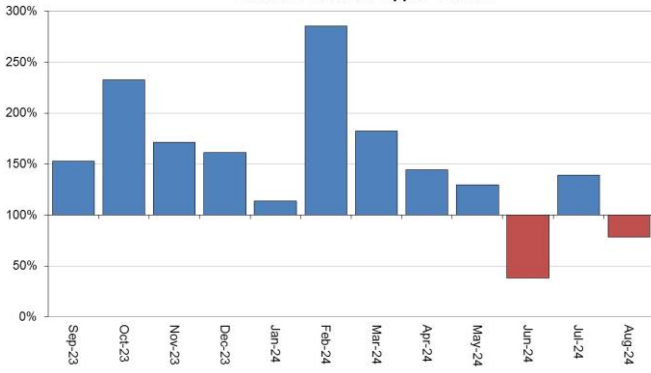
HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2024). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved.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

2.3 Rainfall charts

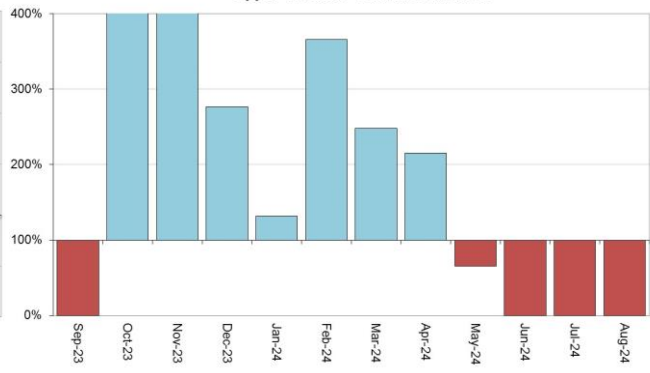
Figure 2.3: Monthly rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average for each areal unit.



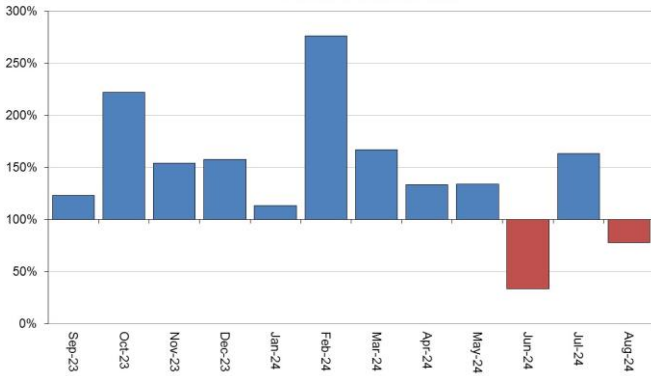
1-Month Period for Upper Thames



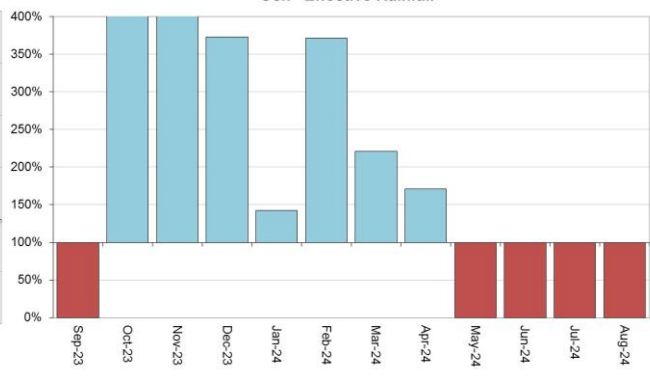
Upper Thames - Effective Rainfall



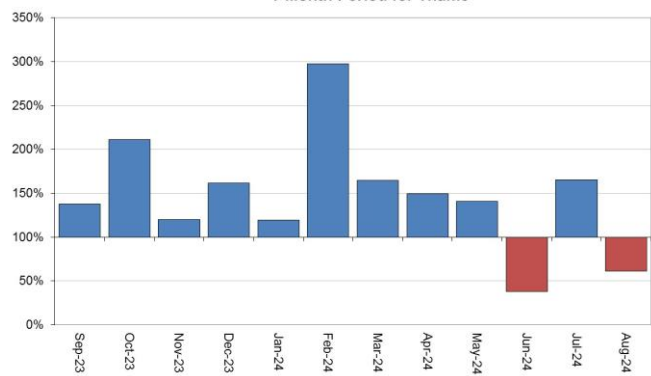
1-Month Period for Ock



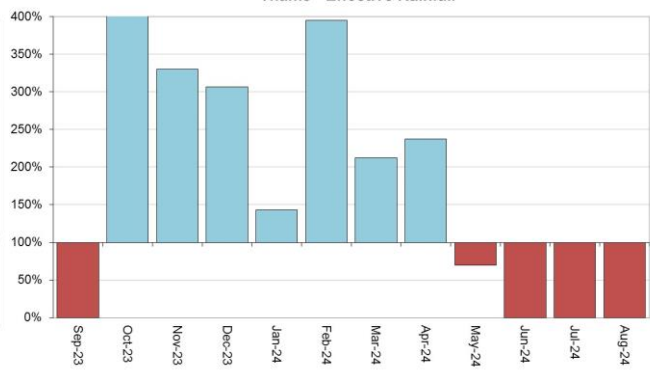
Ock - Effective Rainfall



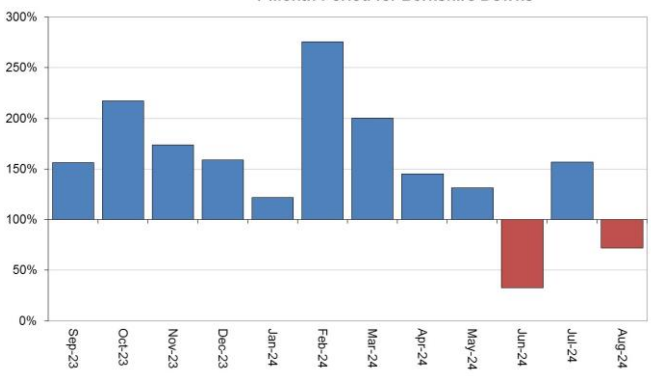
1-Month Period for Thame



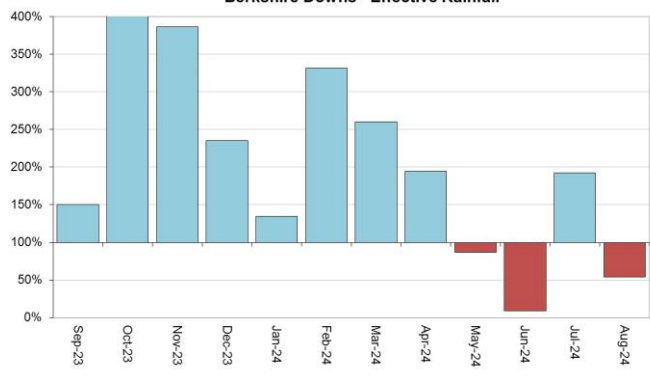
Thame - Effective Rainfall



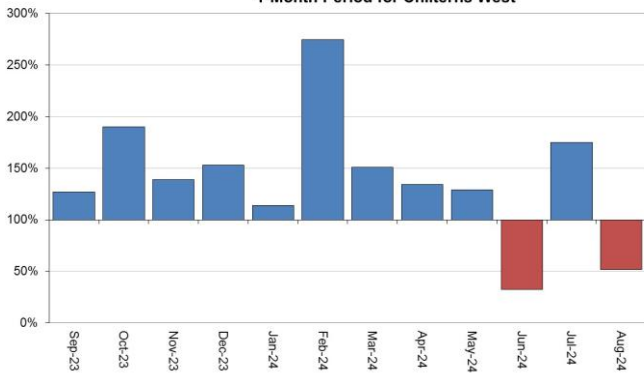
1-Month Period for Berkshire Downs



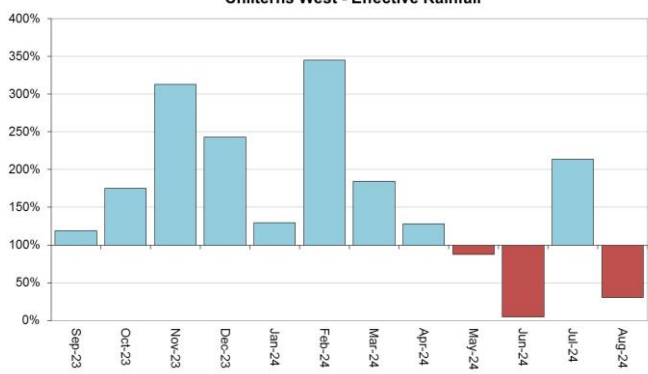
Berkshire Downs - Effective Rainfall



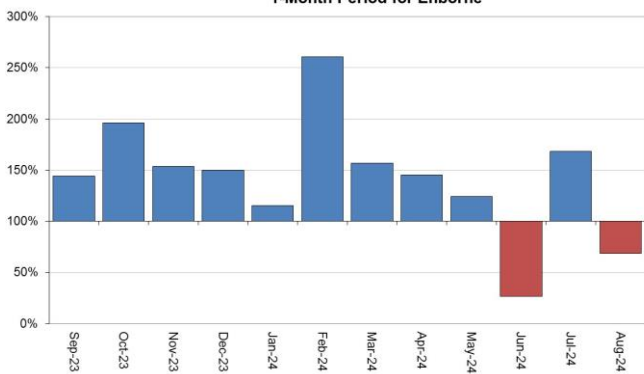
1-Month Period for Chilterns West



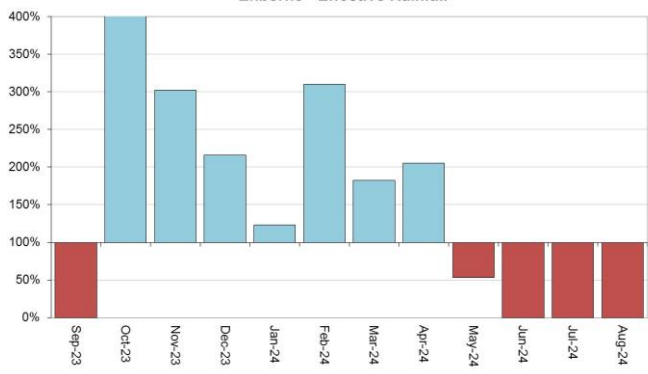
Chilterns West - Effective Rainfall



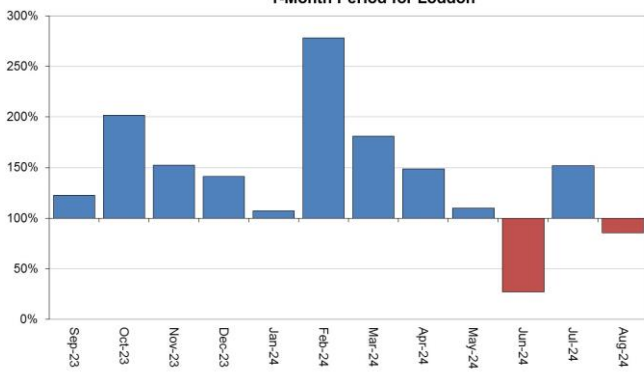
1-Month Period for Enborne



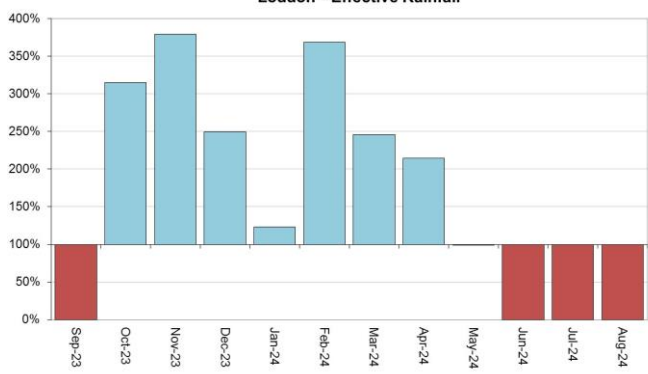
Enborne - Effective Rainfall



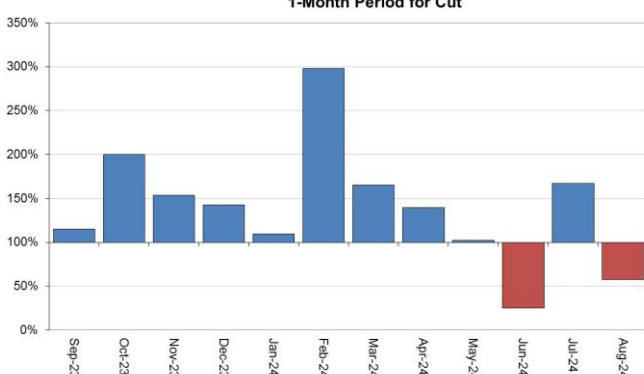
1-Month Period for Loddon



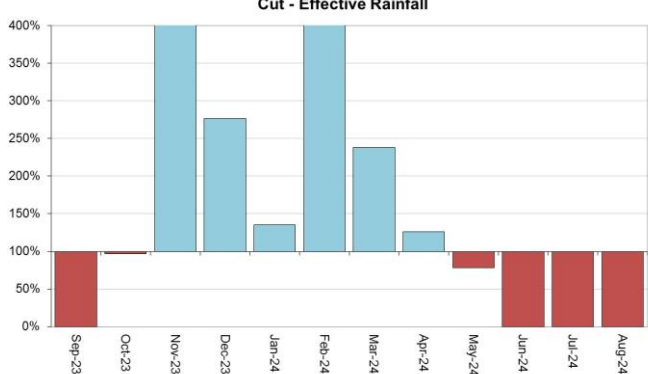
Loddon - Effective Rainfall

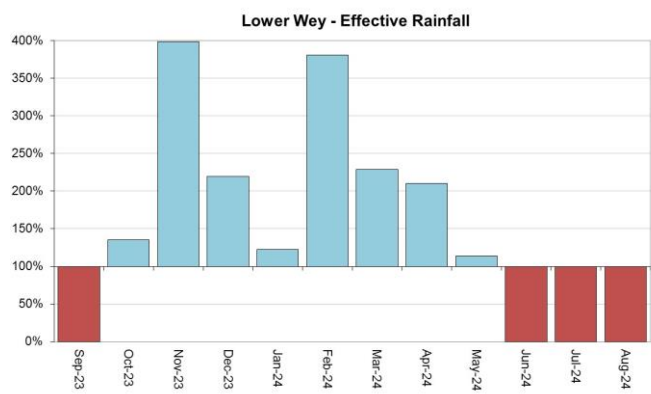
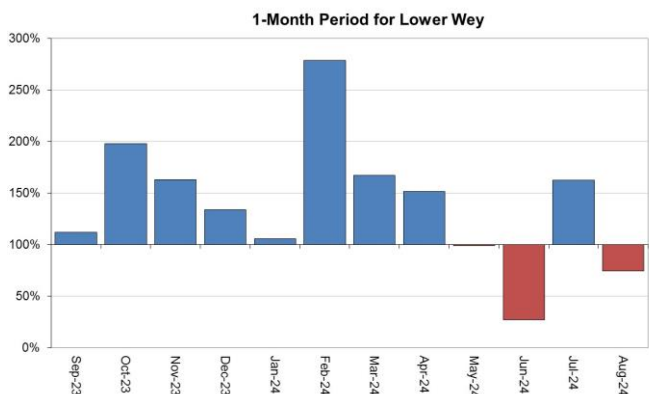
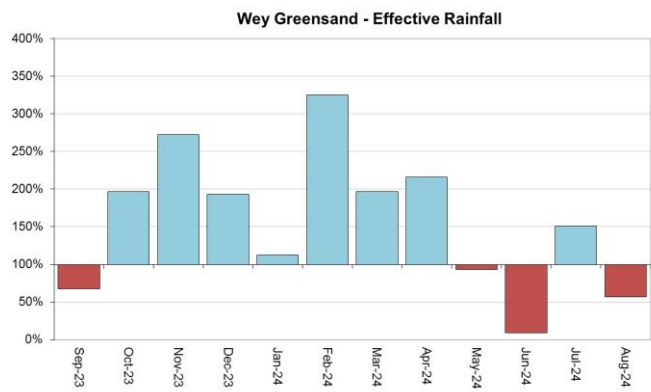
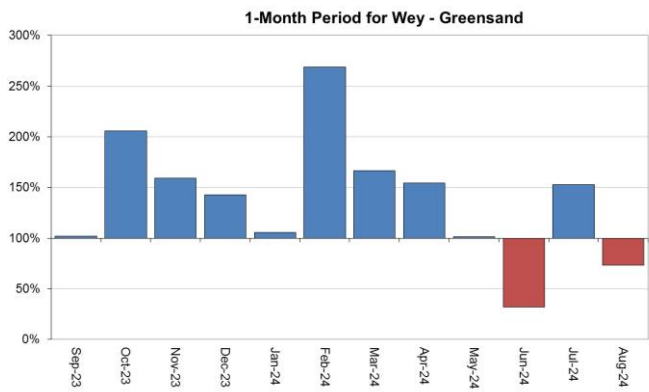
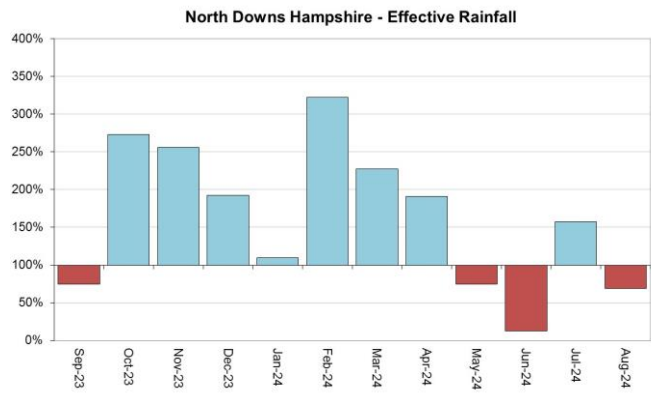
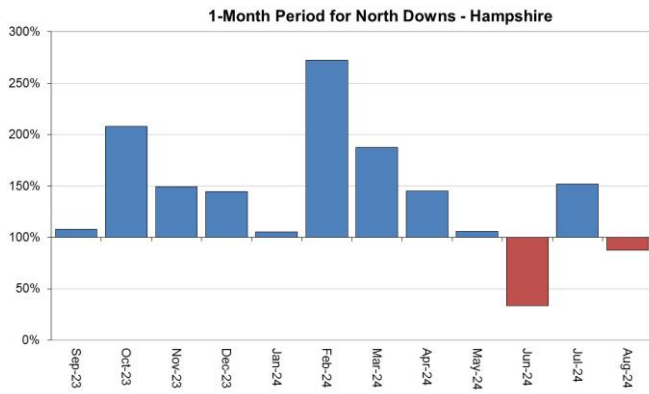


1-Month Period for Cut



Cut - Effective Rainfall





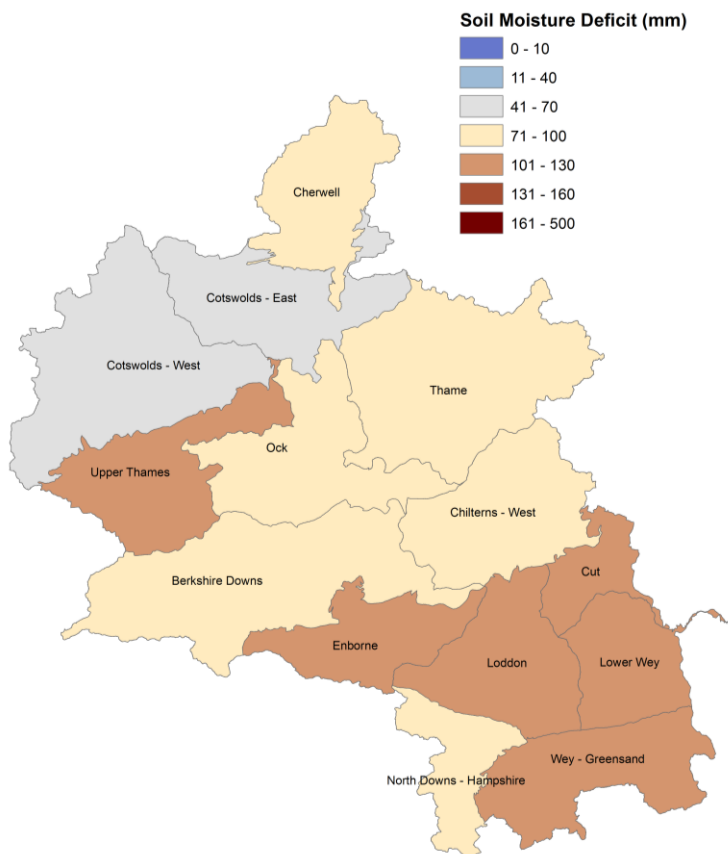
HadUK rainfall data. (Source: Met Office. Crown copyright, 2024).

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 31 August 2024. Shows the areal SMD estimate in millimetres.

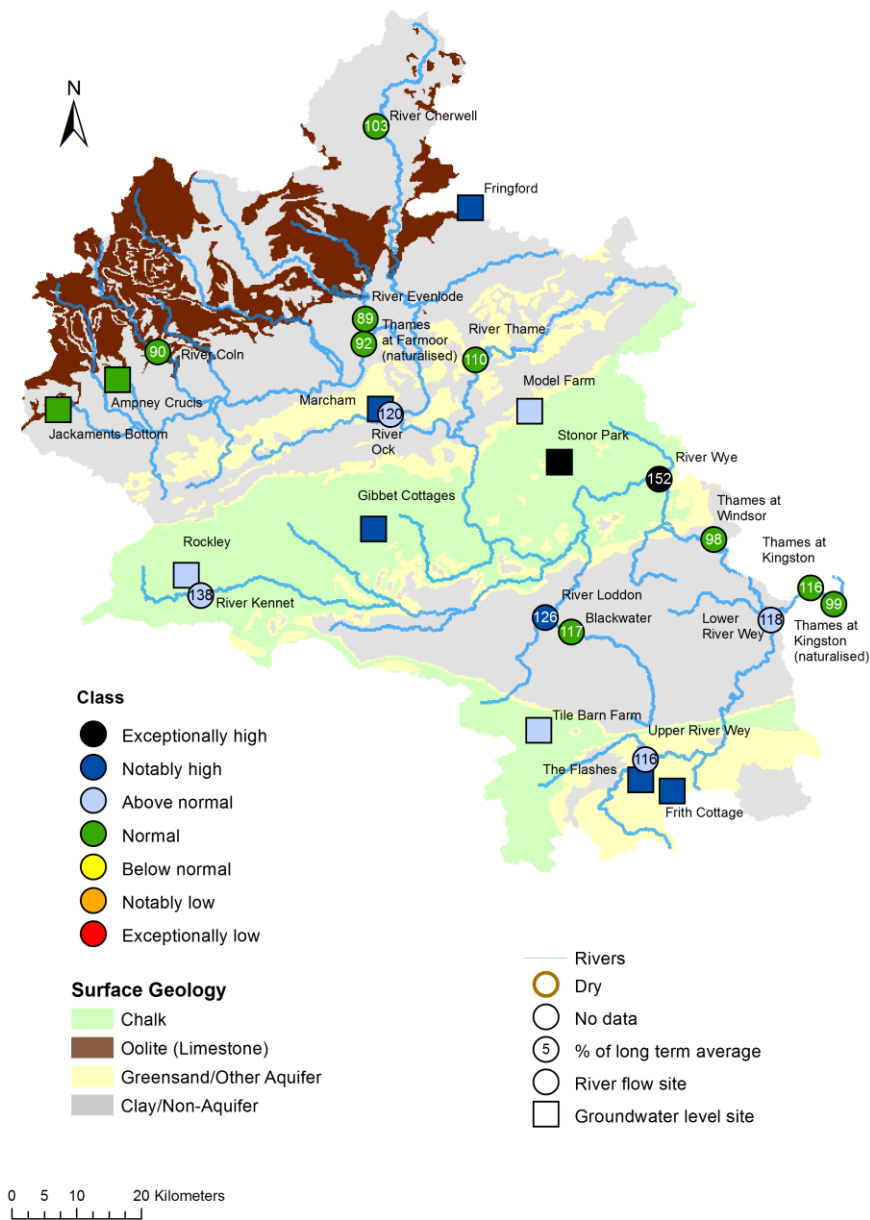


(Source: Met Office. Crown copyright, 2024). All rights reserved. Environment Agency, 100024198, 2024.

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 August 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic August means.

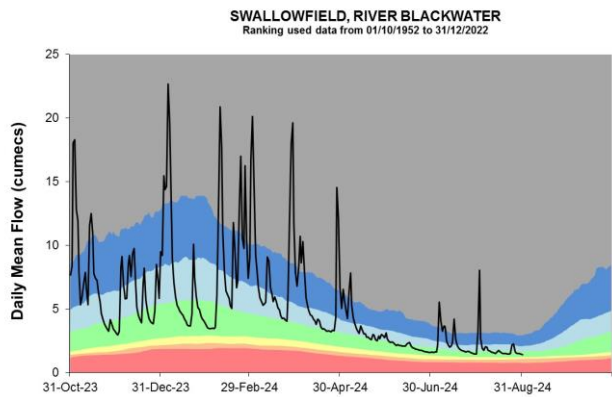
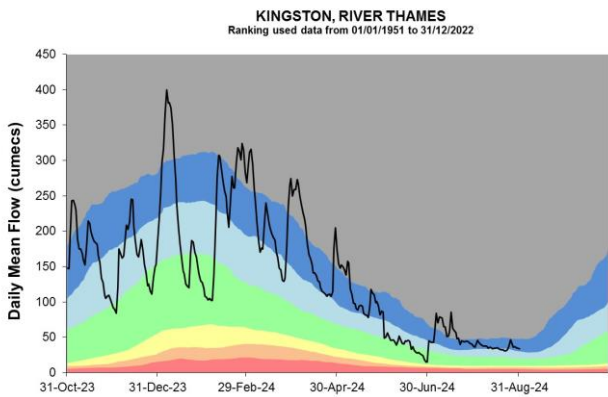
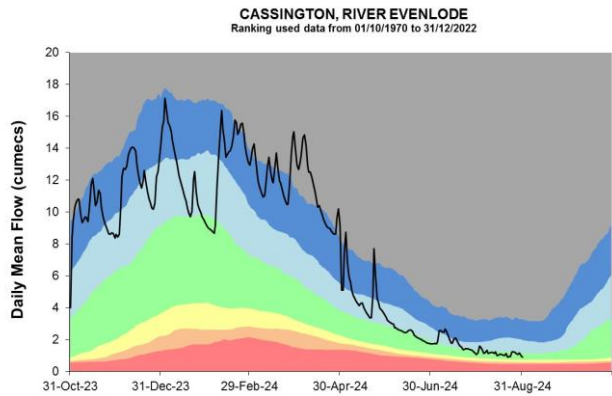
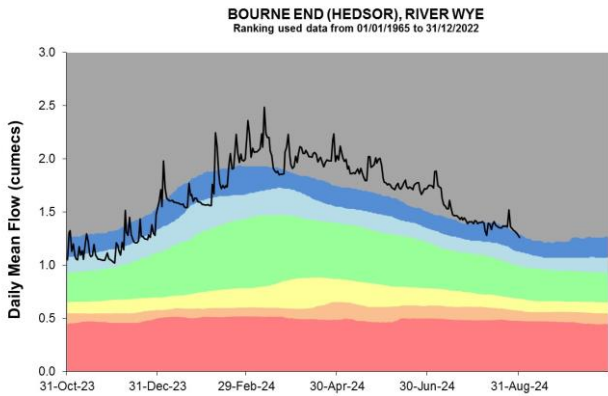
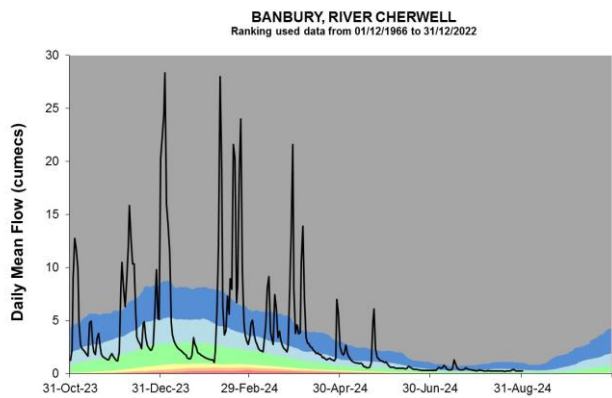
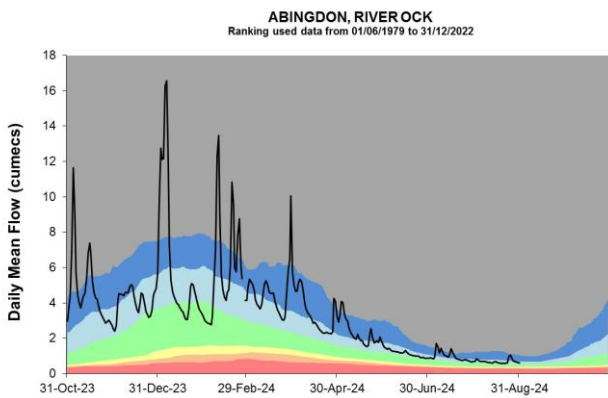
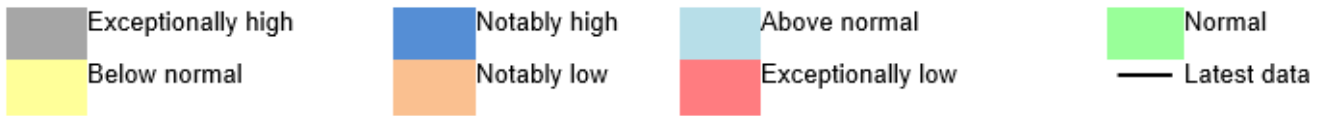


(Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

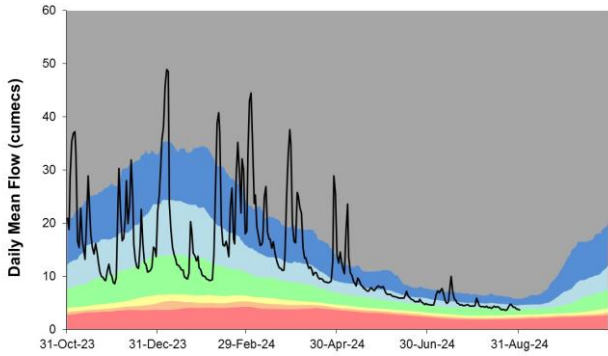
5 River flows

5.1 River flow charts

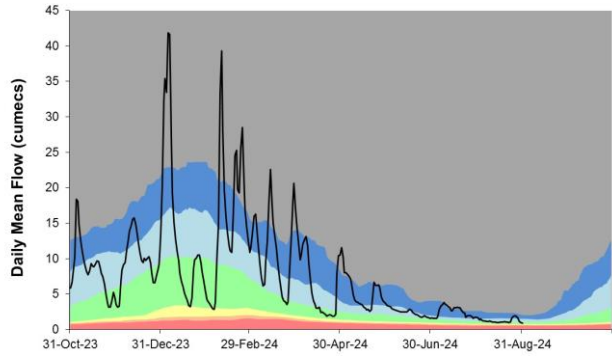
Figure 5.1: Daily mean river flows for indicator sites compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



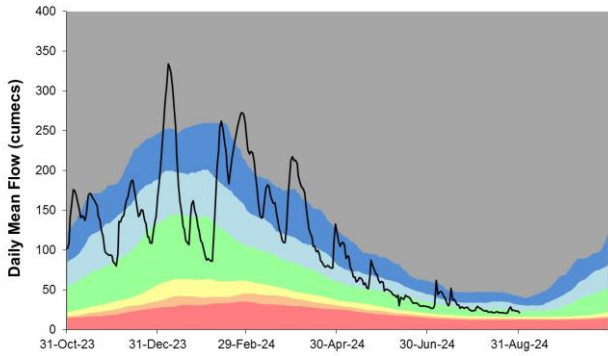
WEYBRIDGE, RIVER WEY
Ranking used data from 01/04/1979 to 31/12/2022



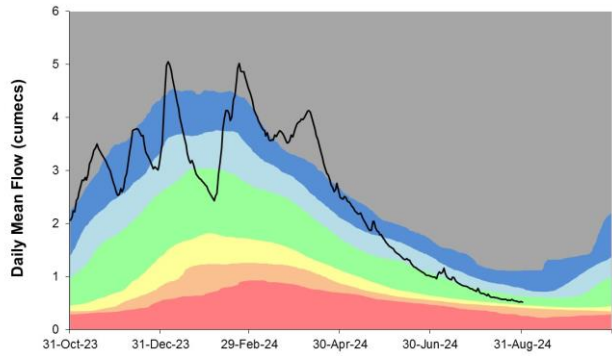
WHEATLEY, RIVER THAME
Ranking used data from 01/01/1990 to 31/12/2022



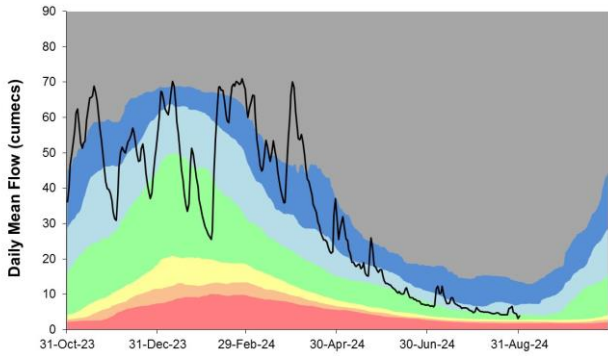
WINDSOR, RIVER THAMES
Ranking used data from 01/08/1979 to 31/12/2022



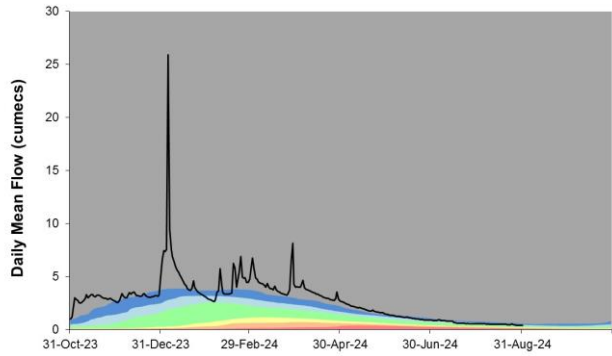
BIBURY, RIVER COLN
Ranking used data from 01/10/1963 to 31/12/2022

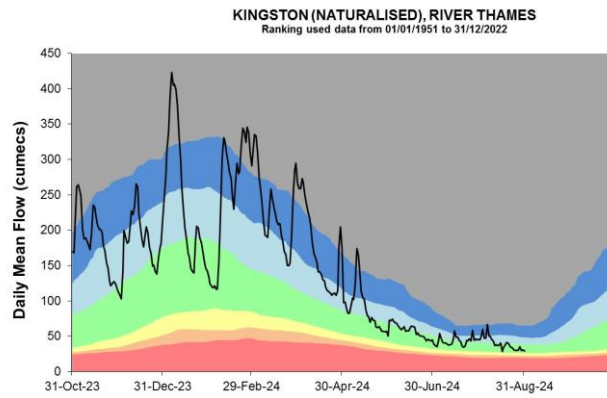
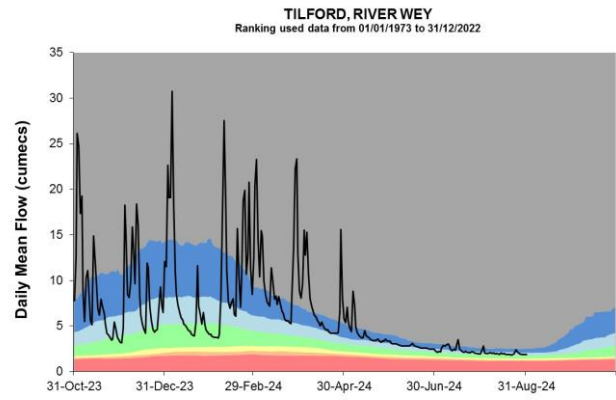
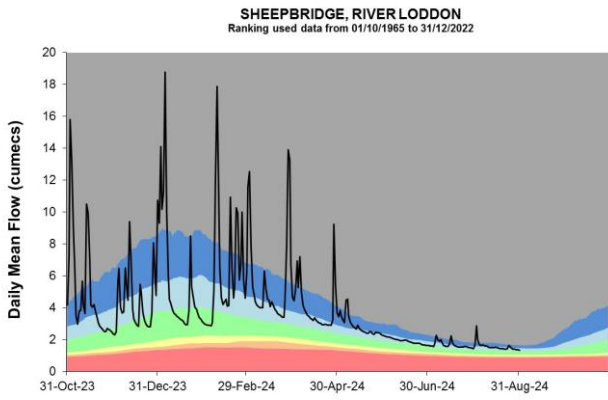


FARMOOR (NATURALISED), RIVER THAMES
Ranking used data from 01/10/1992 to 31/12/2022



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



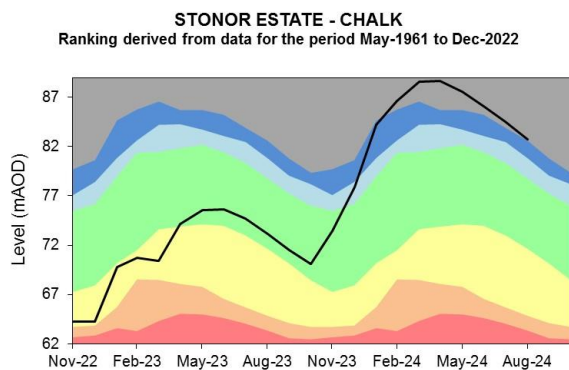
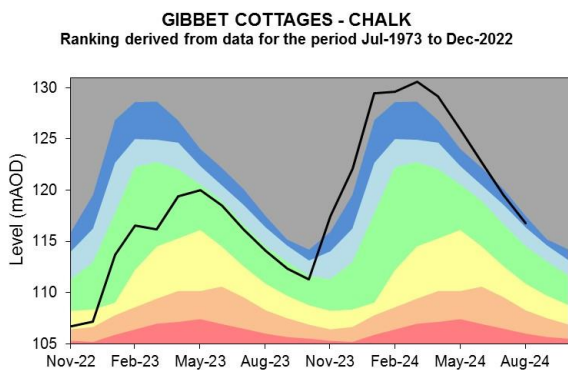
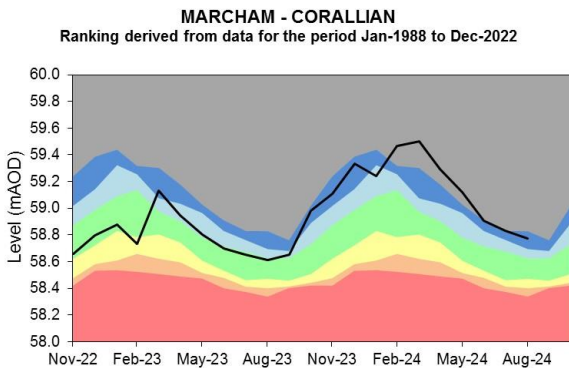
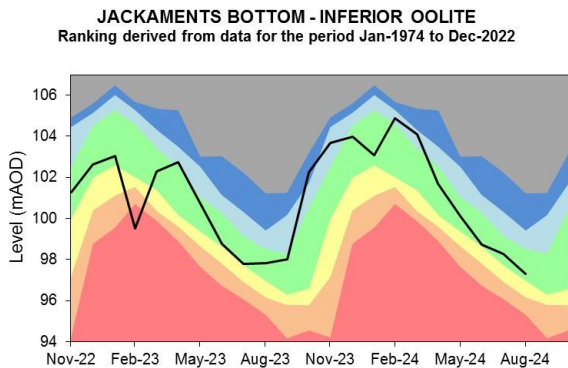
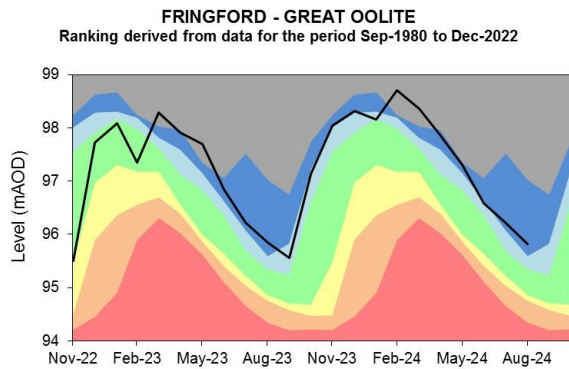
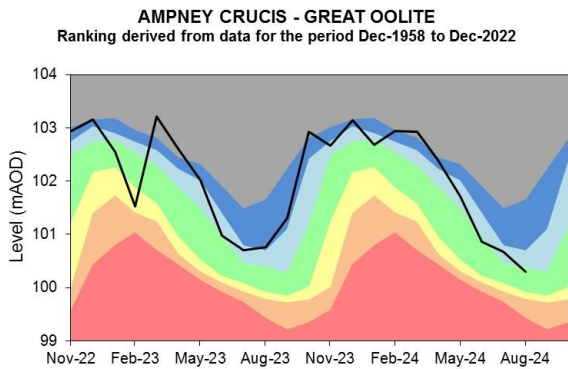
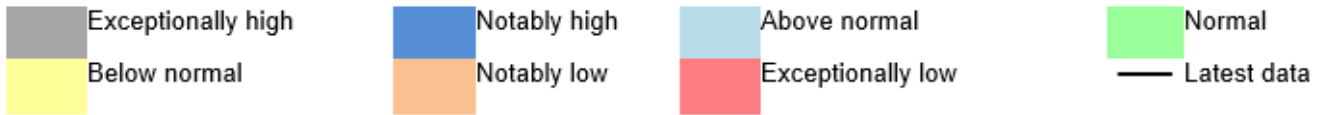


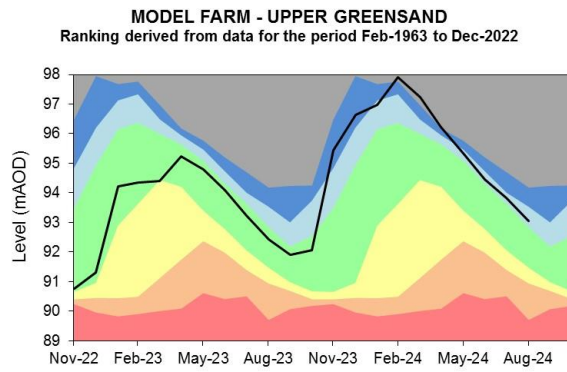
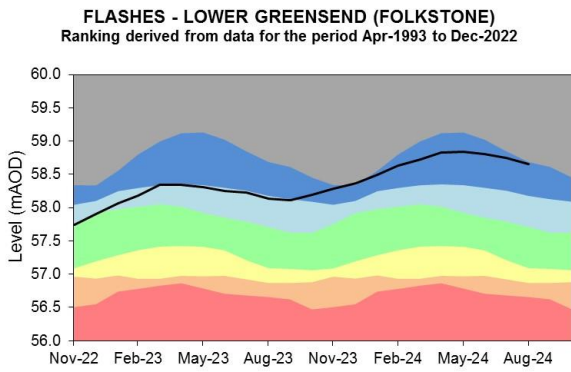
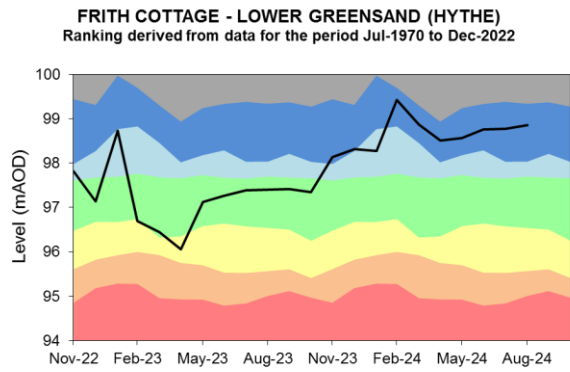
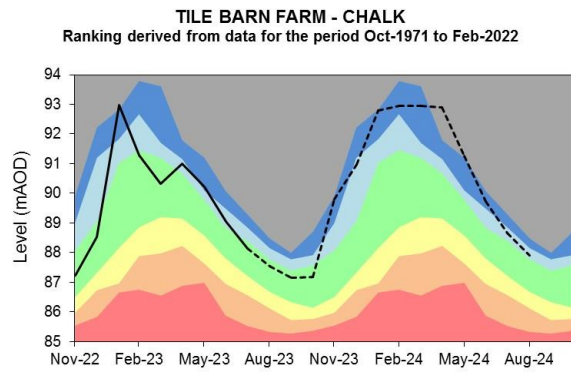
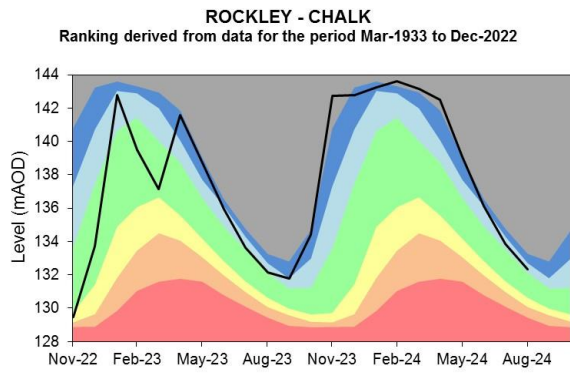
Source: Environment Agency.

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.



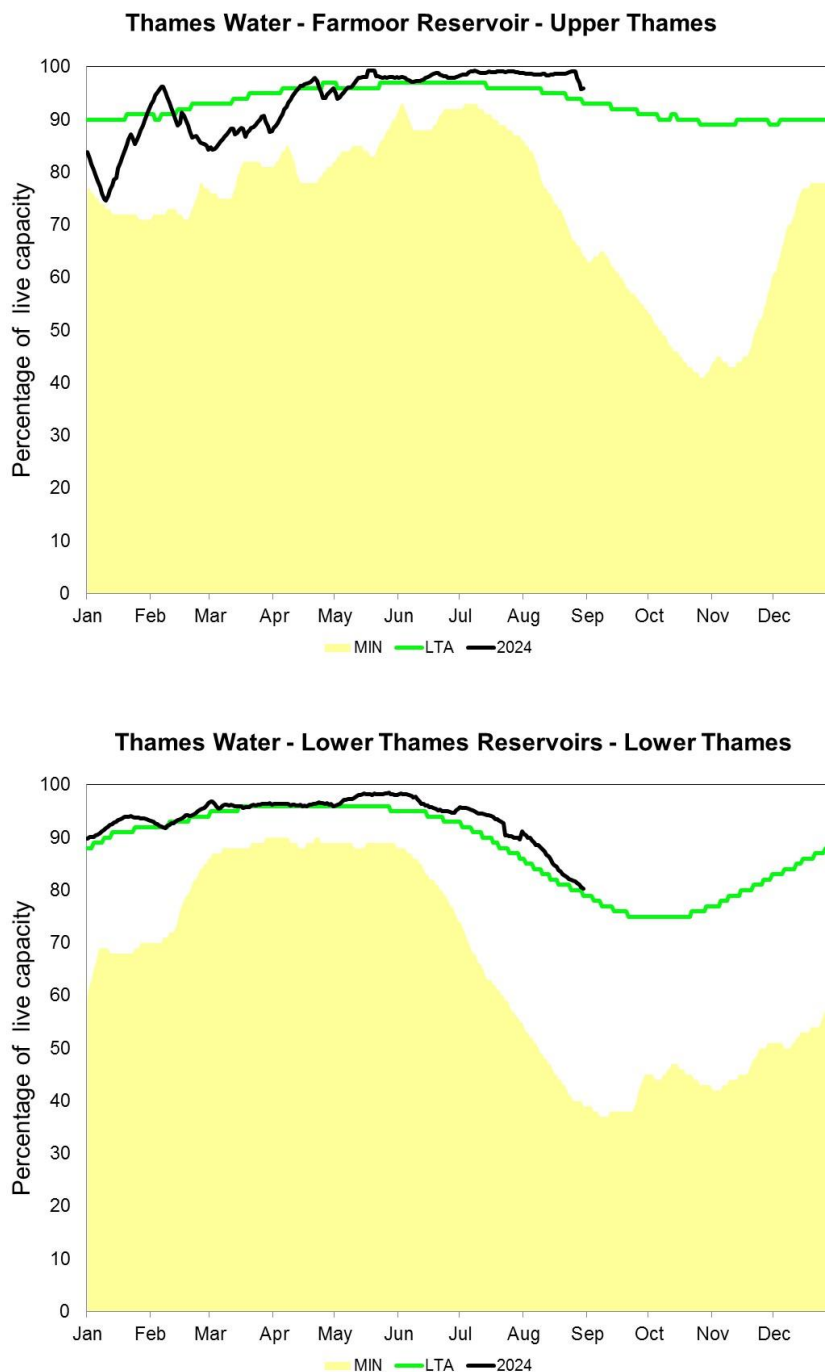


*Tile Barn Farm data has been estimated from two local sites since April 2022. A replacement is planned

Source: Environment Agency, 2024.

7 Reservoir stocks

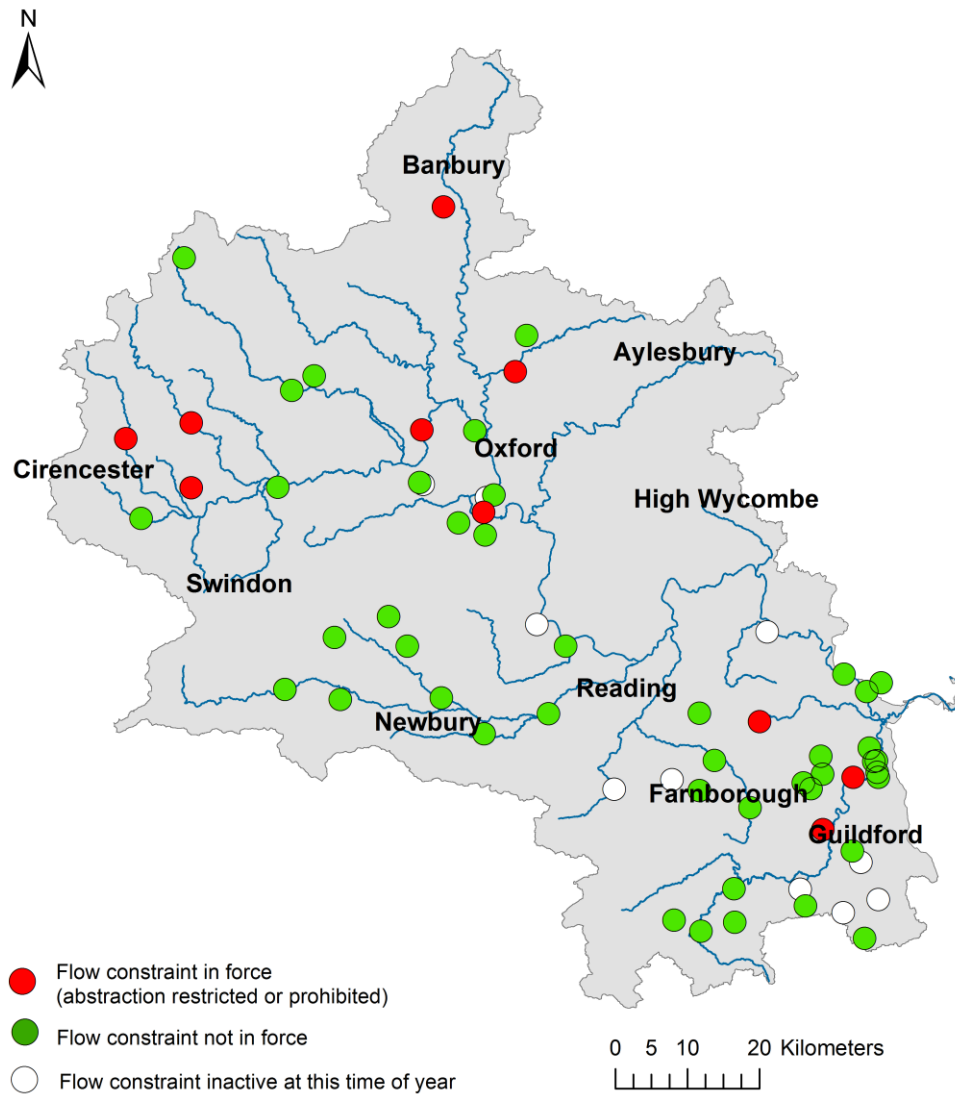
Figure 7.1: End of month regional reservoir stocks compared to minimum and average stocks.



(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	04/08/24	11/08/24	18/08/24	25/08/24
Number of licences being constrained	8	9	17	11

9 Summary of rainfall, effective rainfall and soil moisture deficit

9.1 Rainfall and effective rainfall

Area	Rainfall (mm) 31 day Total	Rainfall (mm) August LTA	Rainfall (mm) % LTA	Effective Rainfall (mm) 31 day total	Effective Rainfall (mm) August LTA	Effective Rainfall (mm) % LTA
Cotswolds - West	50	67	75	3	8	44
Cotswolds - East	42	61	70	3	7	45
Berkshire Downs	47	65	72	3	6	54
Chilterns - West	33	63	52	2	6	31
North Downs - Hampshire	54	62	87	4	6	69
Wey - Greensand	45	61	73	3	6	57
Upper Thames	45	58	78	0	0	0
Cherwell	41	64	63	0	1	0
Thame	35	57	62	0	0	0
Loddon	46	54	86	0	0	0
Lower Wey	41	54	75	0	0	0
Ock	42	54	78	0	0	0
Enborne	42	61	68	0	0	0
Cut	31	54	58	0	0	0
Thames Area	42	60	71	1	3	49

HadUK rainfall data (Source: Met Office Crown copyright 2023)

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

9.2 Soil moisture deficit

Area	SMD (mm) Day 31	SMD (mm) LTA
Cotswolds - West	57	57
Cotswolds - East	62	62
Berkshire Downs	96	91
Chilterns - West	98	92
North Downs - Hampshire	98	90
Wey - Greensand	101	89
Upper Thames	100	94
Cherwell	92	80
Thame	93	89
Loddon	104	97
Lower Wey	104	93
Ock	99	99
Enborne	100	90
Cut	110	100
Thames Area	94	87

HadUK rainfall data (Source: Met Office Crown copyright 2023)

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

9.3 Summer rainfall and effective rainfall

Summer period: 01/04/2024 to 31/08/2024						
Area	Rainfall (mm) Total	Rainfall (mm) LTA	Rainfall (mm) % LTA	Effective Rainfall (mm) Total	Effective Rainfall (mm) LTA	Effective Rainfall (mm) % LTA
Cotswolds - West	336	297	113	67	53	125
Cotswolds - East	300	272	110	46	42	107
Berkshire Downs	298	283	105	48	40	118
Chilterns - West	282	280	101	38	41	93
North Downs - Hampshire	300	289	104	54	46	117
Wey - Greensand	291	286	102	61	49	126
Upper Thames	274	263	104	18	13	135
Cherwell	288	275	105	31	19	162
Thame	284	261	109	25	15	163
Loddon	265	256	104	24	15	157
Lower Wey	256	253	101	26	17	152
Ock	264	248	106	11	11	97
Enborne	274	269	102	25	18	138
Cut	245	255	96	14	15	96
Thames Area	283	271	104	35	28	123

HadUK rainfall data (Source: Met Office Crown copyright 2023)

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	Aug 2024 rainfall % of long term average 1961 to 1990	Aug 2024 band	Jun 2024 to August cumulative band	Mar 2024 to August cumulative band	Sep 2023 to August cumulative band
Berkshire Downs	72	Normal	Below normal	Above normal	Exceptionally high
Chilterns West	52	Below Normal	Normal	Normal	Exceptionally high
Cotswold East	69	Below Normal	Below normal	Above normal	Exceptionally high
Cotswold West	74	Normal	Normal	Notably high	Exceptionally high
Cut	58	Below Normal	Below normal	Normal	Exceptionally high
Enborne	69	Normal	Below normal	Above normal	Exceptionally high
Loddon	86	Normal	Normal	Above normal	Exceptionally high
Lower Wey	75	Normal	Normal	Normal	Exceptionally high
North Downs - Hampshire	88	Normal	Normal	Above normal	Exceptionally high
Ock	78	Normal	Below normal	Above normal	Exceptionally high
Thame	62	Below Normal	Normal	Above normal	Exceptionally high
Upper Cherwell	63	Below Normal	Below normal	Above normal	Exceptionally high
Upper Thames	78	Normal	Below normal	Above normal	Exceptionally high
Wey - Greensand	73	Normal	Below normal	Above normal	Exceptionally high

11.2 River flows table

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

11.3 Groundwater table

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