Monthly water situation report: Devon and Cornwall Area

1 Summary - October 2024

Devon and Cornwall received 130% of the October long term average (LTA) rainfall, which was normal for the time of year. Soil moisture deficit (SMD) decreased overall in October 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 are just beginning their seasonal rise, or are showing signs of being about to do so, and ended the month at normal to exceptionally high for the time of year. Total reservoir storage across Devon and Cornwall ended the month at 80% net storage, with Wimbleball, Colliford and Roadford reservoirs at 69%, 71%, and 88% of net storage respectively at the end of October.

1.1 Rainfall

Devon and Cornwall received 152mm of rain during October (130% of the October LTA), which is classed as normal for the time of year. The most significant periods of rain occurred on 5 to 8 October and 13 to 19 October, with some dry spells mainly occurring at the beginning and end of the month. October was the 18th month out of the previous 24 months to have experienced wetter than average rainfall.

In October, rainfall was normal in most hydrological areas except for the Exe and the Otter, Sid, Axe and Lim where rainfall was above normal for the time of year. In the last 3 months, cumulative rainfall totals were normal in 8 reporting catchments, above normal in the Exe and North Cornwall catchments, and notably 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 October. By 15 October the average deficit for Devon and Cornwall was below 1mm, and remained at this level for the remainder of the month, meaning the average deficit was lower (soils were wetter) than the LTA for the time of year. By the end of October, SMD was similar to the same time in 2023.

1.3 River flows

October monthly mean river flows ranged between normal to exceptionally high for the time of year. Dotton on the River Otter recorded exceptionally high monthly mean river flows, while Whitford on the River Axe and Bodmin Dunmere on the River Camel recorded notably high monthly river flows, reflecting higher rainfall in these catchments. All reporting stations experienced peaks in daily mean river flow in the middle of the month in response to increased rainfall, with a downward trend toward the end of the month. On 31 October, all reporting sites recorded normal daily mean flows, with the exception of St Erth on the River Hayle which recorded above normal daily mean flows for the time of year.

Due to data accuracy concerns, we have low confidence in the data at Truro gauging station on the River Kenwyn and St Erth gauging station on the River Hayle towards the end of October.

1.4 Groundwater levels

On 31 October, groundwater levels were classed as follows:

- Exceptionally high at Branscombe Lane (monitoring the Dawlish Sandstone), Whitlands (monitoring the Upper Greensand), and Woodbury Common No2 (monitoring the Budleigh Salterton Pebble Beds)
- Notably high at Bussels No7A (monitoring the Dawlish Sandstone) and Woodleys No1 (monitoring the Otterton Sandstone Formation)
- Above normal at Coleford Production (monitoring the Permian Breccias and Sandstones)
- Normal at Winnards Perch (monitoring the Staddon Formation)

Bussels No7A and Coleford Production hydrographs have just begun their seasonal rising limbs. Levels at all other sites except Branscombe Lane are flattening out, indicating they are about to begin rising.

1.5 Reservoir stocks

Total reservoir storage was 80% at the end of October, which is an increase of 8% in storage since the end of September. 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 69%, 71% and 88% of net storage respectively, compared to 83%, 52% and 55% this time last year.

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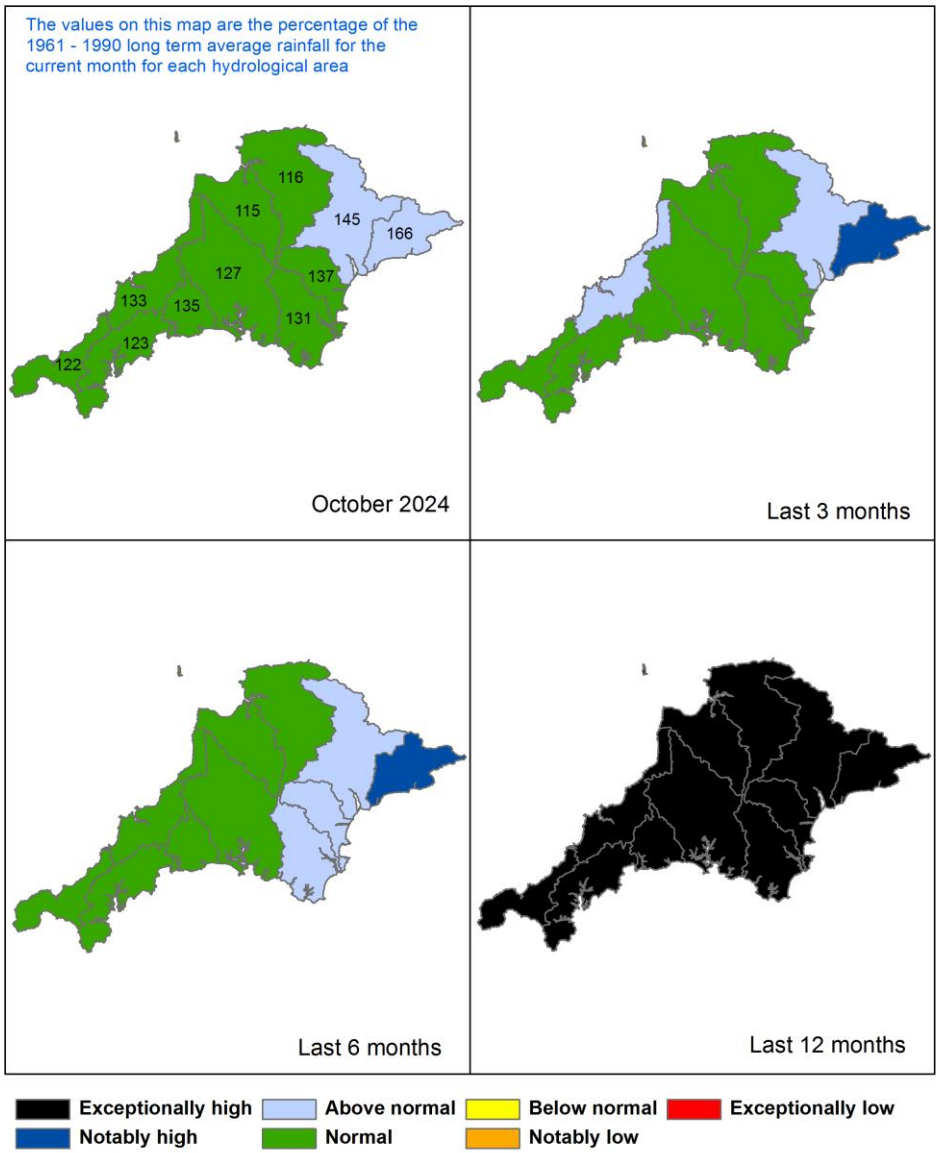
2 Rainfall

2.1 Rainfall map

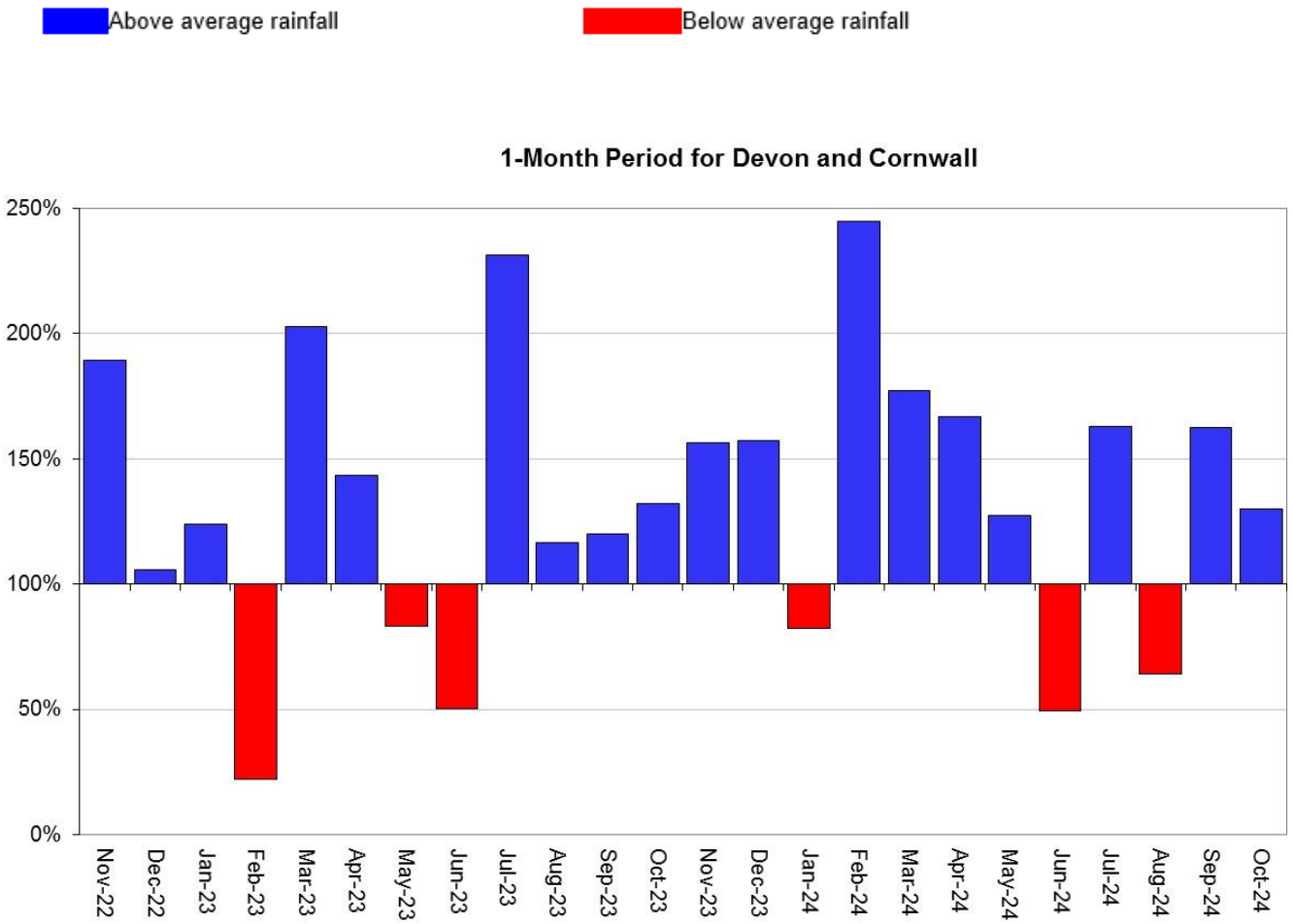
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 31 October 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



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.

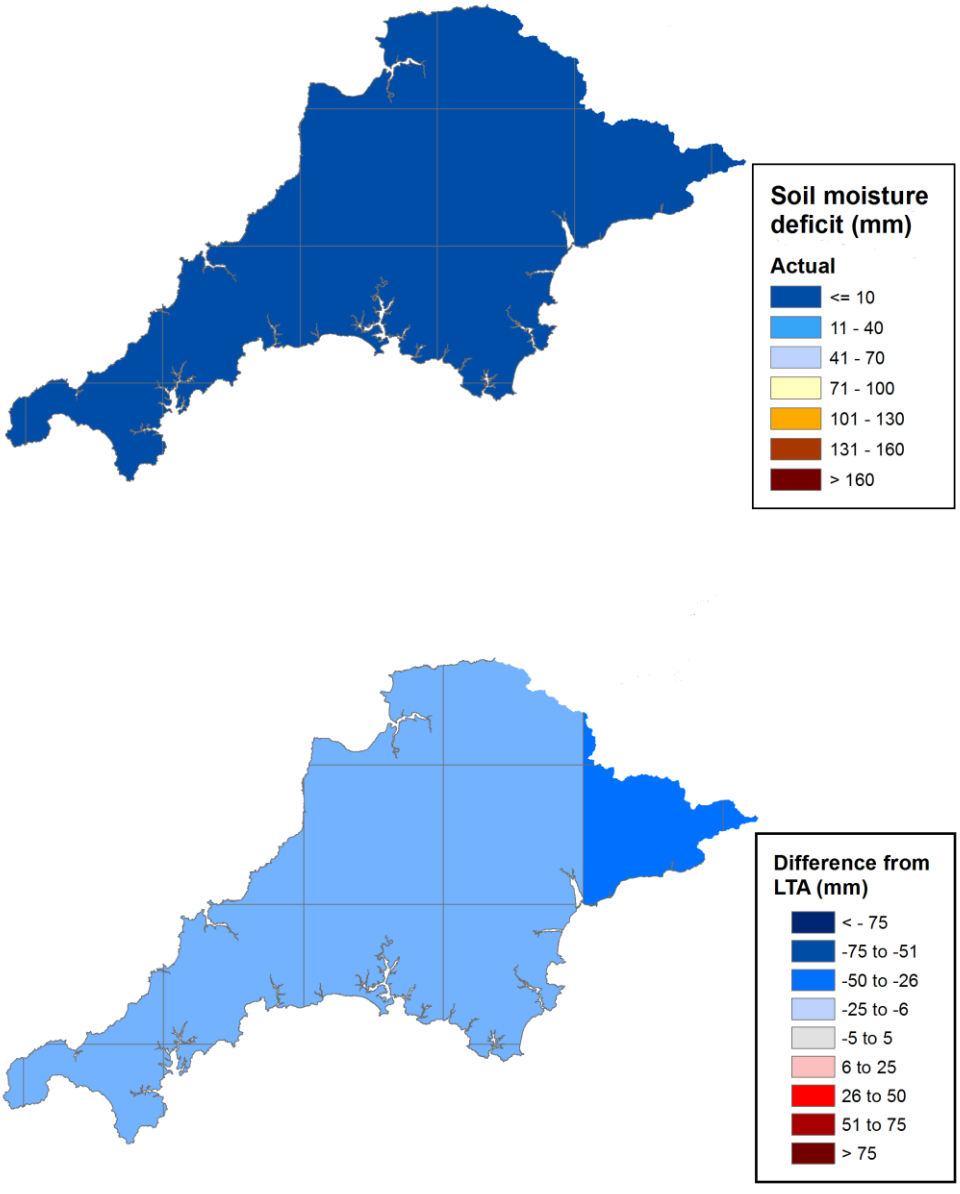


Rainfall data for 2024, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2024). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived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

3 Soil moisture deficit

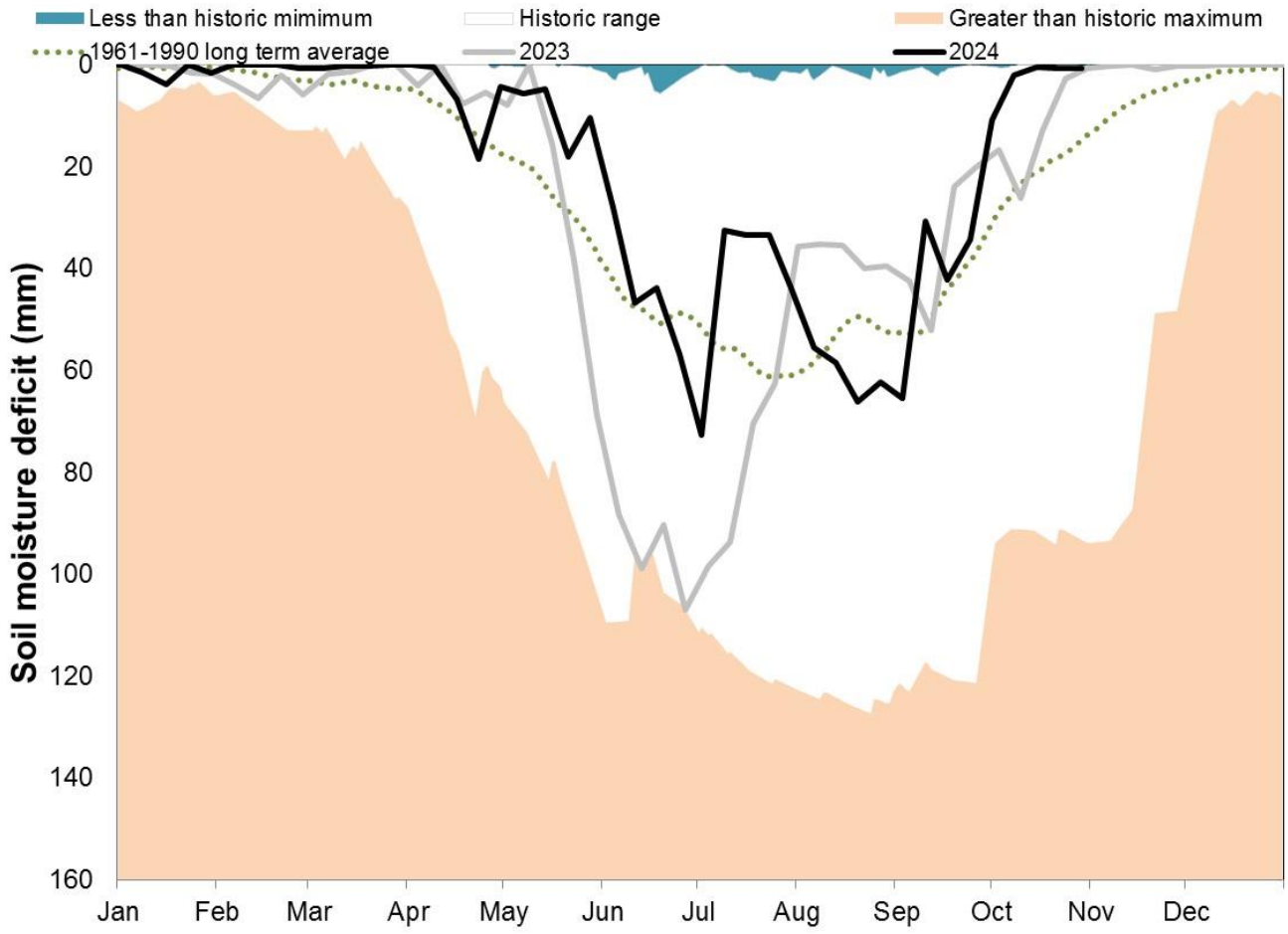
3.1 Soil moisture deficit map

Figure 3.1: Top map shows soil moisture deficit for week ending 31 October 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.



3.2 Soil moisture deficit charts

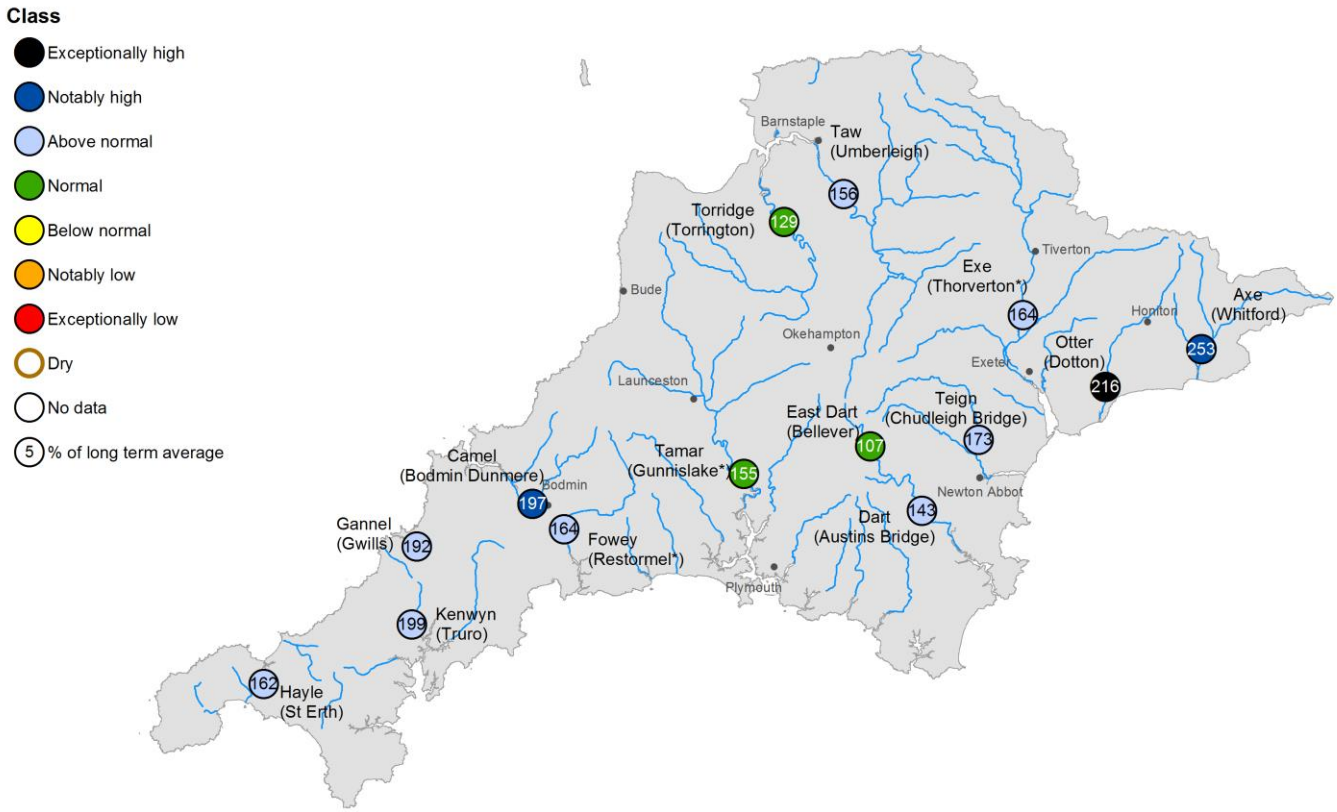
Figure 3.2: Latest soil moisture deficit compared to previous year, maximum, minimum, and 1961 to 1990 long term average. Weekly MORECS data for real land use.



4 River flows

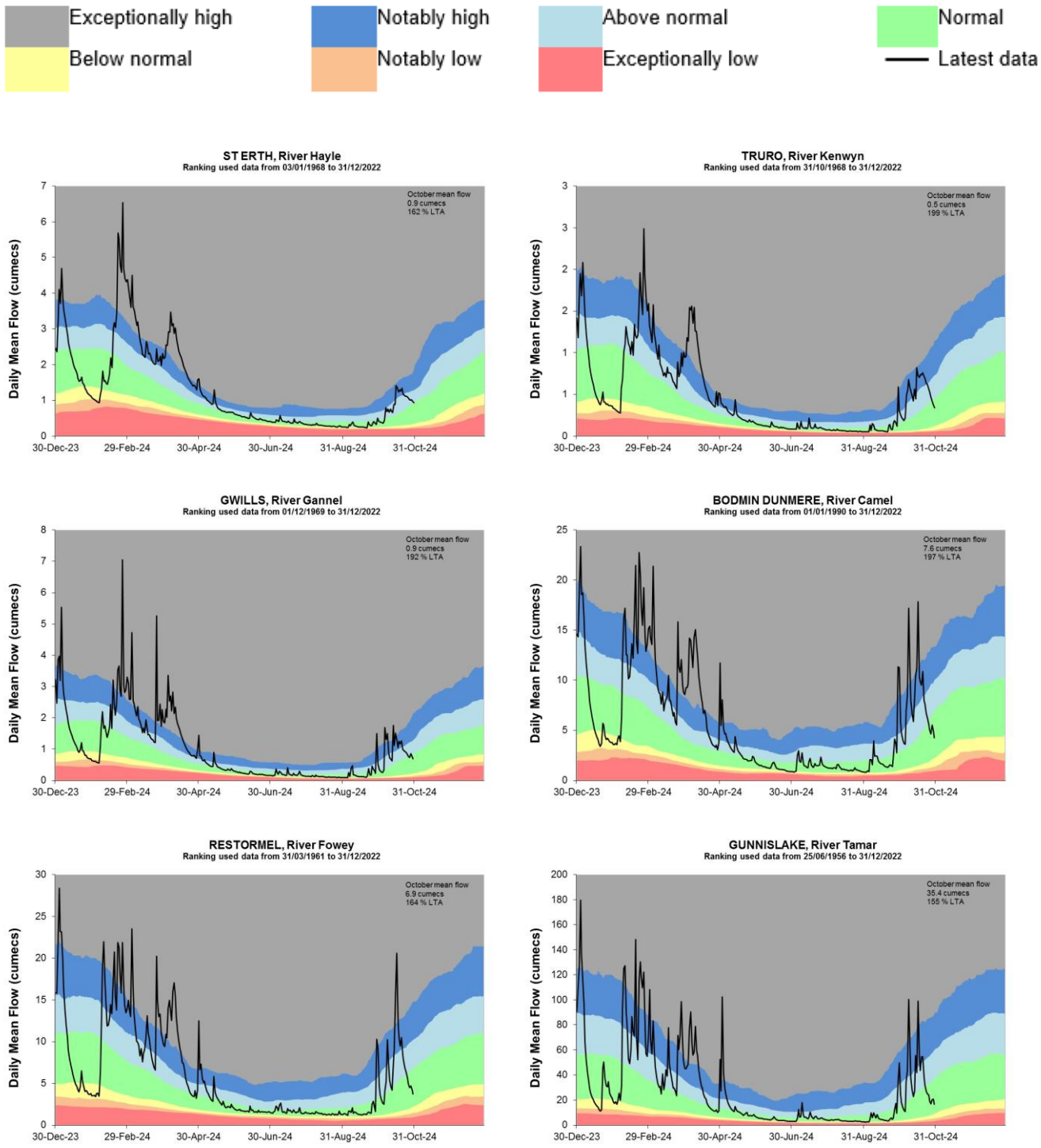
4.1 River flows map

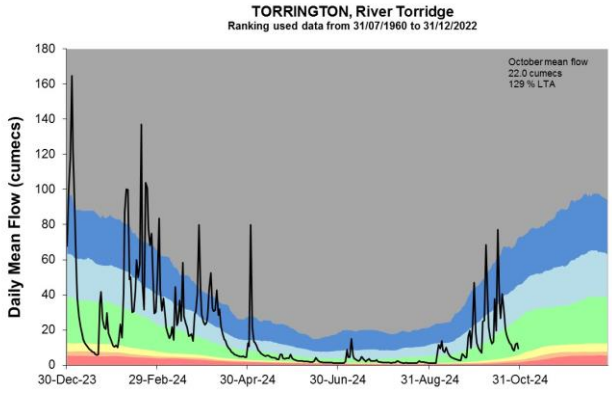
Figure 4.1: Monthly mean river flow for indicator sites for October 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic October monthly means. Table available in the appendices with detailed information.

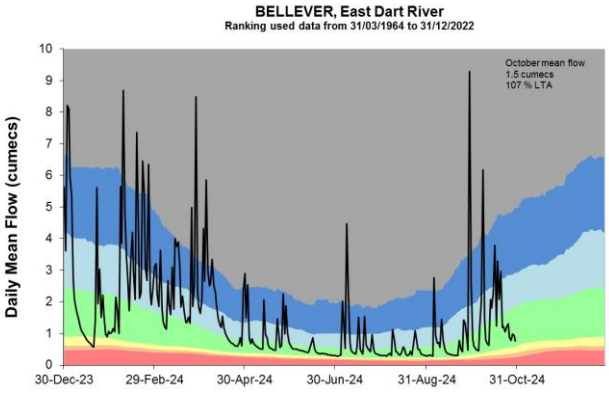


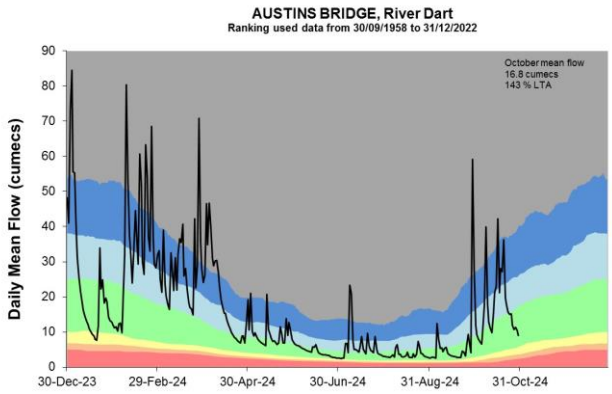
4.2 River flow charts

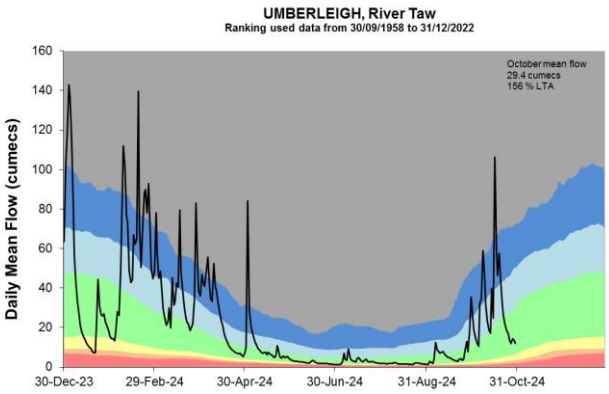
Figure 4.2: Daily mean river flow for indicator sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.

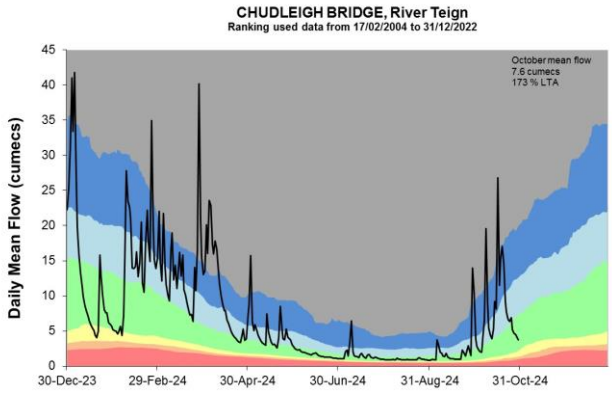


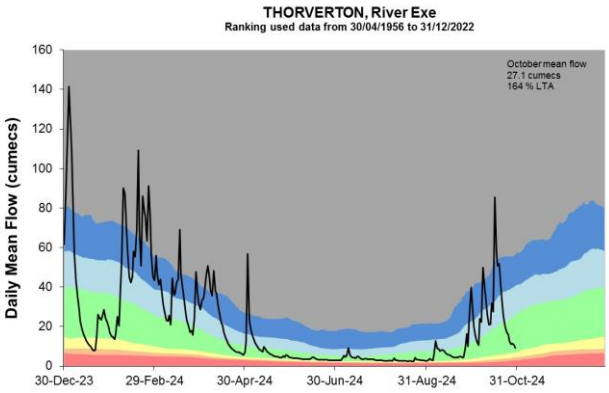


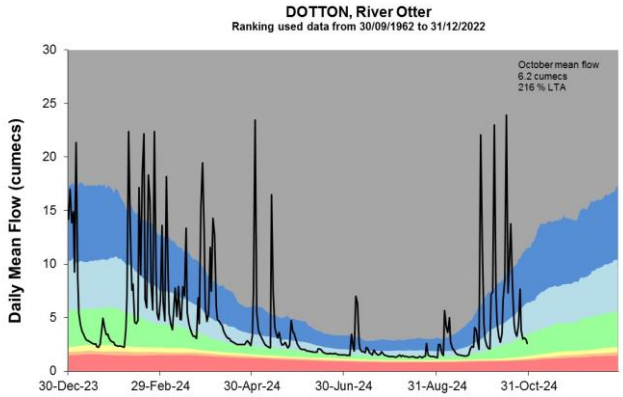


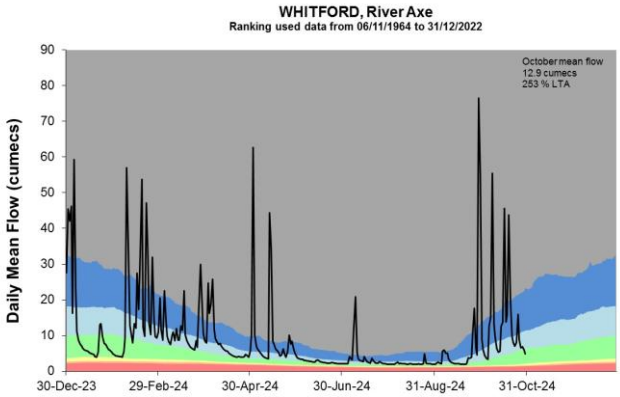










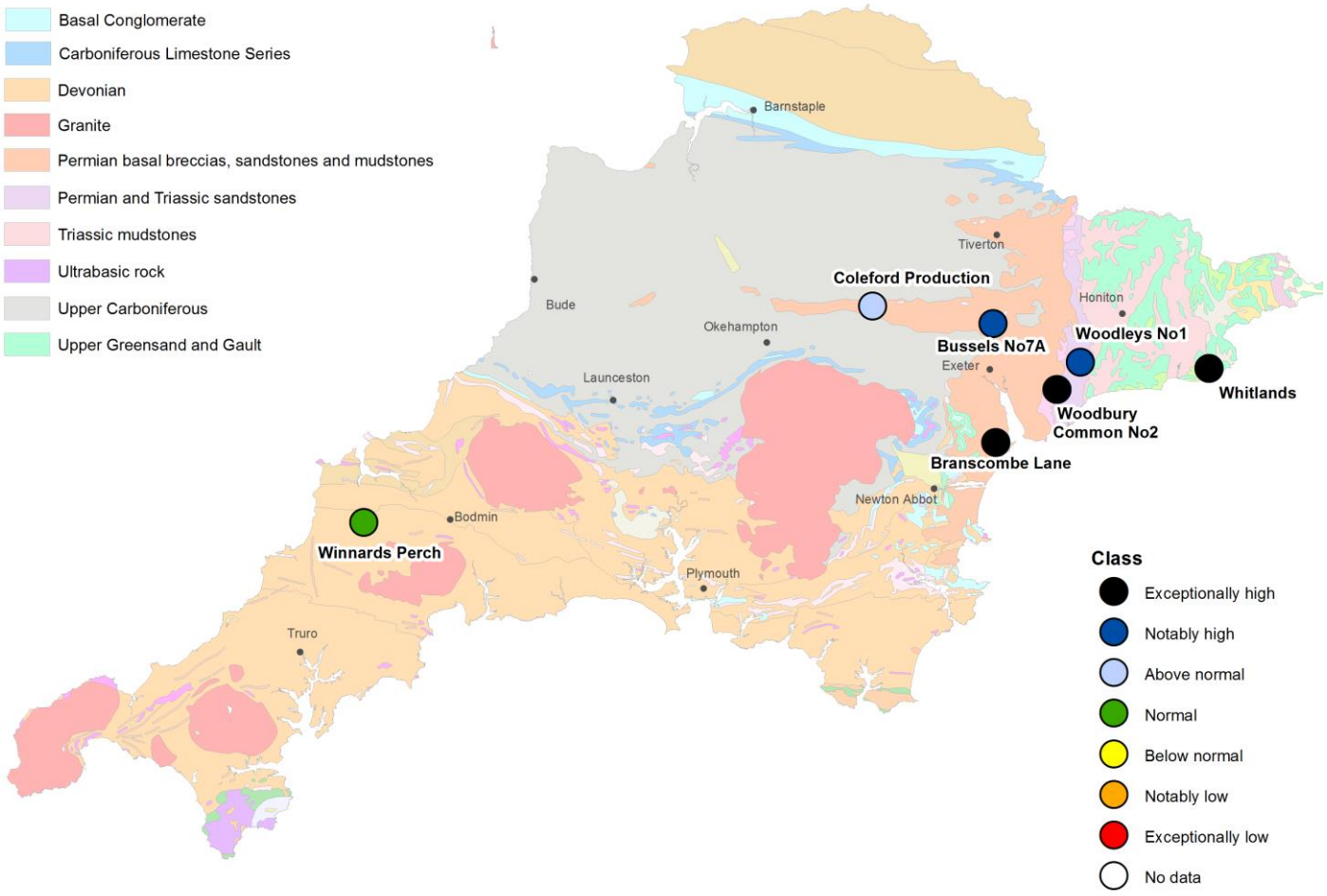


Source: Environment Agency.

5 Groundwater levels

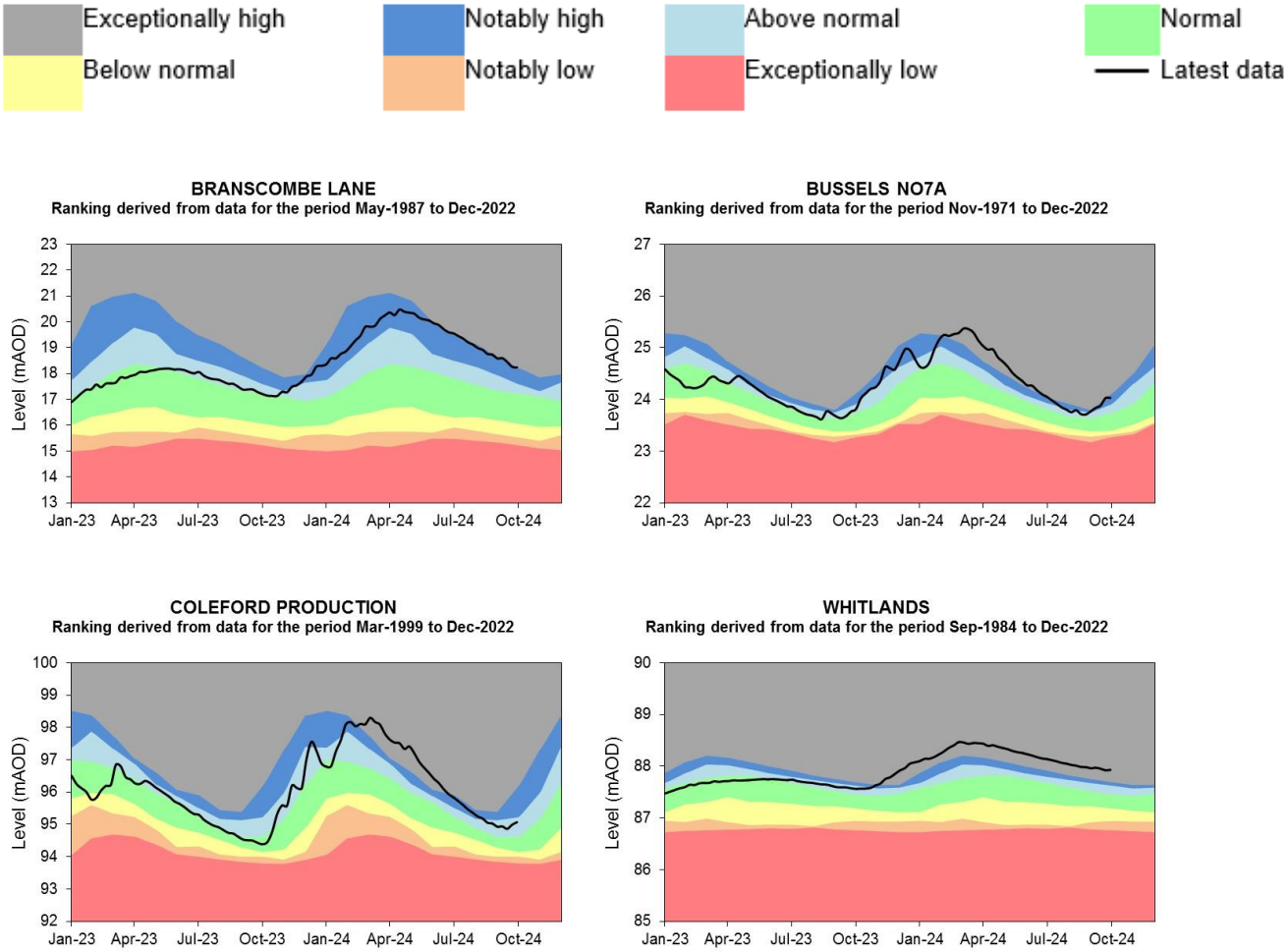
5.1 Groundwater levels map

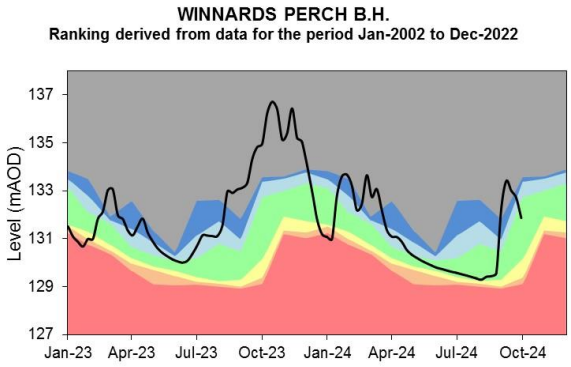
Figure 5.1: Groundwater levels for indicator sites at the end of October 2024, classed relative to an analysis of respective historic October levels. Table available in the appendices with detailed information.

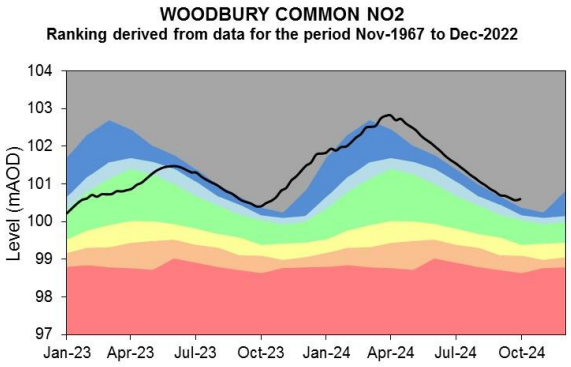


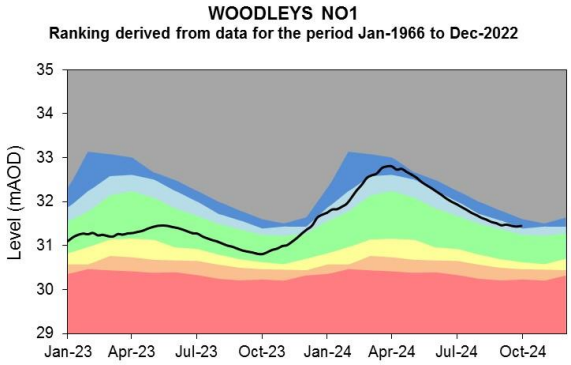
5.2 Groundwater level charts

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.





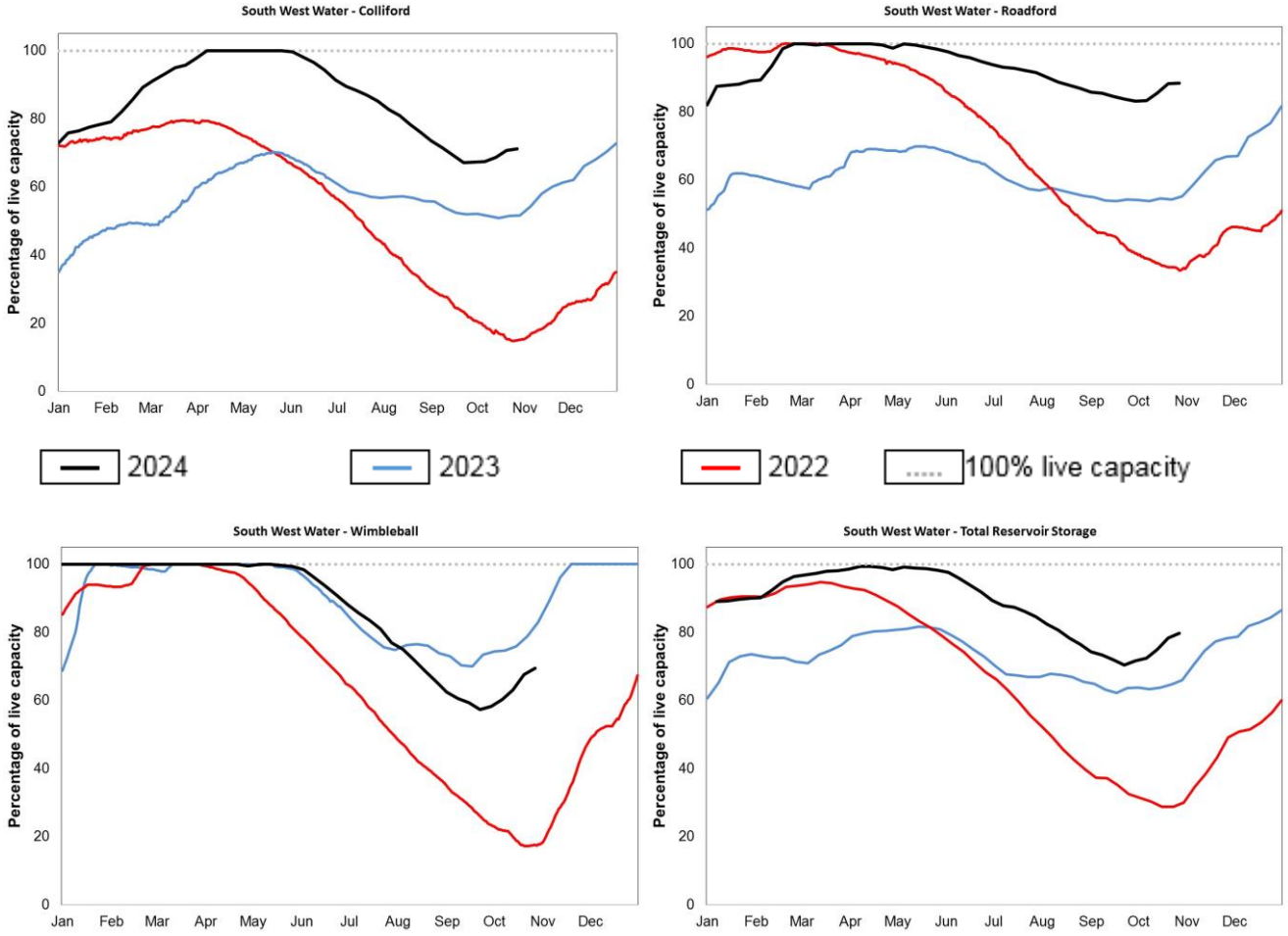




Source: Environment Agency, 2024.

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 (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).

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	Oct 2024 rainfall % of long term average 1961 to 1990	Oct 2024 band	Aug 2024 to October cumulative band	May 2024 to October cumulative band	Nov 2023 to October cumulative band
Avon Dart And Erme	122	Normal	Normal	Above normal	Exceptionally high
Exe	132	Above Normal	Above normal	Above normal	Exceptionally high
Fal And St Austell	115	Normal	Normal	Normal	Exceptionally high
North Cornwall	123	Above Normal	Above normal	Normal	Exceptionally high
Otter Sid Axe And Lim	157	Notably High	Notably high	Notably high	Exceptionally high
Seaton Looe And Fowey	118	Normal	Normal	Normal	Exceptionally high
Tamar	113	Normal	Normal	Normal	Exceptionally high
Taw And North Devon Streams	115	Normal	Normal	Normal	Exceptionally high
Teign And Torbay	123	Normal	Normal	Above normal	Exceptionally high

Torridge And Hartland Streams	114	Normal	Normal	Normal	Exceptionally high
West Cornwall	120	Normal	Normal	Normal	Exceptionally high

8.2 River flows table

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

8.3 Groundwater table

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