

# Monthly water situation report: Thames Area

## 1 Summary - April 2024

Thames area received 74mm of rainfall in April, which is 146% of the long term average (LTA). All the areal units recorded above normal or notably high rainfall. Total rainfall over the past 3, 6 and 12 months was exceptionally high, with the last 12 months being the wettest on record. Soil moisture deficits (SMDs) increased to 6mm across the area with effective rainfall being 196% of the LTA at the end of the month. Monthly mean river flows at the majority of the indicator sites reported notably high or exceptionally high; with 3, the Evenlode at Cassington, the Kennet at Marlborough, and the Wey at Tilford, recording their highest April flows on record. At the end of the month, groundwater levels at the majority of the indicator sites began their seasonal decline, yet remained either notably high or exceptionally high for the time of year.

### 1.1 Rainfall

April was another wet month, receiving a total of 74mm of rain, 146% of the LTA for the month. All areal rainfall units were above normal, apart from Cotswolds West, which was notably high. A third of April's rain occurred in the first 4 days of the month, receiving a total of 23mm of rain, while the wettest day, 27 April, had 26mm. Looking at the last 3, 6, and 12 month rainfall values, all areal units have recorded exceptionally high rainfall. The last 12 months have been the wettest on record.

### 1.2 Soil moisture deficit and recharge

Following a wet winter and April's above normal rainfall, the SMD for Thames area in April was at 6mm. This meant that soils were wetter than the typical April value of 20mm. This was consistent for each of the areal units, primarily at either 5mm or 6mm. As such, the effective rainfall of Thames Area was high, at 23mm, which is 196% of the LTA.

### 1.3 River flows

With the continuing above average rainfall and high effective rainfall throughout Thames area, all river flow indicator sites remained above average. Seven sites were exceptionally high, including 3, the Evenlode at Cassington, the Kennet at Marlborough, and the Wey at Tilford, which had their highest April flows on record. Apart from the River Thame at Wheatley, which had above normal flow, all remaining sites had notably high flows. Additionally, the Wye at Bourne End had its second highest April flows, and for the Coln at Bibury it's fourth. Most of these exceptionally high flow sites responded markedly to April's rain thanks to a strong baseflow contribution following a very wet winter season.

## 1.4 Groundwater levels

Groundwater levels at most of the indicator sites began the typical seasonal decline, albeit somewhat delayed due to the very wet winter and a wet April. By month end all but one of the indicator sites were either notably high or exceptionally high. The Corallian, Upper Greensands, and all the Chalk sites were exceptionally high. Both Lower Greensands and Great Oolites were notably high, while the Inferior Oolite at Jackaments Bottom was normal for the time of year.

## 1.5 Reservoir stocks

Farmoor reservoir capacity at the end of the month was 95% after peaking at 98% during the month. Capacity at the Lower Thames reservoirs was 96% at the end of the month.

## 1.6 Environmental impact

There were 15 fluvial Flood Alerts issued on rivers during April. By month end, there were 7 groundwater Flood Alerts in force. At the end of April, 1 abstraction licence was being constrained in Thames Area in order to protect water resources and the environment.

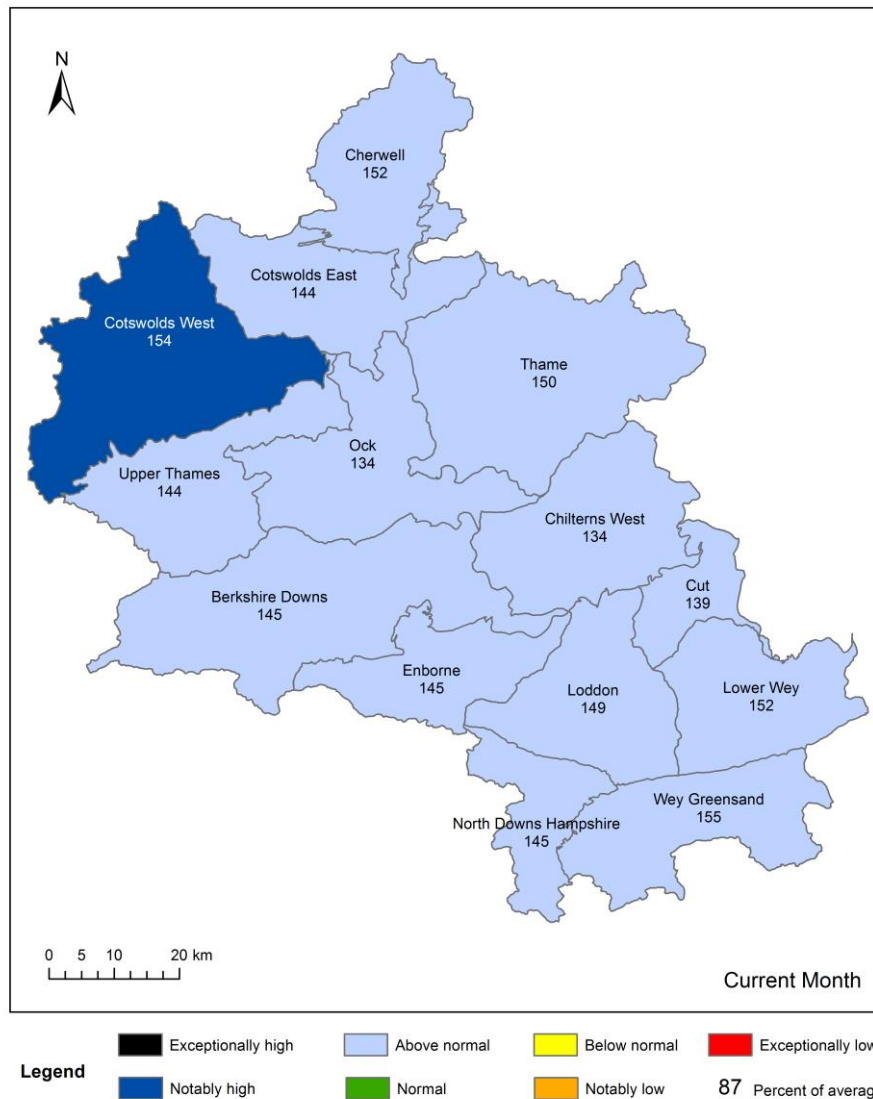
Author: Thames Area Groundwater Resources and Hydrology, [enquiriesWT@environment-agency.gov.uk](mailto:enquiriesWT@environment-agency.gov.uk)

Contact Details: 020 3025 9659

## 2 Rainfall

### 2.1 Rainfall map

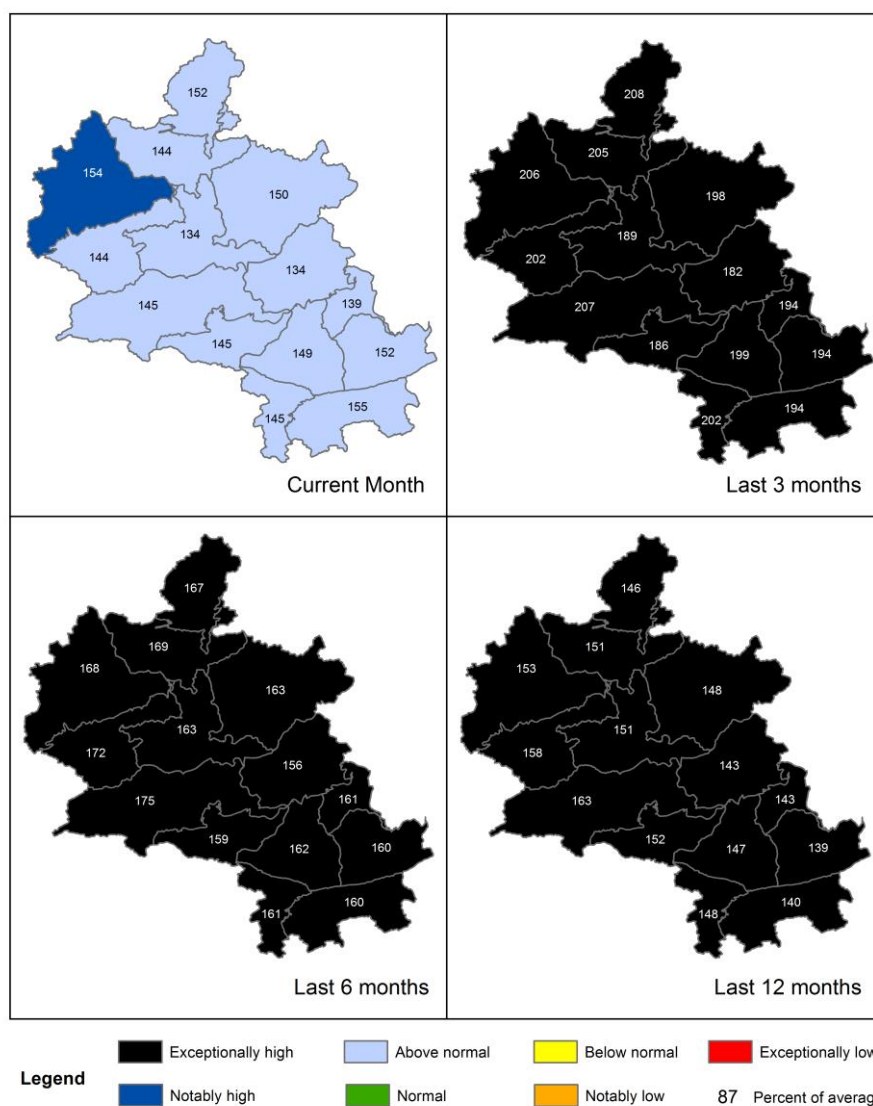
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 30 April 2024), classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



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)

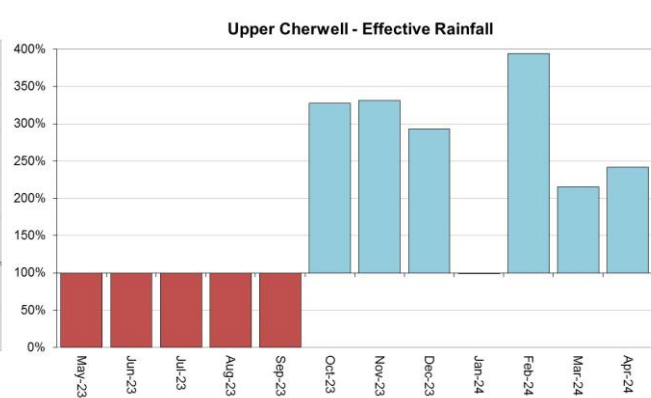
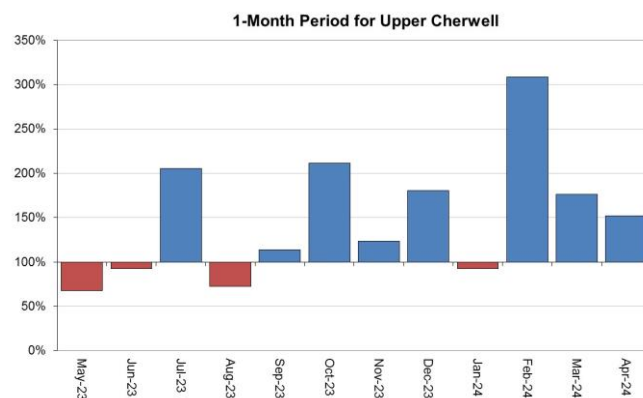
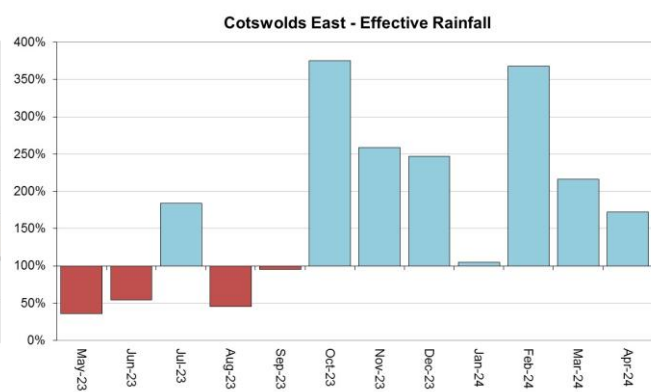
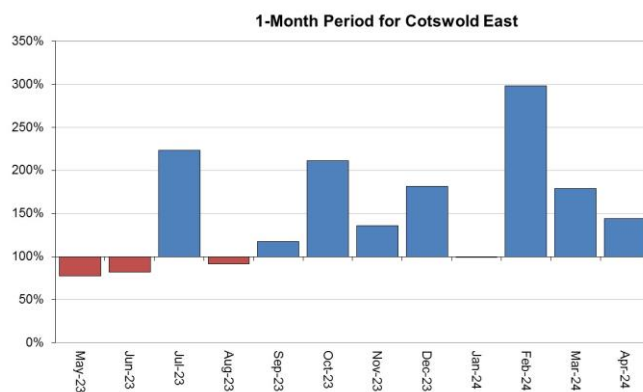
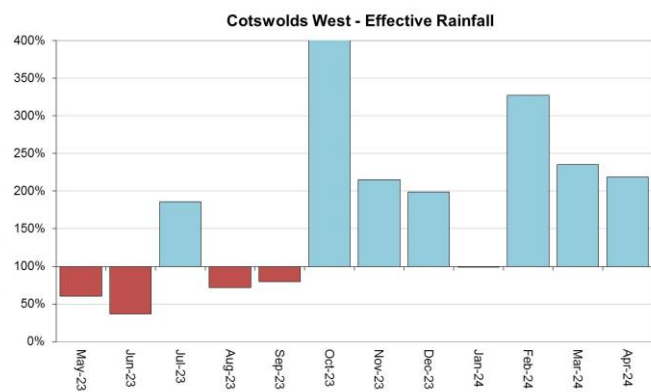
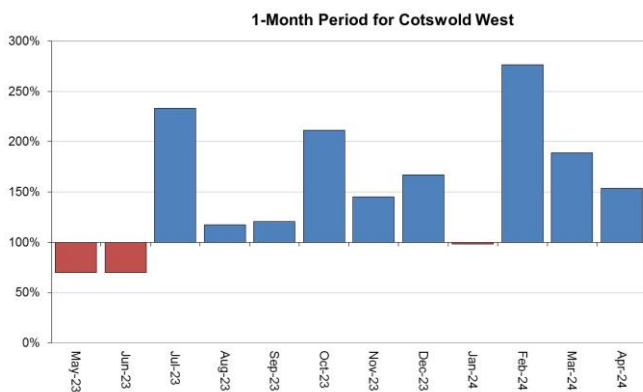
Figure 2.2: Total rainfall for hydrological areas for the current month (up to 30 April 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



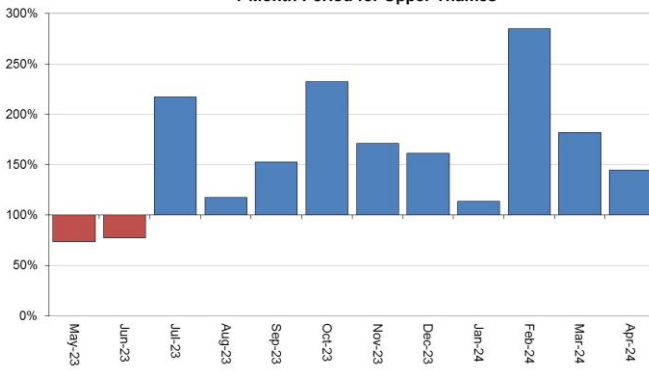
HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office. Crown copyright, 2024). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved.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

## 2.3 Rainfall charts

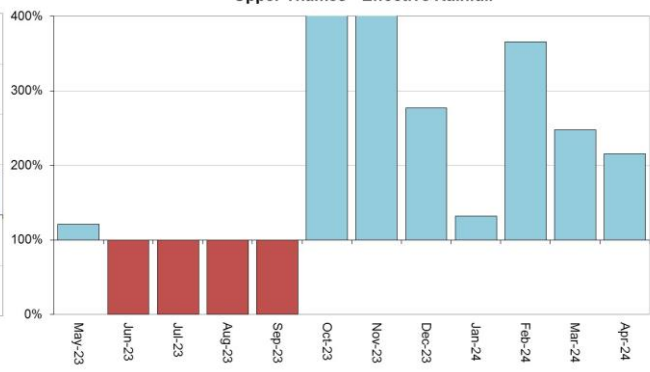
Figure 2.3: Monthly rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average for each areal unit.



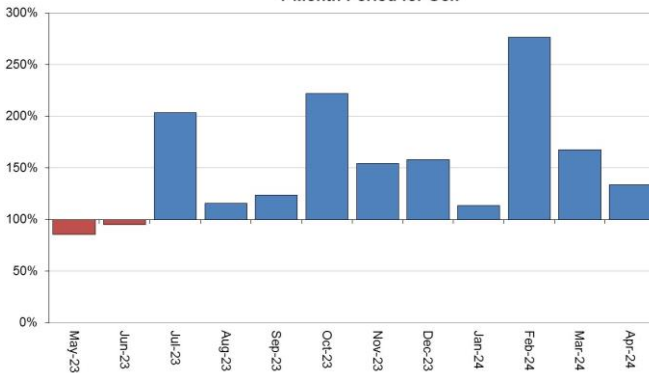
1-Month Period for Upper Thames



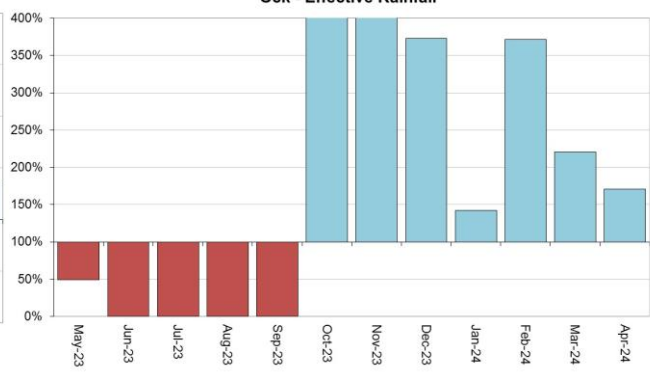
Upper Thames - Effective Rainfall



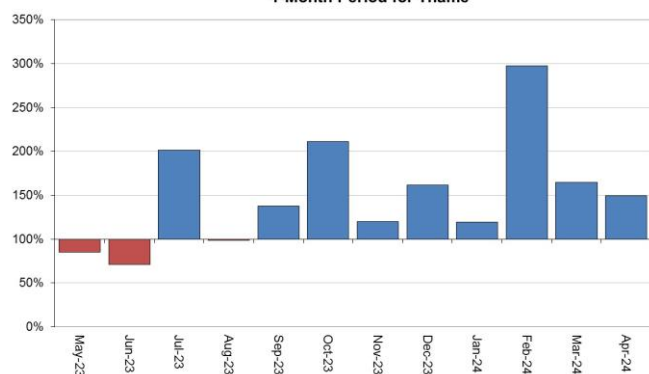
1-Month Period for Ock



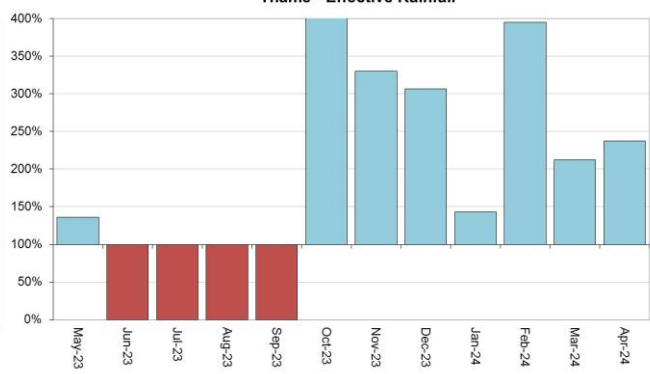
Ock - Effective Rainfall



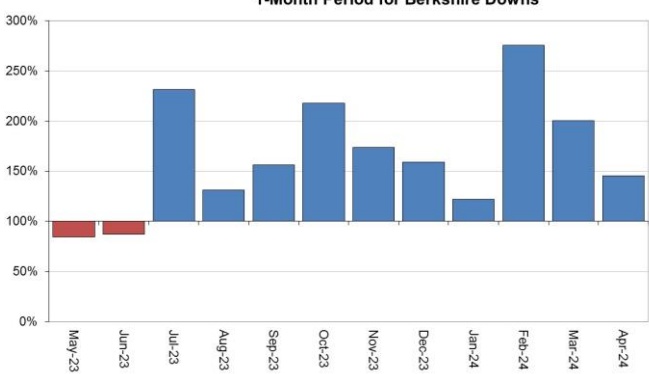
1-Month Period for Thame



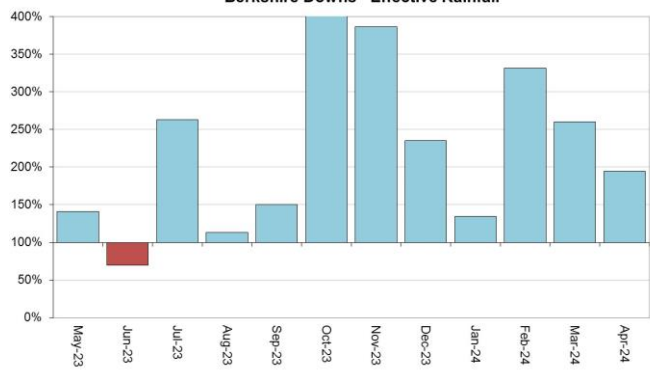
Thame - Effective Rainfall



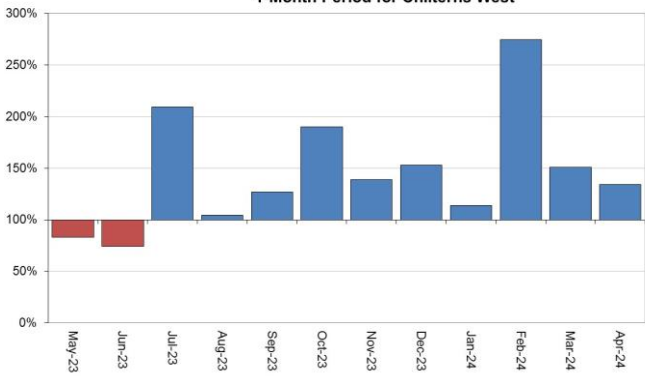
1-Month Period for Berkshire Downs



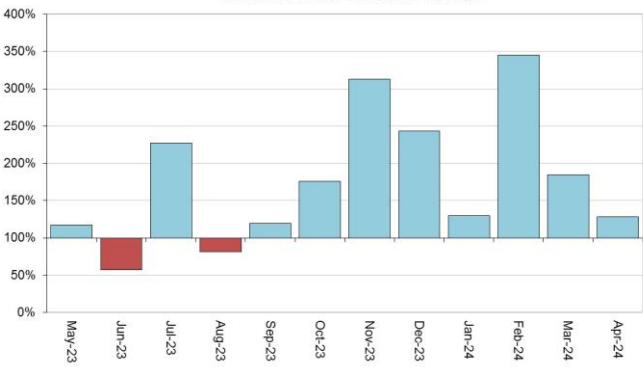
Berkshire Downs - Effective Rainfall



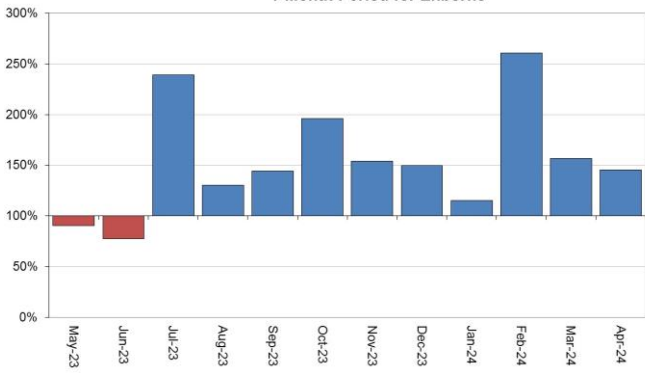
1-Month Period for Chilterns West



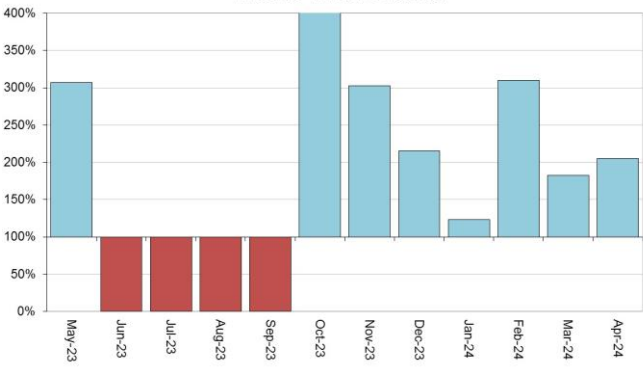
Chilterns West - Effective Rainfall



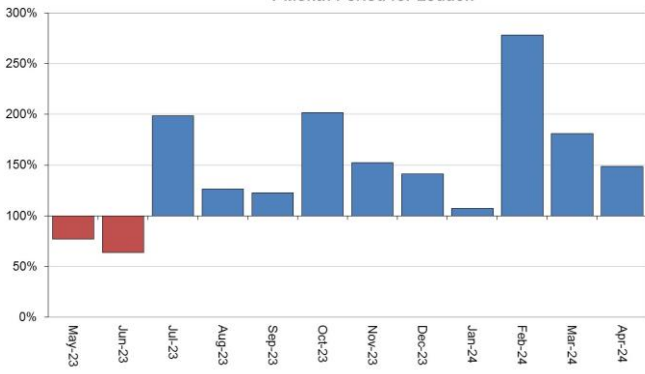
1-Month Period for Enborne



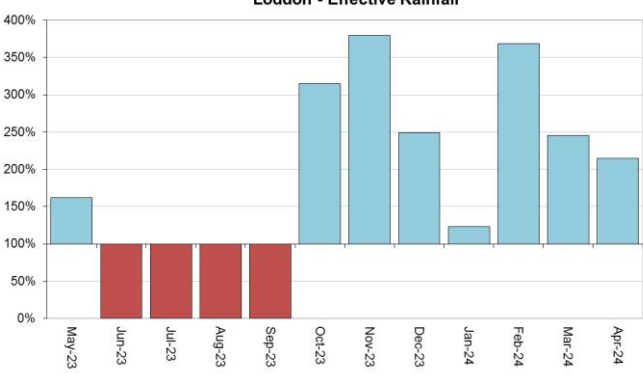
Enborne - Effective Rainfall



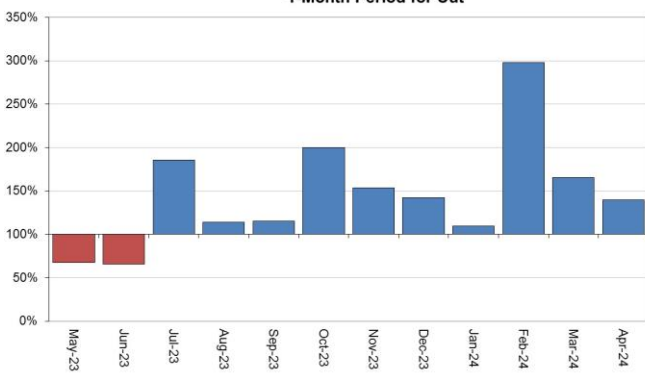
1-Month Period for Loddon



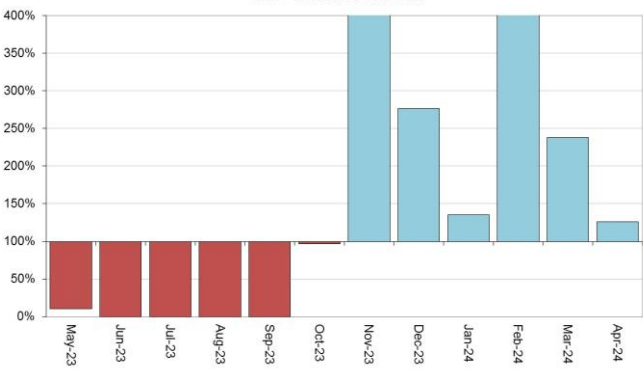
Loddon - Effective Rainfall

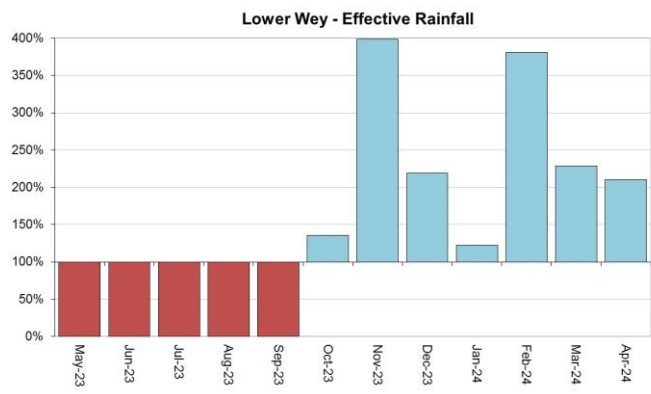
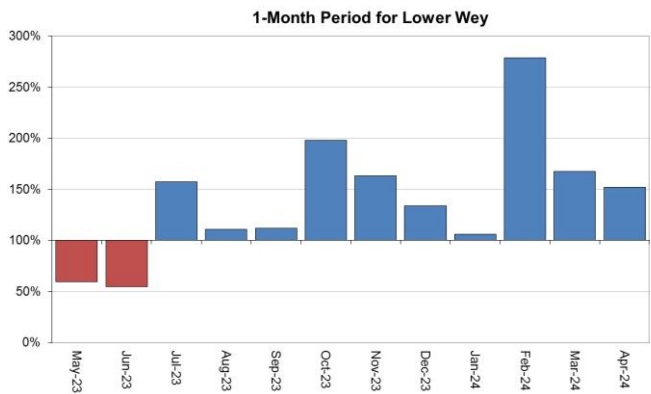
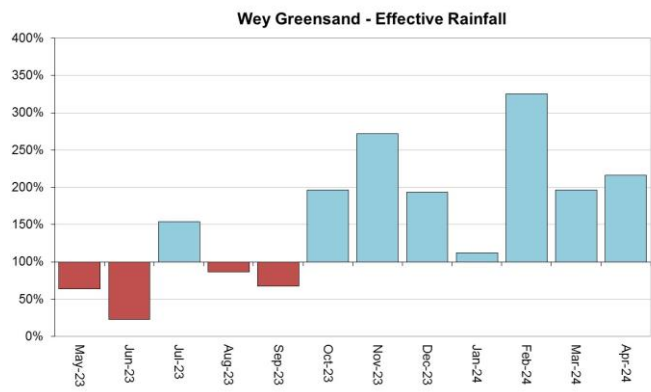
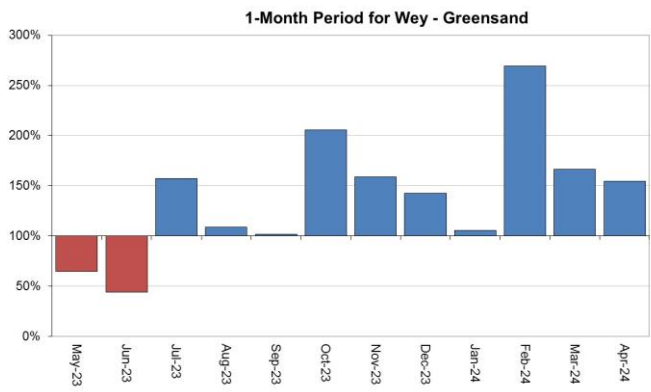
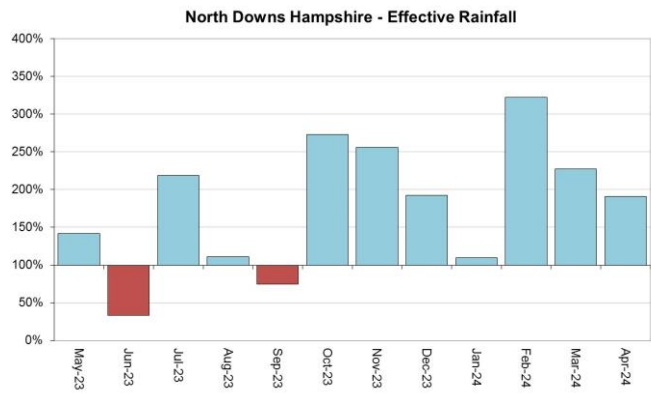
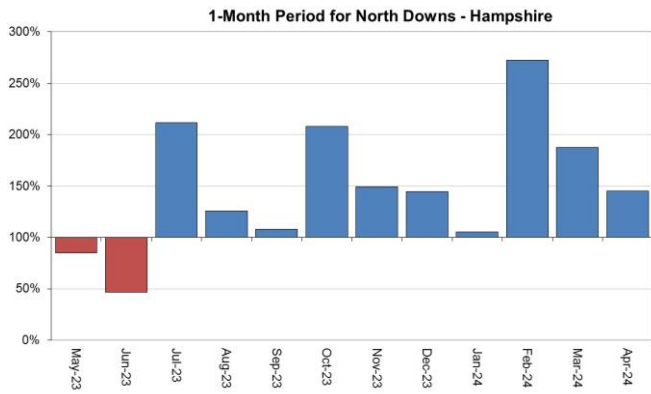


1-Month Period for Cut



Cut - Effective Rainfall





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

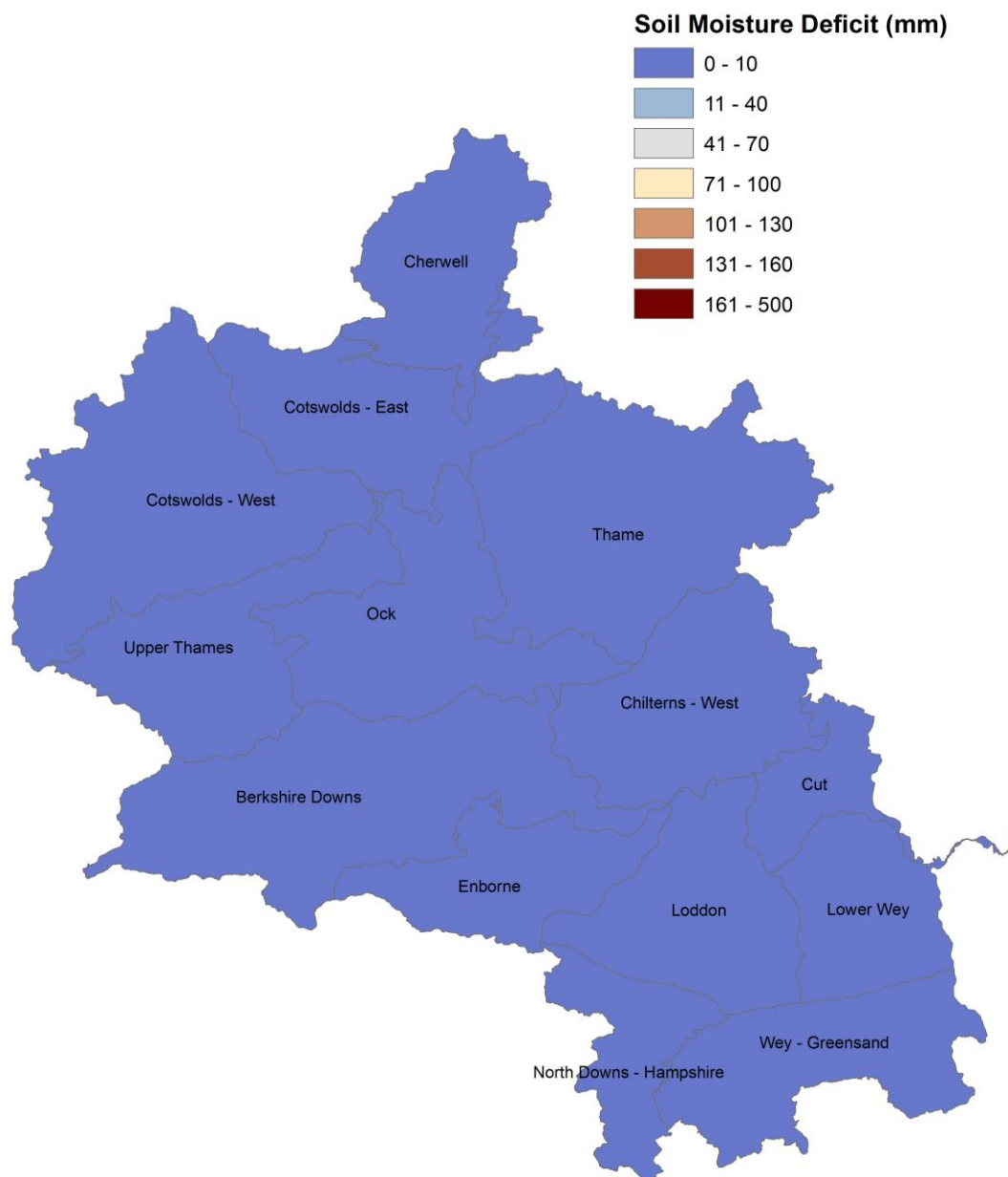
EA effective rainfall data (Source: EA Soil Moisture Model)



### 3 Soil moisture deficit

#### 3.1 Soil moisture deficit map

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

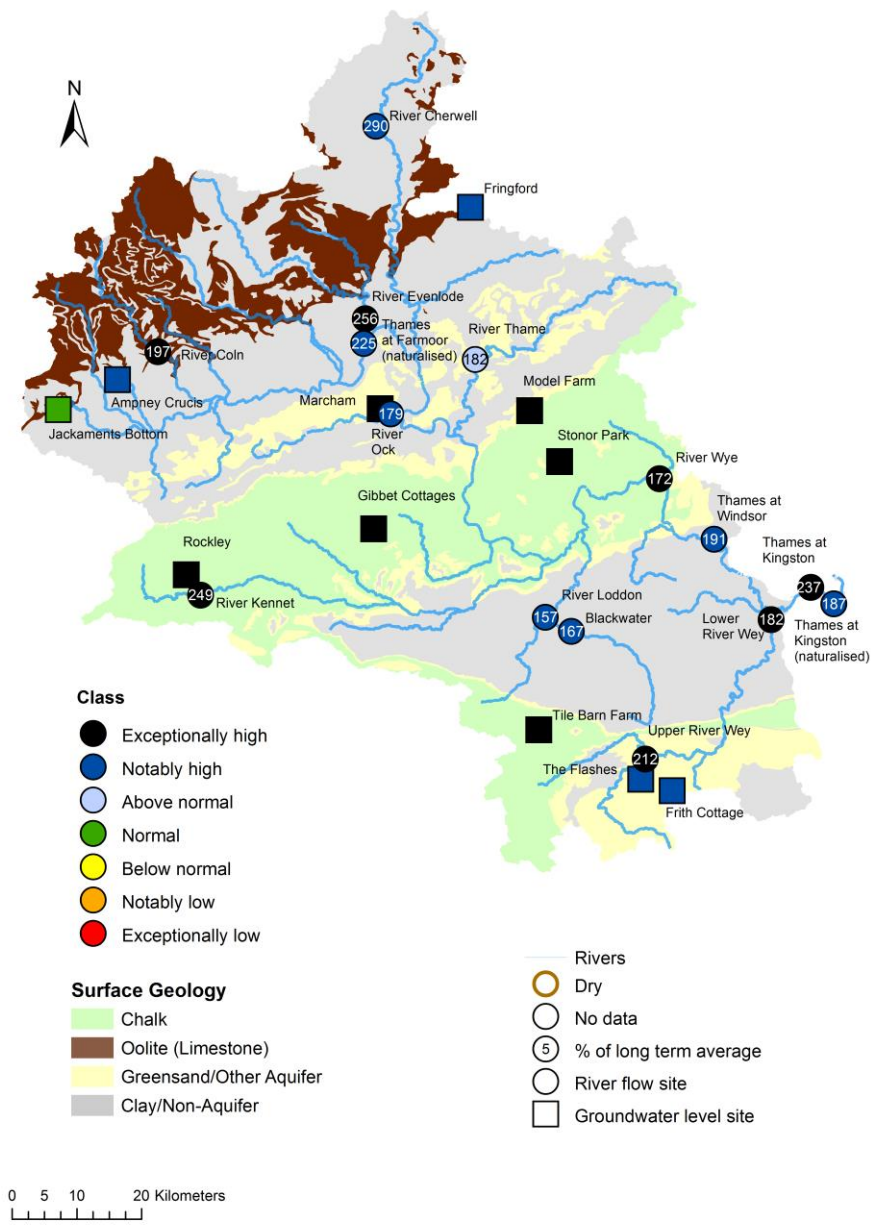


(Source: Met Office. Crown copyright, 2024). All rights reserved. Environment Agency, 100024198, 2024.

# 4 River Flow and Groundwater Status

## 4.1 River flow and groundwater level map

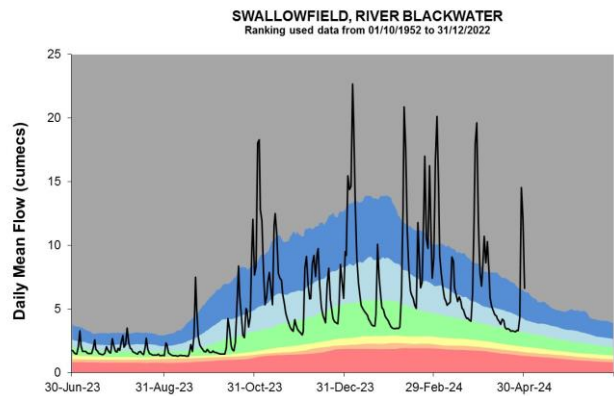
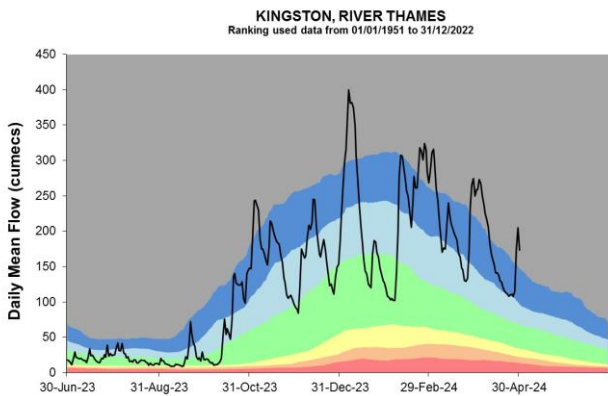
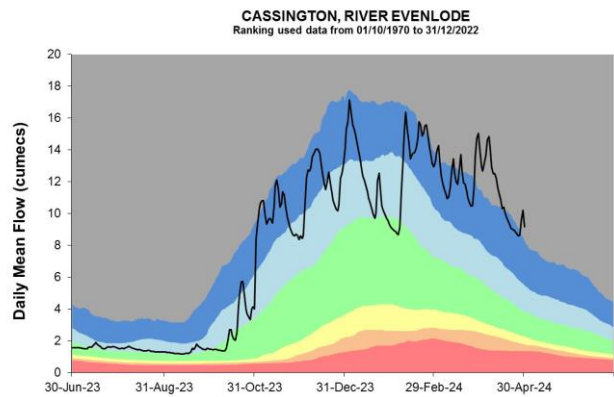
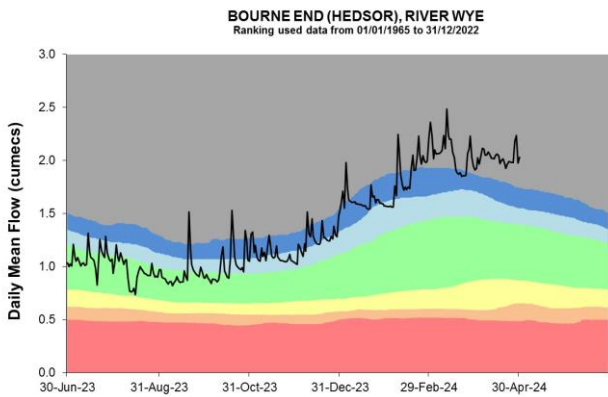
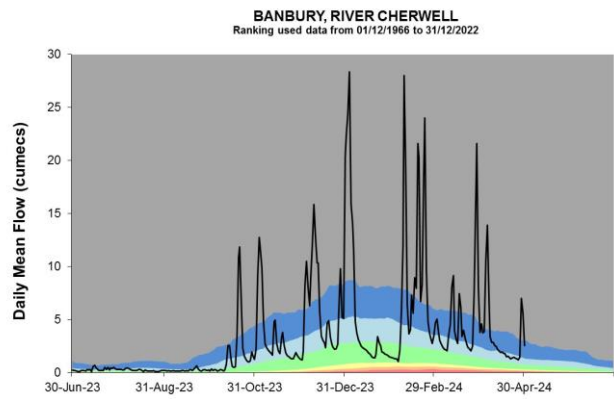
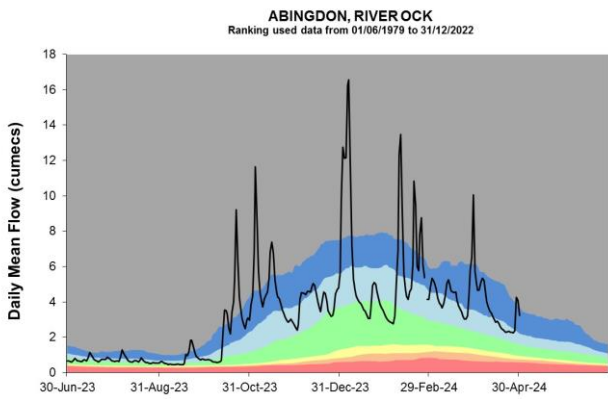
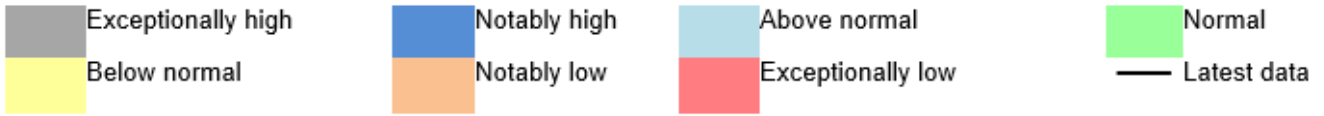
Figure 4.1: Monthly mean river flow for indicator sites and end of month groundwater levels for indicator sites for April 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic April means.



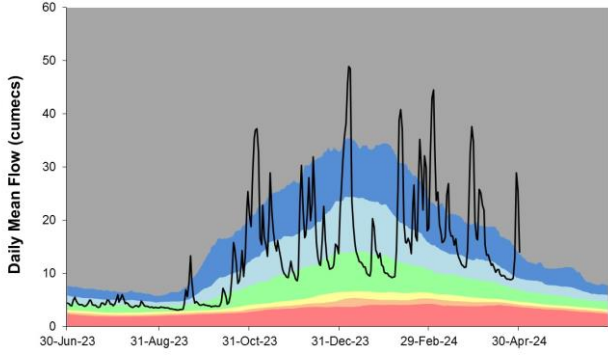
(Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

## 4.2 River flow charts

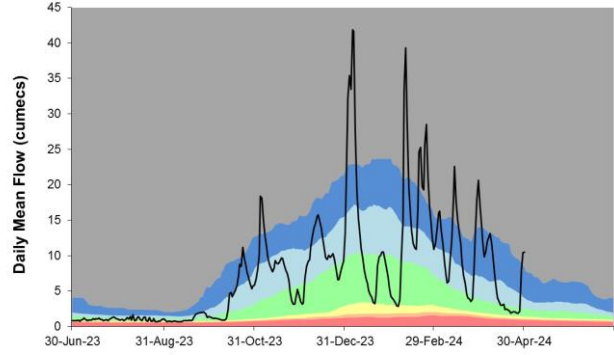
Figure 4.2: Daily mean river flows for indicator sites compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



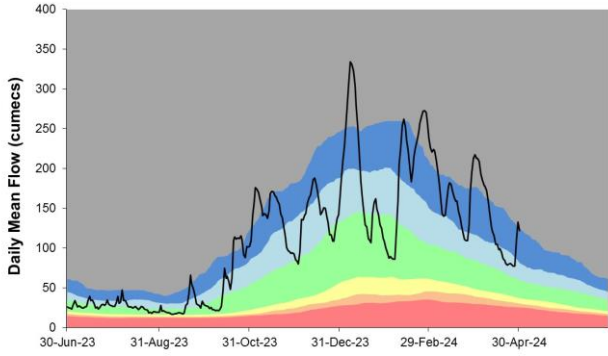
**WEYBRIDGE, RIVER WEY**  
Ranking used data from 01/04/1979 to 31/12/2022



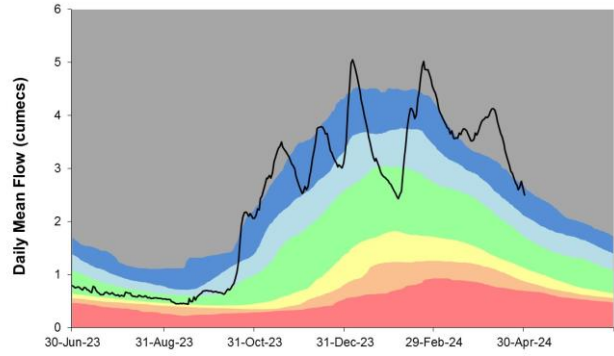
**WHEATLEY, RIVER THAME**  
Ranking used data from 01/01/1990 to 31/12/2022



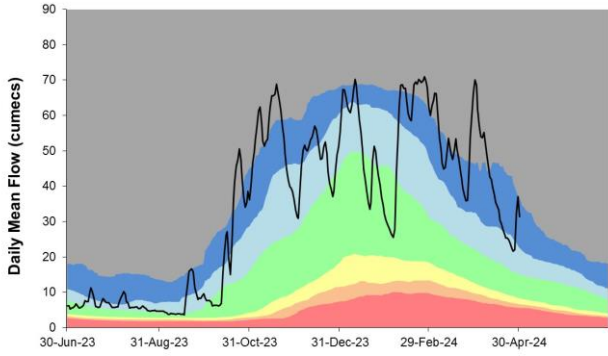
**WINDSOR, RIVER THAMES**  
Ranking used data from 01/08/1979 to 31/12/2022



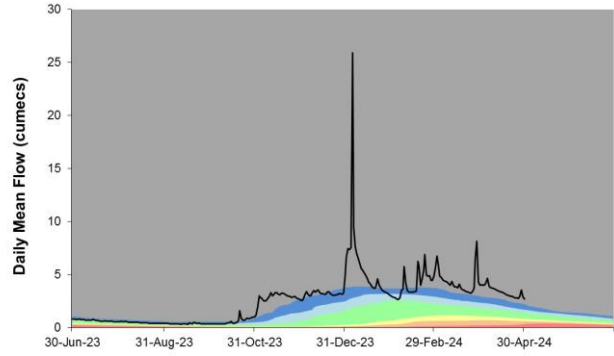
**BIBURY, RIVER COLN**  
Ranking used data from 01/10/1963 to 31/12/2022

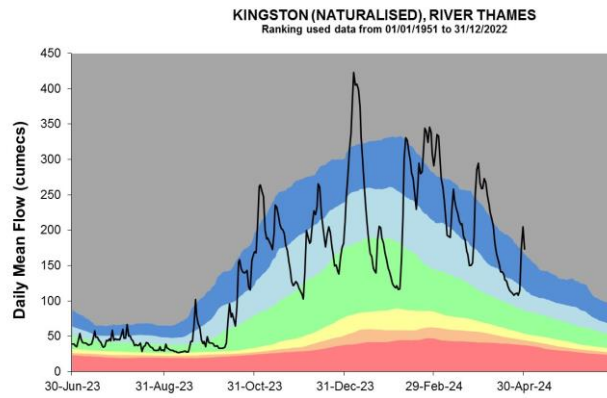
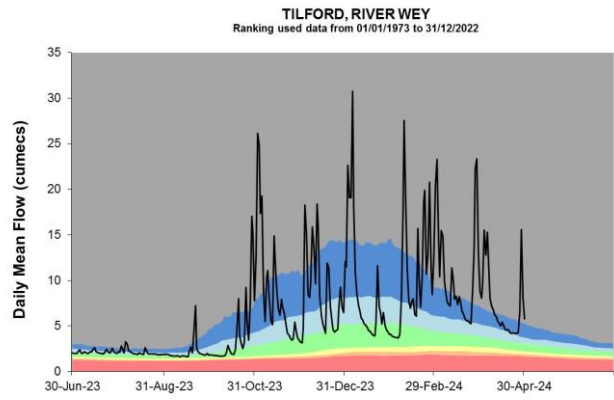
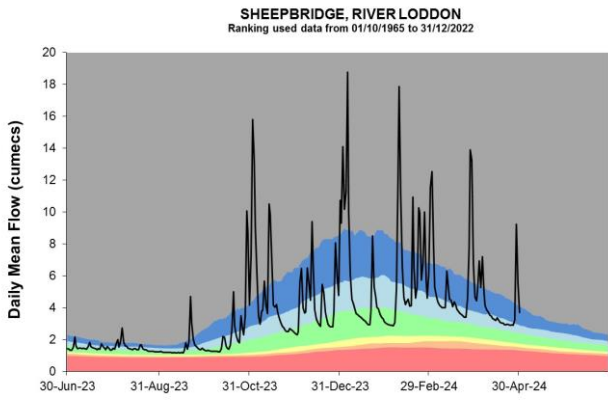


**FARMOOR (NATURALISED), RIVER THAMES**  
Ranking used data from 01/10/1992 to 31/12/2022



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

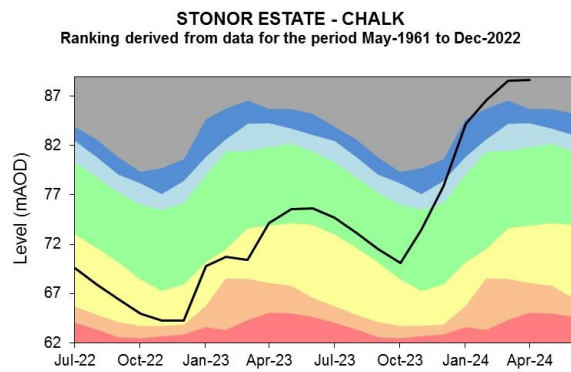
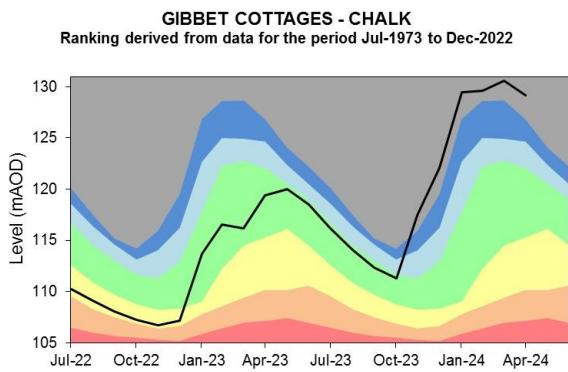
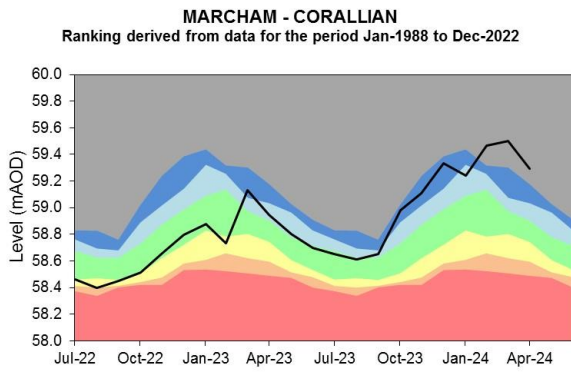
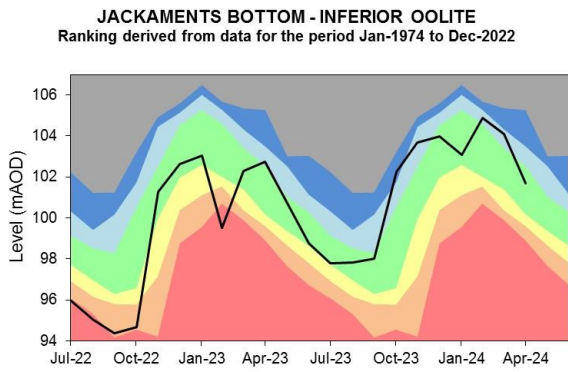
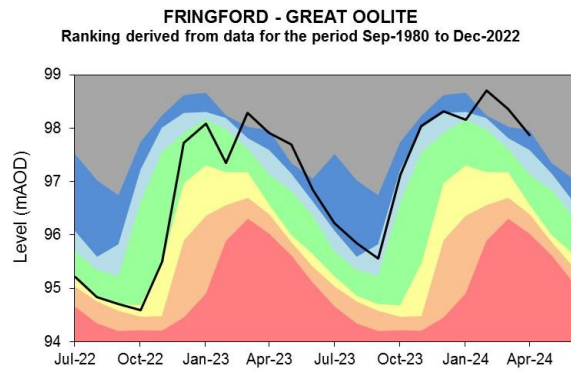
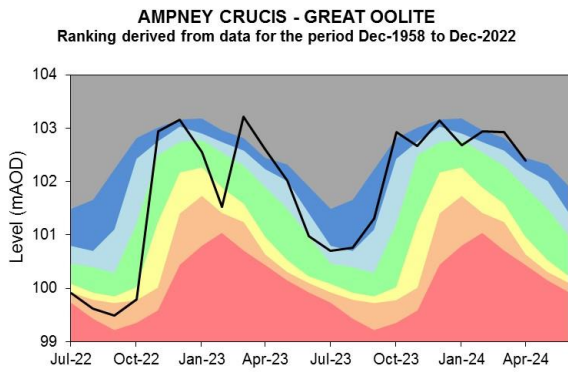
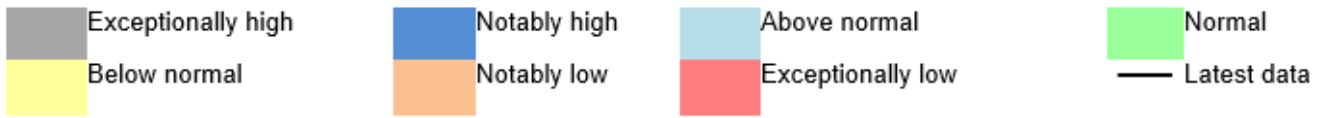


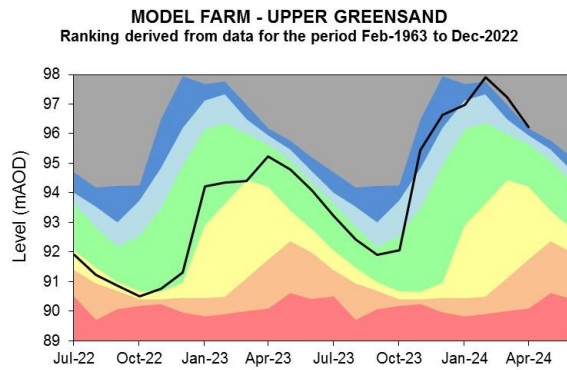
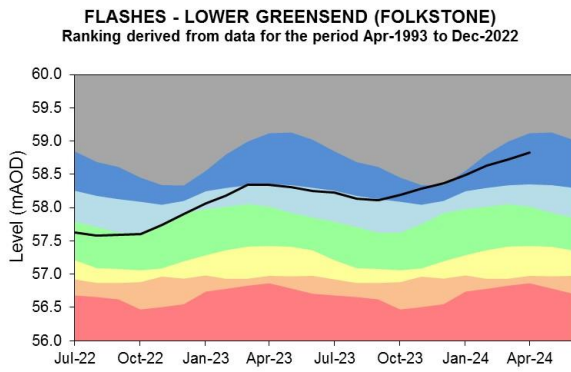
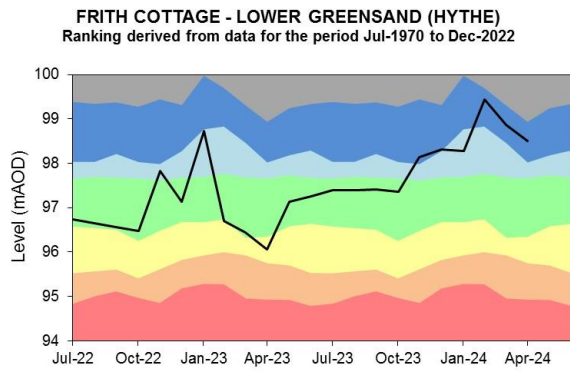
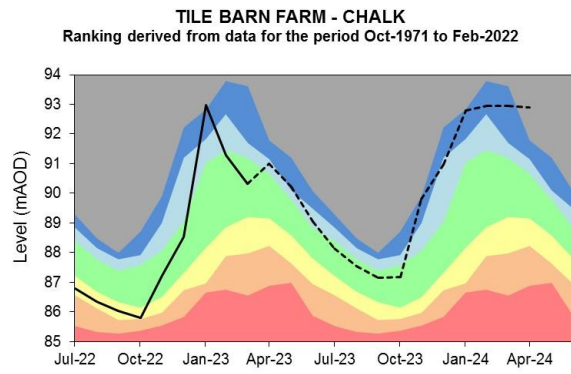
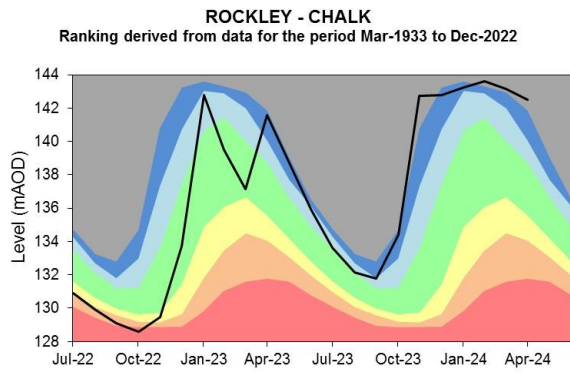


Source: Environment Agency.

### 4.3 Groundwater level charts

Figure 4.3: 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.



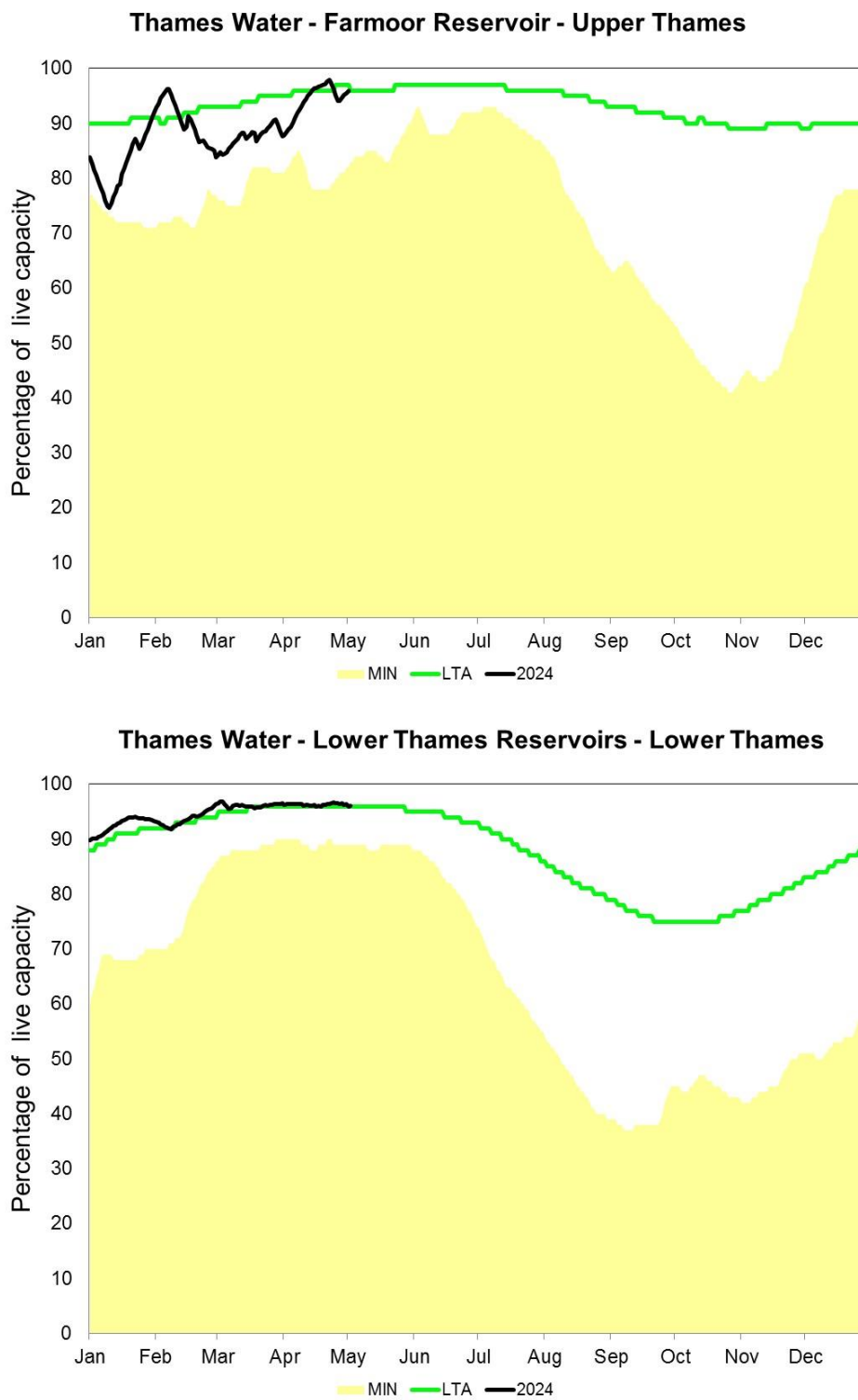


\*Tile Barn Farm data has been estimated from two local sites since April 2022. A replacement is planned

Source: Environment Agency, 2024.

## 5 Reservoir stocks

Figure 5.1: End of month regional reservoir stocks compared to minimum and average stocks.

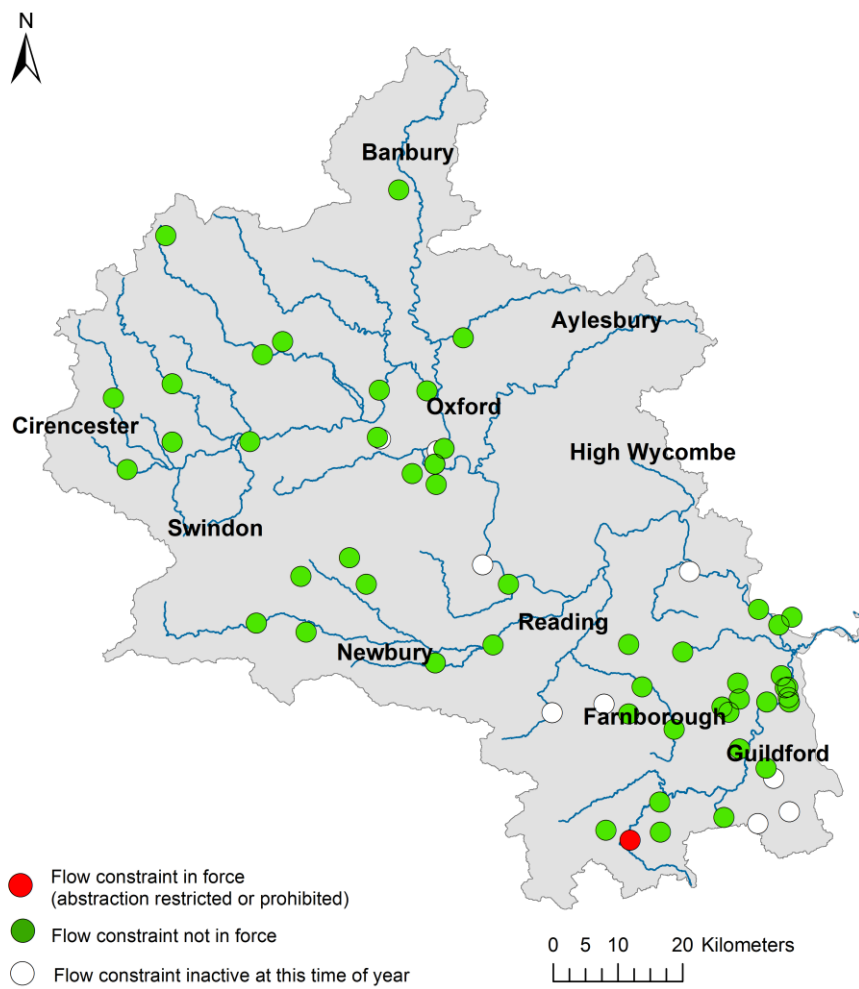


(Source: water companies).



## 6 Flow Constraints

6.1 Figure 6.1: End of month flow constraints in Thames Area.



### 6.2 Summary of flow constraints

Week ending	07/04/24	14/04/24	21/04/24	28/04/24
Number of flow constraints in force	1	1	1	1

## 7 Summary of rainfall, effective rainfall and soil moisture deficit

### 7.1 Rainfall and effective rainfall

Area	Rainfall (mm) 30 day Total	Rainfall (mm) April LTA	Rainfall (mm) % LTA	Effective Rainfall (mm) 30 day total	Effective Rainfall (mm) April LTA	Effective Rainfall (mm) % LTA
Cotswolds - West	87	56	154	37	17	219
Cotswolds - East	71	50	144	22	13	172
Berkshire Downs	77	53	146	28	15	194
Chilterns - West	70	53	133	19	15	128
North Downs - Hampshire	81	56	145	32	17	191
Wey - Greensand	88	57	154	39	18	216
Upper Thames	67	46	144	16	7	215
Cherwell	74	48	152	25	10	242
Thame	71	47	150	22	9	238
Loddon	73	49	149	20	9	214
Lower Wey	73	48	152	21	10	210
Ock	60	45	133	11	6	171
Enborne	73	50	144	23	11	206
Cut	66	48	140	11	9	126
<b>Thames Area</b>	<b>74</b>	<b>50</b>	<b>146</b>	<b>23</b>	<b>12</b>	<b>196</b>

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

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

## 7.2 Soil moisture deficit

Area	SMD (mm) Day 30	SMD (mm) LTA
Cotswolds - West	5	15
Cotswolds - East	5	18
Berkshire Downs	6	19
Chilterns - West	5	19
North Downs - Hampshire	6	17
Wey - Greensand	5	17
Upper Thames	6	22
Cherwell	5	19
Thame	5	20
Loddon	6	20
Lower Wey	6	20
Ock	8	25
Enborne	6	18
Cut	5	24
<b>Thames Area</b>	<b>6</b>	<b>20</b>

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

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

### 7.3 Summer rainfall and effective rainfall

<b>Summer period: 01/04/2024 to 30/04/2024</b>						
<b>Area</b>	<b>Rainfall (mm) Total</b>	<b>Rainfall (mm) LTA</b>	<b>Rainfall (mm) % LTA</b>	<b>Effective Rainfall (mm) Total</b>	<b>Effective Rainfall (mm) LTA</b>	<b>Effective Rainfall (mm) % LTA</b>
Cotswolds - West	87	56	154	37	17	219
Cotswolds - East	71	50	144	22	13	172
Berkshire Downs	77	53	146	28	15	194
Chilterns - West	70	53	133	19	15	128
North Downs - Hampshire	81	56	145	32	17	191
Wey - Greensand	88	57	154	39	18	216
Upper Thames	67	46	144	16	7	215
Cherwell	74	48	152	25	10	242
Thame	71	47	150	22	9	238
Loddon	73	49	149	20	9	214
Lower Wey	73	48	152	21	10	210
Ock	60	45	133	11	6	171
Enborne	73	50	144	23	11	205
Cut	66	48	140	11	9	126
<b>Thames Area</b>	<b>74</b>	<b>50</b>	<b>146</b>	<b>23</b>	<b>12</b>	<b>196</b>

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

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

## 8 Glossary

### 8.1 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 ( $\text{m}^3\text{s}^{-1}$ ).

#### **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).

## 8.2 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.

## 9 Appendices

### 9.1 Rainfall table

Hydrological area	Apr 2024 rainfall % of long term average 1961 to 1990	Apr 2024 band	Feb 2024 to April cumulative band	Nov 2023 to April cumulative band	May 2023 to April cumulative band
Berkshire Downs	146	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Chilterns West	134	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Cotswold East	144	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Cotswold West	154	Notably High	Exceptionally high	Exceptionally high	Exceptionally high
Cut	139	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Enborne	146	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Loddon	149	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Lower Wey	152	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
North Downs - Hampshire	145	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high



Ock	134	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Thame	150	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Upper Cherwell	152	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Upper Thames	145	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Wey - Greensand	155	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high

## 9.2 River flows table

Site name	River	Catchment	Apr 2024 band	Mar 2024 band
Abingdon	River Ock	Ock	Notably high	Exceptionally high
Banbury	River Cherwell	Cherwell Upper	Notably high	Exceptionally high
Bibury	Coln	Cotswolds West	Exceptionally high	Exceptionally high
Bourne End (Hedsor)	River Wye	Wye Bucks	Exceptionally high	Exceptionally high
Cassington	River Evenlode	Evenlode	Exceptionally high	Exceptionally high
Farmoor (naturalised)	River Thames	Thames	Notably high	Exceptionally high
Kingston	River Thames	Thames North Bank	Exceptionally high	Exceptionally high
Kingston (naturalised)	River Thames	Thames North Bank	Notably high	Exceptionally high
Marlborough	River Kennet	Kennet	Exceptionally high	Exceptionally high
Sheepbridge	River Loddon	Loddon	Notably high	Exceptionally high
Swallowfield	River Blackwater	Loddon	Notably high	Exceptionally 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	Above normal	Exceptionally high
Windsor	River Thames	Thames	Notably high	Exceptionally high

### 9.3 Groundwater table

Site name	Aquifer	End of Apr 2024 band	End of Mar 2024 band
Ampney Crucis Obh	Burford Oolitic Limestone (great)	Notably high	Exceptionally 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)	Normal	Above normal
Marcham Obh	Shrivenham Corallian	Exceptionally high	Exceptionally high
Model Farm	Chiltern Upper Greensand	Exceptionally high	Exceptionally high
Rockley Obh	Berkshire Downs Chalk	Exceptionally high	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	Exceptionally high	Notably high
Fringford P.s.	Upper Bedford Ouse Oolitic Limestone (great)	Notably high	Exceptionally high