Monthly water situation report: Devon and Cornwall Area

1 Summary - May 2024

Devon and Cornwall received 127% of the May long term average (LTA) rainfall, which was above normal for the time of year. It was the wettest October to May period in a record starting in 1871. Soil moisture deficit (SMD) increased overall in May 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 all sites receded overall in May, but still ended the month at normal to exceptionally high for the time of year. Total reservoir storage across Devon and Cornwall started and ended May at 98% net storage, with Wimbleball, Colliford and Roadford reservoirs at 99%, 100% and 99% of net storage respectively at the end of the month.

1.1 Rainfall

Devon and Cornwall received 92mm of rain during May (127% of the May LTA), which is classed as above normal for the time of year. It was the wettest October to May period in a record starting in 1871. Rain fell throughout the month but the highest daily rainfall totals were seen on the first and 13th of the month. In May, rainfall was normal for the time of year in most of Cornwall, and above normal in most of Devon, except for the Otter, Sid, Axe and Lim hydrological area where rainfall was exceptionally high for the time of year. In the last 3 months, 6 months, and 12 months, cumulative rainfall totals were exceptionally high in all hydrological areas when compared to historic respective totals.

1.2 Soil moisture deficit

SMD increased from 1 to 21 May, before decreasing again. SMD ended the month higher than at the end of April. On 28 May, the deficit was around 10mm, lower (soils were wetter) than the LTA for the time of year, and much lower than the deficit at the same time in 2023. On 28 May, soils were wetter in the east of the area, which reflects where highest rainfall totals were received.

1.3 River flows

May monthly mean river flows were normal or above normal for the time of year across most sites. The river Hayle at St Erth experienced notably high flows for the time of year. The river Otter at Dotton experienced ‘exceptionally high’ flows for the time of year in response to exceptionally high rainfall in the Otter, Sid, Axe and Lim hydrological area. Daily mean river

flows fluctuated throughout the month in response to rainfall events. On 31 May, all reporting sites recorded normal or above normal daily mean flows for the time year.

Due to data accuracy concerns, Whitford gauging station is not reported on this month.

1.4 Groundwater levels

Levels at all groundwater sites receded overall in May. On 31 May, groundwater levels were exceptionally high for the time of year at Bussels No7a (monitoring the Dawlish Sandstone aquifer), Coleford Production (monitoring the Permian Breccias and Sandstones aquifer), Whitlands (monitoring the Upper Greensand aquifer) and Woodbury Common No2 (monitoring the Budleigh Salterton Pebble Beds aquifer). Groundwater levels were notably high for the time of year at Woodleys No1 and Branscombe lane, and normal at Winnards Perch.

1.5 Reservoir storage

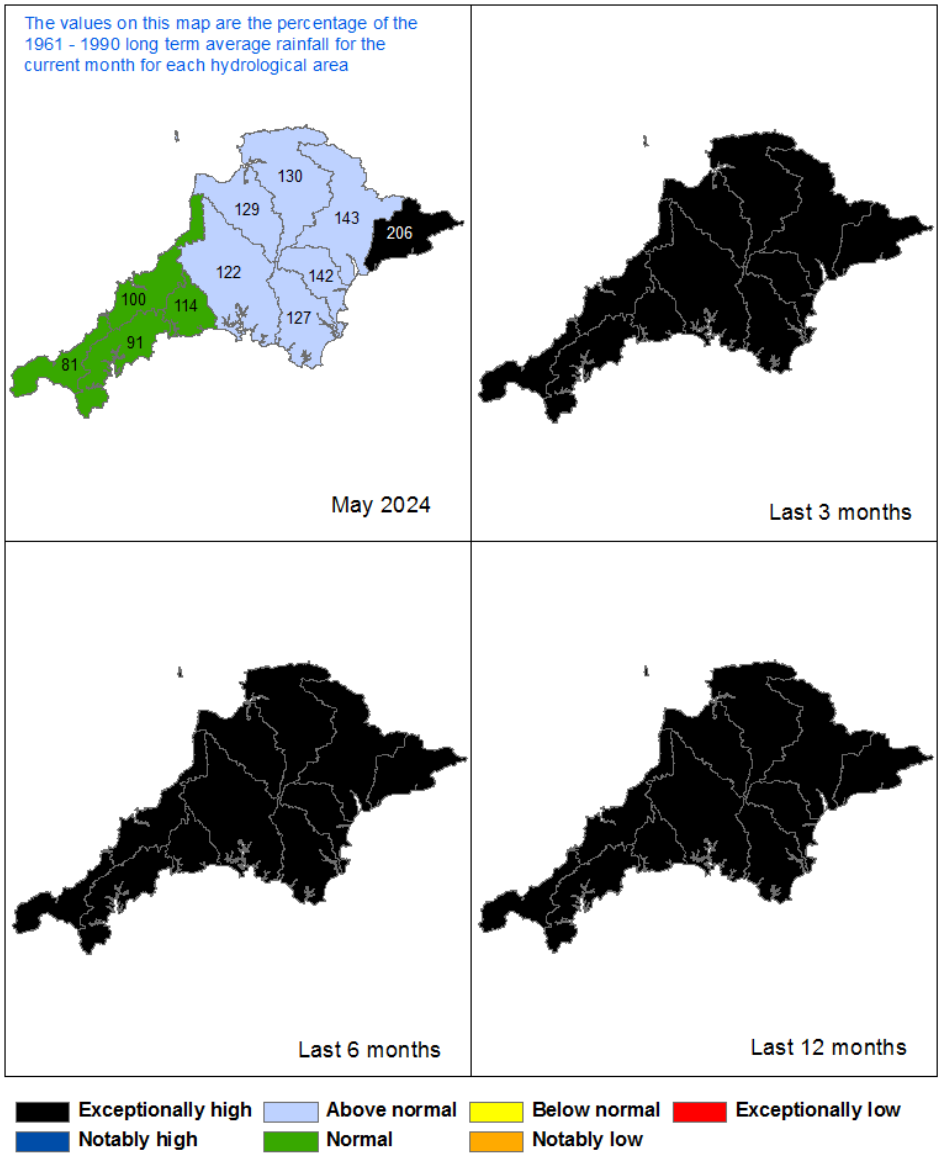
Total reservoir storage was 98% at the end of May, which is the same as storage at the end of April. This is higher than total storage at the same time last year. At the end of the month, storage at Wimbleball, Colliford and Roadford reservoirs were 99%, 100% and 98% of net storage respectively, compared to 99%, 70% and 69% this time last year.

Author: Devon and Cornwall Hydrology, hydrology.dandc@environment-agency.gov.uk

2 Rainfall

2.1 Rainfall map

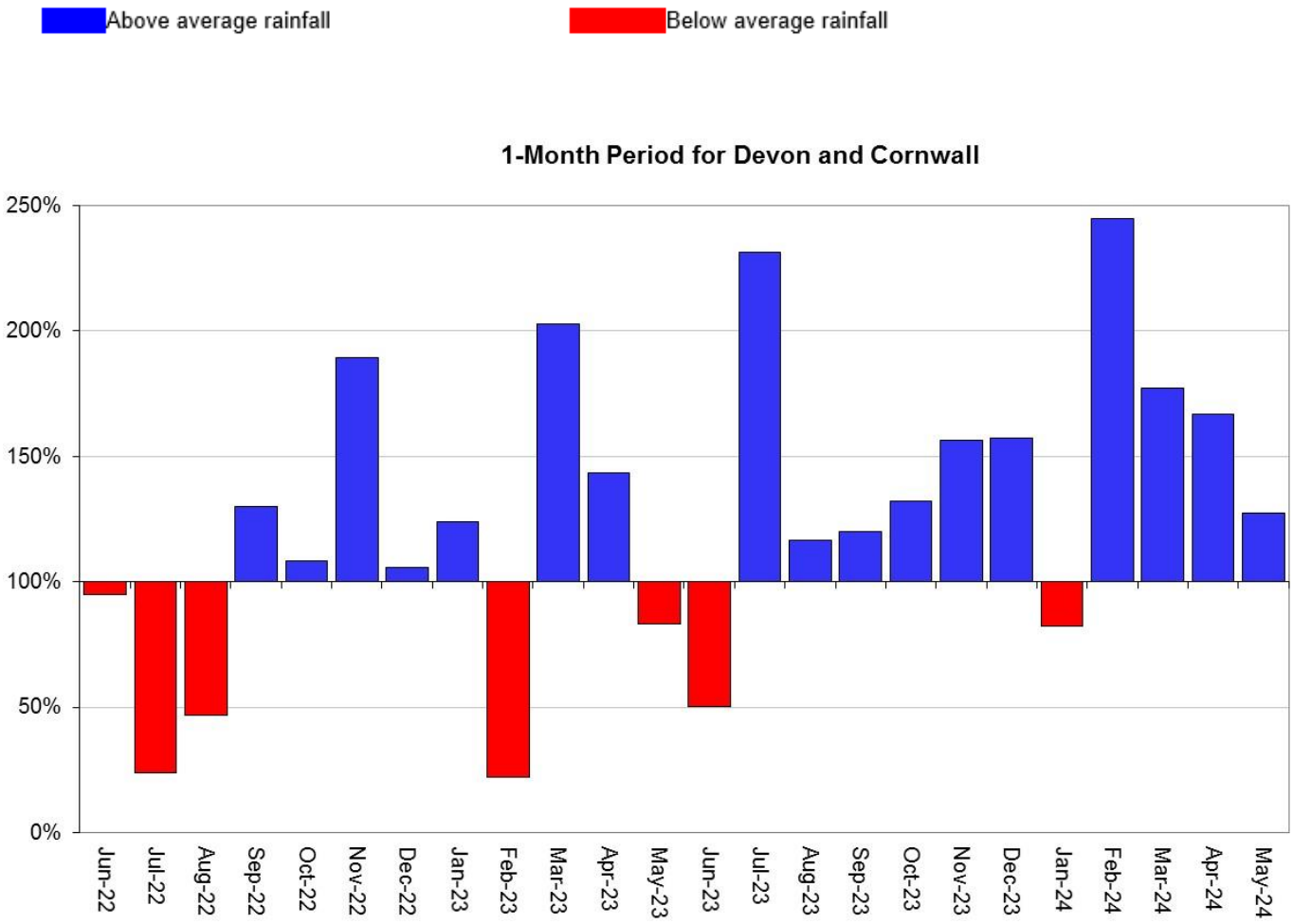
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 31 May 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



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.

2.2 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.

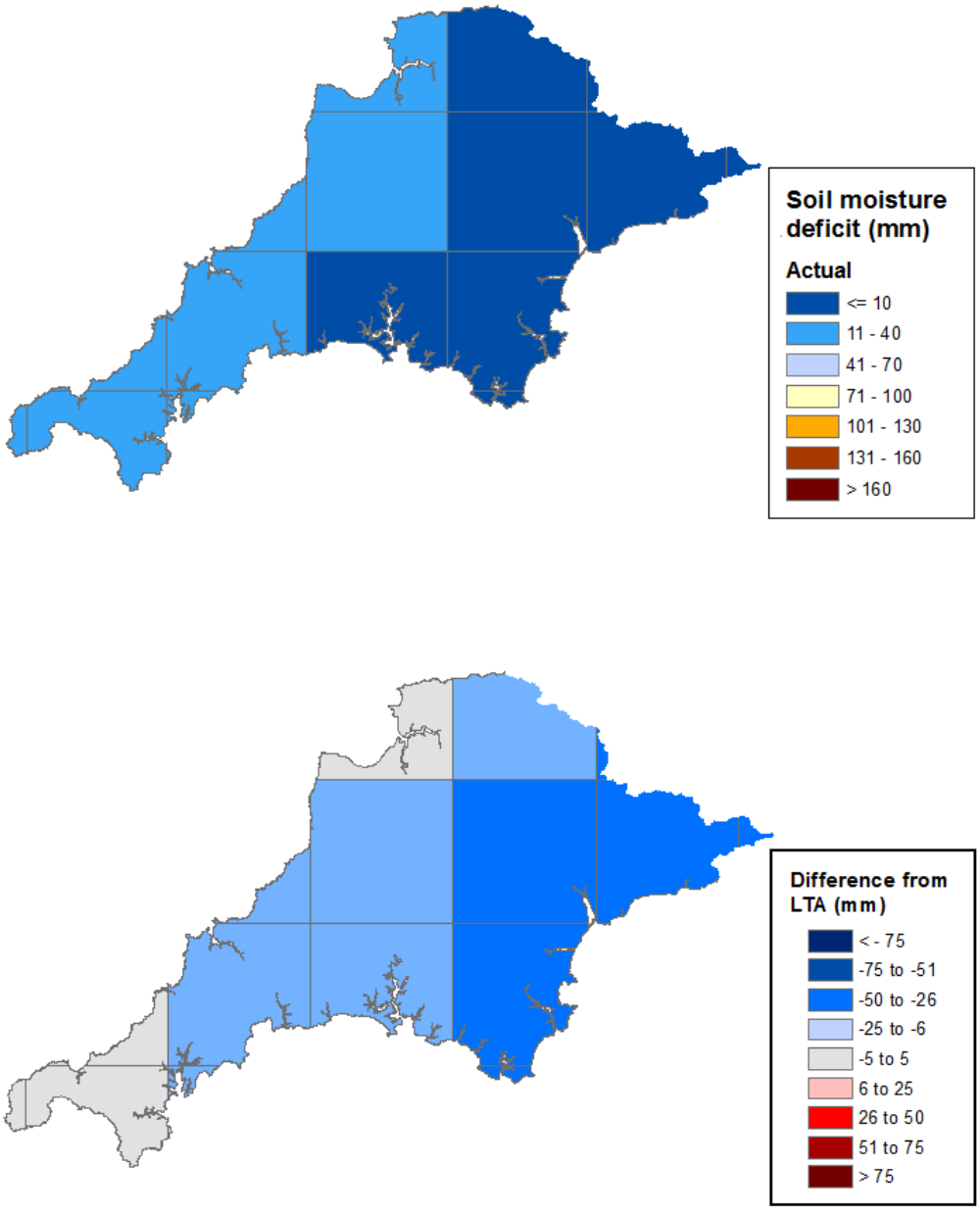


Rainfall data for 2023, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2024). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived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

3 Soil moisture deficit

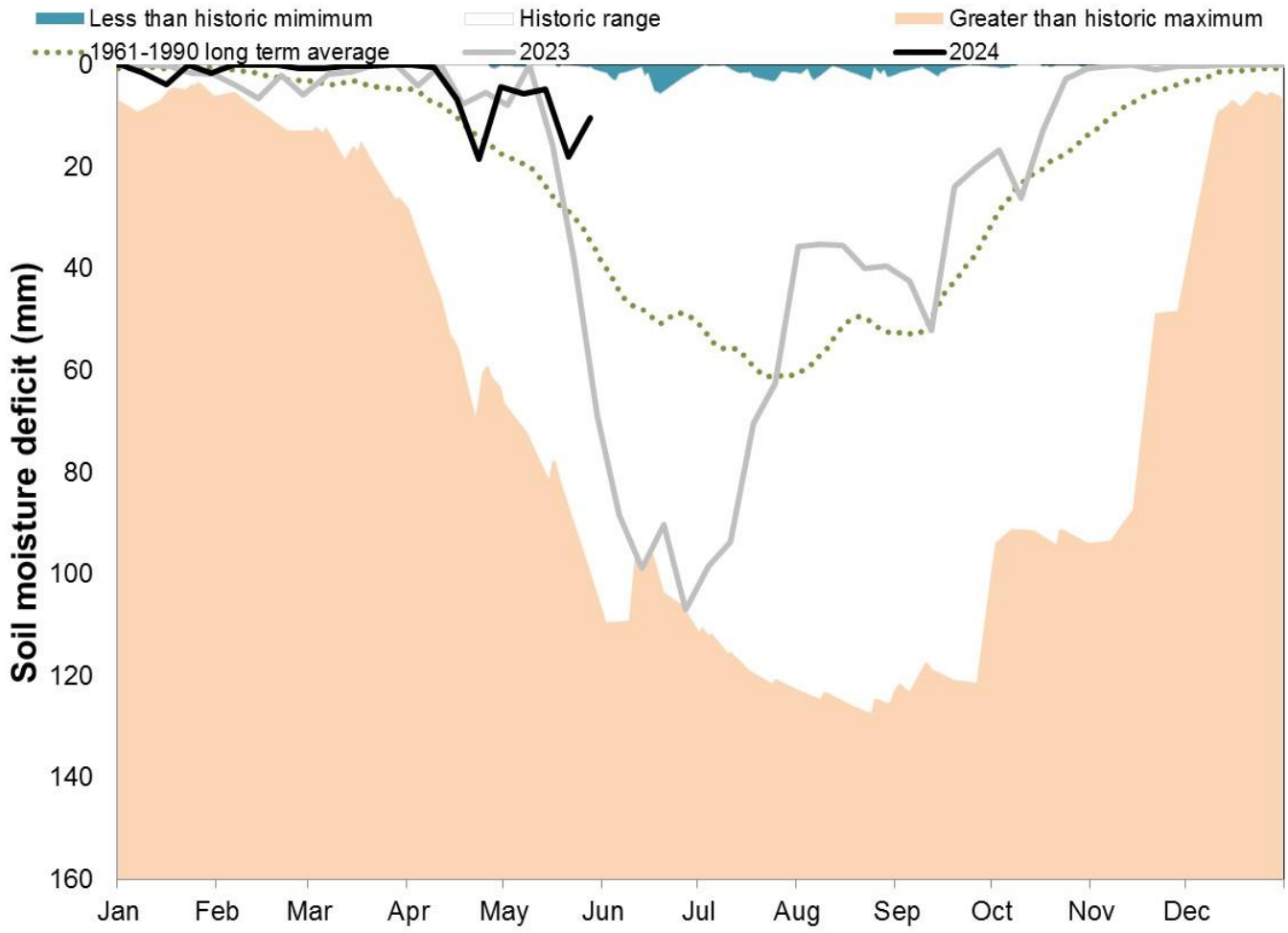
3.1 Soil moisture deficit map

Figure 3.1: Top map shows soil moisture deficit for week ending 28 May 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

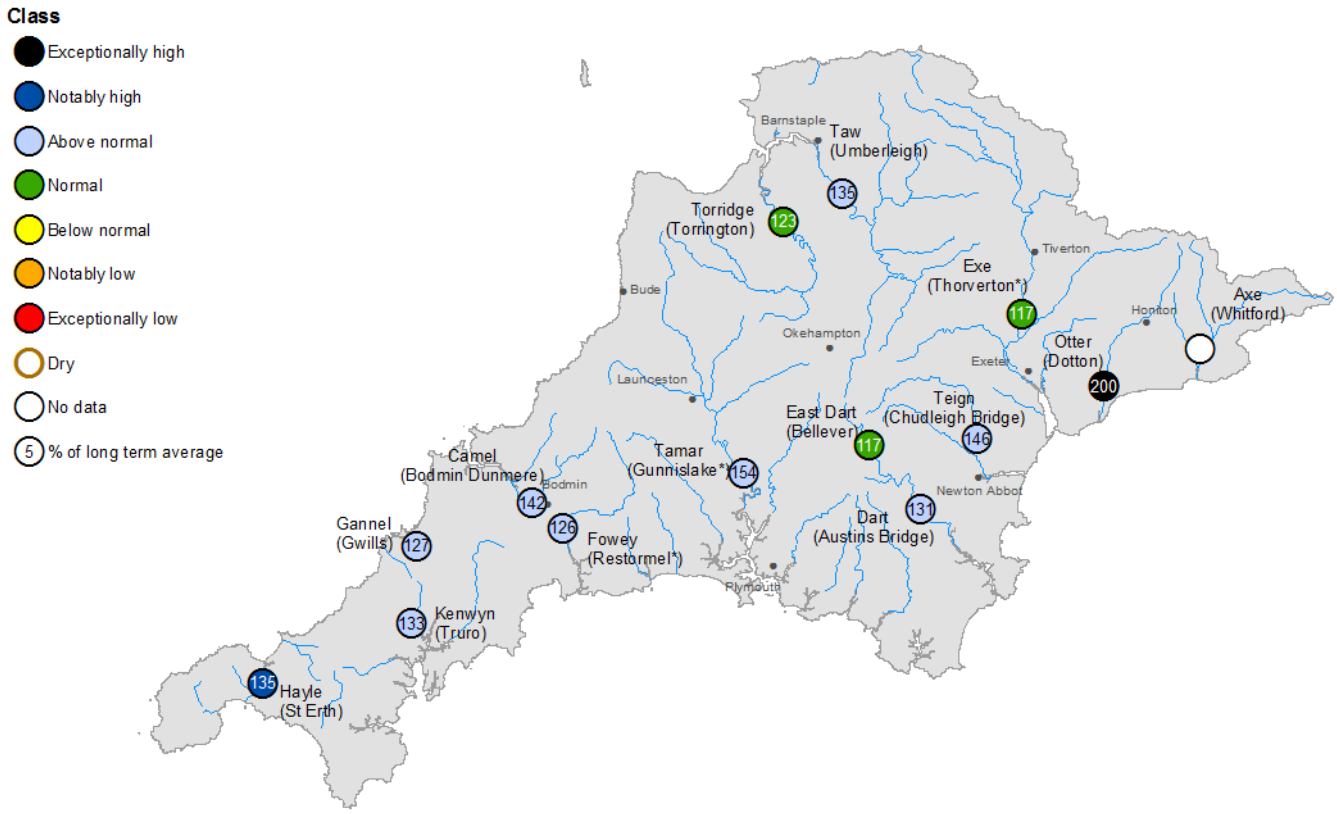
Figure 3.2: Latest soil moisture deficit compared to previous year, maximum, minimum, and 1961 to 1990 long term average. Weekly MORECS data for real land use.



4 River flows

4.1 River flows map

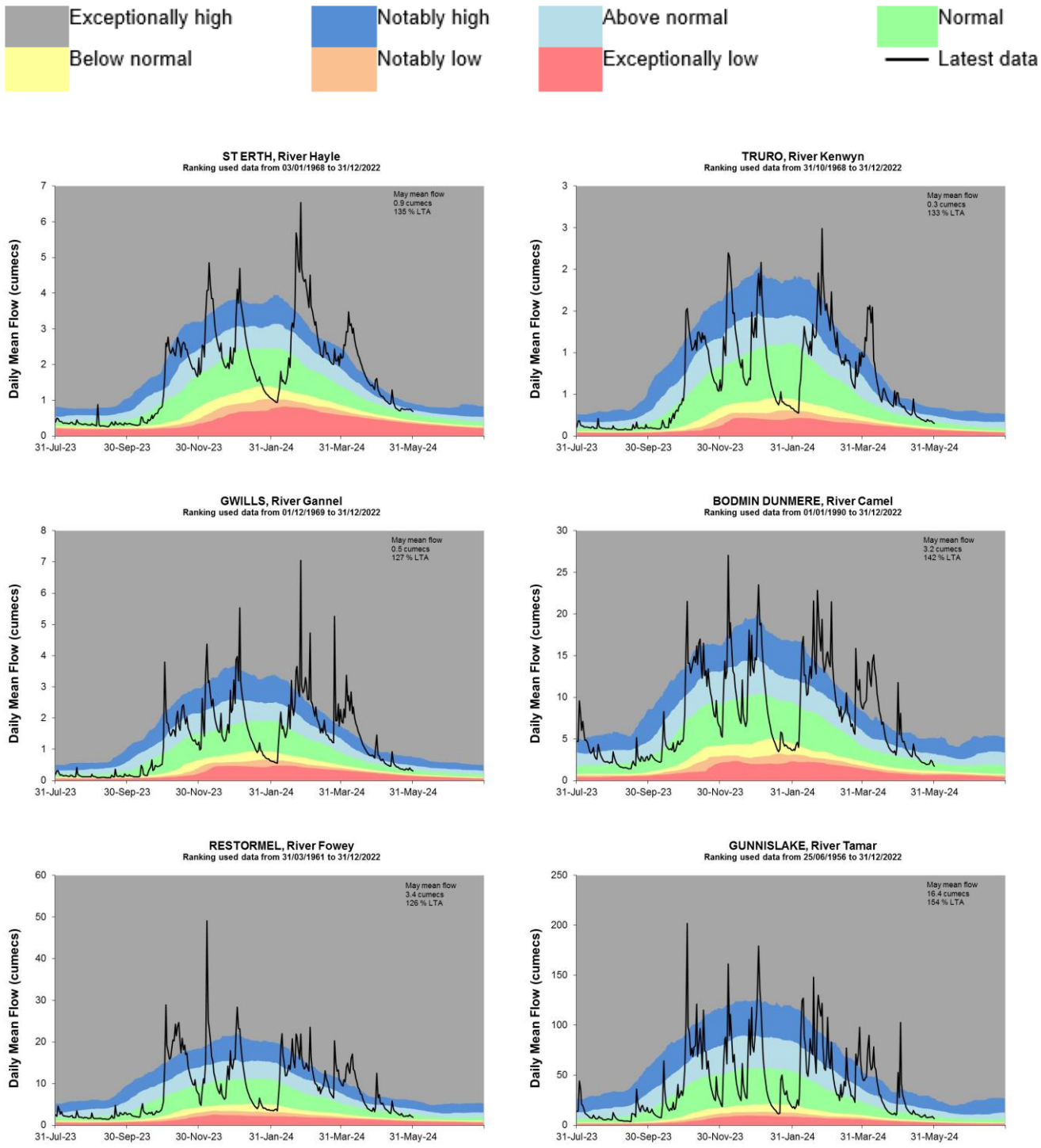
Figure 4.1: Monthly mean river flow for indicator sites for May 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic May monthly means. Table available in the appendices with detailed information.

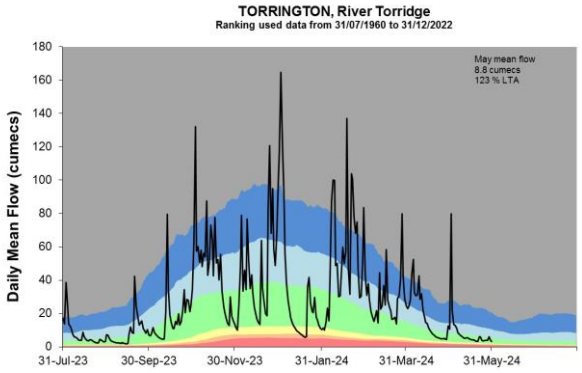


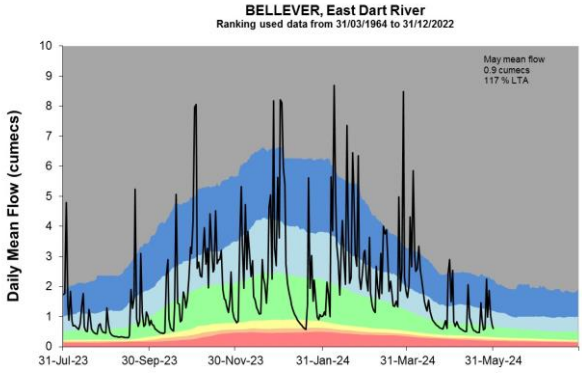
*Flows may be impacted at these sites by reservoir releases from upstream reservoirs.

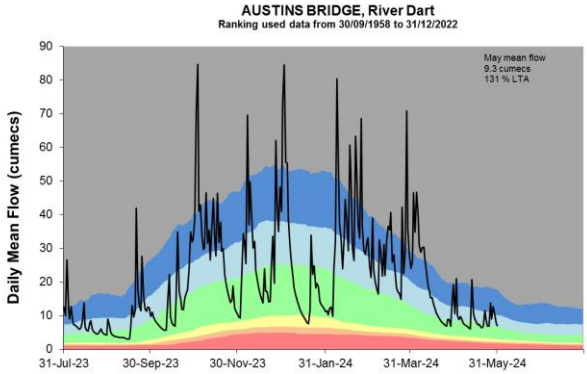
4.2 River flow charts

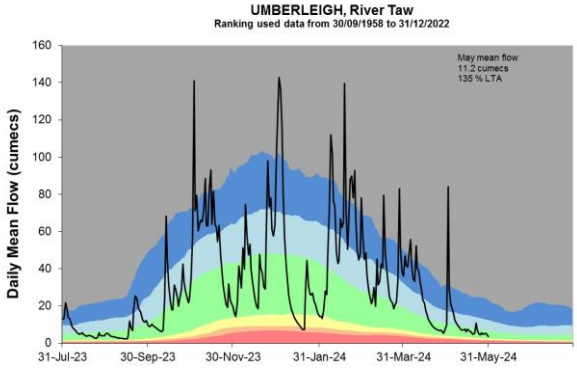
Figure 4.2: Daily mean river flow for indicator sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.

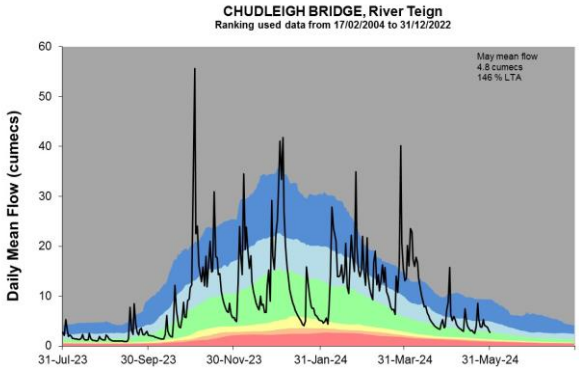


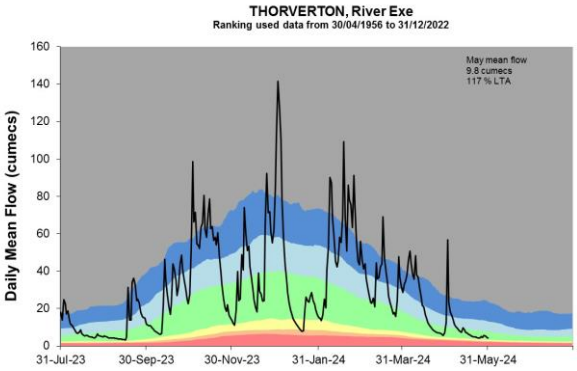


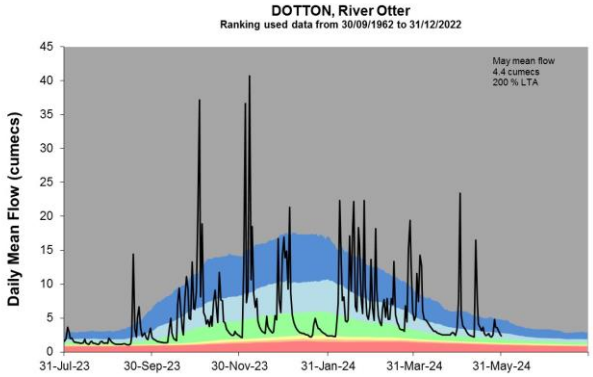










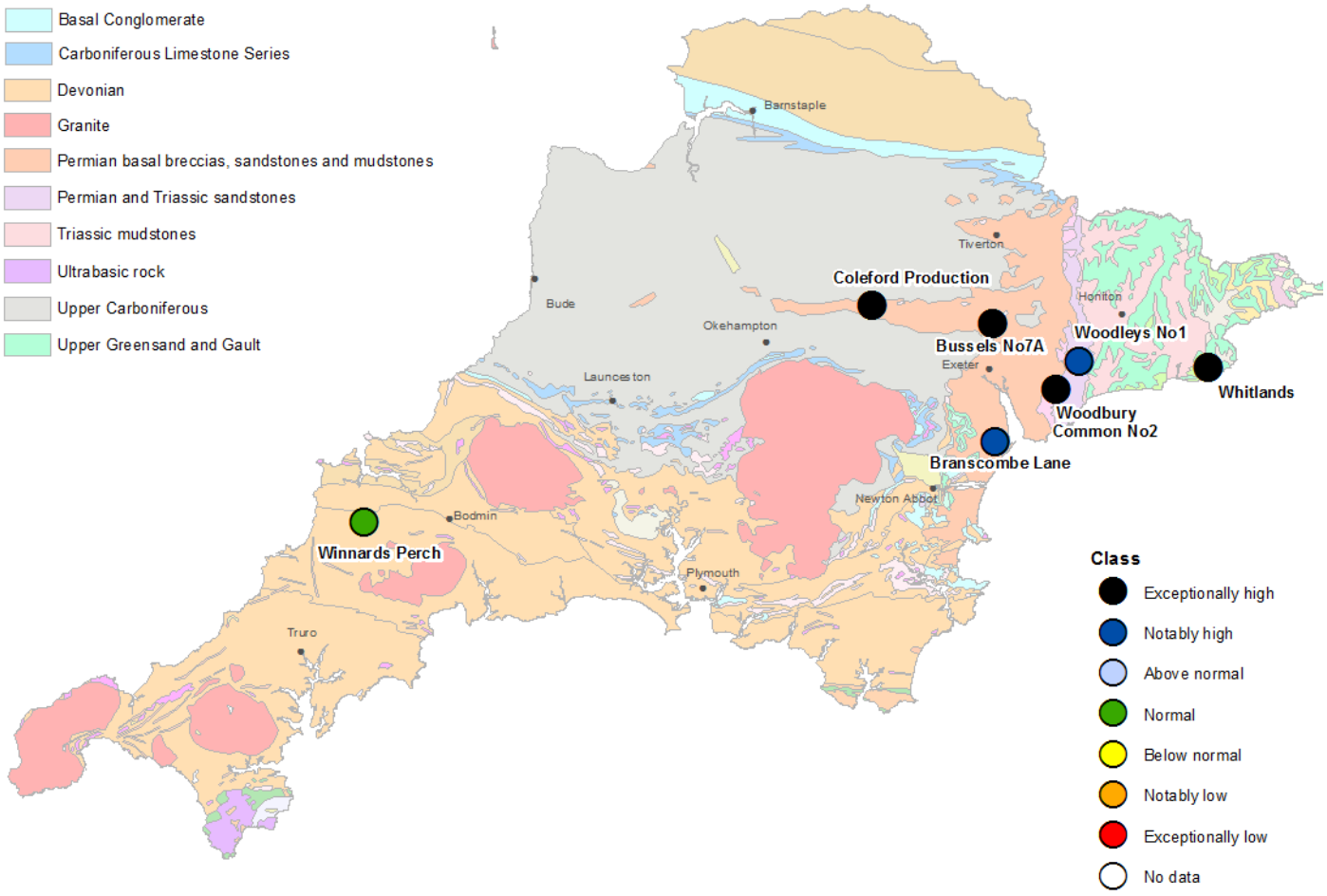


Source: Environment Agency.

5 Groundwater levels

5.1 Groundwater levels map

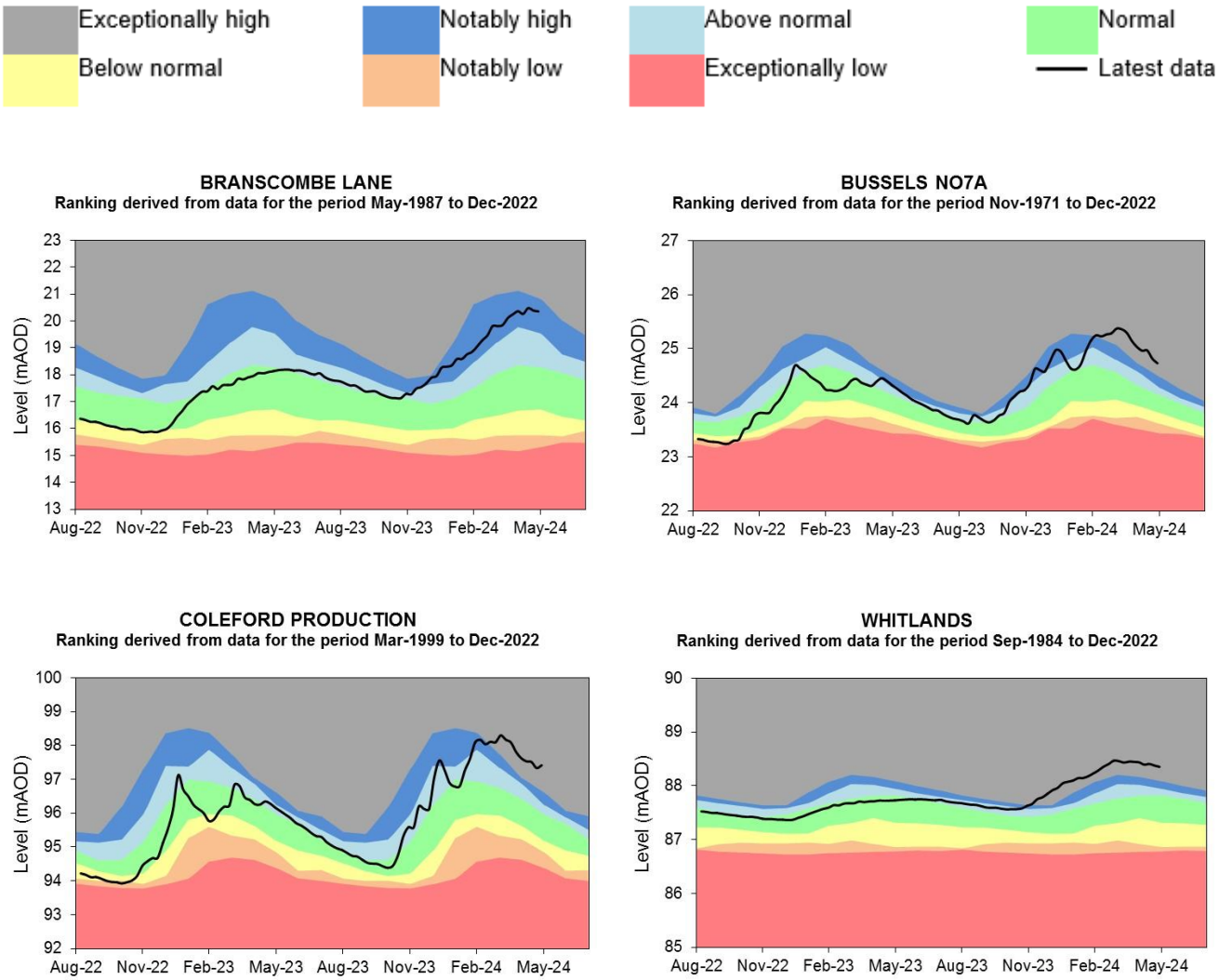
Figure 5.1: Groundwater levels for indicator sites at the end of May 2024, classed relative to an analysis of respective historic May levels. Table available in the appendices with detailed information.

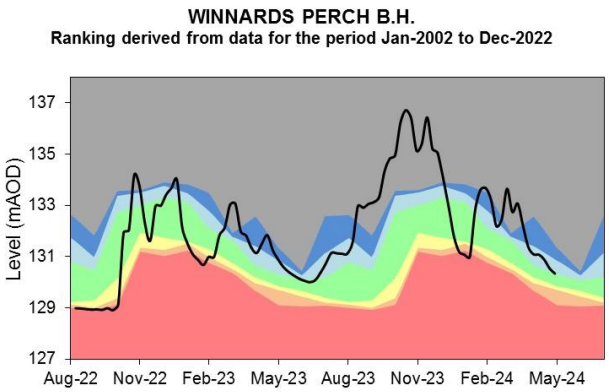


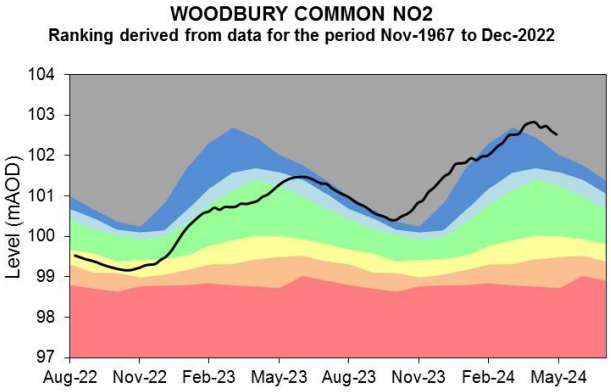
(Source: Environment Agency). Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

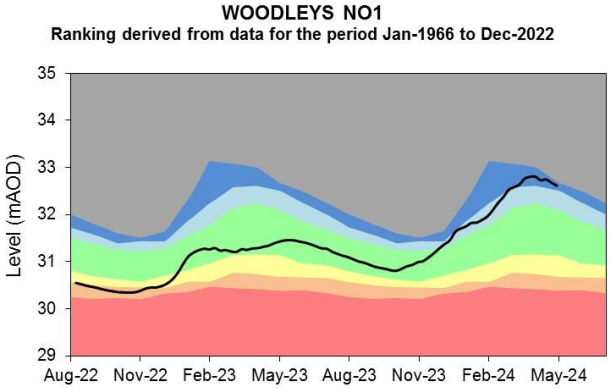
5.2 Groundwater level charts

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.





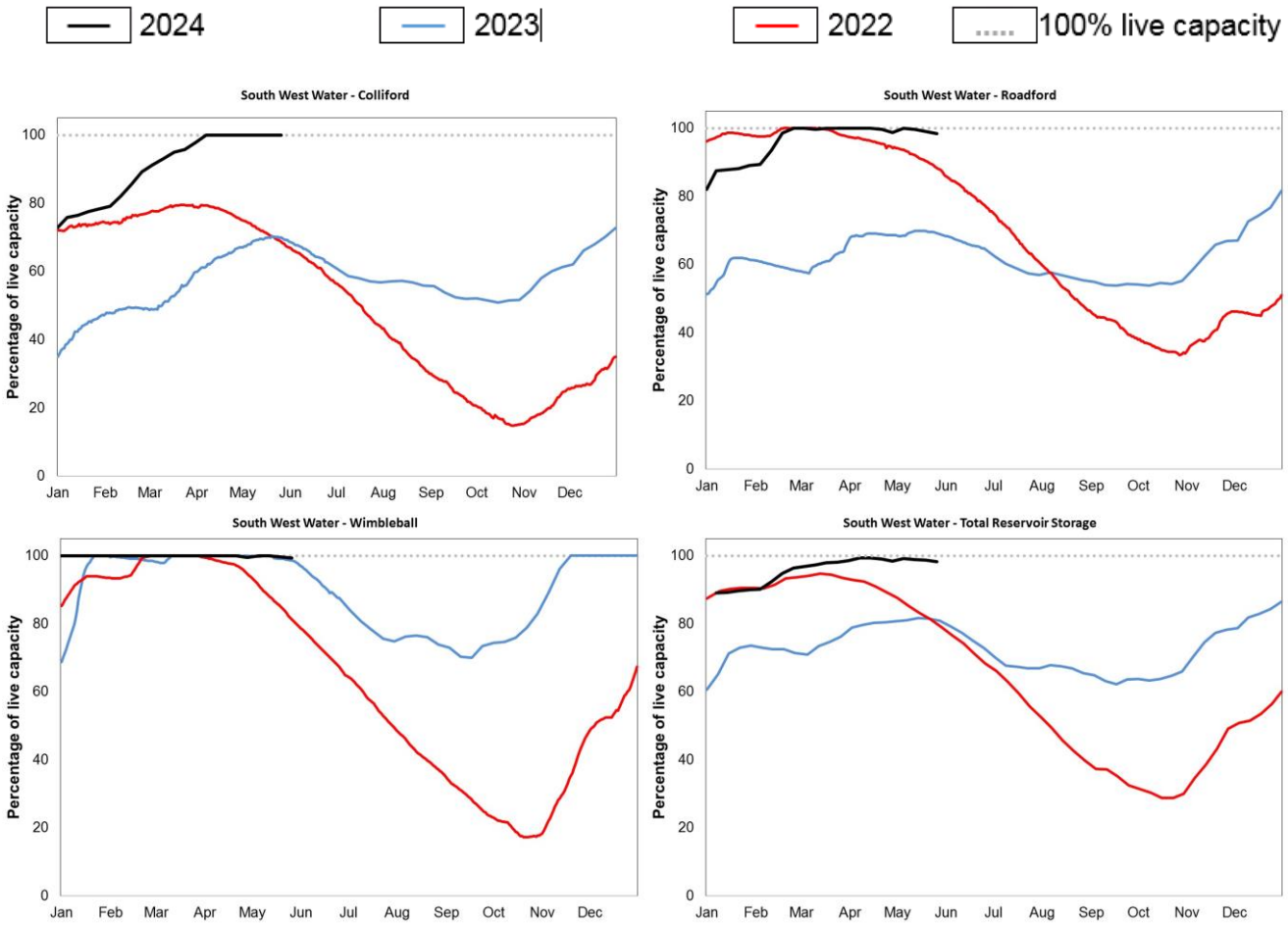




Source: Environment Agency, 2024.

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	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
Avon Dart And Erme	127	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Exe	143	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Fal And St Austell	91	Normal	Exceptionally high	Exceptionally high	Exceptionally high
North Cornwall	100	Normal	Exceptionally high	Exceptionally high	Exceptionally high
Otter Sid Axe And Lim	206	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high
Seaton Looe And Fowey	114	Normal	Exceptionally high	Exceptionally high	Exceptionally high
Tamar	122	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Taw And North Devon Streams	130	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Teign And Torbay	142	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high

Torridge And Hartland Streams	129	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
West Cornwall	81	Normal	Exceptionally high	Exceptionally high	Exceptionally high

8.2 River flows table

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

8.3 Groundwater table

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