Monthly water situation report: Thames Area

1 Summary - June 2024

Thames area received 18mm of rainfall in June, 34% of the long term average (LTA). All of our areal rainfall units were notably low, except for the Cotswolds West and Cotswolds East units, which were below normal for the time of the year. Soil moisture deficits (SMDs) increased from last month to 76mm across the area and was higher than expected for the time of the year (61mm). Monthly mean river flows at all of our indicator sites decreased in June with all sites recording a normal or higher flows for the time of the year. At the end of the month, groundwater levels at nearly all of our indicator sites continued their seasonal decline, with the majority of the groundwater indicator sites recording higher than normal levels for the time of the year.

1.1 Rainfall

It was a dry month in June, with Thames Area receiving 18mm of rainfall, 34% of the LTA for the month. This month has been the first month since June 2023 that the rainfall is below 100% of the LTA. All of our areal rainfall units were notably low, except the Cotswolds West and Cotswolds East units, which were below normal for the time of the year. Over the last 3 months, rainfall was normal across Thames Area, with the exception of Cotswolds West (above normal). Rainfall over the past 12 months was exceptionally high across the Area, and this 12 month period to June has been the wettest on record.

1.2 Soil moisture deficit and recharge

SMDs for in Thames Area increased to 76mm by the end of June. This meant that soils were drier than expected for the time of the year (61mm LTA). As a result of notably low rainfall across majority of the Thames area, the effective rainfall was below average for the time of the year.

1.3 River flows

Due to dry conditions in June, all of our indicator sites had decreasing monthly mean flow compared to May. Despite this, all our indicator sites recorded normal or higher flows for the time of the year. This is due to high rainfall over the past 6 months and 12 months leading to aquifer recharge and higher than normal groundwater levels at majority of the sites. Being supported by the strong base flow, the River Kennet at Marlborough was notably high, and the River Wye at Bourne End remained exceptionally high for the time of the year.

1.4 Groundwater levels

Groundwater levels at all our indicator sites continued their seasonal decline in June, except for Frith Cottage in the Lower Greensand. Nearly all the groundwater indicator sites recorded higher than normal levels, with the exception of Jackaments Bottom (Inferior Oolite) and Ampney Crucis (Great Oolites) whose groundwater levels were normal. Despite the decline, groundwater levels of the Chalk at Stonor Estate and Gibbet Cottages remained exceptionally high for the time of the year.

1.5 Reservoir stocks

Reservoir capacity at Farmoor remained at 98% and was above the LTA at the end of the month. Capacity at the Lower Thames reservoirs decreased from 98% in May to 95% at the end of June but remained above the LTA for the time of the year.

1.6 Environmental impact

There were no flood alerts or warnings issued across Thames Area during June due to the dry conditions. At the end of June 19 abstraction licences were being constrained in Thames Area in order to protect water resources and the environment.

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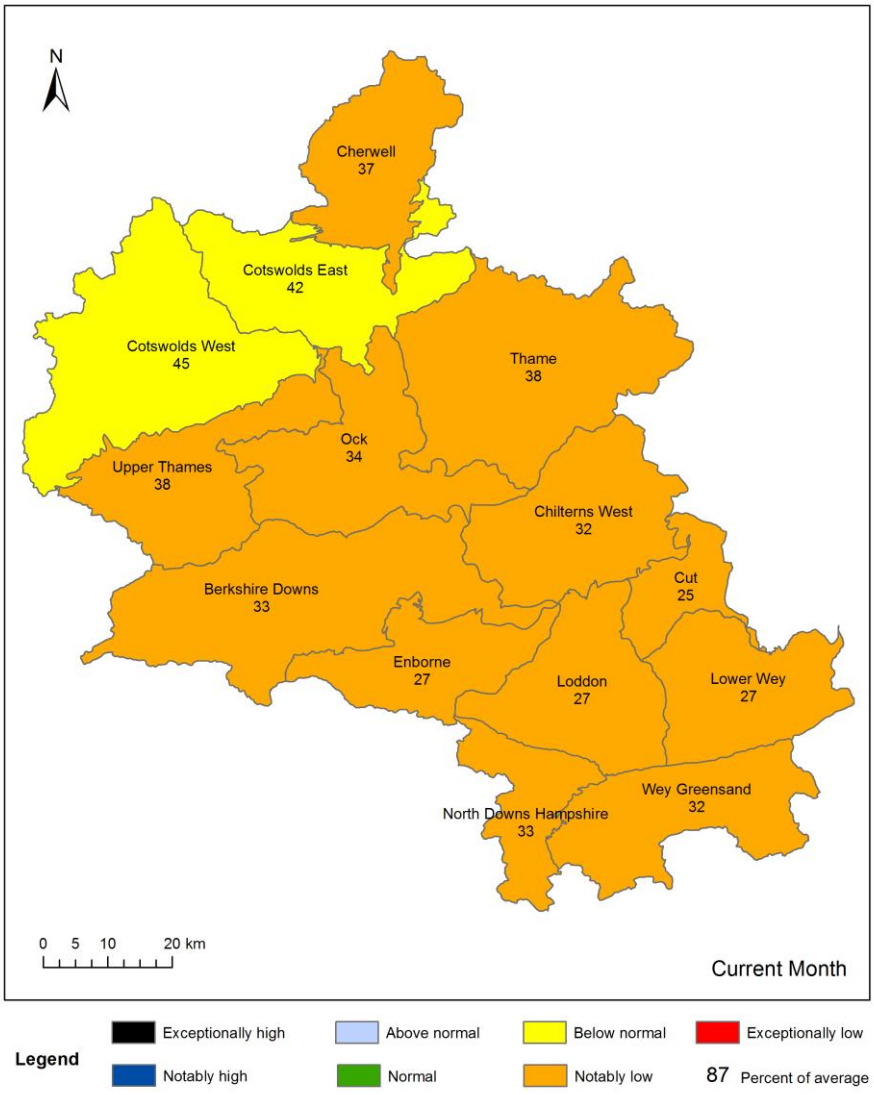
2 Rainfall

2.1 Rainfall map

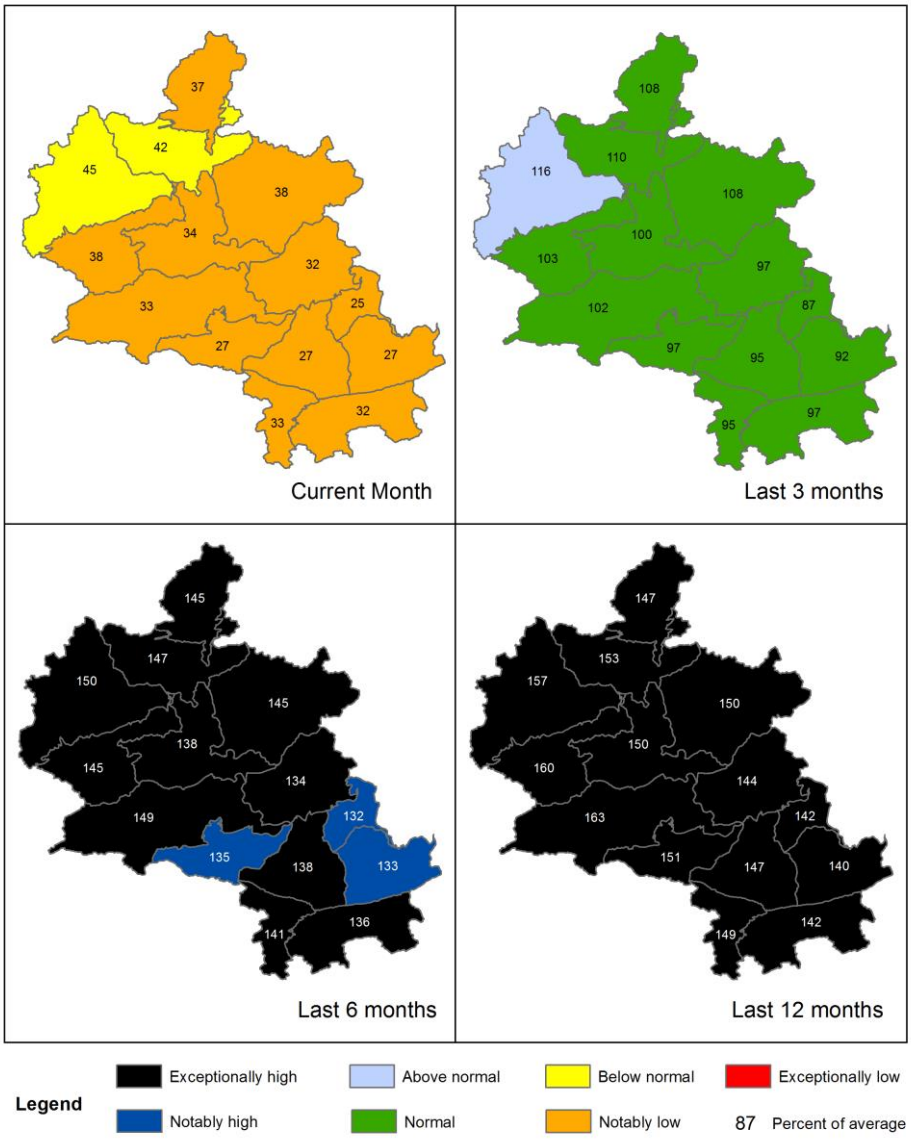
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 30 June 2024), classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



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)

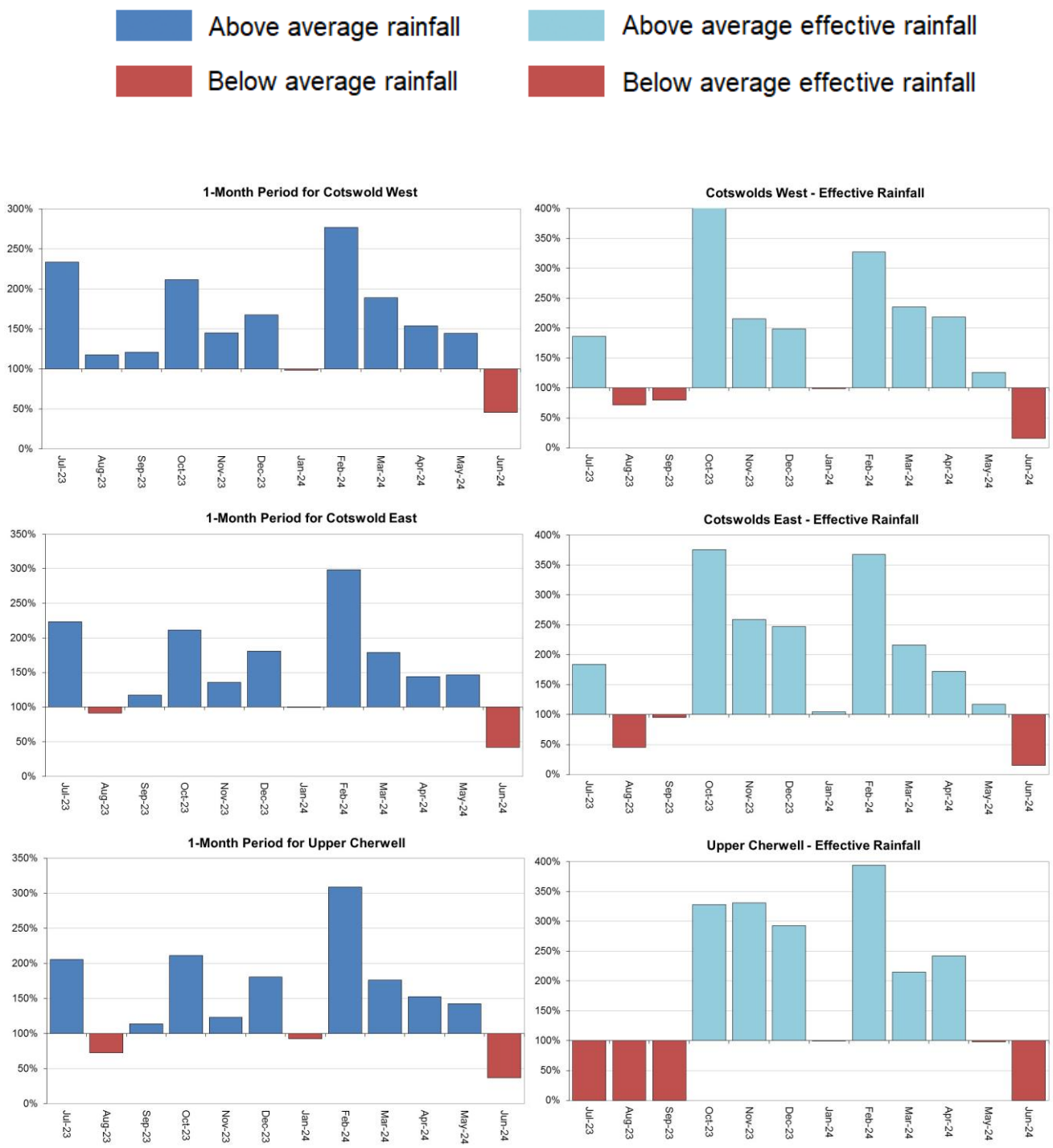
Figure 2.2: Total rainfall for hydrological areas for the current month (up to 30 June 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.

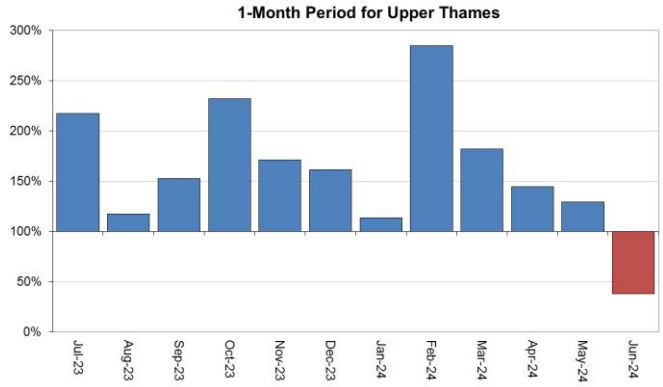


HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2024). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved.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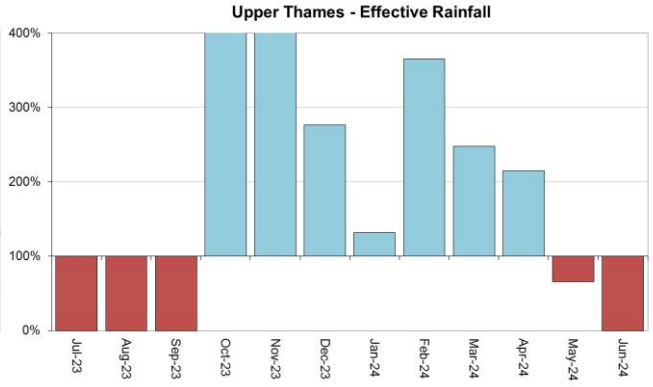
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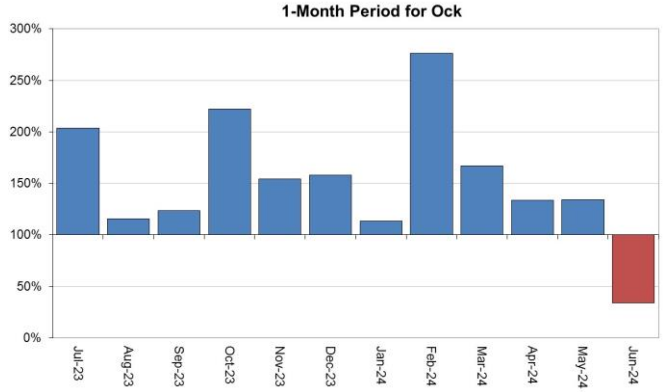
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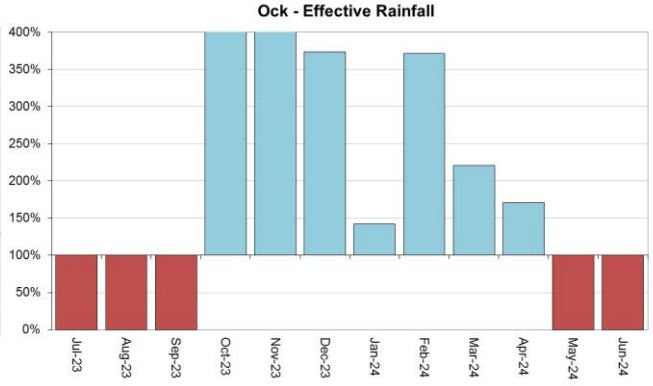
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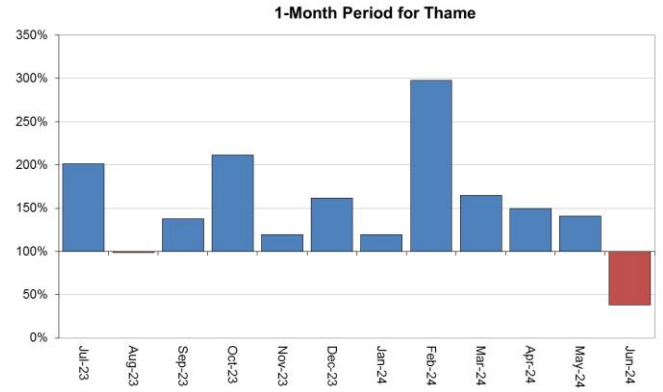
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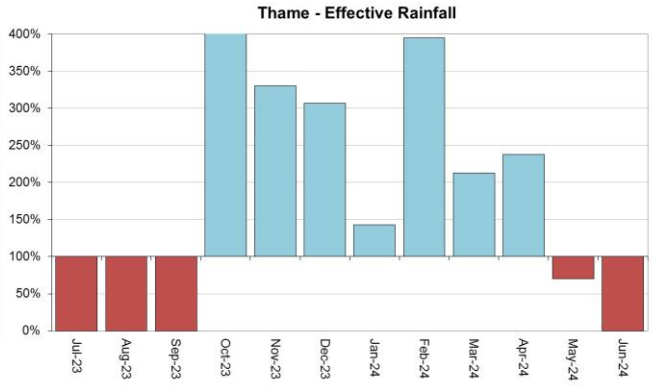
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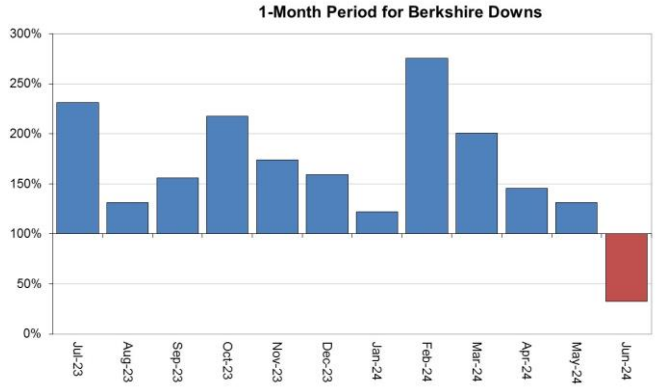
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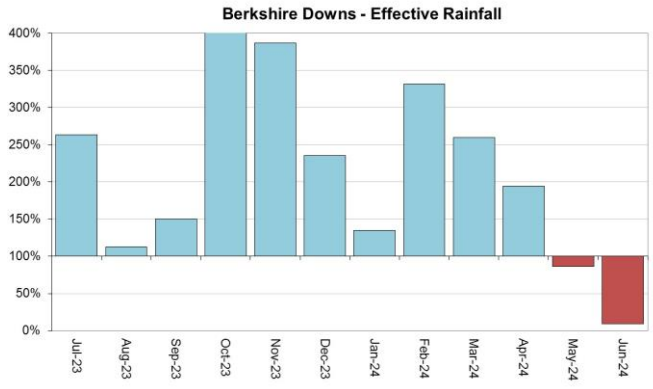
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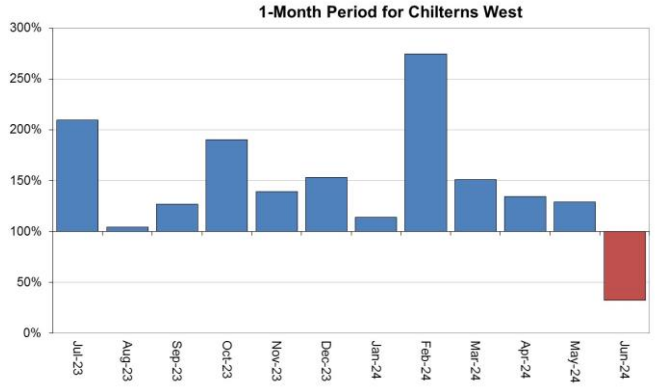
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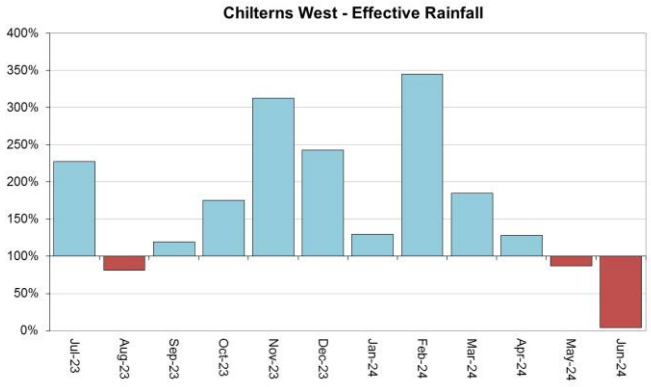
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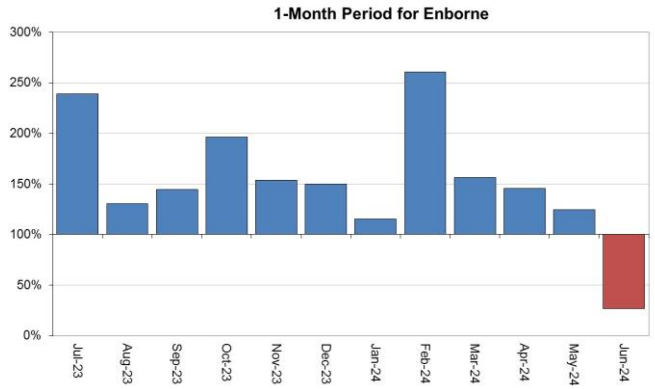
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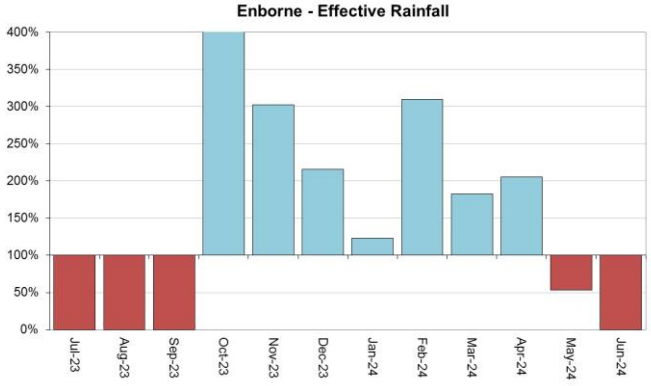
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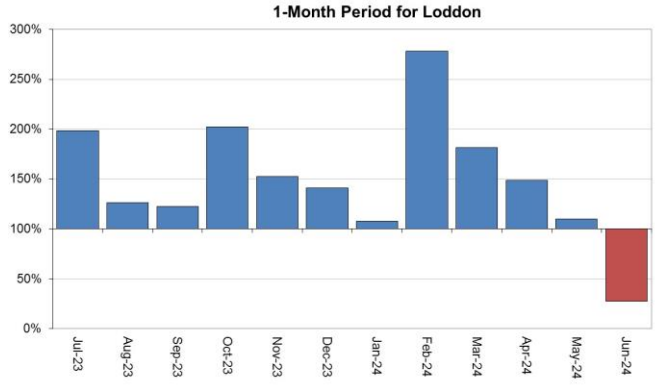
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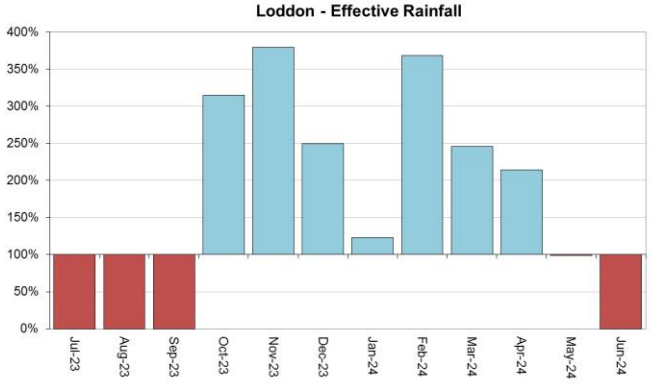
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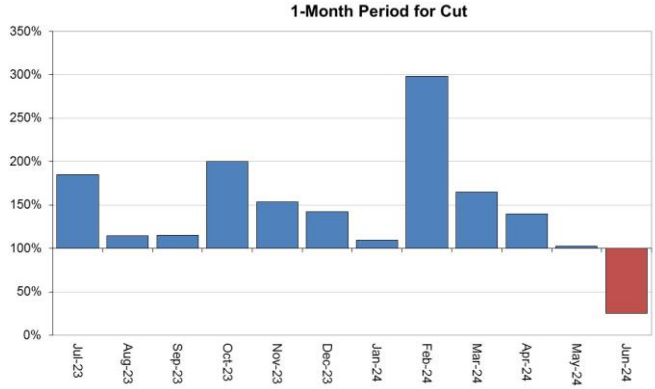
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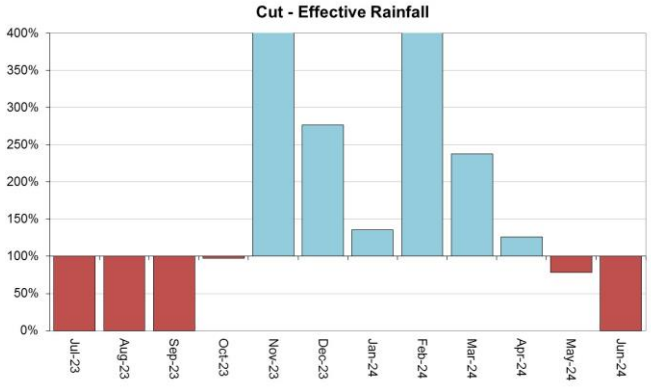
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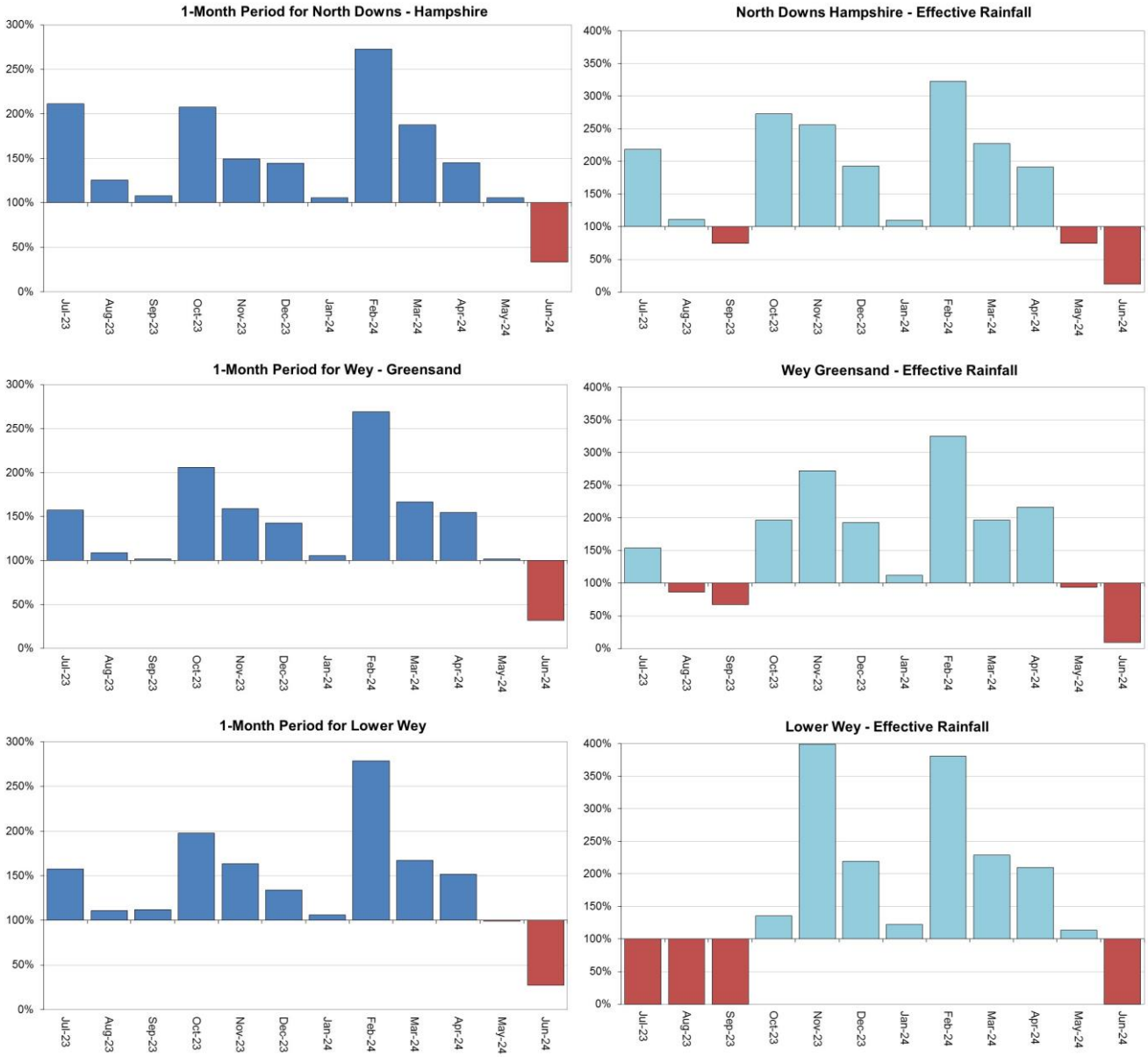


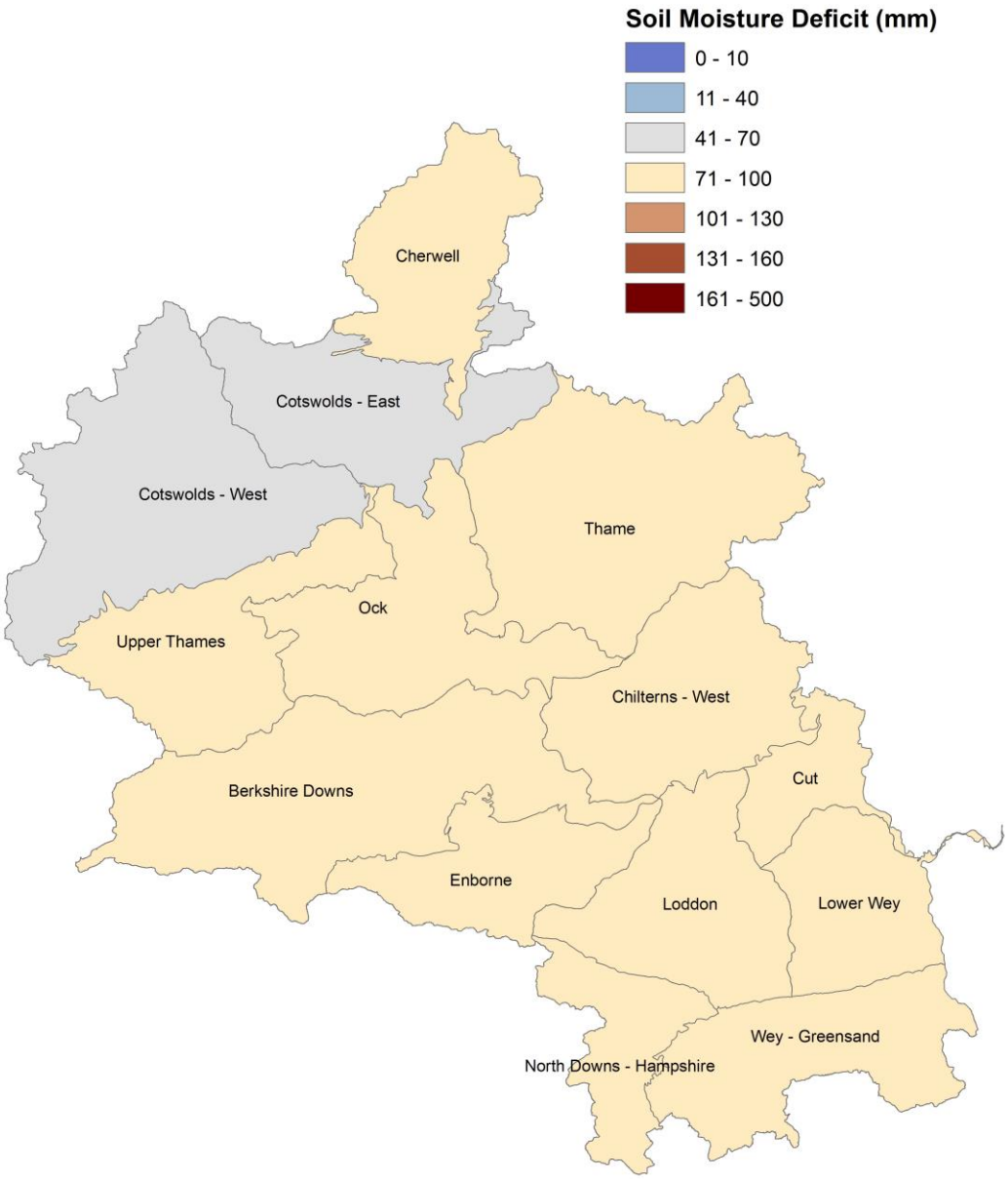
HadUK rainfall data. (Source: Met Office. Crown copyright, 2024).

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

3 Soil moisture deficit

3.1 Soil moisture deficit map

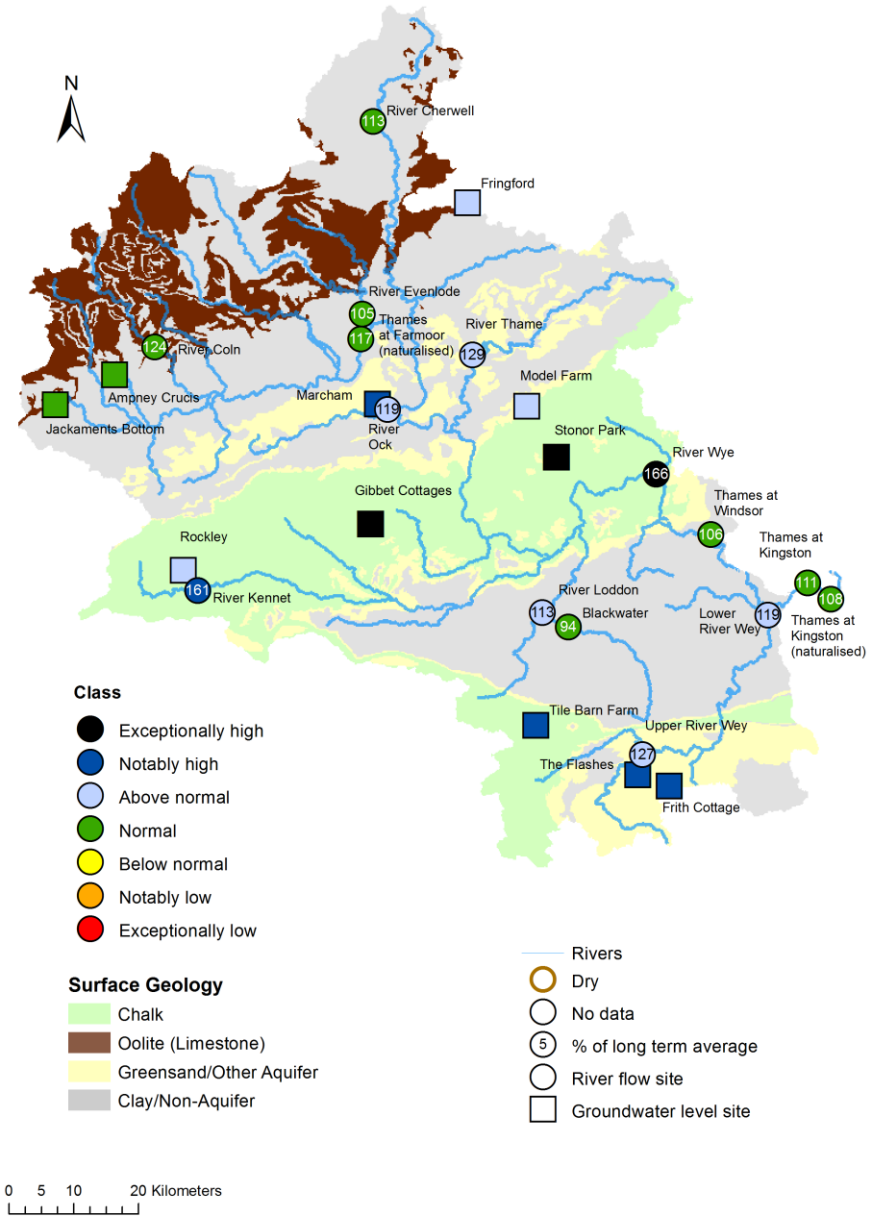
Figure 3.1: Soil moisture deficits for the week ending 30 June 2024. Shows the areal SMD estimate in millimetres.



4 River Flow and Groundwater Status

4.1 River flow and groundwater level map

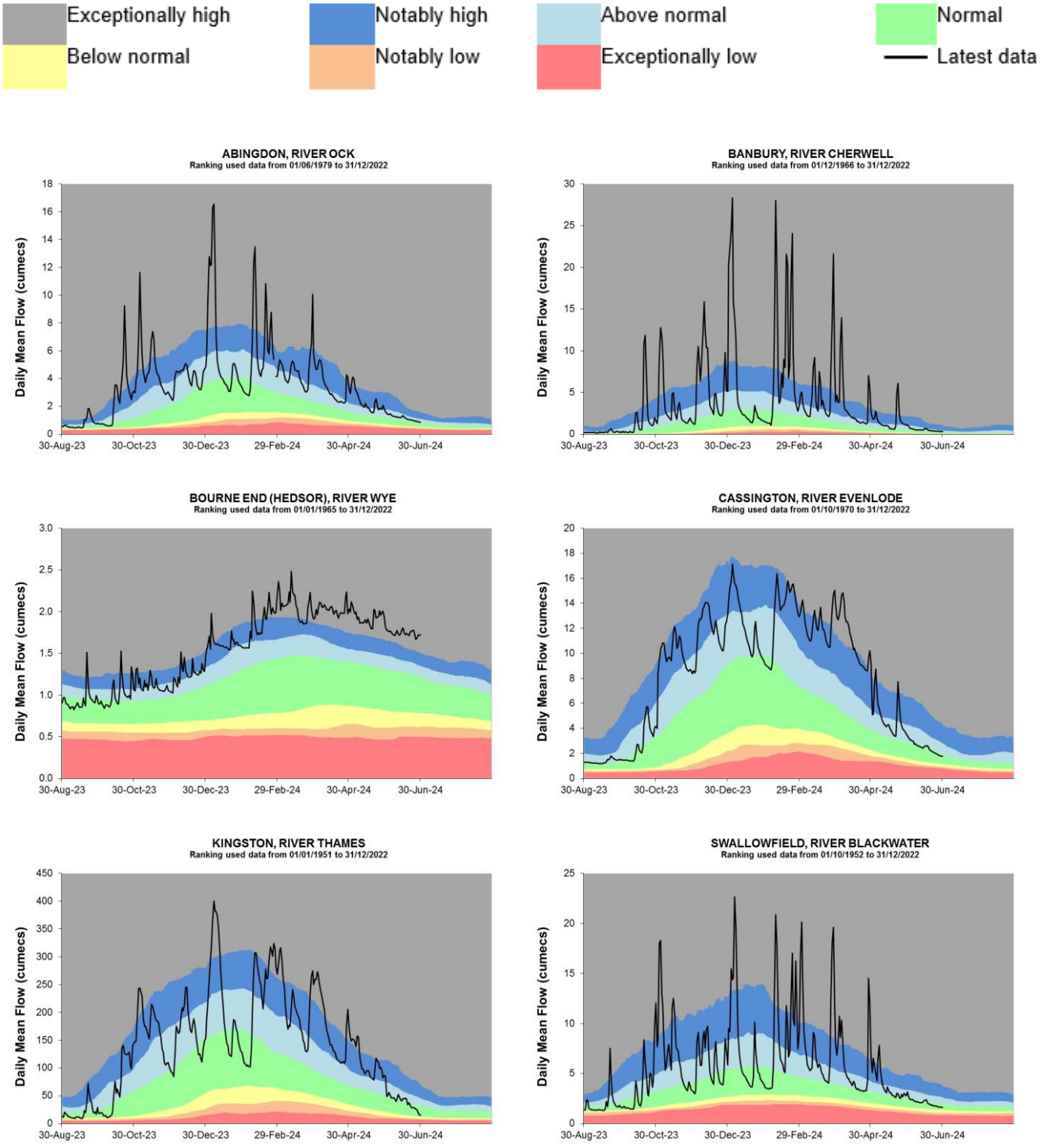
Figure 4.1: Monthly mean river flow for indicator sites and end of month groundwater levels for indicator sites for June 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic June means.



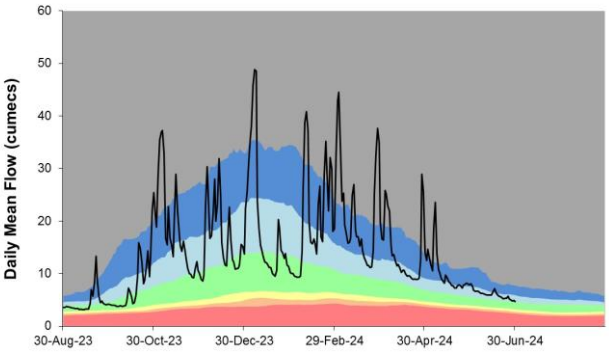
5 River flows

5.1 River flow charts

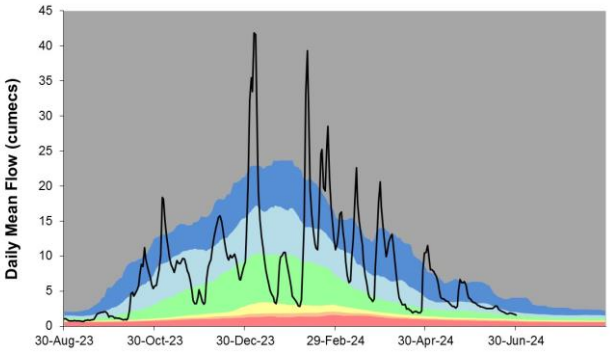
Figure 5.1: Daily mean river flows for indicator sites compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



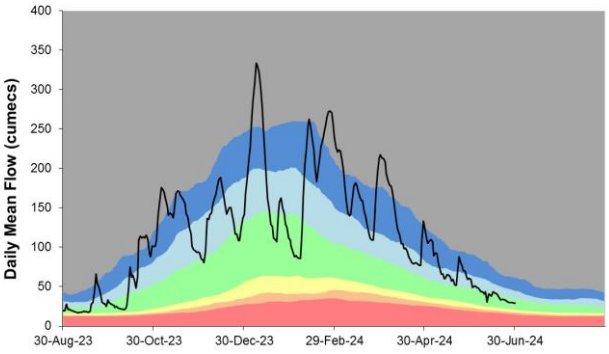
WEYBRIDGE, RIVER WEY
Ranking used data from 01/04/1979 to 31/12/2022



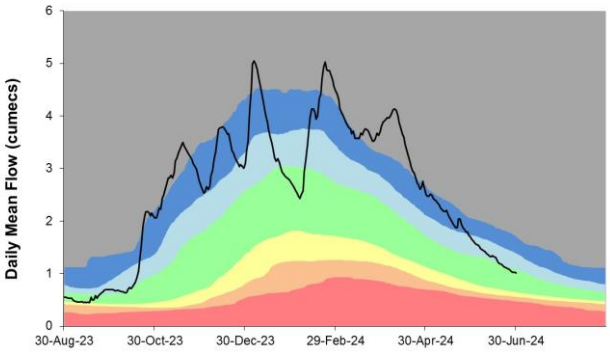
WHEATLEY, RIVER THAME
Ranking used data from 01/01/1990 to 31/12/2022



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



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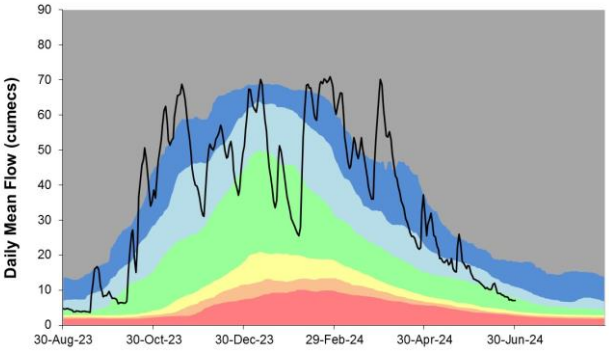
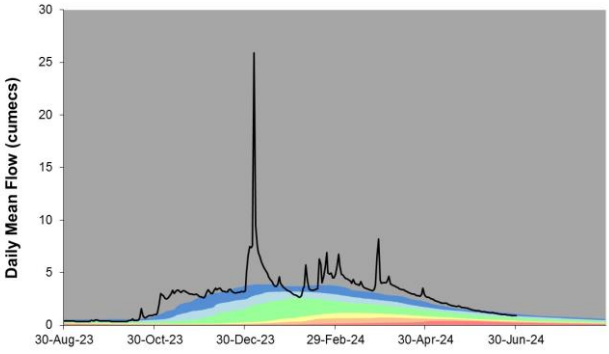
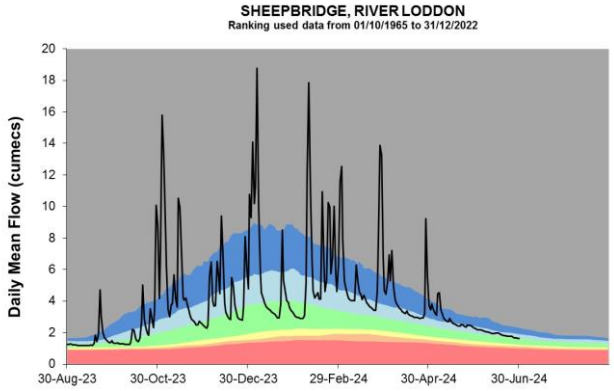
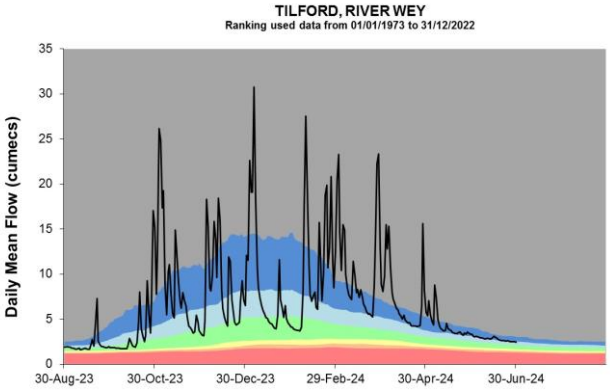
Ranking used data from 01/10/1992 to 31/12/2022

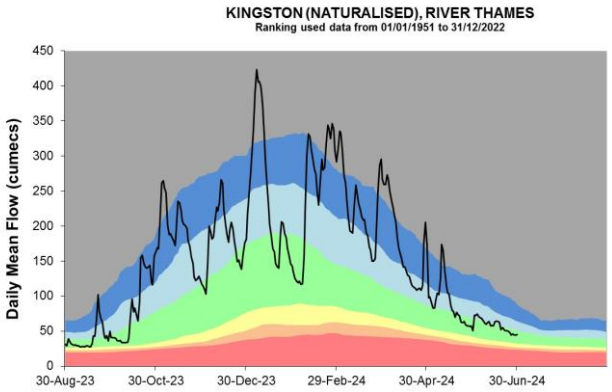


MARLBOROUGH, RIVER KENNET
Ranking used data from 01/02/1972 to 31/12/2022







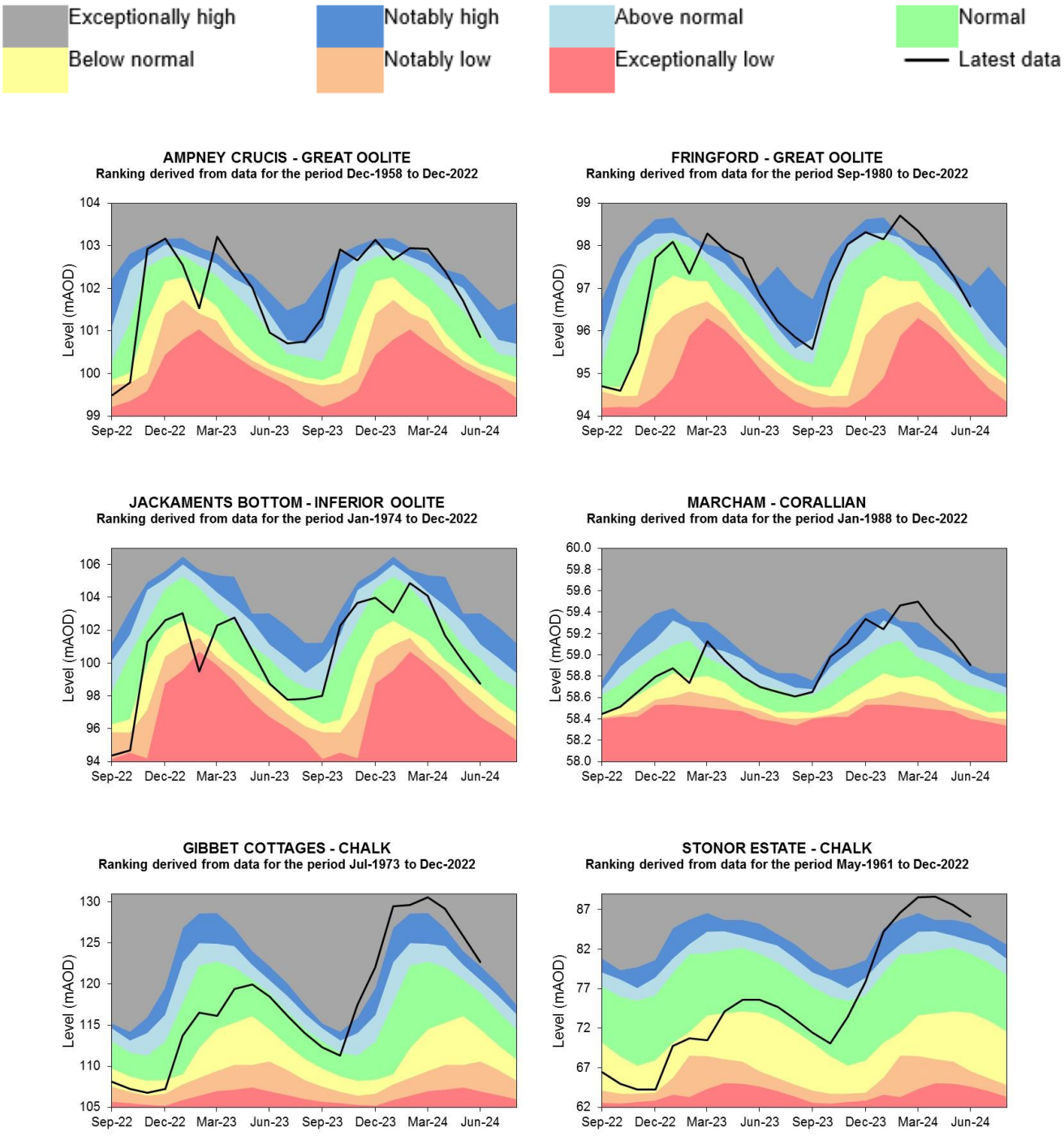


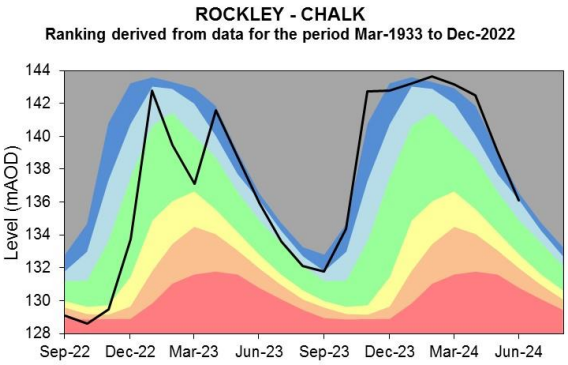
Source: Environment Agency.

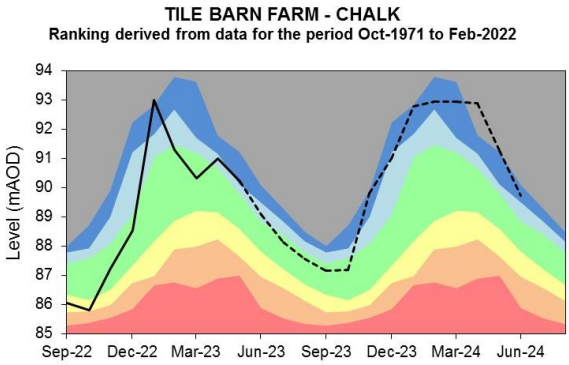
6 Groundwater levels

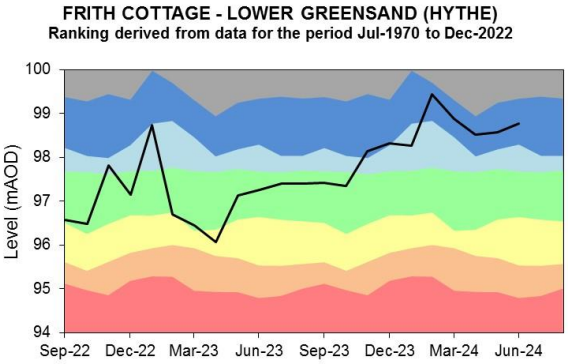
6.1 Groundwater level charts

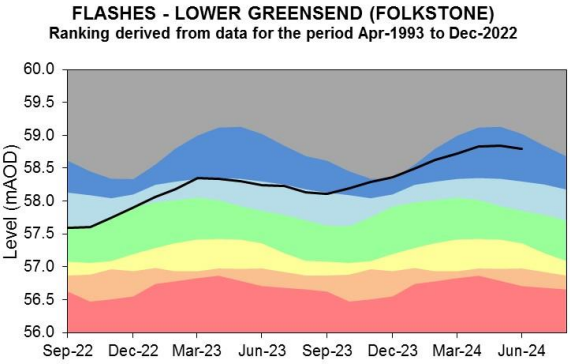
Figure 6.1: End of month groundwater levels for indicator sites, compared to an analysis of historic end of month levels, and long term maximum and minimum levels.

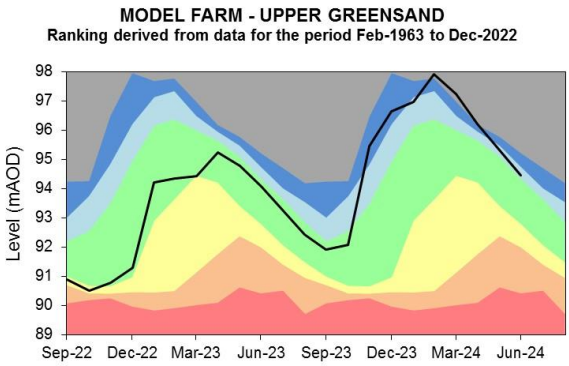










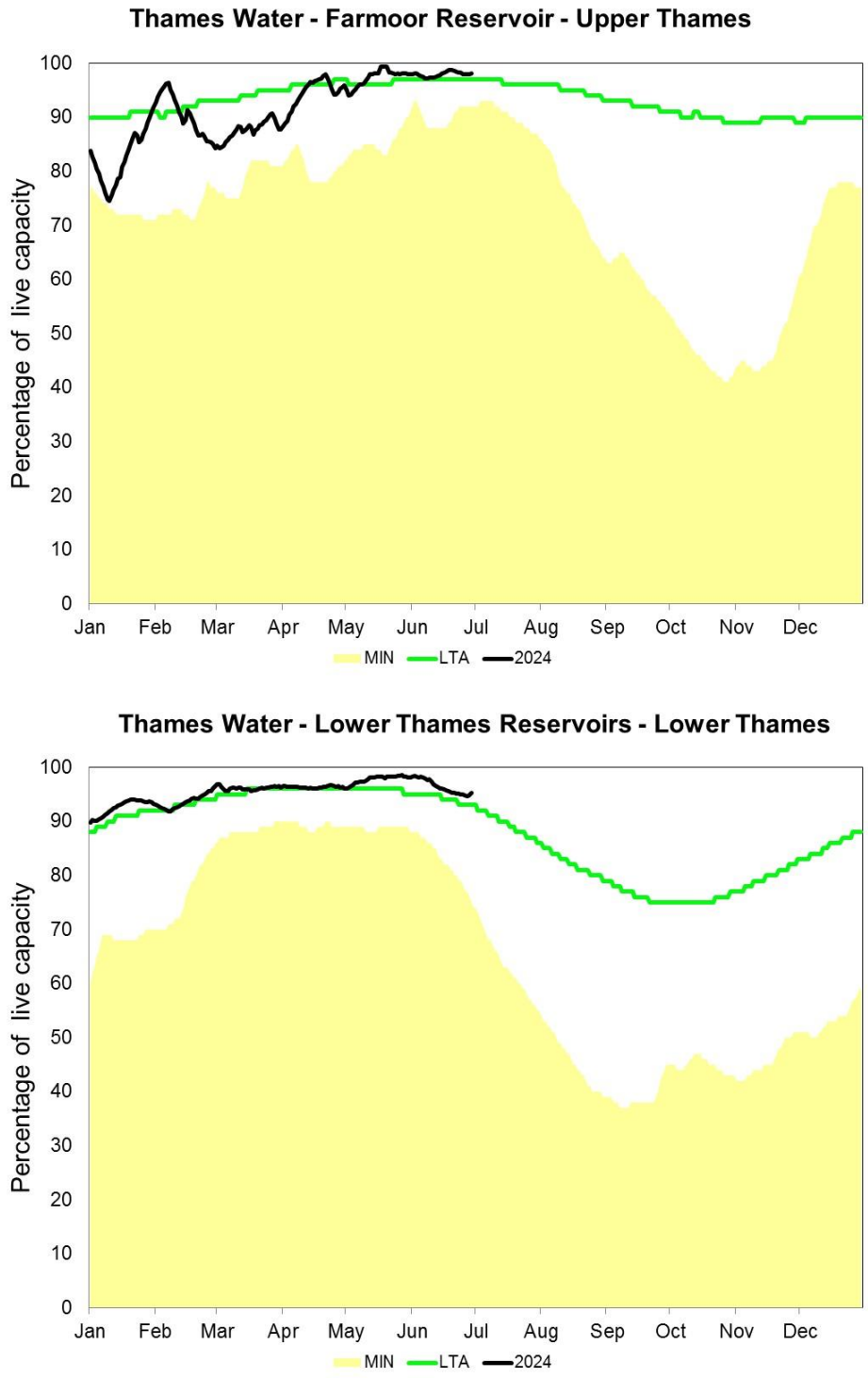


*Tile Barn Farm data has been estimated from two local sites since April 2022. A replacement is planned

Source: Environment Agency, 2024.

7 Reservoir stocks

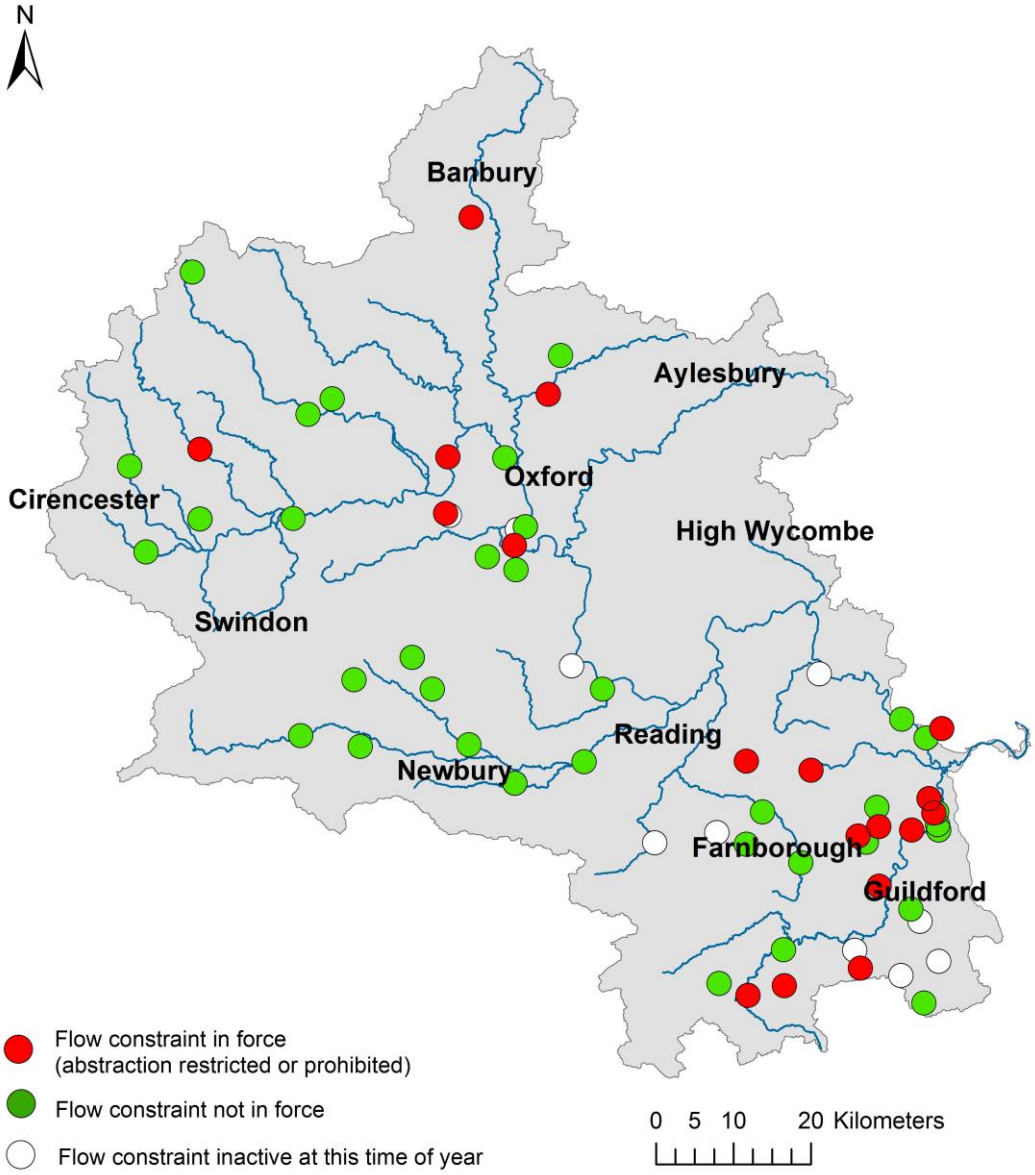
Figure 7.1: End of month regional reservoir stocks compared to minimum and average stocks.



(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	02/06/24	09/06/24	16/06/24	23/06/24	13/06/24
Number of flow constraints in force	2	3	3	2	19

9 Summary of rainfall, effective rainfall and soil moisture deficit

9.1 Rainfall and effective rainfall

Area	Rainfall (mm) 30 day Total	Rainfall (mm) June LTA	Rainfall (mm) % LTA	Effective Rainfall (mm) 30 day total	Effective Rainfall (mm) June LTA	Effective Rainfall (mm) % LTA
Cotswolds - West	26	56	45	1	9	16
Cotswolds - East	23	55	42	1	7	15
Berkshire Downs	19	57	33	1	7	9
Chilterns - West	19	58	32	0	7	5
North Downs - Hampshire	19	56	33	1	7	12
Wey - Greensand	17	55	32	1	8	9
Upper Thames	21	53	38	0	1	0
Cherwell	21	56	37	0	2	0
Thame	21	53	39	0	1	0
Loddon	14	52	27	0	2	0
Lower Wey	14	51	27	0	3	0
Ock	17	51	34	0	2	0
Enborne	15	56	26	0	2	0
Cut	13	53	25	0	2	0
Thames Area	**18**	**55**	**34**	**0**	**4**	**8**

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	44	39
Cotswolds - East	44	41
Berkshire Downs	78	62
Chilterns - West	79	64
North Downs - Hampshire	82	63
Wey - Greensand	83	62
Upper Thames	79	64
Cherwell	75	60
Thame	76	63
Loddon	85	66
Lower Wey	86	64
Ock	80	69
Enborne	81	61
Cut	87	69
Thames Area	**76**	**61**

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

Summer period: 01/04/2024 to 30/06/2024						
Area	Rainfall (mm) Total	Rainfall (mm) LTA	Rainfall (mm) % LTA	Effective Rainfall (mm) Total	Effective Rainfall (mm) LTA	Effective Rainfall (mm) % LTA
Cotswolds - West	205	177	116	56	40	141
Cotswolds - East	179	163	110	35	30	116
Berkshire Downs	174	170	103	37	30	121
Chilterns - West	162	168	97	27	30	88
North Downs - Hampshire	166	175	95	42	35	119
Wey - Greensand	169	175	97	51	38	134
Upper Thames	162	158	103	18	12	146
Cherwell	173	160	108	31	18	172
Thame	169	156	108	25	15	163
Loddon	148	155	95	24	15	157
Lower Wey	141	153	92	26	17	152
Ock	150	150	100	11	11	97
Enborne	158	164	96	25	18	138
Cut	136	155	88	14	15	96
Thames Area	**164**	**163**	**101**	**30**	**23**	**129**

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	Jun 2024 rainfall % of long term average 1961 to 1990	Jun 2024 band	Apr 2024 to June cumulative band	Jan 2024 to June cumulative band	Jul 2023 to June cumulative band
Berkshire Downs	33	Notably Low	Normal	Exceptionally high	Exceptionally high
Chilterns West	32	Notably Low	Normal	Exceptionally high	Exceptionally high
Cotswold East	42	Below Normal	Normal	Exceptionally high	Exceptionally high
Cotswold West	45	Below Normal	Above normal	Exceptionally high	Exceptionally high
Cut	25	Notably Low	Normal	Notably high	Exceptionally high
Enborne	27	Notably Low	Normal	Notably high	Exceptionally high
Loddon	27	Notably Low	Normal	Exceptionally high	Exceptionally high
Lower Wey	27	Notably Low	Normal	Notably high	Exceptionally high
North Downs - Hampshire	33	Notably Low	Normal	Exceptionally high	Exceptionally high

Ock	34	Notably Low	Normal	Exceptionally high	Exceptionally high
Thame	38	Notably Low	Normal	Exceptionally high	Exceptionally high
Upper Cherwell	37	Notably Low	Normal	Exceptionally high	Exceptionally high
Upper Thames	38	Notably Low	Normal	Exceptionally high	Exceptionally high
Wey - Greensand	32	Notably Low	Normal	Exceptionally high	Exceptionally high

11.2 River flows table

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

Wheatley	River Thame	Thame	Above normal	Exceptionally high
Windsor	River Thames	Thames	Normal	Notably high
Kingston (naturalised)	River Thames	Thames North Bank	Normal	Notably high

11.3 Groundwater table

Site name	Aquifer	End of Jun 2024 band	End of May 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	Exceptionally high	Exceptionally 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	Exceptionally high
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	Notably high	Exceptionally high

Fringford P.s.	Upper Bedford Ouse Oolitic Limestone (great)	Above normal	Notably high