

# Monthly water situation report: Devon and Cornwall Area

## 1 Summary - September 2024

Devon and Cornwall received 163% of the September long term average (LTA) rainfall, which was above normal for the time of year. September marked the end of the wettest water year in a record starting in 1871. Soil moisture deficit (SMD) decreased overall in September and ended the month lower (wetter) than the LTA for the time of year. Monthly mean river flows ranged from normal to exceptionally high for the time of year across the area. Groundwater levels at most sites decreased overall during September, but still ended the month at above normal to exceptionally high for the time of year. Total reservoir storage across Devon and Cornwall ended the month at 72% net storage, with Wimbleball, Colliford and Roadford reservoirs at 58%, 67% and 83% of net storage respectively at the end of September.

### 1.1 Rainfall

Devon and Cornwall received 151mm of rain during September (163% of the September LTA), which is classed as above normal for the time of year. The highest rainfall totals occurred on 5 to 7 September and 21 to 29 September, with drier periods in the remainder of the month. In September, rainfall was above normal in most hydrological areas apart from the Exe and North Cornwall, where rainfall was notably high for the time of year, and the Otter, Sid, Axe and Lim, where rainfall was exceptionally high for the time of year. It was the 4<sup>th</sup> wettest September on record in the Otter, Sid, Axe and Lim catchment (in a record starting 1871).

September marked the end of the wettest hydrological water year in a record starting in 1871. In the last 3 months, cumulative rainfall totals were normal in 5 reporting catchments, above normal in 5 reporting catchments, and exceptionally high in the Otter, Sid, Axe and Lim catchment, for the time of year. Cumulative rainfall over the last 12 months has been exceptionally high.

### 1.2 Soil moisture deficit

SMD decreased (soils became wetter) overall in September. By 01 October, the average deficit for Devon and Cornwall was close to 10mm, and was lower (soils were wetter) than the LTA for the time of year. The SMD was lower (soils were wetter) than the same time in 2023.

### 1.3 River flows

September monthly mean river flows ranged between normal to exceptionally high for the time of year. Whitford on the River Axe and Dotton on the River Otter recorded notably high and exceptionally high monthly mean river flows respectively, reflecting higher rainfall in these catchments. All reporting stations experienced peaks in daily mean river flow at the beginning and end of the month in response to the increased rainfall. The highest peaks were seen at the end of the month. On 30 September, most reporting sites recorded notably high or exceptionally high daily mean flows for the time of year.

### 1.4 Groundwater levels

Levels at all groundwater sites receded overall in September, except for Winnards Perch, which is the fastest responding site and whose seasonal rising hydrograph limb has begun. Groundwater levels were classed as follows:

- Exceptionally high at Whitlands (monitoring the Upper Greensand), Winnards Perch (monitoring the Staddon Formation) and Woodbury Common No2 (monitoring the Budleigh Salterton Pebble Beds)
- Notably high at Branscombe Lane (monitoring the Dawlish Sandstone) and Bussels No7A (monitoring the Dawlish Sandstone)
- Above normal at Coleford Production (monitoring the Permian Breccias and Sandstones) and Woodleys NO1 (monitoring the Otterton Sandstone Formation)

### 1.5 Reservoir stocks

Total reservoir storage was 72% at the end of September, which is a reduction of 2% of storage since the end of August. This is higher than the total storage at the same time last year and in 2022. At the end of the month, storage at Wimbleball, Colliford and Roadford was 58%, 67% and 83% of net storage respectively, compared to 74%, 52% and 54% this time last year.

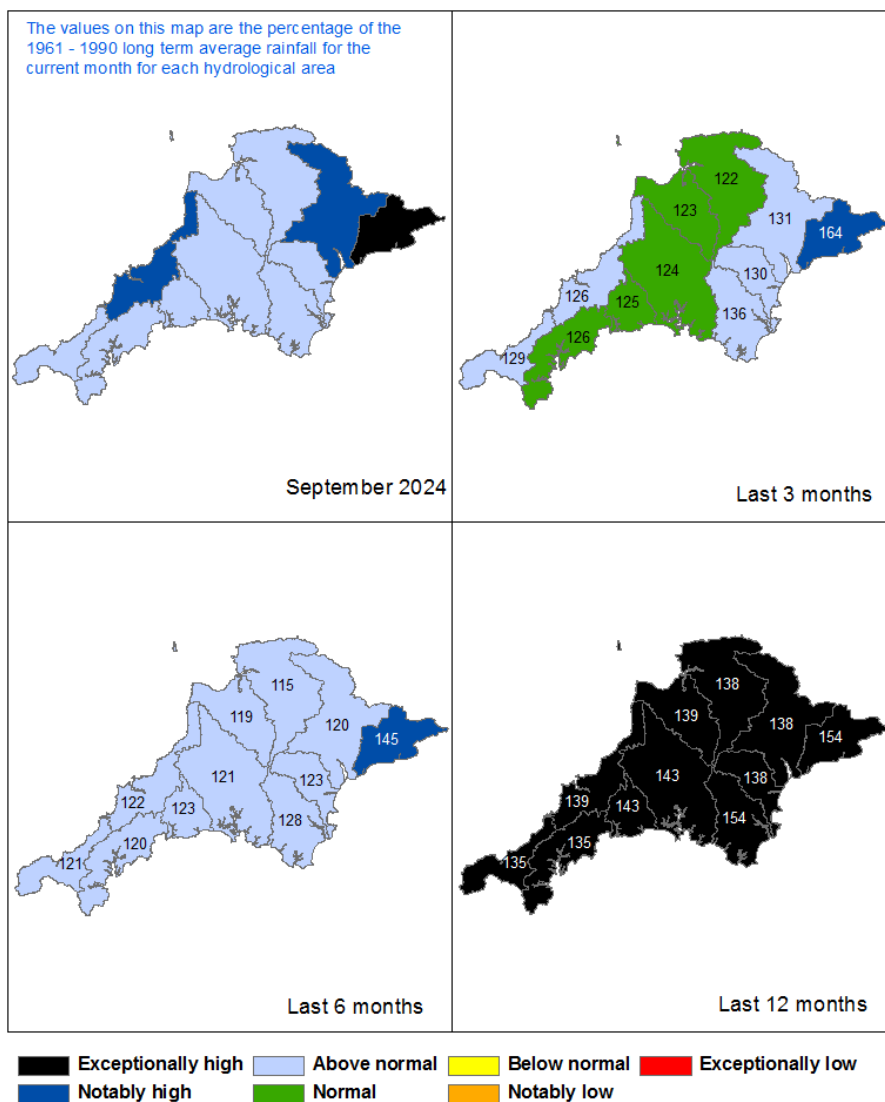
Author: Environment Agency, [hydrology.dandc@environment-agency.gov.uk](mailto:hydrology.dandc@environment-agency.gov.uk)

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## 2 Rainfall

### 2.1 Rainfall map

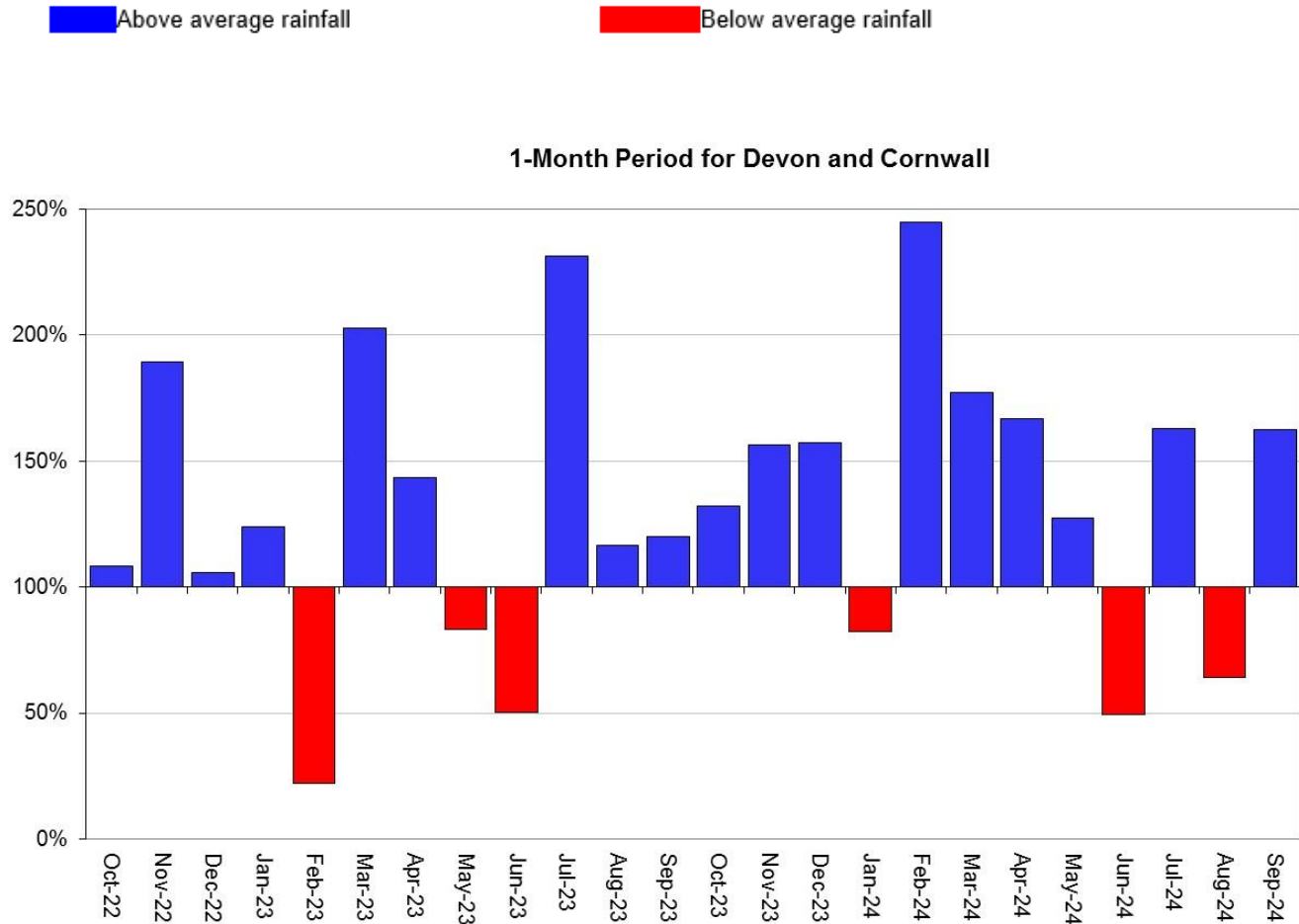
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 30 September 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



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.

## 2.2 Rainfall charts

Figure 2.2: Monthly rainfall totals for the past 24 months as a percentage of the 1961 to 1990 long term average for Devon and Cornwall area.

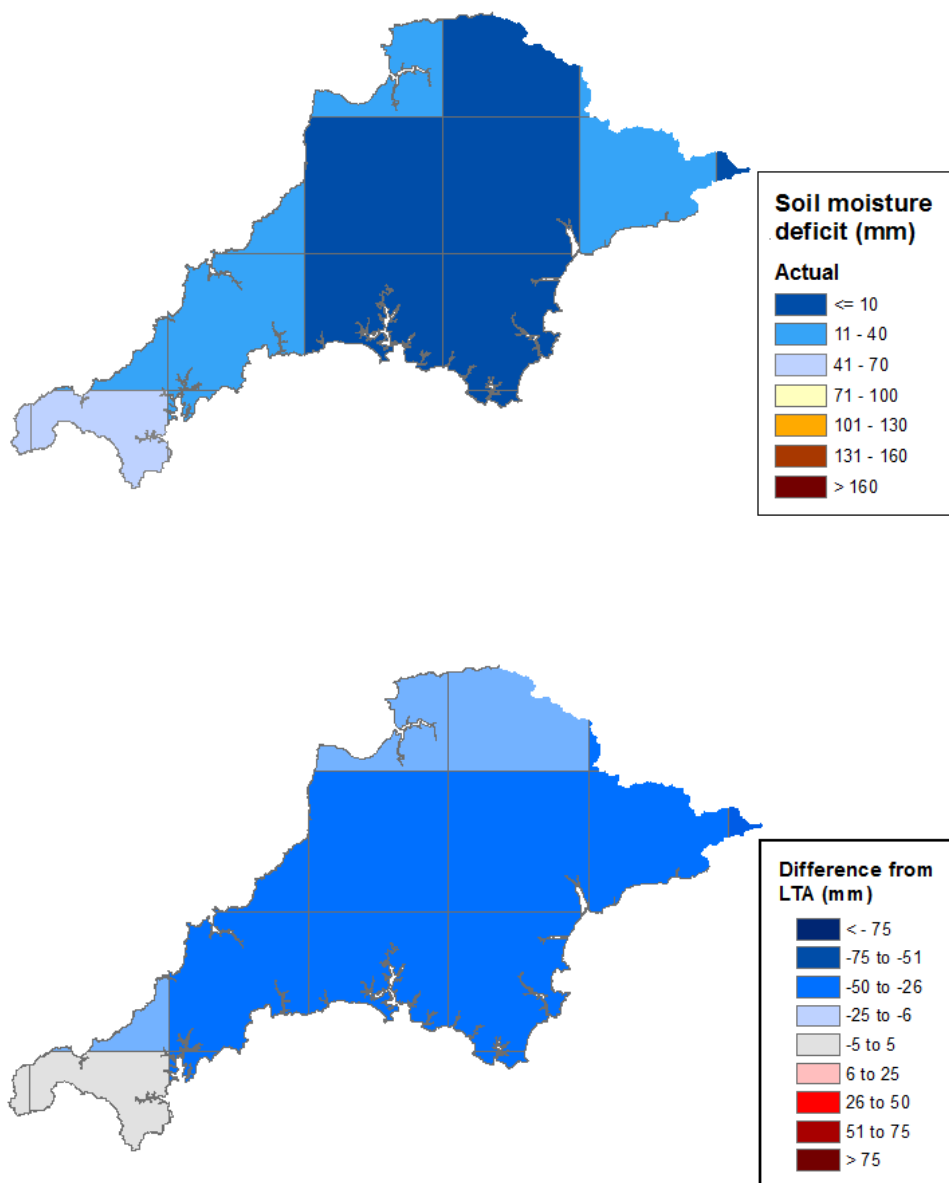


Rainfall data for 2024, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2024). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived from registered rain gauges (Source: Met Office. Crown copyright, 2024).

### 3 Soil moisture deficit

#### 3.1 Soil moisture deficit map

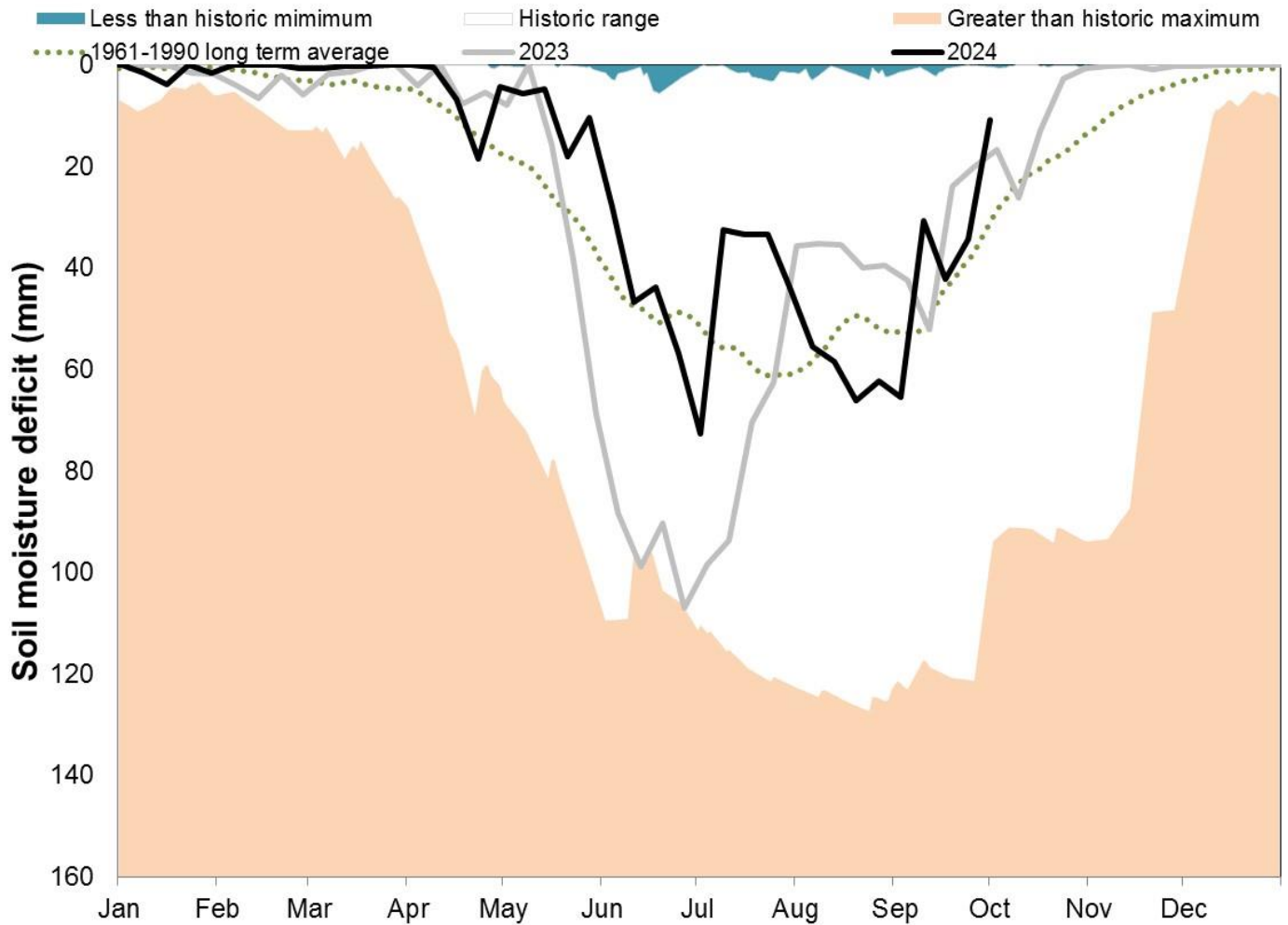
Figure 3.1: Top map shows soil moisture deficit for week ending 30 September 2024. Bottom map shows the difference (mm) between the actual soil moisture deficit and the 1961 to 1990 long term average soil moisture deficits. MORECS data for real land use.



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

### 3.2 Soil moisture deficit charts

Figure 3.2: Latest soil moisture deficit compared to previous year, maximum, minimum, and 1961 to 1990 long term average. Weekly MORECS data for real land use.

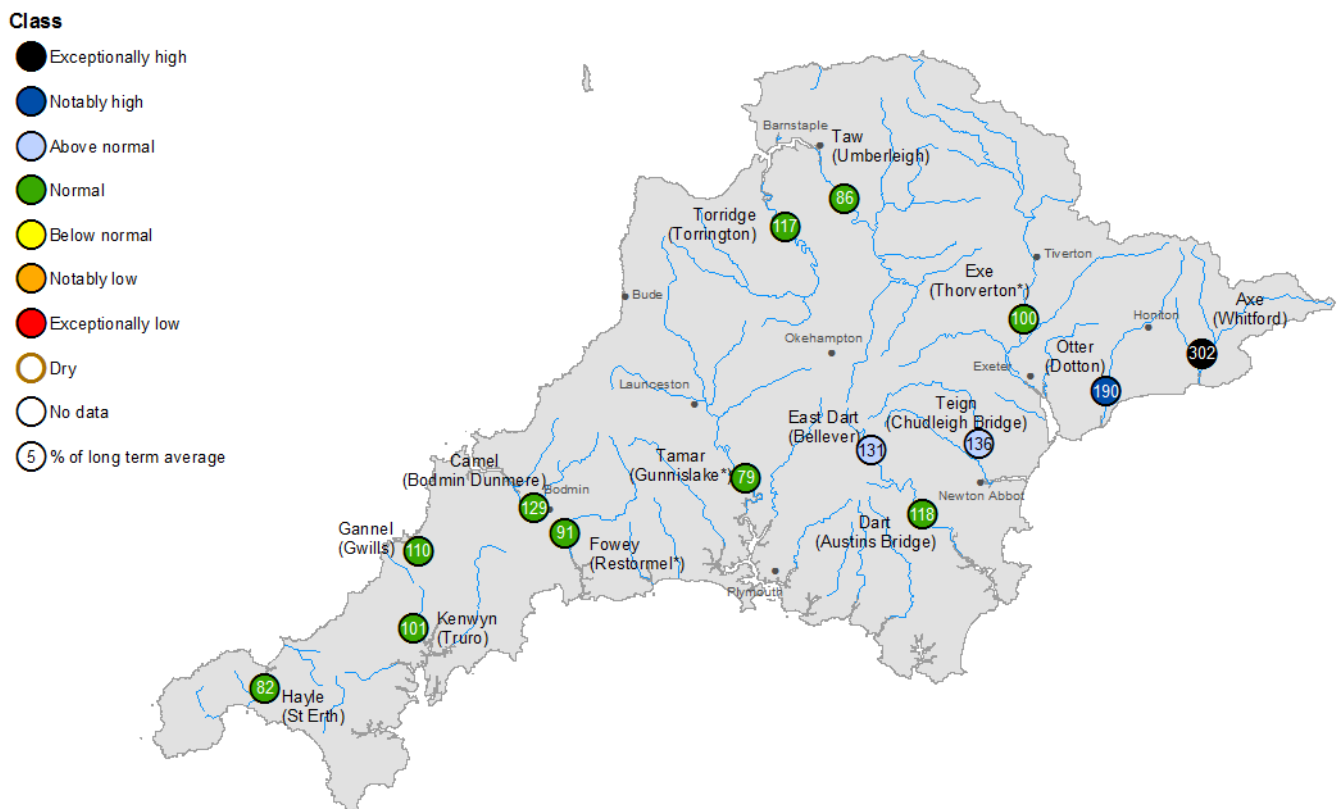


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## 4 River flows

### 4.1 River flows map

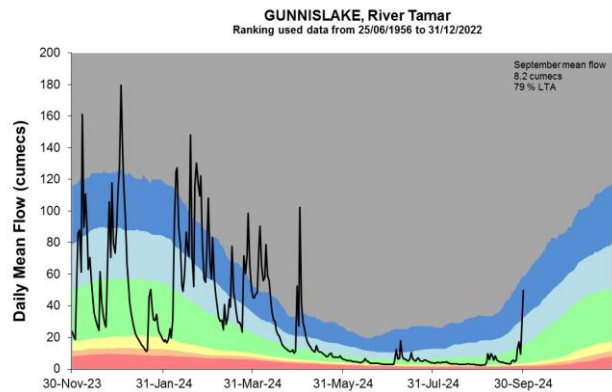
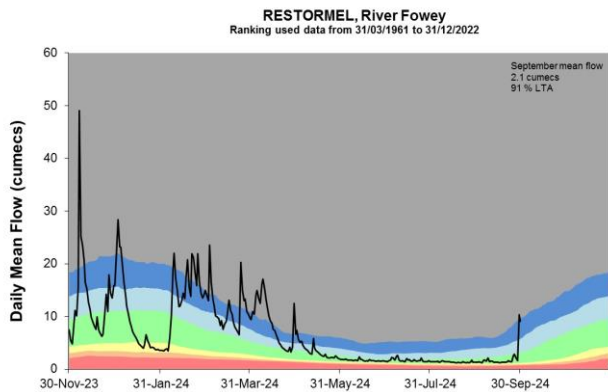
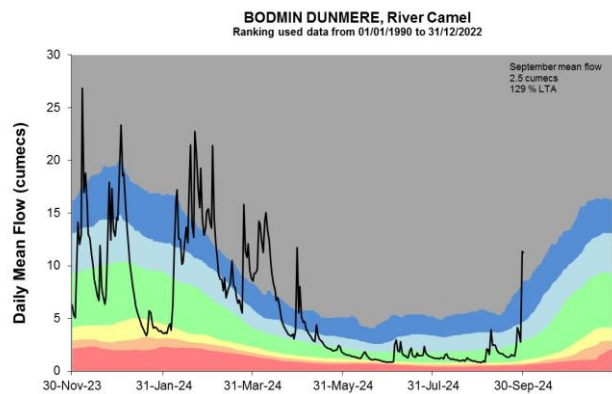
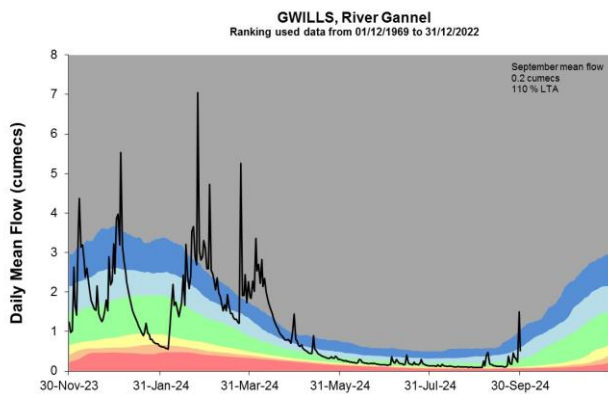
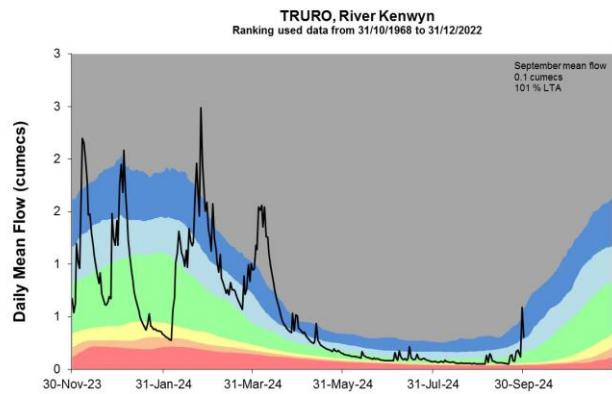
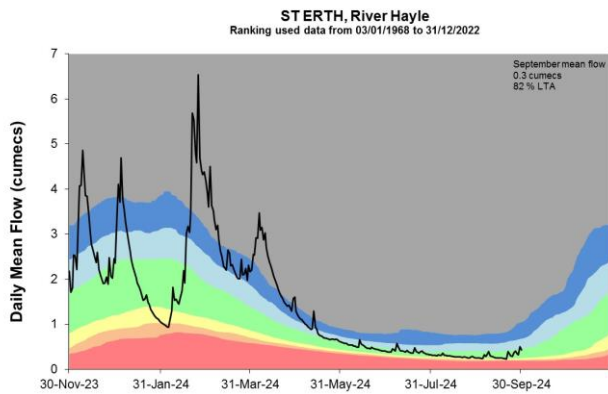
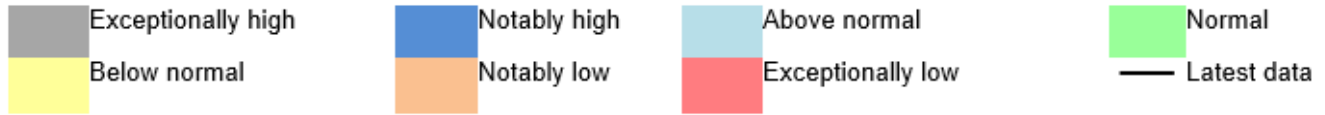
Figure 4.1: Monthly mean river flow for indicator sites for September 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic September monthly means. Table available in the appendices with detailed information.



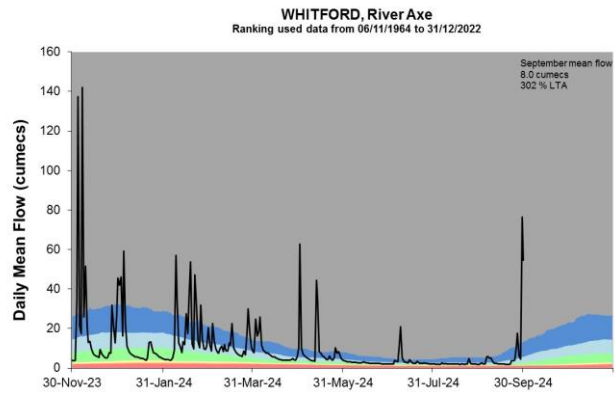
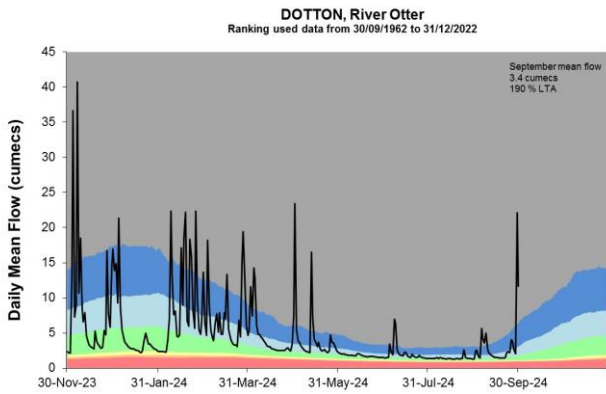
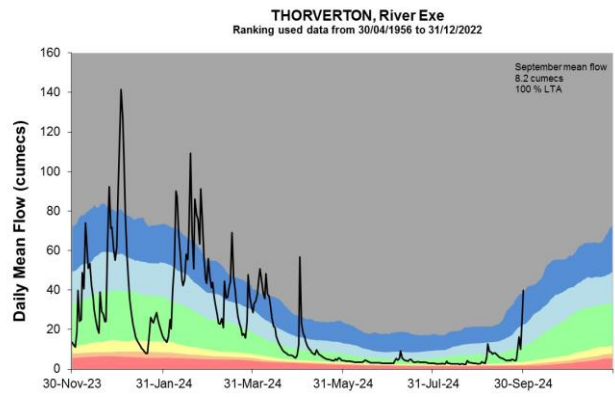
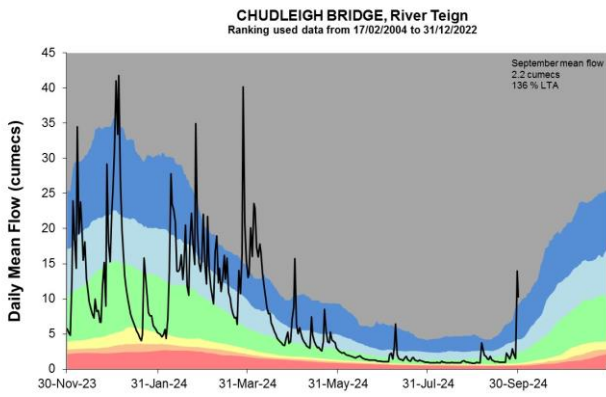
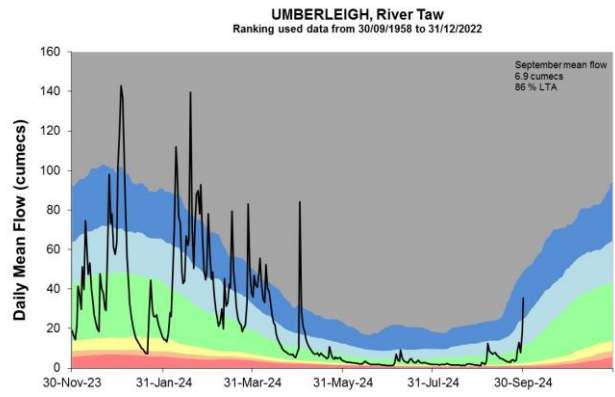
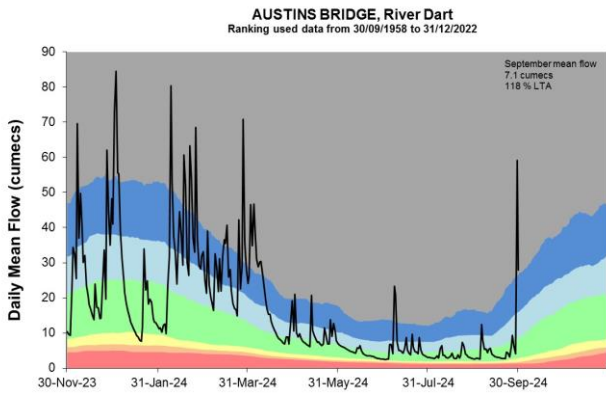
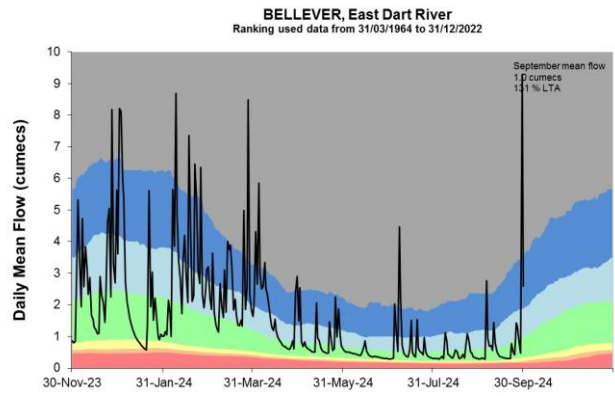
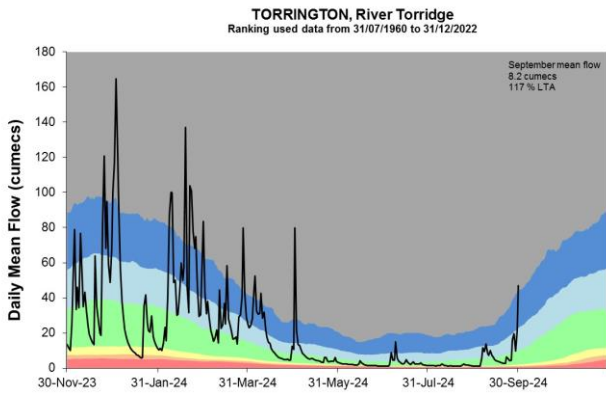
(Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

## 4.2 River flow charts

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





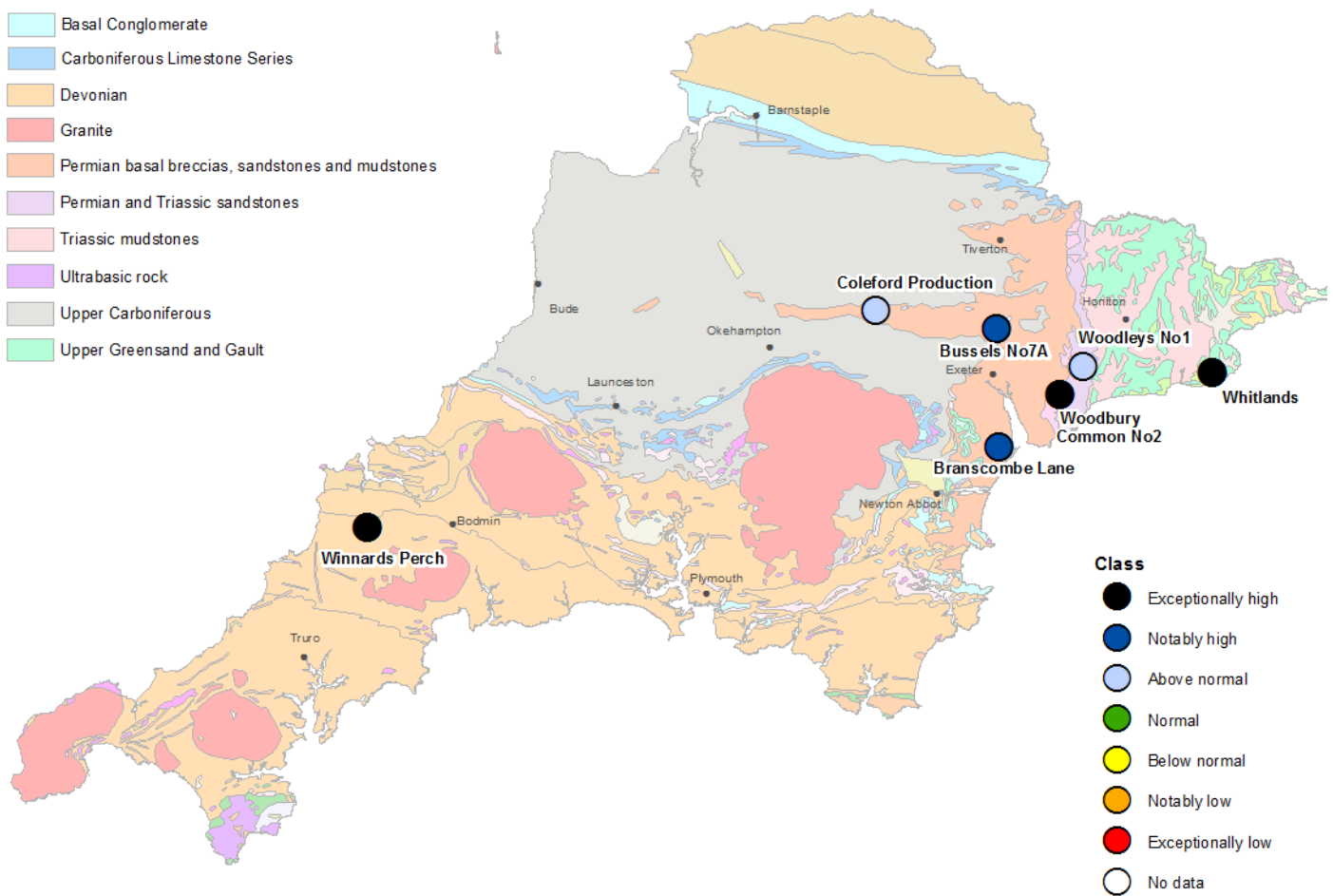


Source: Environment Agency.

# 5 Groundwater levels

## 5.1 Groundwater levels map

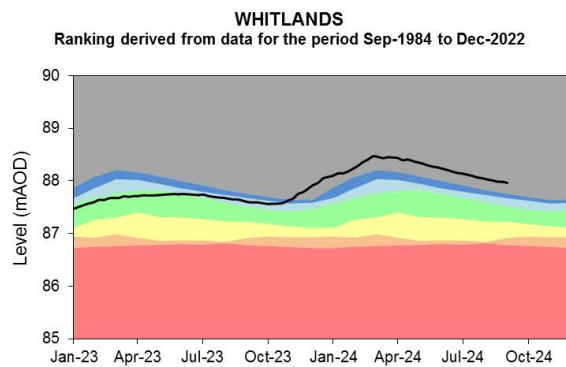
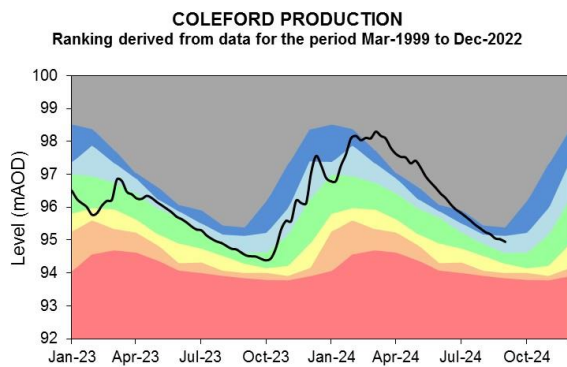
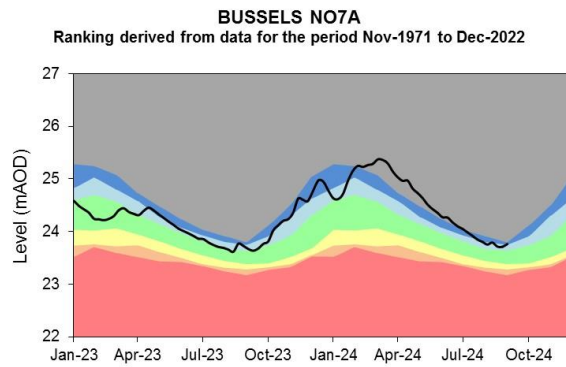
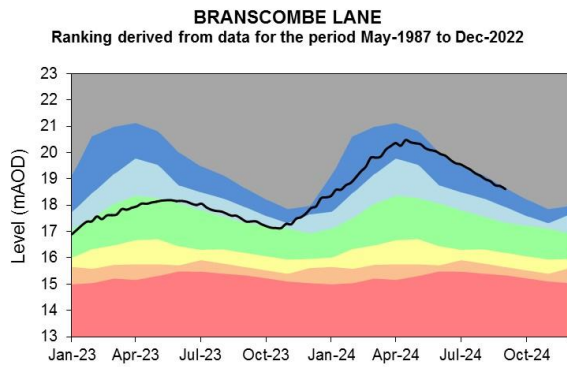
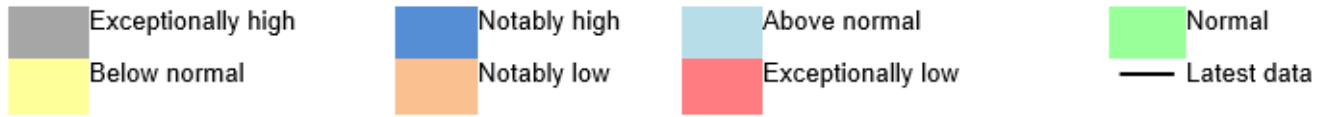
Figure 5.1: Groundwater levels for indicator sites at the end of September 2024, classed relative to an analysis of respective historic September levels. Table available in the appendices with detailed information.



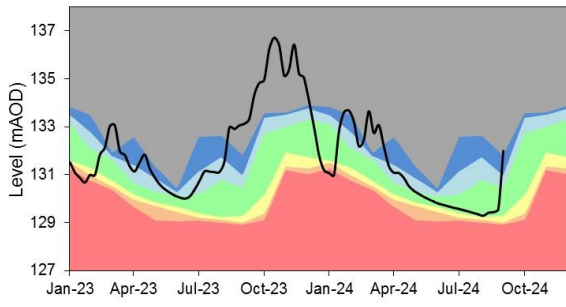
(Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

## 5.2 Groundwater level charts

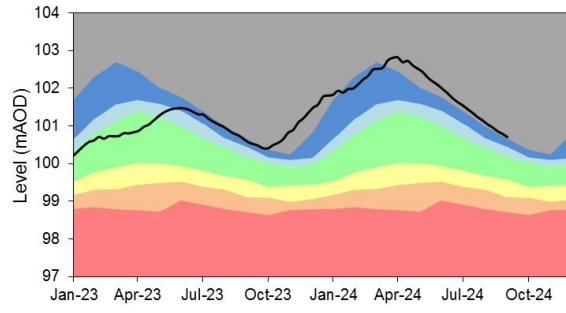
Figure 5.2: End of month groundwater levels at index groundwater level sites for major aquifers. 22 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.



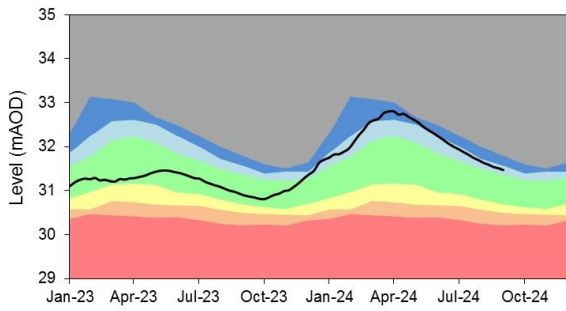
**WINNARDS PERCH B.H.**  
Ranking derived from data for the period Jan-2002 to Dec-2022



**WOODBURY COMMON NO2**  
Ranking derived from data for the period Nov-1967 to Dec-2022



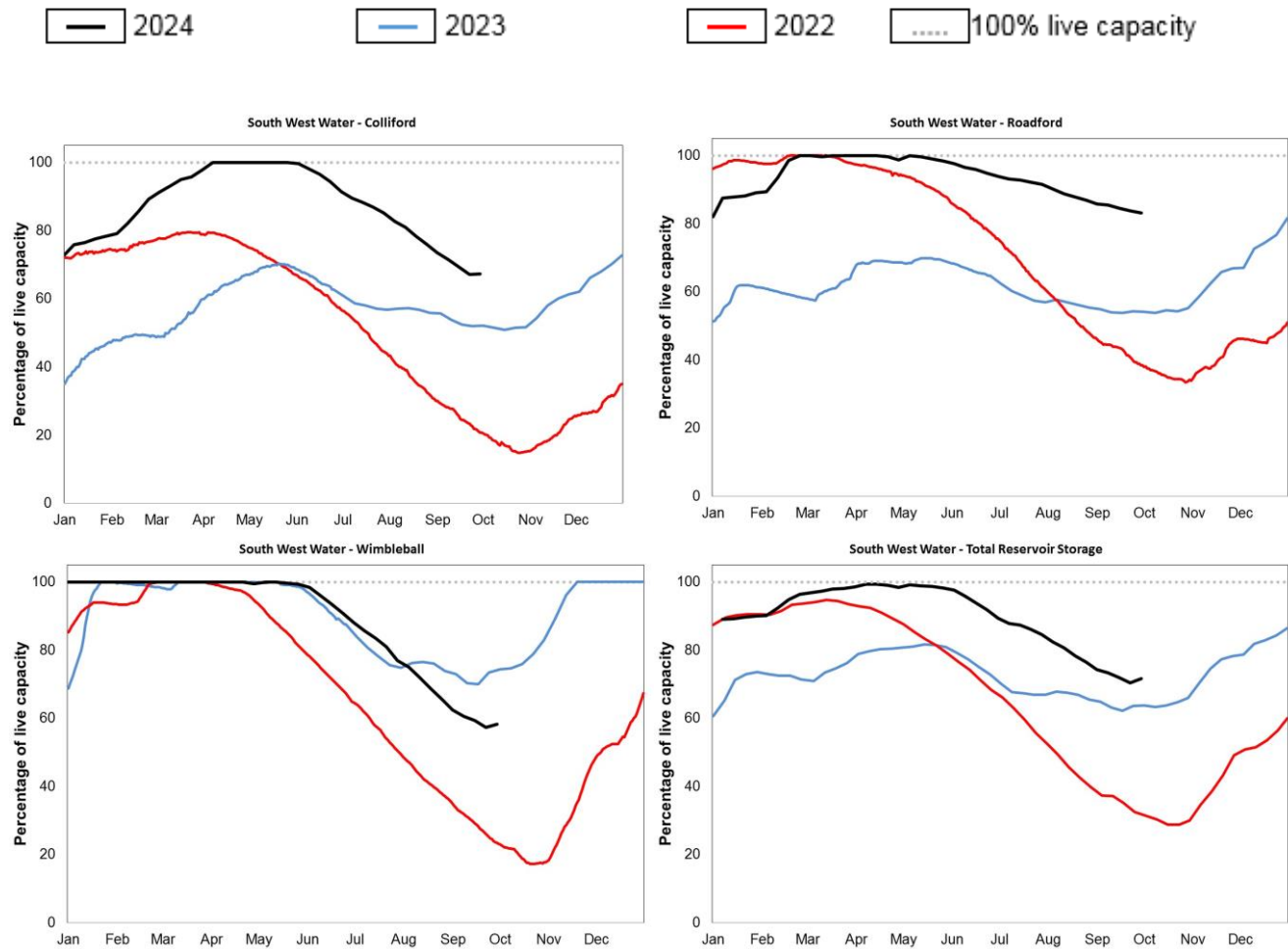
**WOODLEYS NO1**  
Ranking derived from data for the period Jan-1966 to Dec-2022



Source: Environment Agency, 2024.

## 6 Reservoir stocks

Figure 6.1: End of month reservoir storage compared to previous year and a historic drought year. Note: Historic records of individual reservoirs vary in length.



(Source: South West Water).

## 7 Glossary

### 7.1 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).

## 7.2 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.



## 8 Appendices

### 8.1 Rainfall table

Hydrological area	Sep 2024 rainfall % of long term average 1961 to 1990	Sep 2024 band	Jul 2024 to September cumulative band	Apr 2024 to September cumulative band	Oct 2023 to September cumulative band
Avon Dart And Erme	144	Above Normal	Above normal	Above normal	Exceptionally high
Exe	190	Notably High	Above normal	Above normal	Exceptionally high
Fal And St Austell	159	Above Normal	Normal	Above normal	Exceptionally high
North Cornwall	164	Notably High	Above normal	Above normal	Exceptionally high
Otter Sid Axe And Lim	237	Exceptionally High	Notably high	Notably high	Exceptionally high
Seaton Looe And Fowey	145	Above Normal	Normal	Above normal	Exceptionally high
Tamar	139	Above Normal	Normal	Above normal	Exceptionally high
Taw And North Devon Streams	158	Above Normal	Normal	Above normal	Exceptionally high
Teign And Torbay	171	Above Normal	Above normal	Above normal	Exceptionally high

Torridge And Hartland Streams	157	Above Normal	Normal	Above normal	Exceptionally high
West Cornwall	165	Above Normal	Above normal	Above normal	Exceptionally high

## 8.2 River flows table

Site name	River	Catchment	Sep 2024 band	Aug 2024 band
Austins Bridge	Dart	Dart	Normal	Normal
Bellever	East Dart	Dart	Above normal	Normal
Bodmin Dunmere	Camel	Camel	Normal	Normal
Chudleigh Bridge	Teign	Teign Upper	Above normal	Normal
Dotton	Otter	Otter	Notably high	Normal
Gunnislake	Tamar	Tamar Lower	Normal	Normal
Gwills	Gannel	Gannel	Normal	Below normal
Restormel	Fowey	Fowey	Normal	Normal
St Erth	Hayle	Hayle	Normal	Normal
Thorverton	Exe	Exe Lower	Normal	Below normal
Torrington	Torridge	Torridge Middle	Normal	Below normal
Truro	Kenwyn	Tresillian Trevella Kenwyn	Normal	Below normal
Umberleigh	Taw	Taw Middle	Normal	Below normal
Whitford	Axe	Axe Devon Middle	Exceptionally high	Normal



### 8.3 Groundwater table

Site name	Aquifer	End of Sep 2024 band	End of Aug 2024 band
Branscombe Lane	Dawlish Sandstone	Notably high	Notably high
Bussels No7a	Dawlish Sandstone	Notably high	Above normal
Coleford Production	Permian Breccias And Sandstones	Above normal	Notably high
Whitlands	Upper Greensand	Exceptionally high	Exceptionally high
Winnards Perch B.h.	Staddon Formation	Exceptionally high	Normal
Woodbury Common No2	Budleigh Salterton Pebble Beds	Exceptionally high	Exceptionally high
Woodleys No1	Otterton Sandstone Formation	Above normal	Above normal