Monthly water situation report: Thames Area

1 Summary - May 2024

Thames area received 72mm of rainfall in May, 125% of the long term average (LTA). Areal units in the north-west received above normal rainfall and those in the south-east received normal rainfall. Soil moisture deficits (SMD) increased from last month to 20mm across the area, lower than expected for the time of the year (38mm). Monthly mean river flows at the majority of our indicator sites were notably high or exceptionally high with three rivers, the Thame, Kennet and Wye experiencing their second highest May flows. At the end of the month, groundwater levels at the majority of our indicator sites continued their seasonal decline, yet most remained above normal or higher for the time of year.

1.1 Rainfall

In May 72mm of rain fell in Thames area, 125% of the LTA. For the past 3 months, total accumulated rainfall was notably high or exceptionally high for all areal units. For the past 6 months and 12 months the total accumulated rainfall was exceptionally high for all areal units. Geographically, there was more rain in the north-west of Thames area (above normal), compared to the south-eastern units, which received normal rainfall.

1.2 Soil moisture deficit and recharge

Thanks to a wet winter and May's above normal rainfall, the SMD for Thames area was 20mm. This meant soils were wetter than expected for the time of the year (38mm). However, there was a wide range of SMDs for the areal rainfall units, ranging between 9mm and 35mm, with wetter soils found towards the north of the area. Effective rainfall for the month was 7mm, which is typical for May, a change from the above average effective rainfall experienced most months over the last half year.

1.3 River flows

Due to another month of higher than average rainfall, and a wet spring in general, all our river flow indicator sites had notably high and exceptionally high monthly mean flows in May, except for the Blackwater at Swallowfield (above normal). For our groundwater fed rivers, this was due to high rainfall and aquifer recharge leading to high groundwater levels over the past 6 months. The River Thame at Wheatley had its second wettest May on record, as did the River Kennet at Marlborough and the River Wye at Bourne End, with last two being supported by a strong baseflow thanks to elevated Chalk groundwater levels.

1.4 Groundwater levels

Most of the groundwater sites continued their seasonal decline typically expected for May. Thanks to the very wet winter, nearly all the groundwater indicator sites were higher than normal, with the exception of the Inferior Oolite aquifer at Jackaments Bottom, whose level was normal. The Great Oolite sites' levels were above normal at Ampney Crucis and notably high at Fringford. Groundwater levels of all the Chalk indicator sites were exceptionally high, with Gibbet Cottages having exceptionally high levels for over half a year. Groundwater levels remained notably high for the Lower Greensand and receded to above normal for the Upper Greensand.

1.5 Reservoir stocks

The capacity for both of the Lower Thames and Farmoor reservoirs at the end of the month was at 98%, up from 96% and 95%, respectively, last month.

1.6 Environmental impact

There were six fluvial Flood Alerts issued on rivers during May. By month end, there were five groundwater Flood Alerts in force. At the end of May, three abstraction licences was being constrained in Thames Area in order to protect water resources and the environment.

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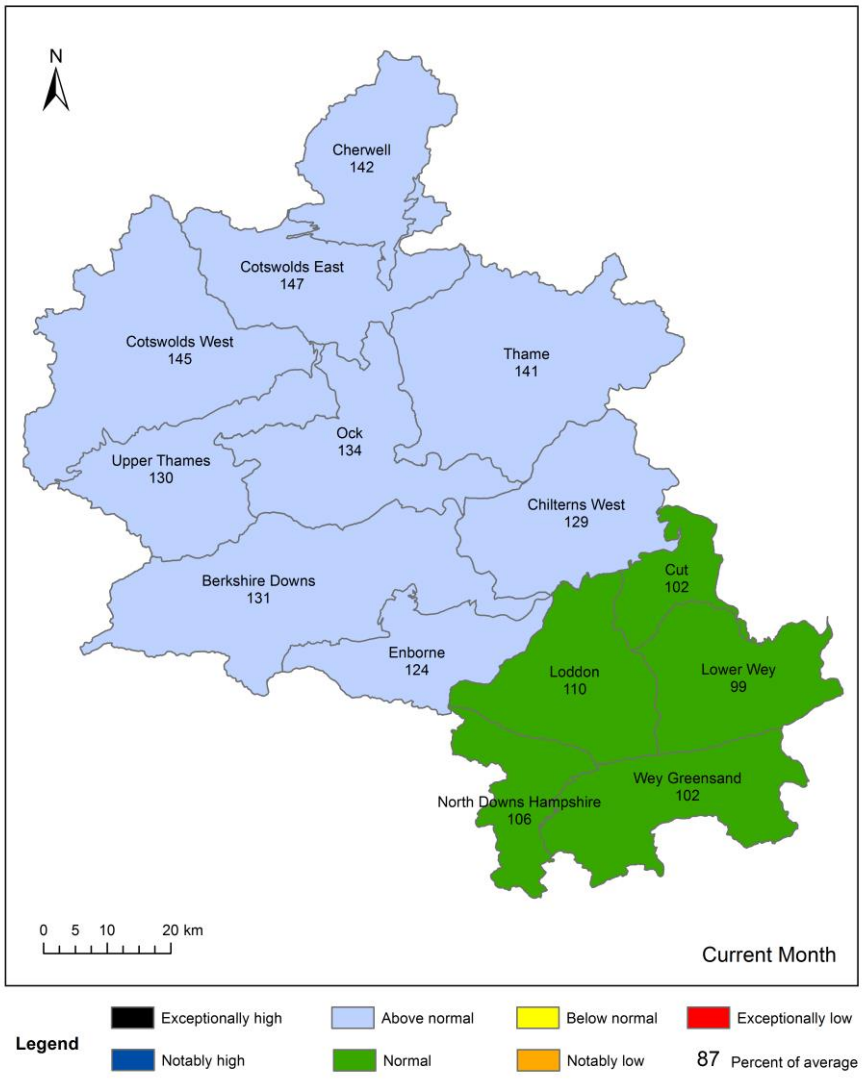
Contact Details: 020 3025 9659

2 Rainfall

2.1 Rainfall map

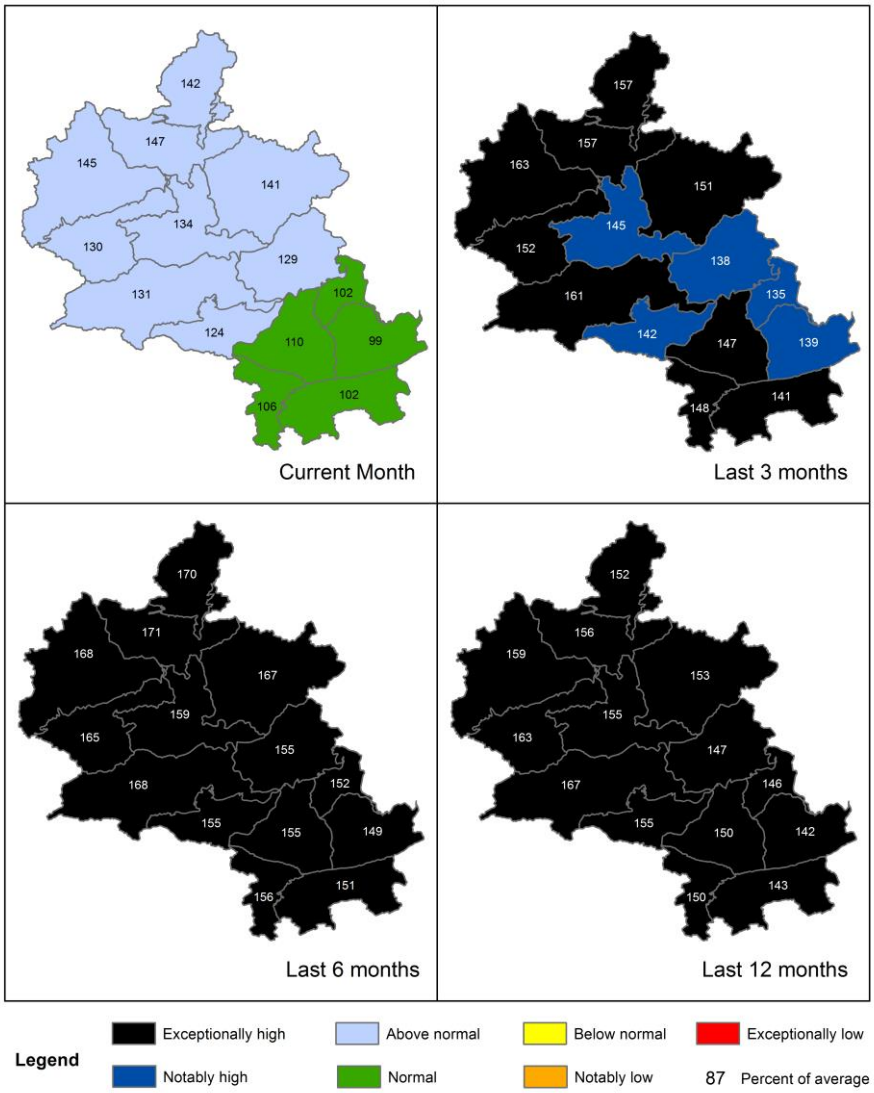
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 31 May 2024), classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



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)

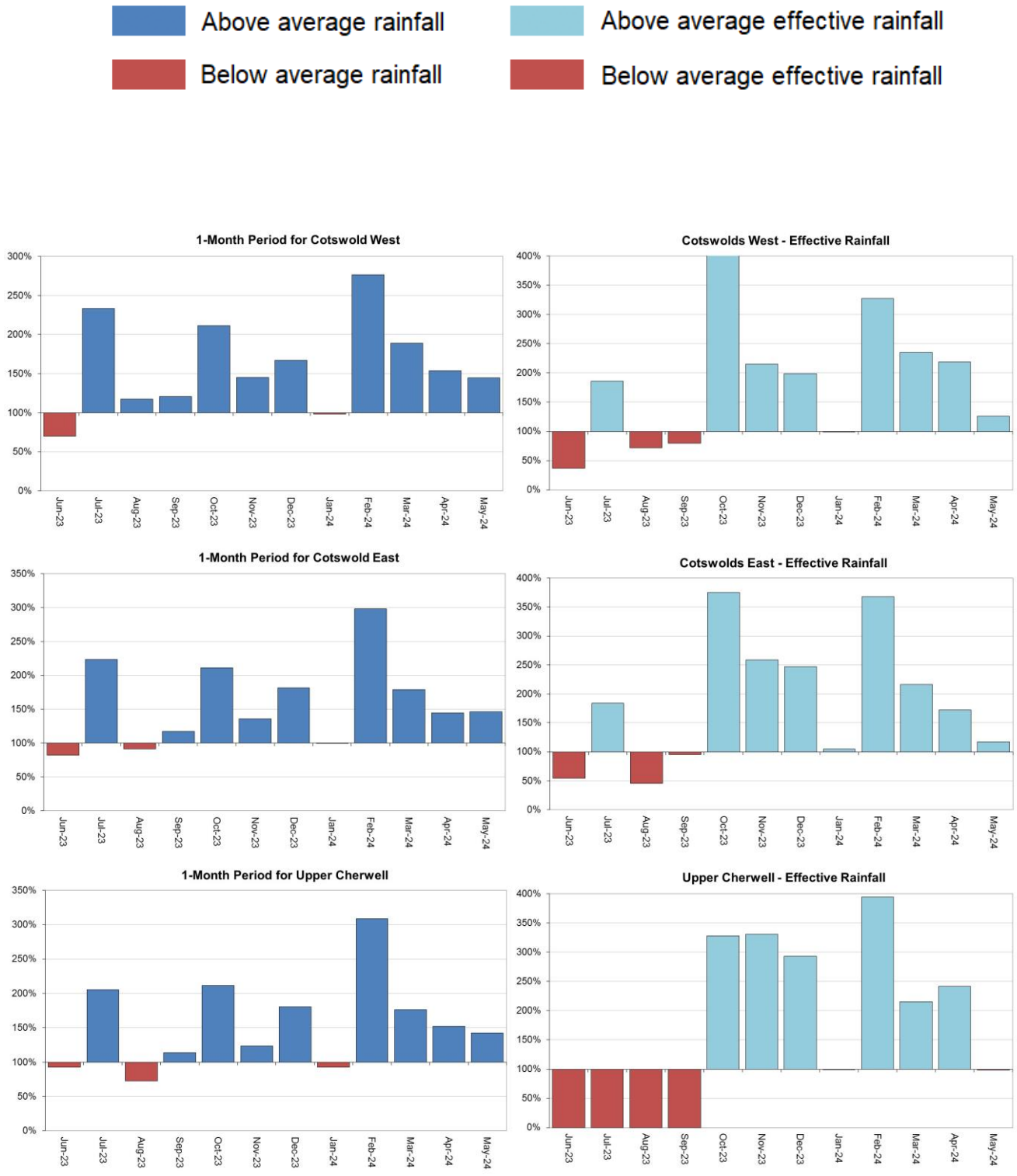
Figure 2.2: Total rainfall for hydrological areas for the current month (up to 31 May 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.

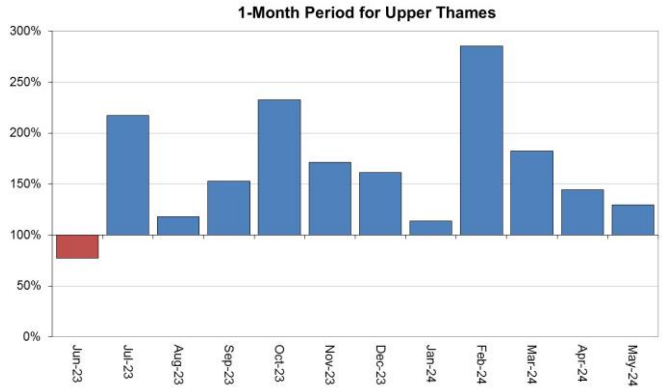


HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2024). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved. 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
300%
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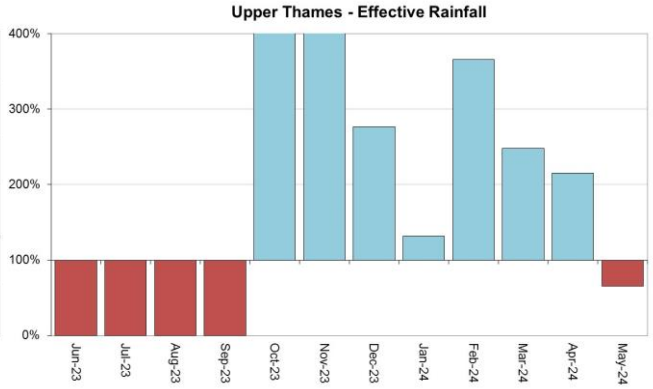
Upper Thames - Effective Rainfall
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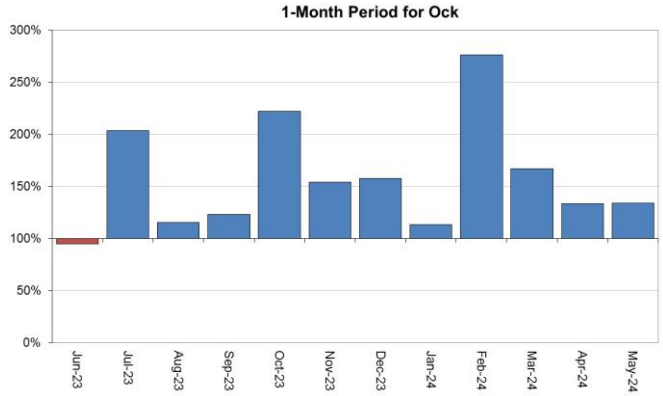
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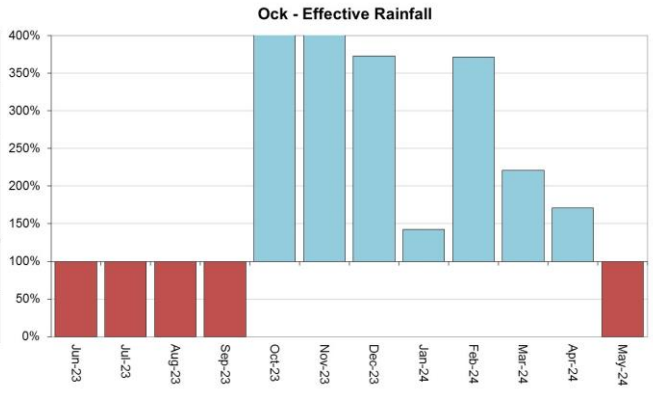
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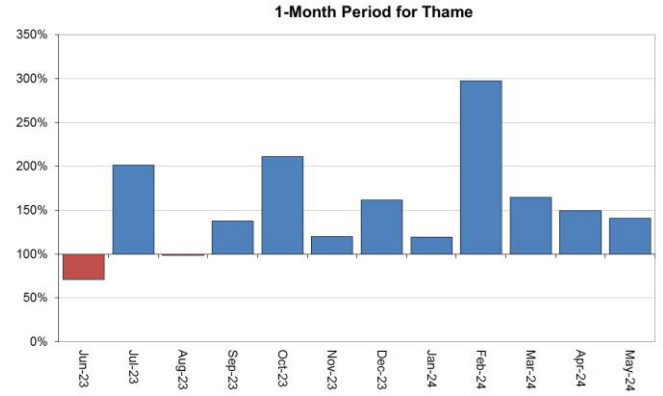
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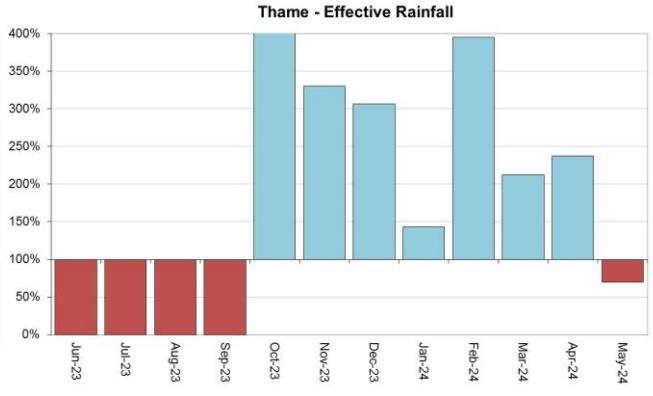
Thame - Effective Rainfall
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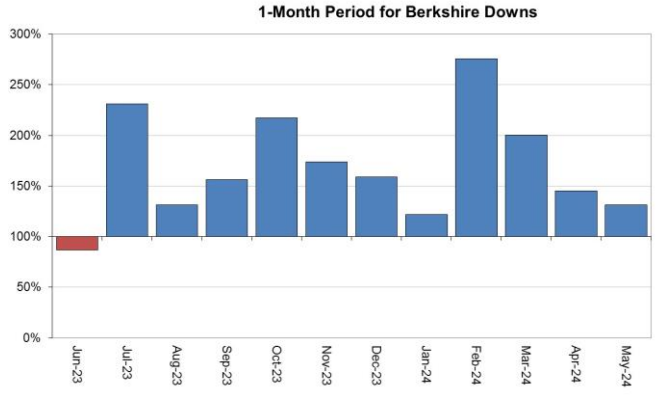
1-Month Period for Berkshire Downs
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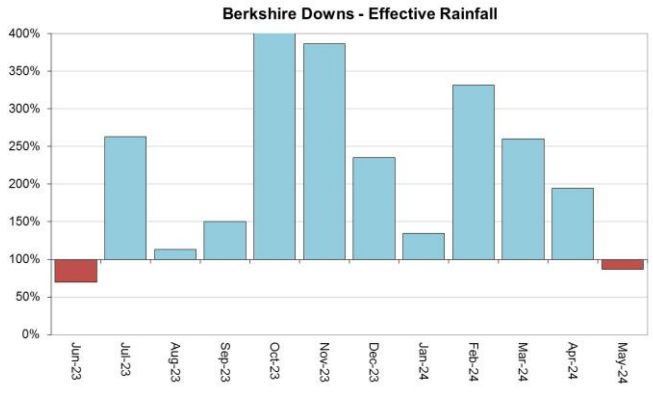
Berkshire Downs - Effective Rainfall
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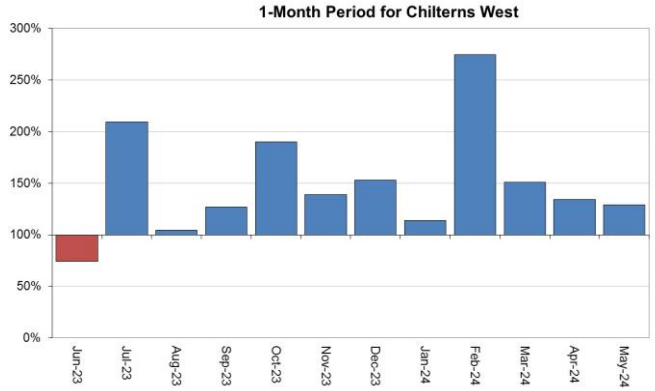
1-Month Period for Chilterns West
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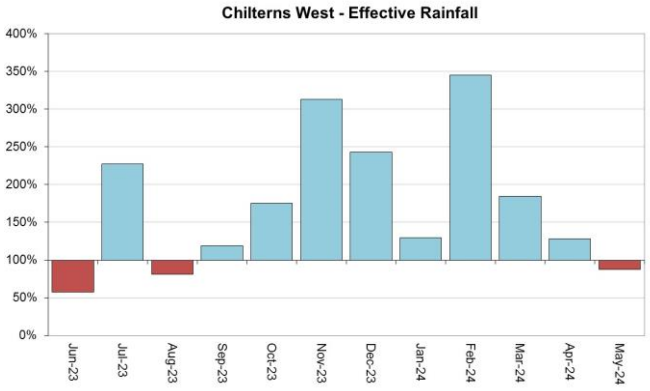
Chilterns West - Effective Rainfall
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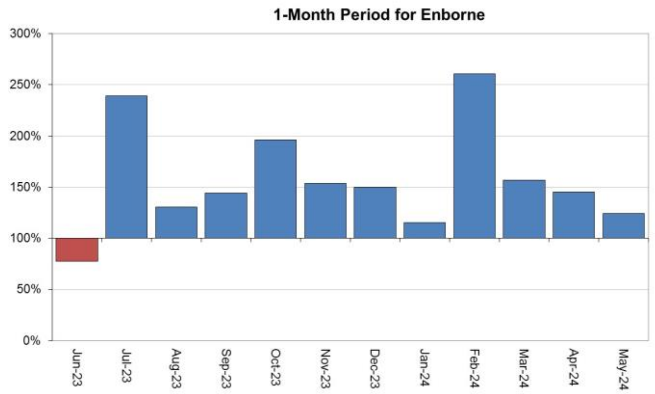
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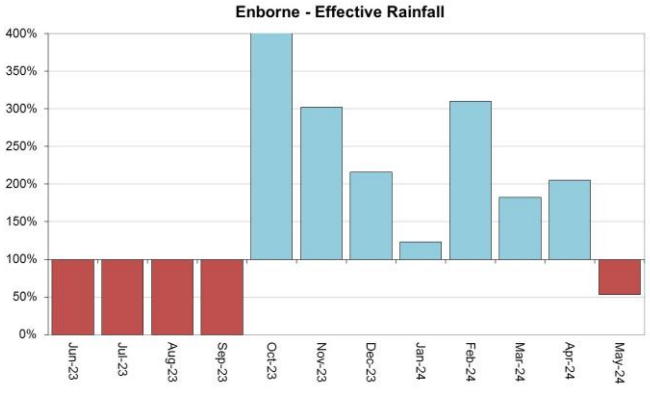
Enborne - Effective Rainfall
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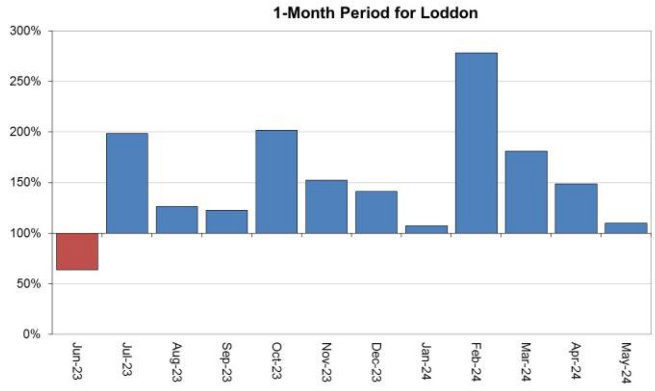
1-Month Period for Loddon
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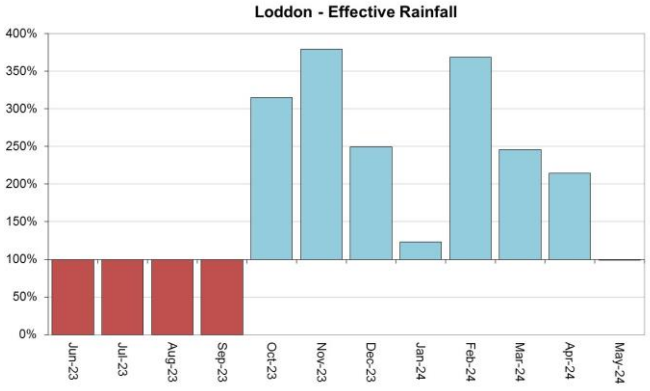
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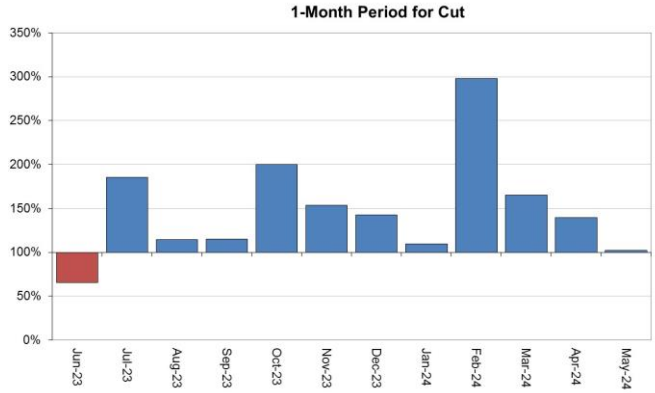
1-Month Period for Cut
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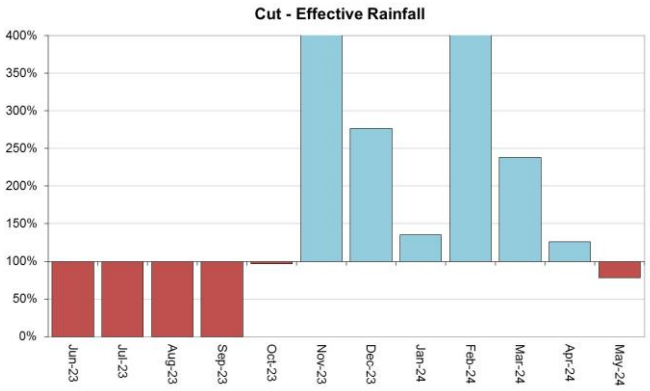
Cut - Effective Rainfall
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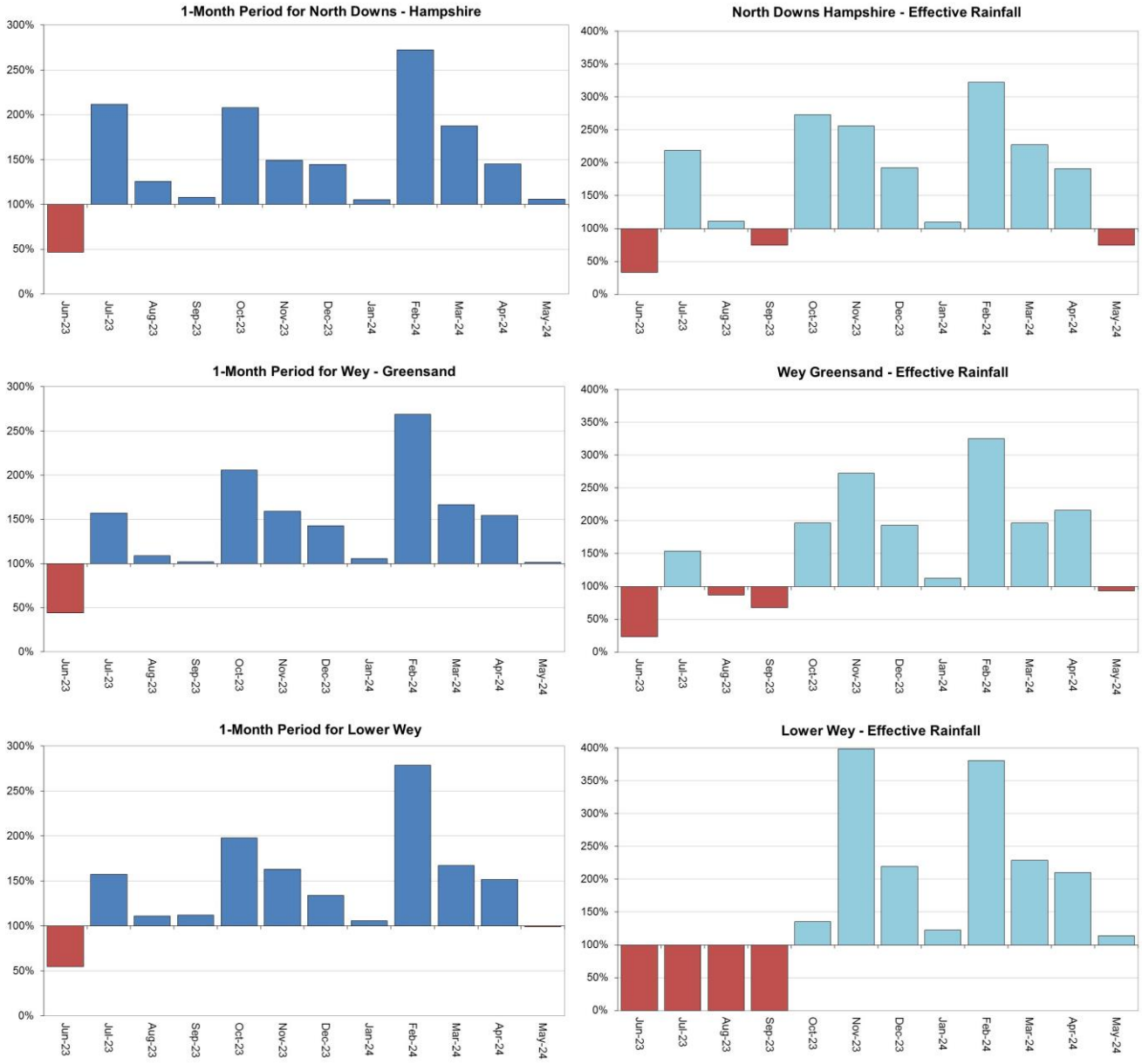


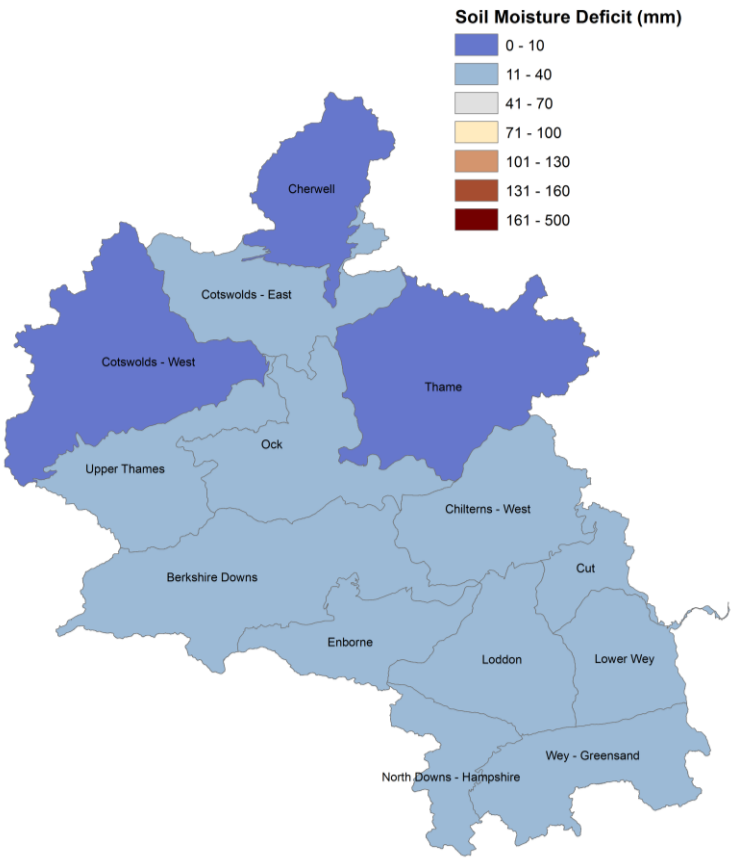
HadUK rainfall data. (Source: Met Office. Crown copyright, 2024).

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

3 Soil moisture deficit

3.1 Soil moisture deficit map

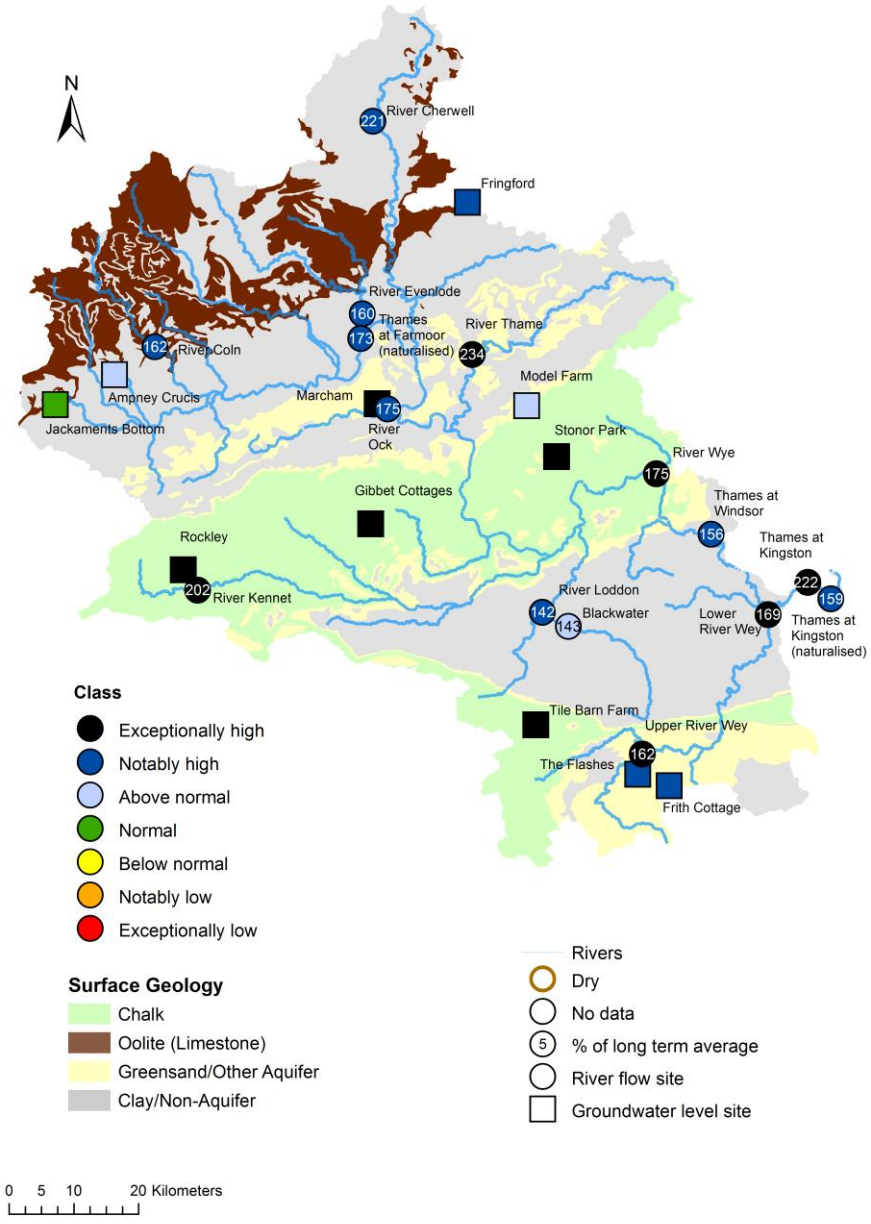
Figure 3.1: Soil moisture deficits for the week ending 31 May 2024. Shows the areal SMD estimate in millimetres.



4 River Flow and Groundwater Status

4.1 River flow and groundwater level map

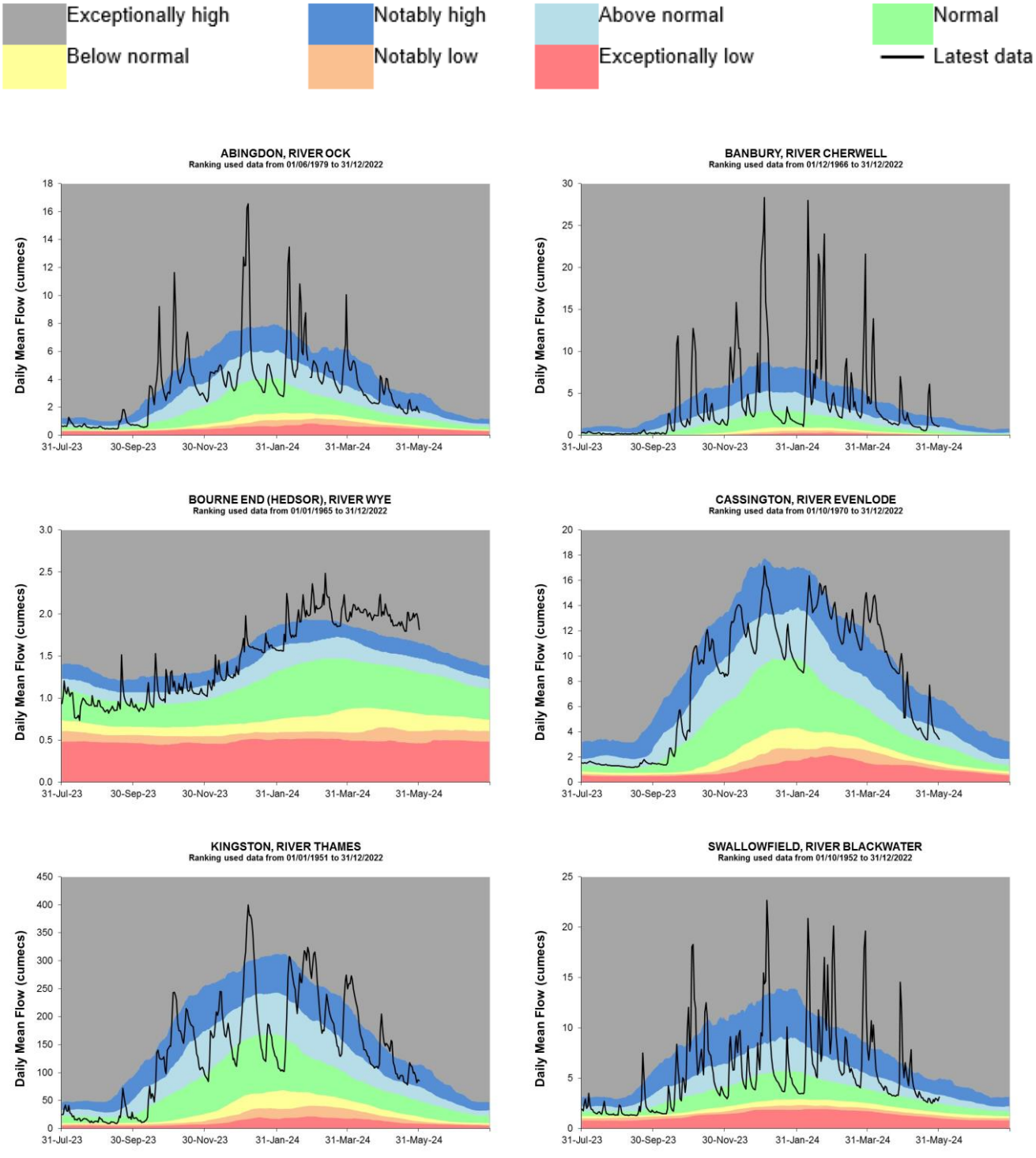
Figure 4.1: Monthly mean river flow for indicator sites and end of month groundwater levels for indicator sites for May 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic May means.



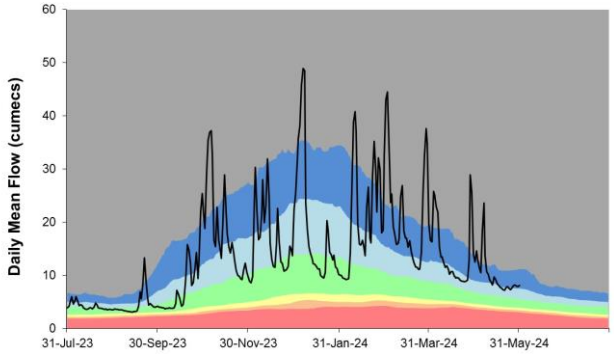
5 River flows

5.1 River flow charts

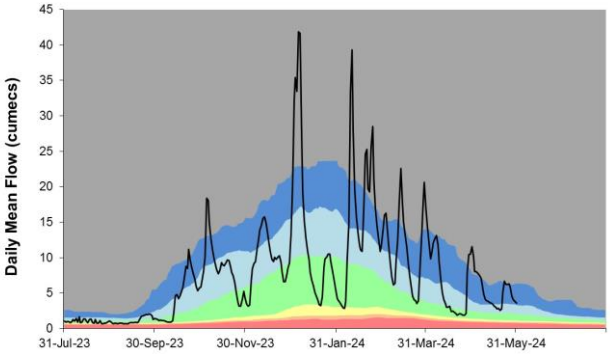
Figure 5.1: Daily mean river flows for indicator sites compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



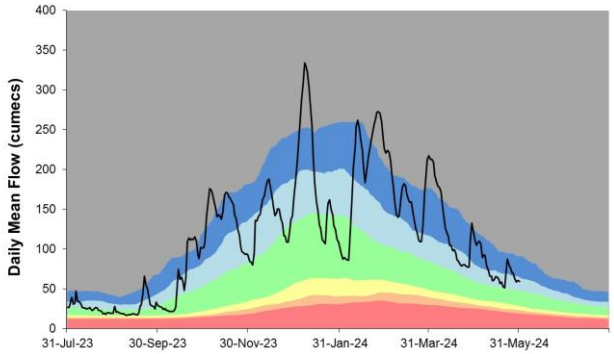
WEYBRIDGE, RIVER WEY
Ranking used data from 01/04/1979 to 31/12/2022



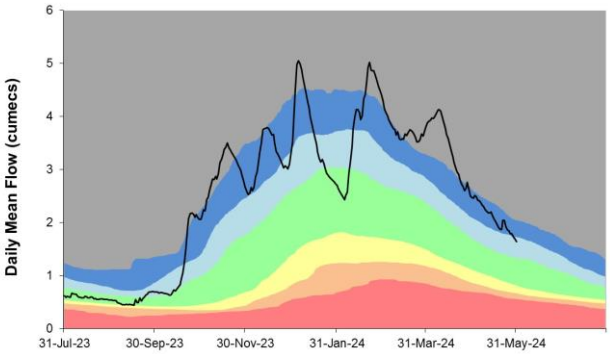
WHEATLEY, RIVER THAME
Ranking used data from 01/01/1990 to 31/12/2022



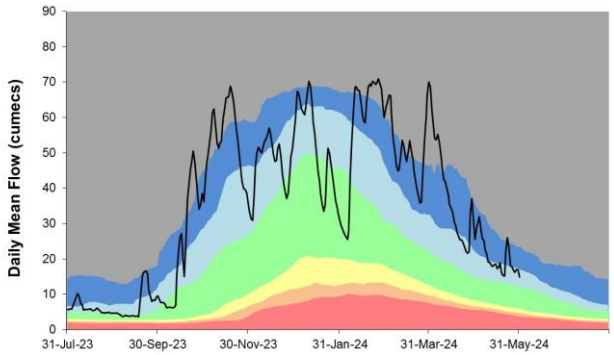
WINDSOR, RIVER THAMES
Ranking used data from 01/08/1979 to 31/12/2022



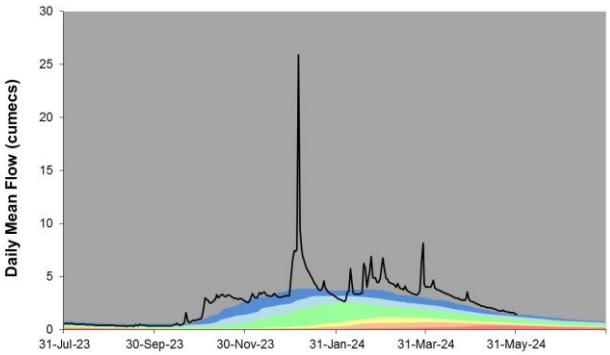
BIBURY, RIVER COLN
Ranking used data from 01/10/1963 to 31/12/2022

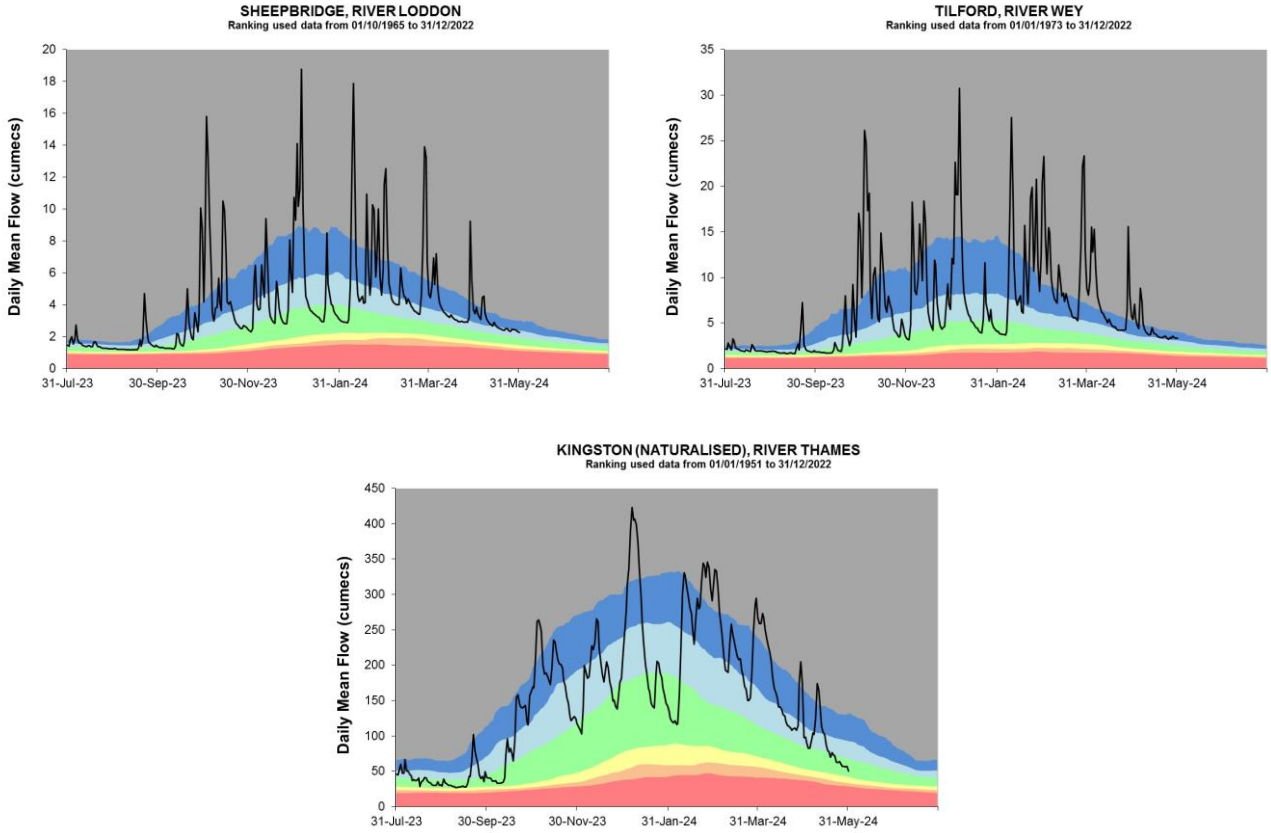


FARMOOR (NATURALISED), RIVER THAMES
Ranking used data from 01/10/1992 to 31/12/2022



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



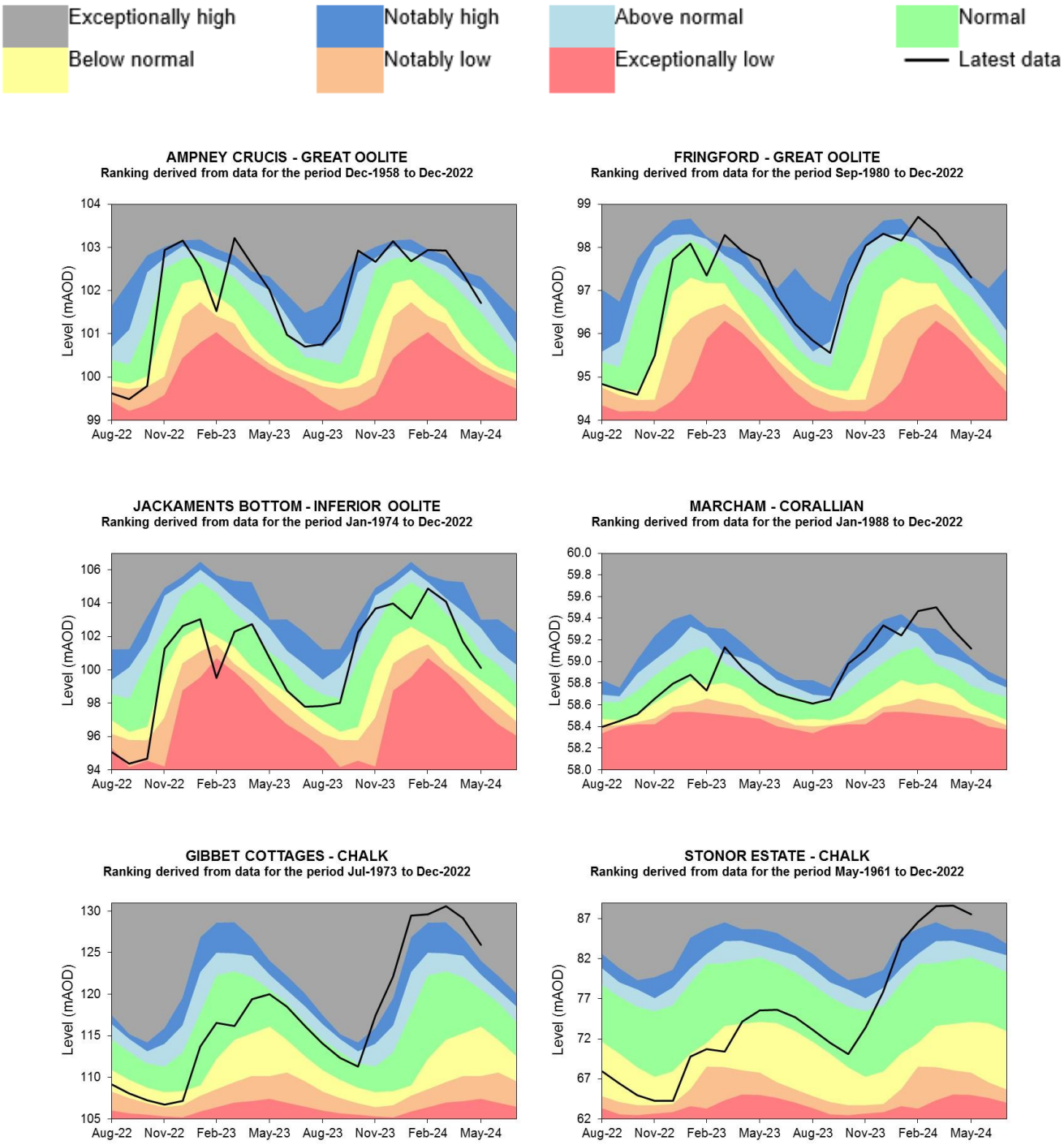


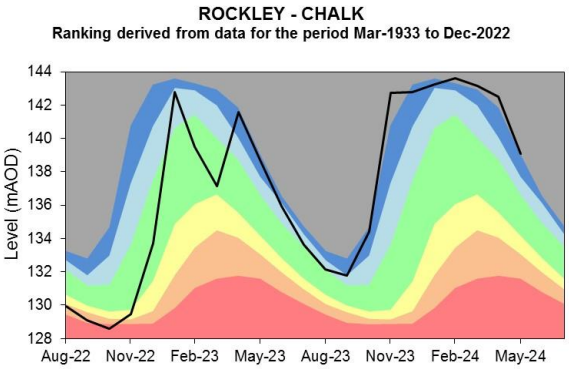
Source: Environment Agency.

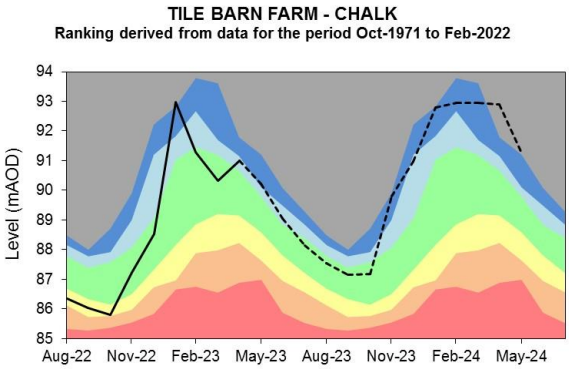
6 Groundwater levels

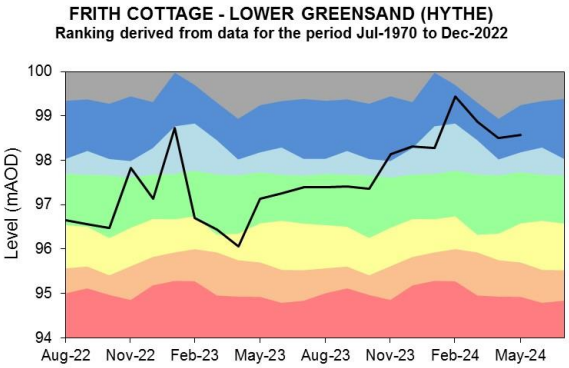
6.1 Groundwater level charts

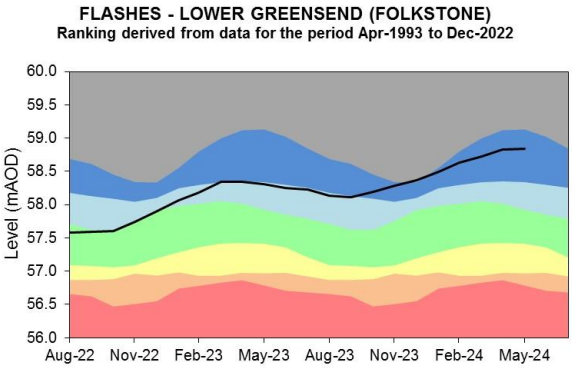
Figure 6.1: End of month groundwater levels for indicator sites, compared to an analysis of historic end of month levels, and long term maximum and minimum levels.

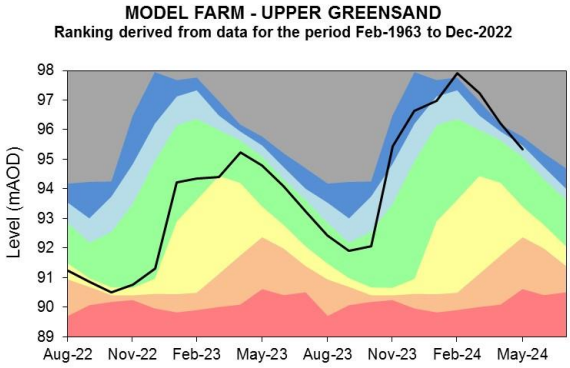










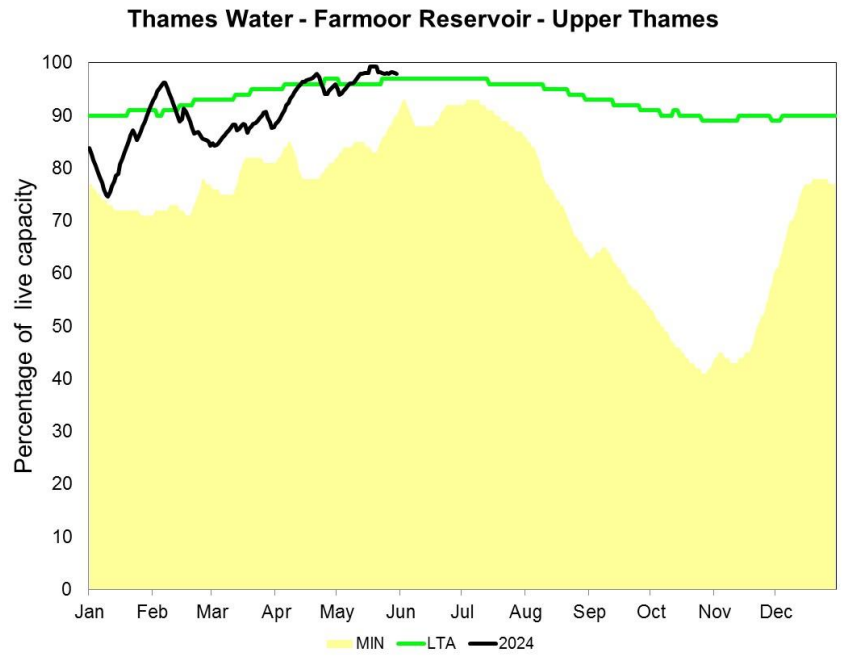


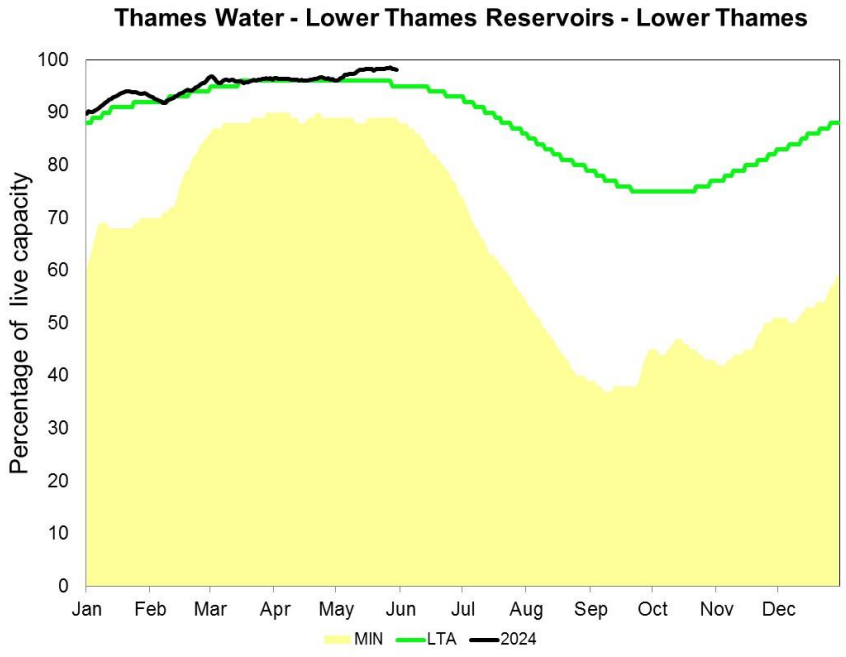
*Tile Barn Farm data has been estimated from two local sites since April 2022. A replacement is planned

Source: Environment Agency, 2024.

7 Reservoir stocks

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

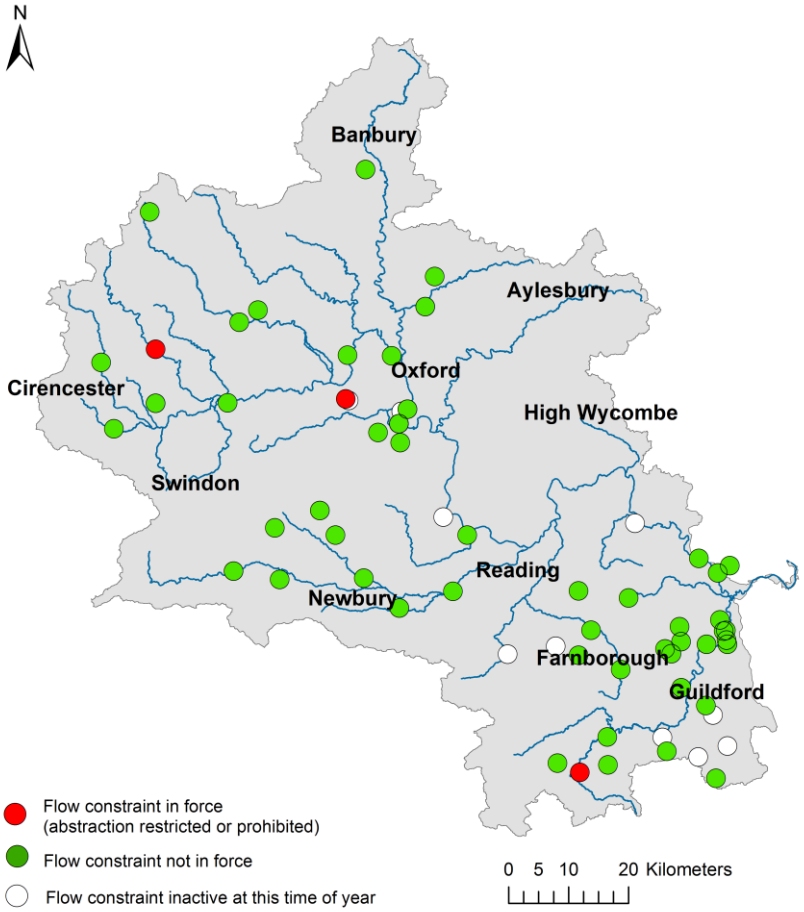




(Source: water companies).

8 Flow Constraints

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



8.2 Summary of flow constraints

Week ending	05/05/24	12/05/24	19/05/24	19/05/24
Number of flow constraints in force	1	1	1	3

9 Summary of rainfall, effective rainfall and soil moisture deficit

9.1 Rainfall and effective rainfall

Area	Rainfall (mm) 31 day Total	Rainfall (mm) May LTA	Rainfall (mm) % LTA	Effective Rainfall (mm) 31 day total	Effective Rainfall (mm) May LTA	Effective Rainfall (mm) % LTA
Cotswolds - West	93	64	145	18	14	126
Cotswolds - East	84	58	146	12	10	117
Berkshire Downs	79	60	132	8	9	87
Chilterns - West	74	57	129	8	9	87
North Downs - Hampshire	66	62	106	9	12	74
Wey - Greensand	64	63	101	12	13	93
Upper Thames	75	58	130	2	4	66
Cherwell	79	56	142	6	6	98
Thame	77	55	141	3	5	70
Loddon	61	55	111	4	4	99
Lower Wey	54	54	99	5	4	114
Ock	73	54	134	0	3	0
Enborne	70	57	124	3	5	53
Cut	56	55	103	3	3	78
Thames Area	**72**	**58**	**125**	**7**	**7**	**91**

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	9	25
Cotswolds - East	10	30
Berkshire Downs	13	39
Chilterns - West	17	39
North Downs - Hampshire	27	37
Wey - Greensand	31	36
Upper Thames	16	42
Cherwell	9	39
Thame	9	39
Loddon	31	41
Lower Wey	35	40
Ock	17	46
Enborne	19	38
Cut	35	45
Thames Area	**20**	**38**

HadUK rainfall data (Source: Met Office Crown copyright 2023)
EA effective rainfall data (Source: EA Soil Moisture Model)

9.3 Winter rainfall and effective rainfall

Summer period: 01/04/2024 to 31/05/2024						
Area	Rainfall (mm) Total	Rainfall (mm) LTA	Rainfall (mm) % LTA	Effective Rainfall (mm) Total	Effective Rainfall (mm) LTA	Effective Rainfall (mm) % LTA
Cotswolds - West	180	121	149	55	31	176
Cotswolds - East	156	107	145	34	23	148
Berkshire Downs	156	113	138	36	23	153
Chilterns - West	144	110	131	26	23	113
North Downs - Hampshire	147	118	124	41	29	144
Wey - Greensand	152	120	127	50	30	166
Upper Thames	142	104	136	18	11	165
Cherwell	153	104	147	31	16	190
Thame	148	102	145	25	14	180
Loddon	134	104	129	24	13	180
Lower Wey	127	102	124	26	14	181
Ock	133	99	134	11	10	117
Enborne	143	107	133	25	16	160
Cut	123	102	120	14	12	113
Thames Area	**145**	**108**	**134**	**30**	**19**	**156**

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	May 2024 rainfall % of long term average 1961 to 1990	May 2024 band	Mar 2024 to May cumulative band	Dec 2023 to May cumulative band	Jun 2023 to May cumulative band
Berkshire Downs	131	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Chilterns West	129	Above Normal	Notably high	Exceptionally high	Exceptionally high
Cotswold East	147	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Cotswold West	145	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Cut	102	Normal	Notably high	Exceptionally high	Exceptionally high
Enborne	124	Above Normal	Notably high	Exceptionally high	Exceptionally high
Loddon	110	Normal	Exceptionally high	Exceptionally high	Exceptionally high
Lower Wey	99	Normal	Notably high	Exceptionally high	Exceptionally high
North Downs - Hampshire	106	Normal	Exceptionally high	Exceptionally high	Exceptionally high

Ock	134	Above Normal	Notably high	Exceptionally high	Exceptionally high
Thame	141	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Upper Cherwell	142	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Upper Thames	130	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Wey - Greensand	102	Normal	Exceptionally high	Exceptionally high	Exceptionally high

11.2 River flows table

Site name	River	Catchment	May 2024 band	Apr 2024 band
Abingdon	River Ock	Ock	Notably high	Notably high
Banbury	River Cherwell	Cherwell Upper	Notably high	Notably 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	Notably high	Exceptionally high
Farmoor (naturalised)	River Thames	Thames	Notably high	Notably high
Kingston	River Thames	Thames North Bank	Exceptionally high	Exceptionally high
Marlborough	River Kennet	Kennet	Exceptionally high	Exceptionally high
Sheepbridge	River Loddon	Loddon	Notably high	Notably high
Swallowfield	River Blackwater	Loddon	Above normal	Notably high
Tilford	River Wey	Wey Addleston Bourne	Exceptionally high	Exceptionally high
Weybridge	River Wey	Wey Addleston Bourne	Exceptionally high	Exceptionally high

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

11.3 Groundwater table

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

Fringford	Upper Bedford Ouse Oolitic Limestone (Great)	Notably high	Notably high