

Monthly water situation report: Devon and Cornwall Area

1 Summary - March 2024

Devon and Cornwall received 177% of the March long term average (LTA) rainfall, which was 'exceptionally high' for the time of year. Soil moisture deficit (SMD) remained close to 0 mm in March and ended the month lower (wetter) than the LTA for the time of year. Monthly mean river flows ranged from 'notably high' to 'exceptionally high' for the time of year across all reporting stations. Levels at all reporting groundwater sites ended the month higher than the previous month. Total reservoir storage increased overall in March across Devon and Cornwall with Wimbleball, Colliford and Roadford reservoirs at 100%, 98% and 100% of net storage respectively at the end of the month.

1.1 Rainfall

Devon and Cornwall received 176 mm of rain during March (177% of the March LTA), which is classed as 'exceptionally high' for the time of year. Rainfall was 'exceptionally high' across all hydrological areas in March, except the Taw and North Devon Streams, the Exe, Torridge and Hartland Streams and the Otter, Sid, Axe and Lim hydrological areas where rainfall was 'notably high' for the time of year. Devon and Cornwall received rainfall everyday throughout the month, with the highest quantities of rain falling on 04, 16 and 25 March. The 6-month cumulative rainfall total (October to March) for Devon and Cornwall was the 2nd wettest 6-month period since records began in 1871.

1.2 Soil moisture deficit

Soil moisture deficit decreased overall in March but remained close to 0 mm. On 26 March, the deficit was less than 10 mm and was lower (soils were wetter) than the LTA for the time of year, and similar to the deficit at the same time in 2023.

1.3 River flows

March monthly mean river flows ranged from 'notably high' to 'exceptionally high' for the time of year across the area, with Austins Bridge, Bodmin Dunmere, Gwillis and Restormel all recording over 200% of the monthly LTA flow for March. Daily river flows fluctuated throughout

the month in response to rainfall events. On 31 March, most reporting sites recorded 'above normal' to 'notably high' daily mean flows for the time of year, except for Bodmin Dunmere on the River Camel and Gwills on the River Gannel recording 'exceptionally high' daily mean flow for the time of year.

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

1.4 Groundwater levels

Levels at all groundwater sites continued their recharge throughout March and all reporting site hydrographs are generally on their rising limbs, as would be expected at this time of year. On 26 March, groundwater levels were 'above normal' at Woodleys No1 (monitoring the Otterton Sandstone Formation), 'notably high' at Branscombe Lane (monitoring the Dawlish Sandstone Formation) and Woodbury Common No2 (monitoring the Budleigh Salterton Pebble Beds) and 'exceptionally high' at all other reporting sites.

Due to missing data, Winnards Perch (monitoring the Staddon Formation) is not reported on this month.

1.5 Reservoir stocks

Total reservoir storage increased from 96% at the end of February to 99% at the end of March, ending the month higher than this time last year, and higher than the same time in 2022 (94%). At the end of the month, storage at Wimbleball, Colliford and Roadford reservoirs were 100%, 98% and 100% of net storage respectively, compared to 100%, 60% and 67% this time last year.

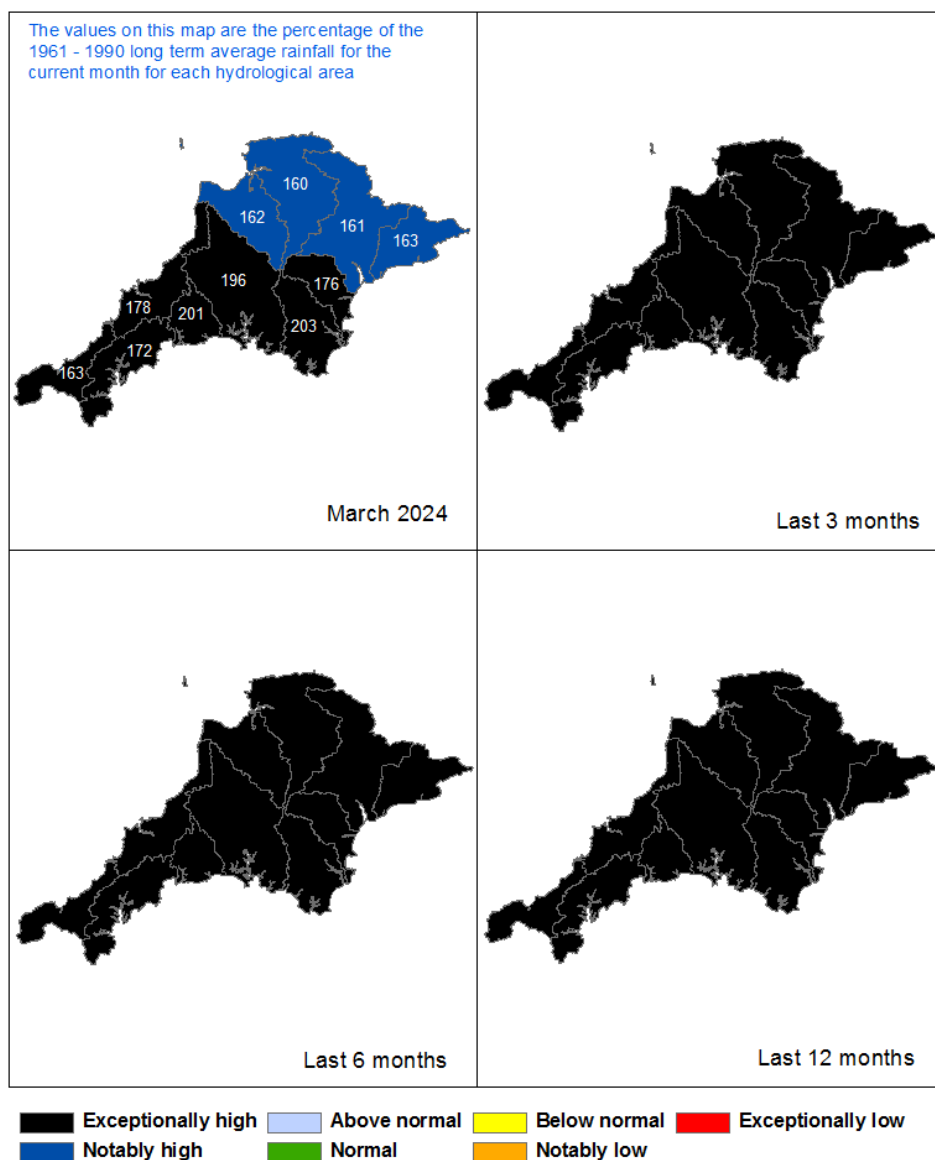
Author: Environment Agency, hydrology.dandc@environment-agency.gov.uk

All data are provisional and maybe subject to revision. The views expressed in this document are not necessarily the views of the Environment Agency. Its officers, servants, or agents accept no liability for loss or damage arising from the interpretation or use of the information, or reliance upon views contained in this report.

2 Rainfall

2.1 Rainfall map

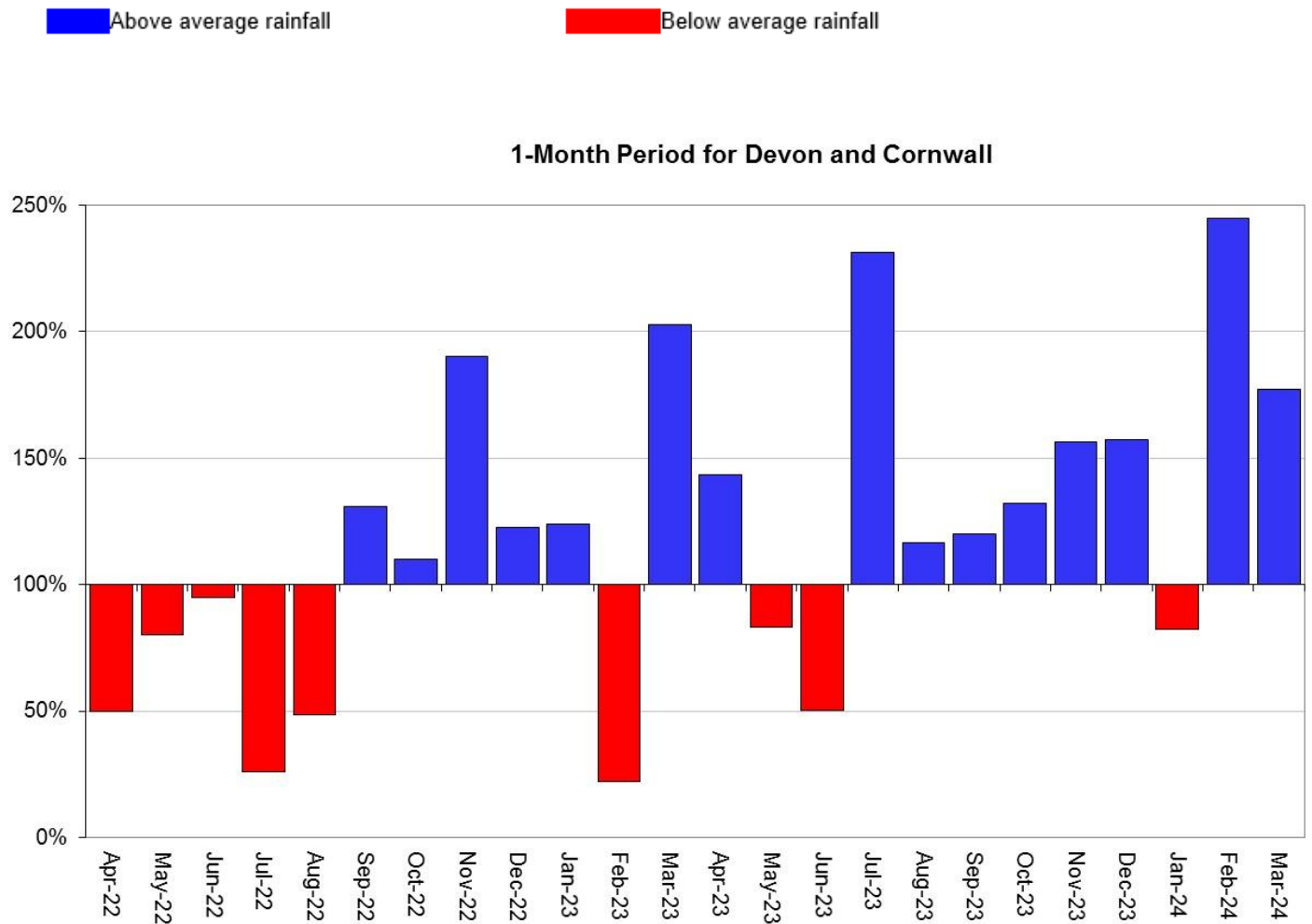
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 31 March 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



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.

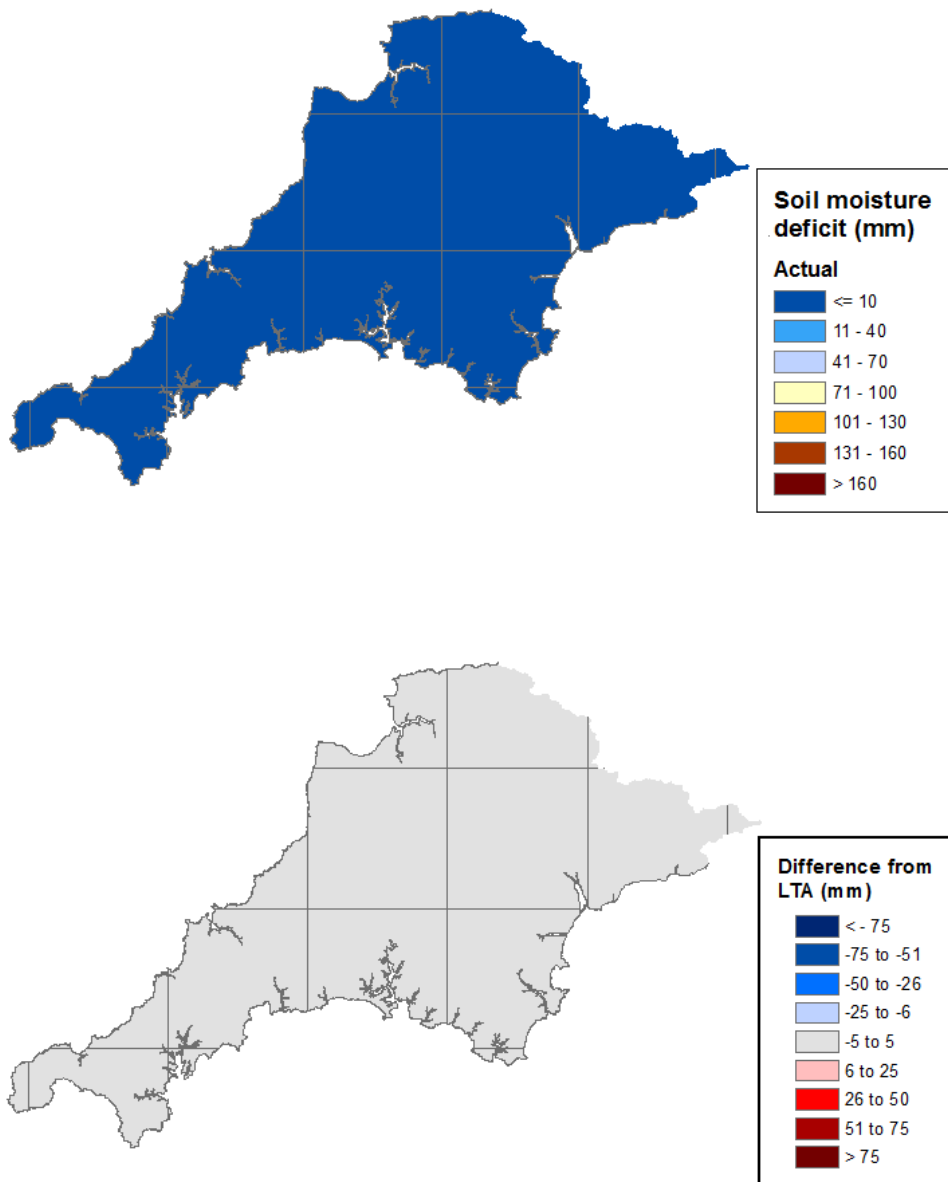


Rainfall data for 2023, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2024). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived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

3 Soil moisture deficit

3.1 Soil moisture deficit map

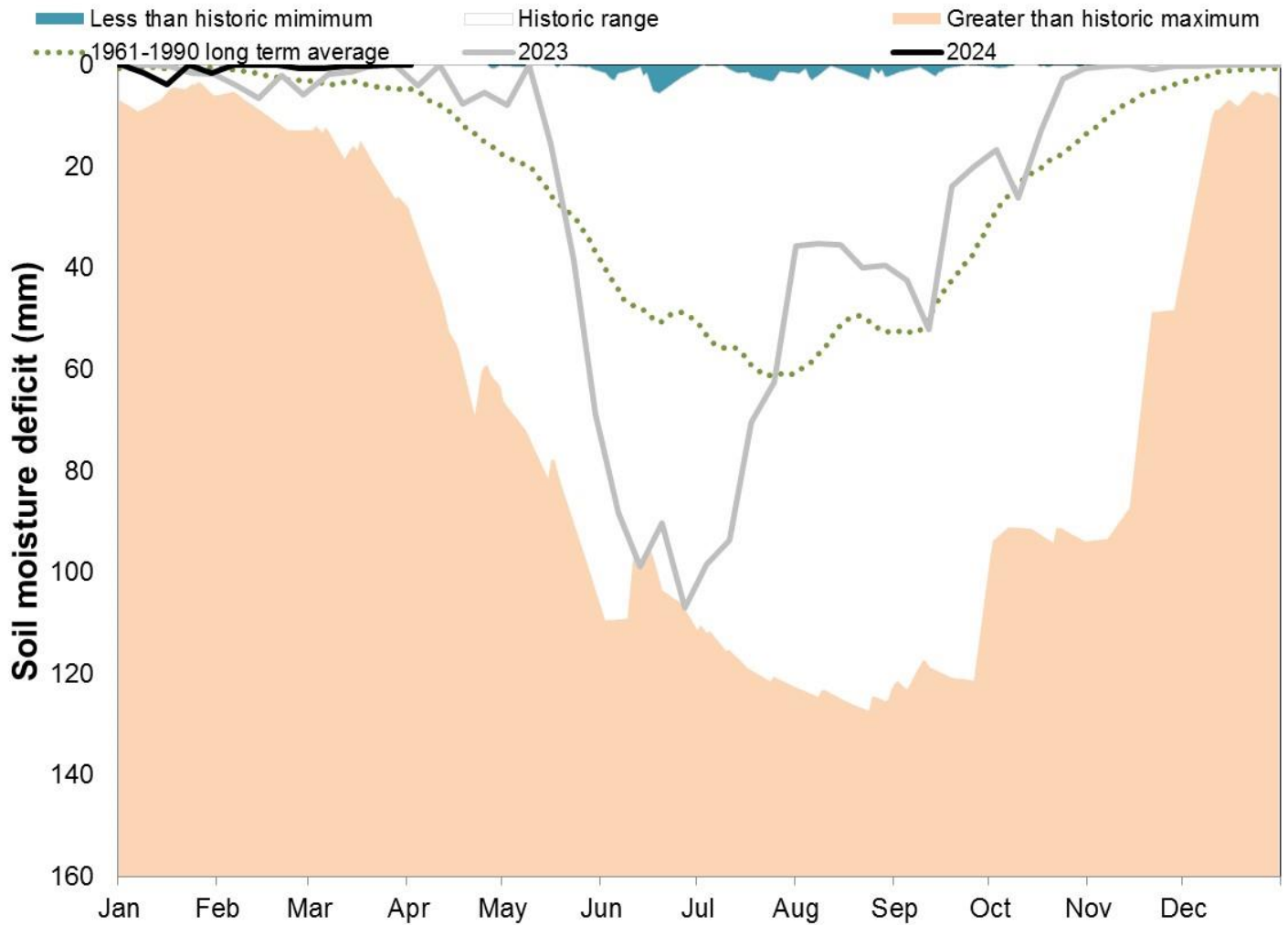
Figure 3.1: Top map shows soil moisture deficit for week ending 31 March 2024. Bottom map shows the difference (mm) between the actual soil moisture deficit and the 1961 to 1990 long term average soil moisture deficits. MORECS data for real land use.



(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.

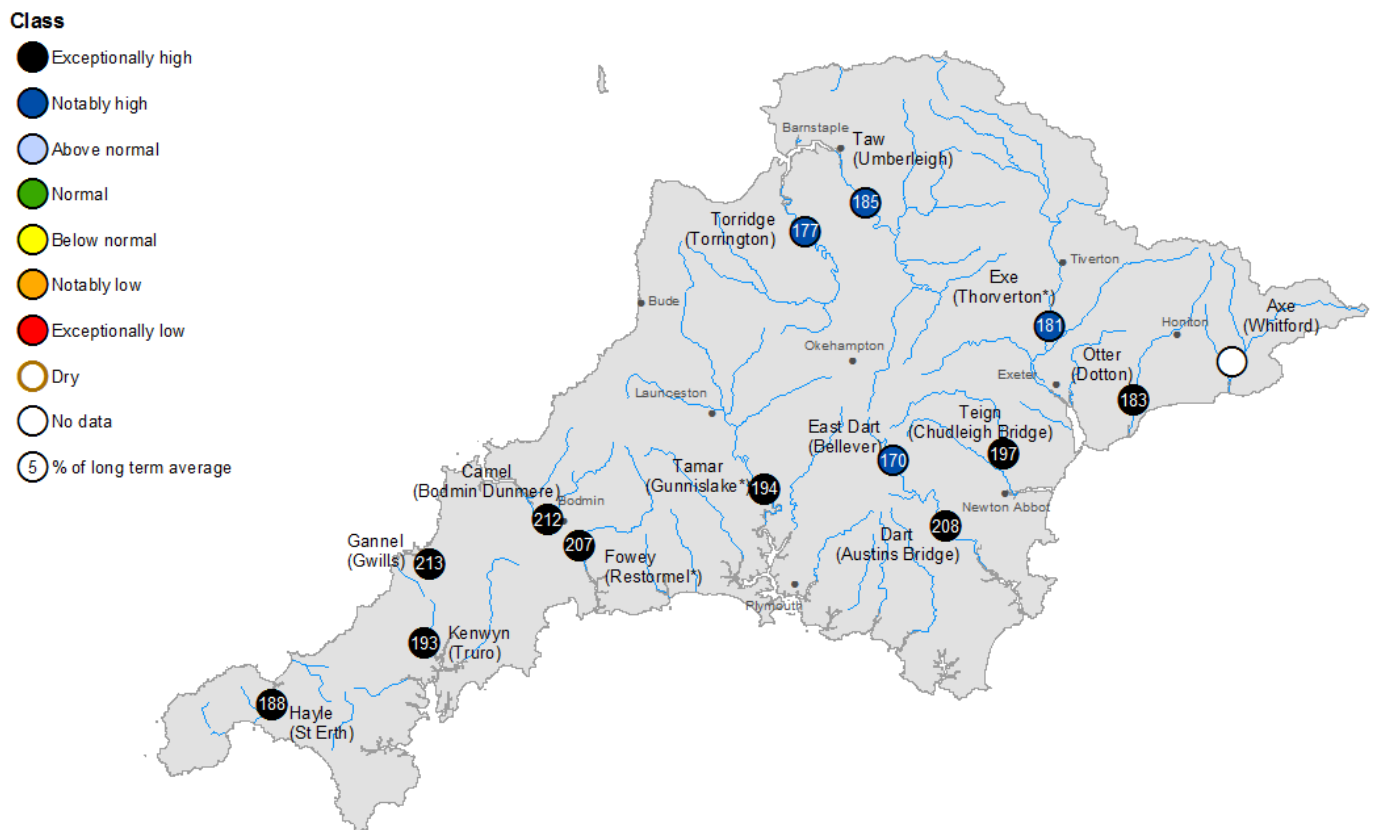


(Source: Met Office. Crown copyright, 2024). All rights reserved. Environment Agency, 100024198, 2024

4 River flows

4.1 River flows map

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

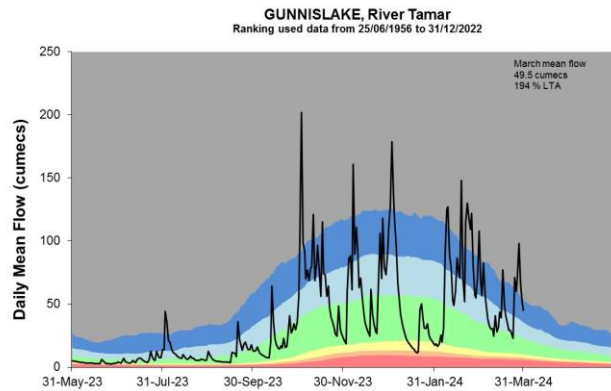
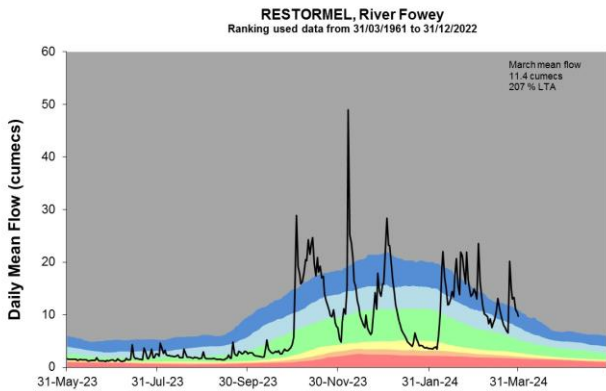
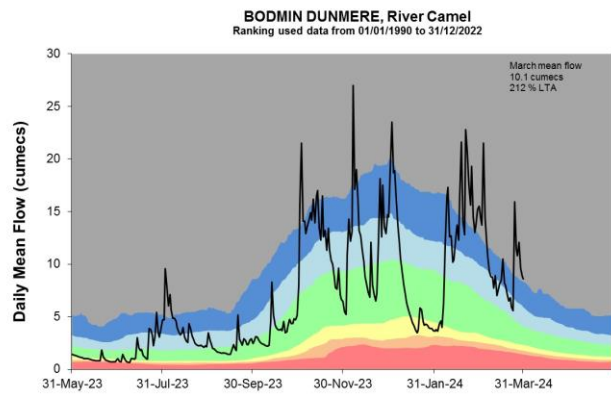
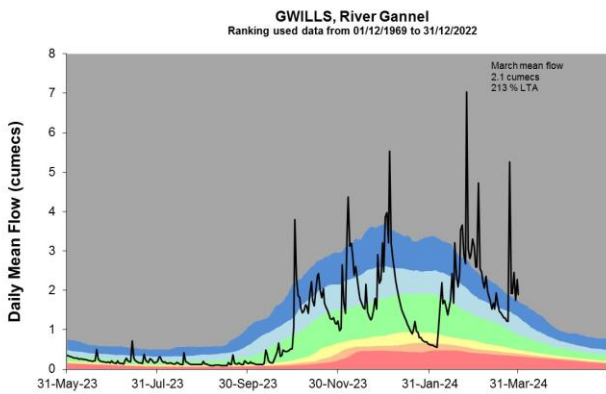
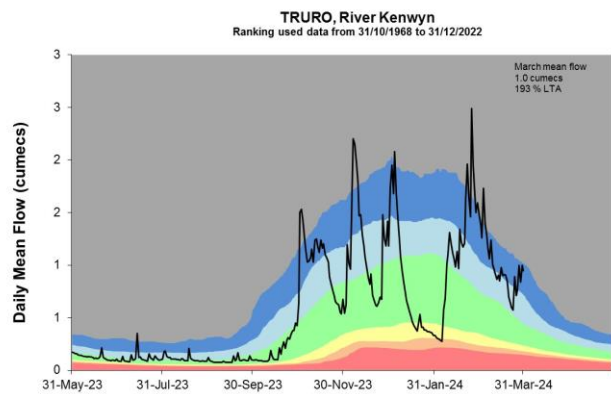
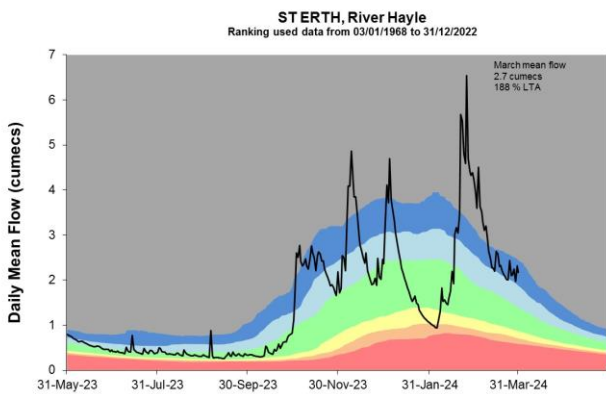
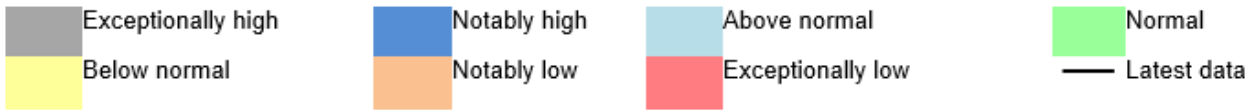


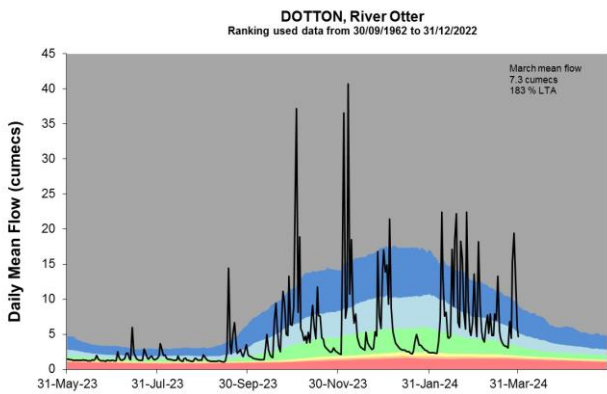
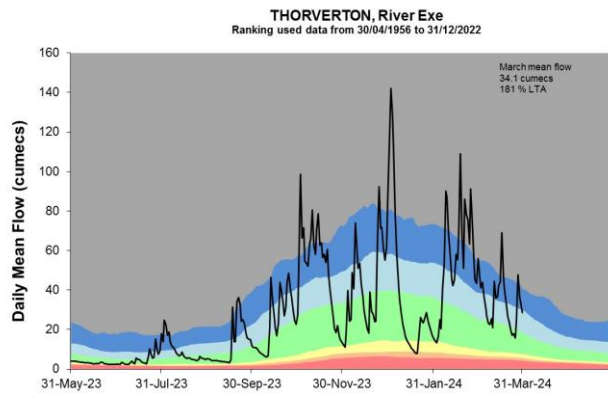
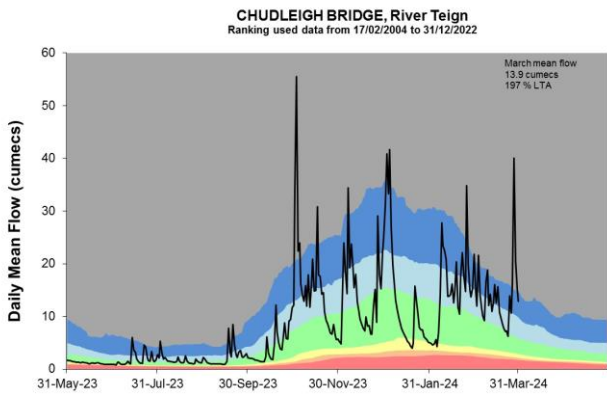
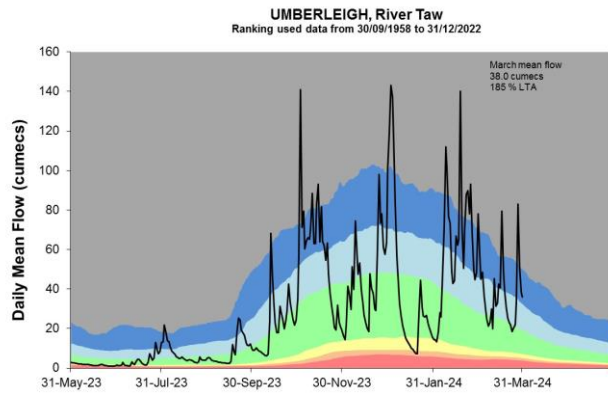
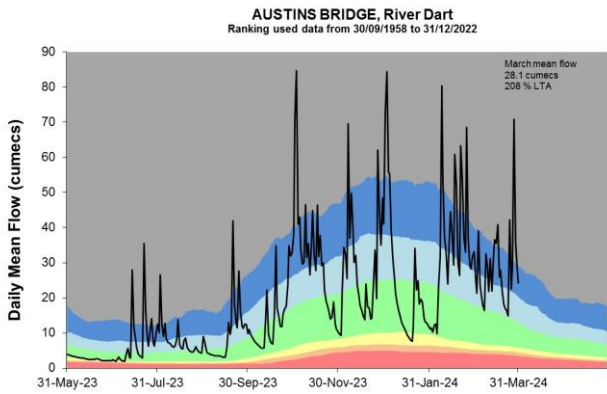
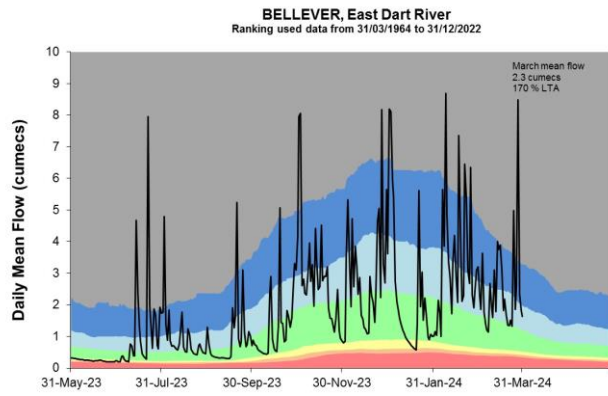
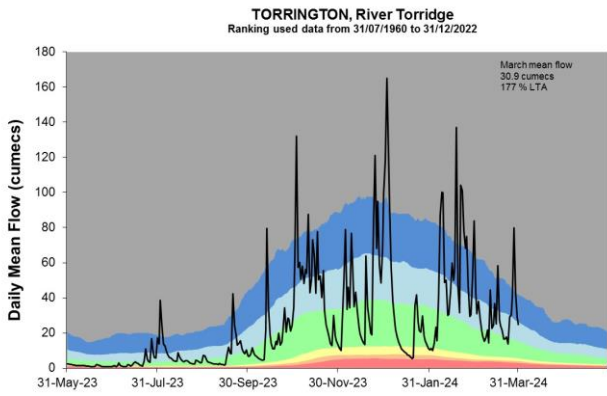
* Flows may be impacted at these sites by water releases from upstream reservoirs.

(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.



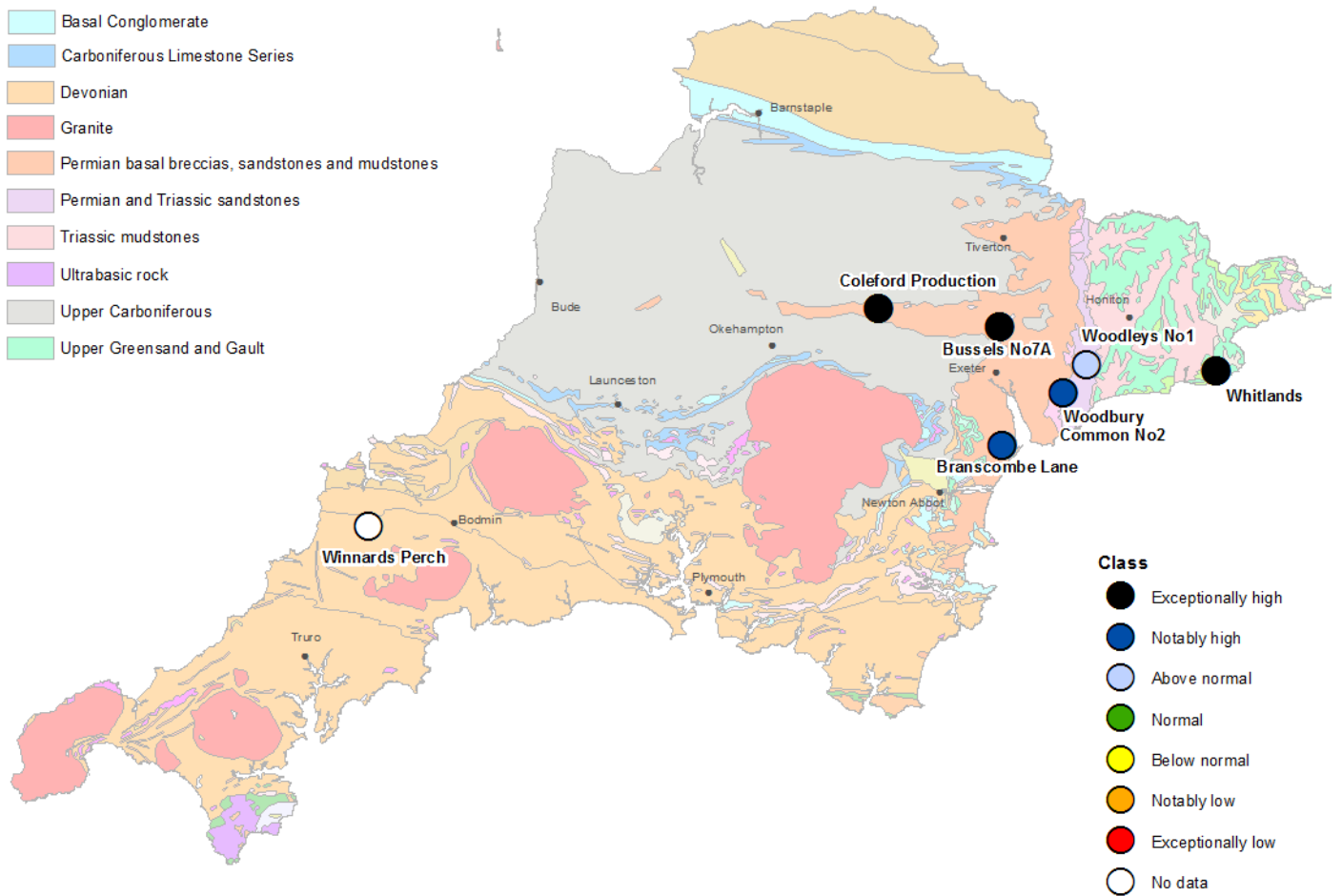


Source: Environment Agency.

5 Groundwater levels

5.1 Groundwater levels map

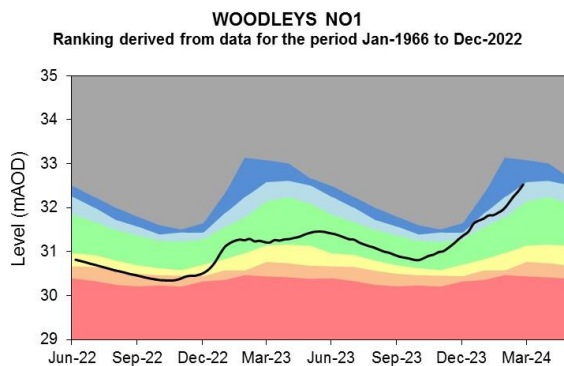
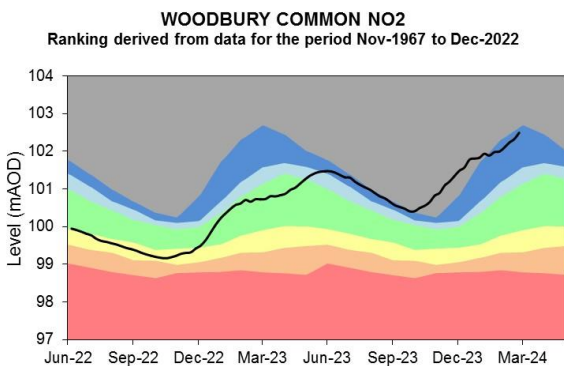
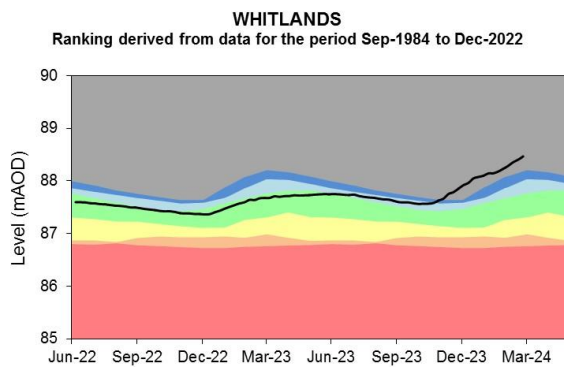
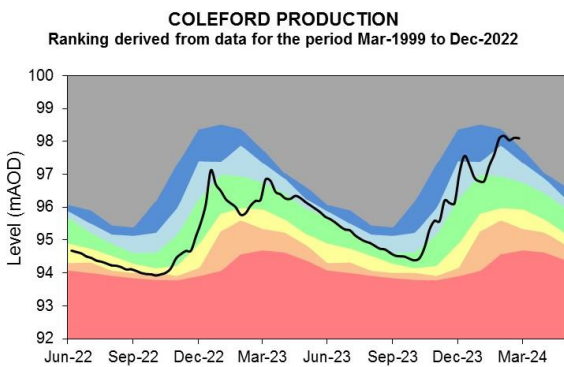
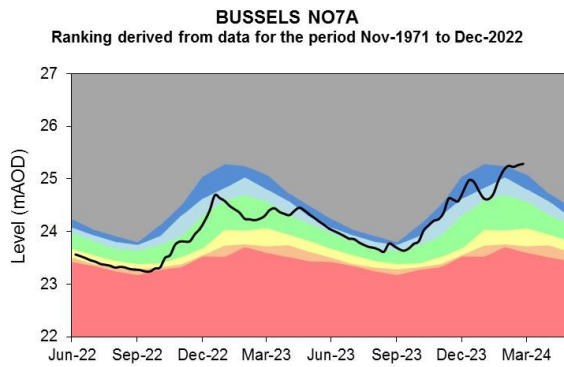
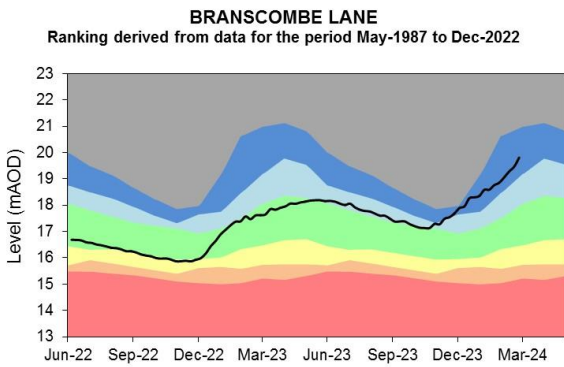
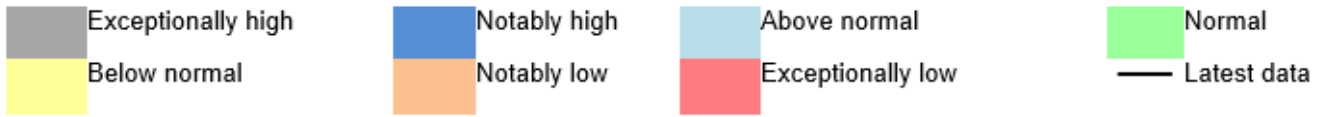
Figure 5.1: Groundwater levels for indicator sites at the end of March 2024, classed relative to an analysis of respective historic March levels. Table available in the appendices with detailed information.



(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

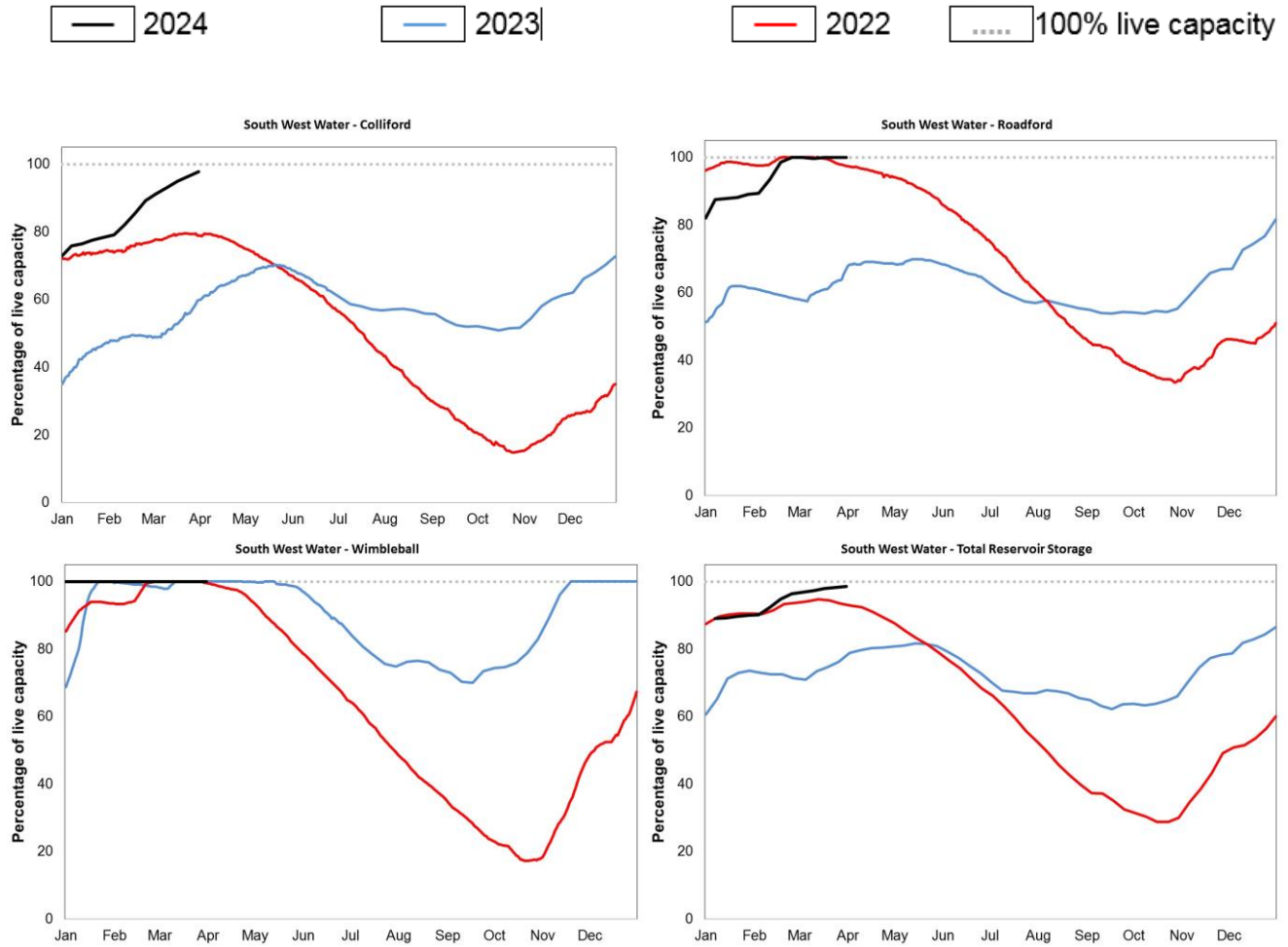
Figure 5.2: End of month groundwater levels at index groundwater level sites for major aquifers. 22 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.



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	Mar 2024 rainfall % of long term average 1961 to 1990	Mar 2024 band	Jan 2024 to March cumulative band	Oct 2023 to March cumulative band	Apr 2023 to March cumulative band
Avon Dart And Erme	204	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high
Exe	161	Notably High	Exceptionally high	Exceptionally high	Exceptionally high
Fal And St Austell	172	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high
North Cornwall	178	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high
Otter Sid Axe And Lim	163	Notably High	Exceptionally high	Exceptionally high	Exceptionally high
Seaton Looe And Fowey	201	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high
Tamar	196	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high
Taw And North Devon Streams	161	Notably High	Exceptionally high	Exceptionally high	Exceptionally high
Teign And Torbay	176	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high

Torridge And Hartland Streams	162	Notably High	Exceptionally high	Exceptionally high	Exceptionally high
West Cornwall	163	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high

8.2 River flows table

Site name	River	Catchment	Mar 2024 band	Feb 2024 band
Austins Bridge	River Dart	Dart	Exceptionally high	Notably high
Bellever	East Dart	Dart	Notably high	Notably high
Bodmin Dunmere	River Camel	Camel	Exceptionally high	Notably high
Chudleigh Bridge	River Teign	Teign Upper	Exceptionally high	Above normal
Dotton	River Otter	Otter	Exceptionally high	Notably high
Gunnislake	River Tamar	Tamar Lower	Exceptionally high	Notably high
Gwills	River Gannel	Gannel	Exceptionally high	Above normal
Restormel	River Fowey	Fowey	Exceptionally high	Notably high
St Erth	River Hayle	Hayle	Exceptionally high	Above normal
Thorverton	River Exe	Exe Lower	Notably high	Exceptionally high
Torrington	River Torridge	Torridge Middle	Notably high	Notably high

Truro	River Kenwyn	Tresillian Trevella Kenwyn	Exceptionally high	Above normal
Umberleigh	River Taw	Taw Middle	Notably high	Exceptionally high
Whitford	River Axe	Axe Devon Middle		

8.3 Groundwater table

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