Monthly water situation report: Devon and Cornwall Area

1 Summary - February 2024

Devon and Cornwall received 245% of the February long term average (LTA) rainfall, which was ‘exceptionally high’ for the time of year. This was the wettest February in Devon and Cornwall since records began in 1871. Soil moisture deficit (SMD) decreased overall during February and ended the month lower (wetter) than the LTA for the time of year. Monthly mean river flows ranged from ‘above normal’ to ‘exceptionally high’ for the time of year across the area. Levels at all groundwater sites ended the month higher than the start of February. Total reservoir storage increased overall in February across Devon and Cornwall, with Wimbleball, Colliford and Roadford reservoirs at 100%, 89% and 100% of net storage respectively at the end of the month.

1.1 Rainfall

Devon and Cornwall received 248 mm of rain during February (245% of the February LTA), which is classed as ‘exceptionally high’ for the time of year. Rainfall was ‘exceptionally high’ across all hydrological areas in February except the Teign and Torbay area where it was ‘notably high’. Devon and Cornwall received rainfall everyday throughout the month, with the highest quantities of rain falling from 06 February until the end of the month. This was the wettest February since records began in 1871, and the 5 month period from October 2023 (start of the water year) to February 2024 was the 4th wettest on record.

1.2 Soil moisture deficit

Soil moisture deficit decreased overall during February. On 27 February, the deficit was less than 10 mm and was slightly lower (soils were wetter) than the LTA for the time of year, and also lower (soils were wetter) than the same time in 2023.

1.3 River flows

February monthly mean river flows ranged from ‘above normal’ to ‘exceptionally high’ for the time of year across the area. Two sites reported ‘exceptionally high’ mean river flows at Thorverton on the River Exe and Umberleigh on the River Taw. Daily river flows had peaked

at most sites across Devon and Cornwall by 22 February in response to the persistent rainfall throughout the month, with all but 2 of the reporting sites reporting ‘exceptionally high’ daily mean flows by this time. By 29 February daily mean river flows had reduced with flows ranging from ‘above normal’ to ‘exceptionally high’ for the time of year.

1.4 Groundwater levels

Levels at all groundwater sites continued their winter recharge throughout February, in response to the wet winter period. All reporting site hydrographs are generally on their rising limbs, as would be expected at the time of year. On 29 February, groundwater levels were ‘above normal’ at Woodleys No1 (monitoring the Otterton Sandstone Formation), ‘notably high’ at 4 reporting sites, and ‘exceptionally high’ at Whitlands (monitoring the Upper Greensand) for the time of year.

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 90% at the end of January to 96% at the end of February, ending the month higher than this time last year, and higher than the same time in 2022. At the end of the month, storage at Wimbleball, Colliford and Roadford reservoirs was 100%, 89% and 100% of net storage respectively, compared to 98%, 49% and 58% this time last year.

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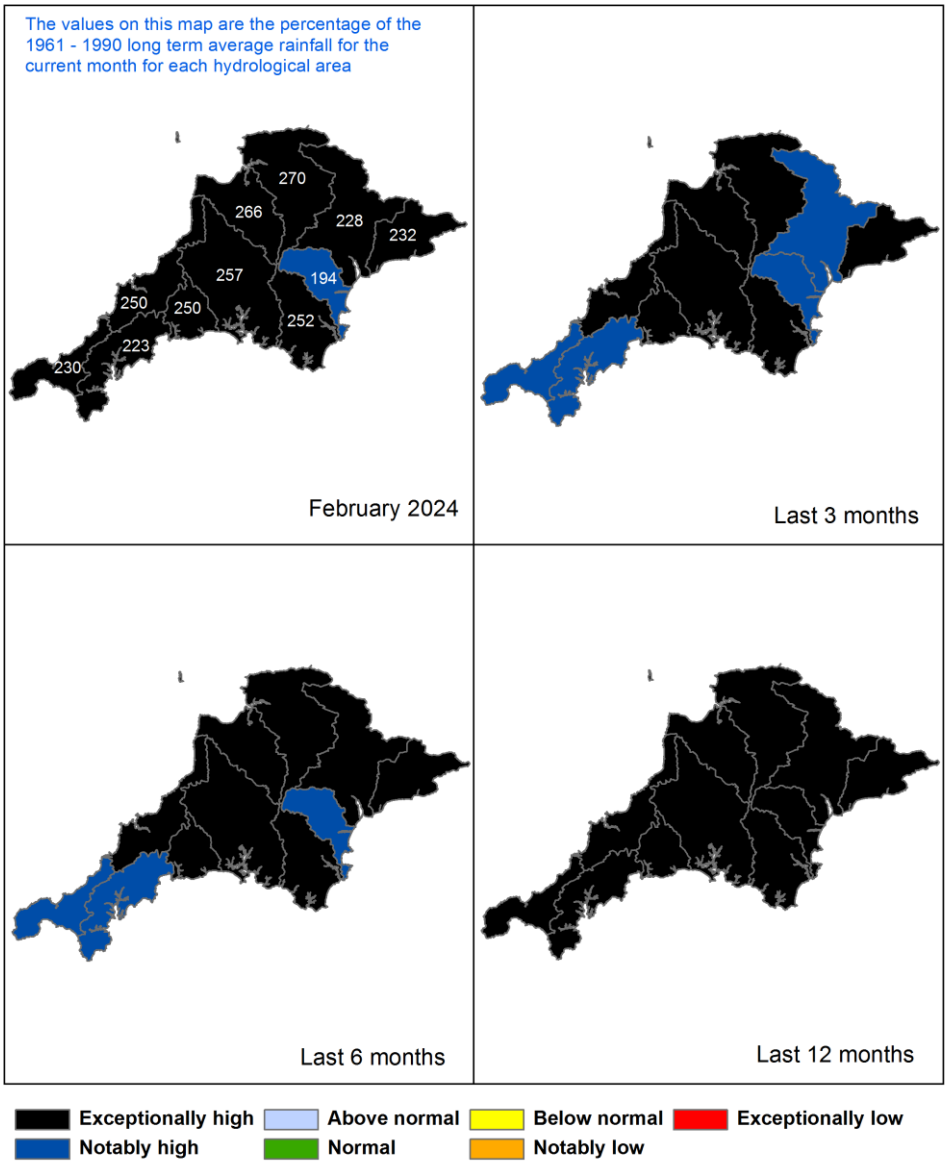
2 Rainfall

2.1 Rainfall map

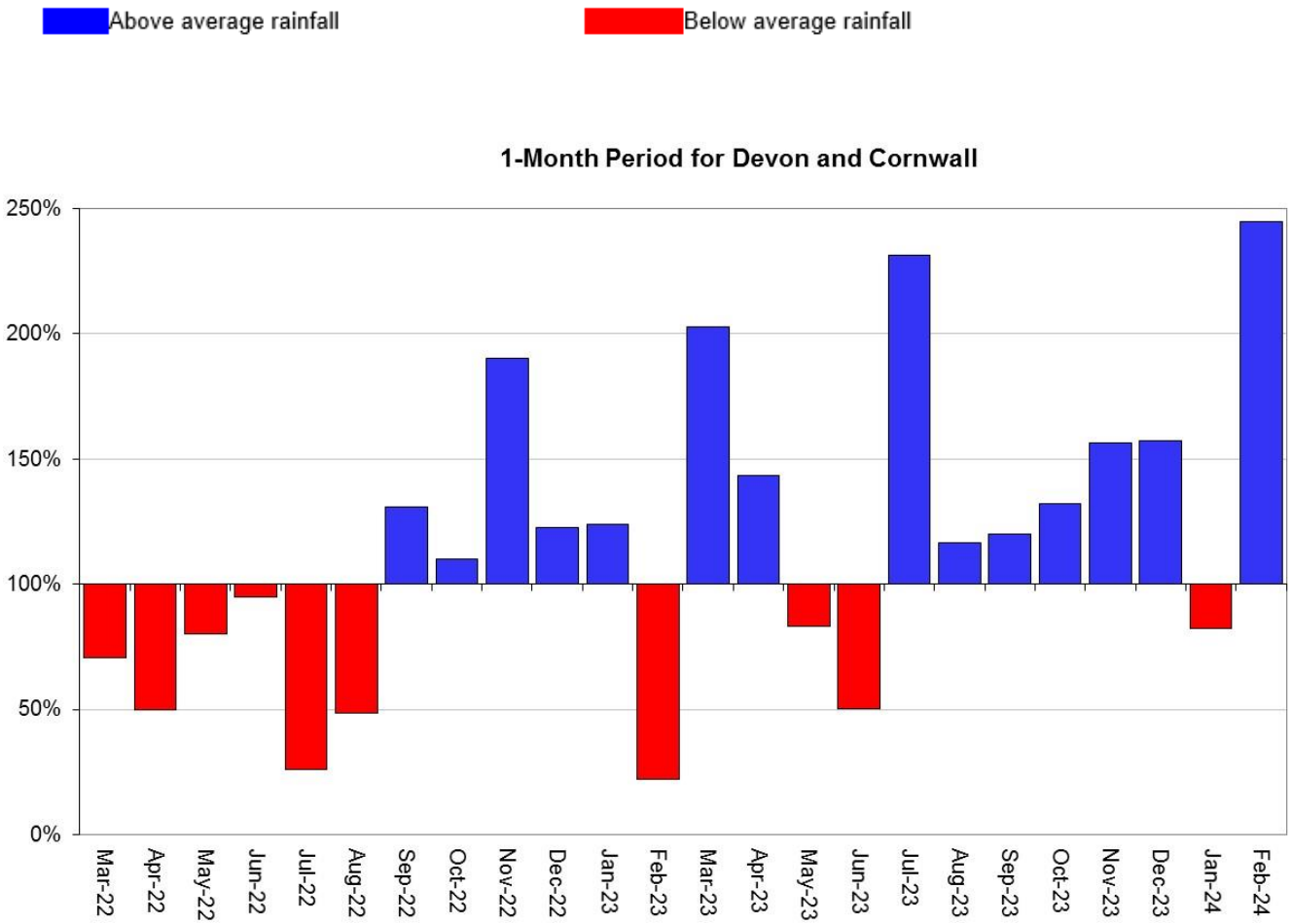
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 29 February 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information.



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.

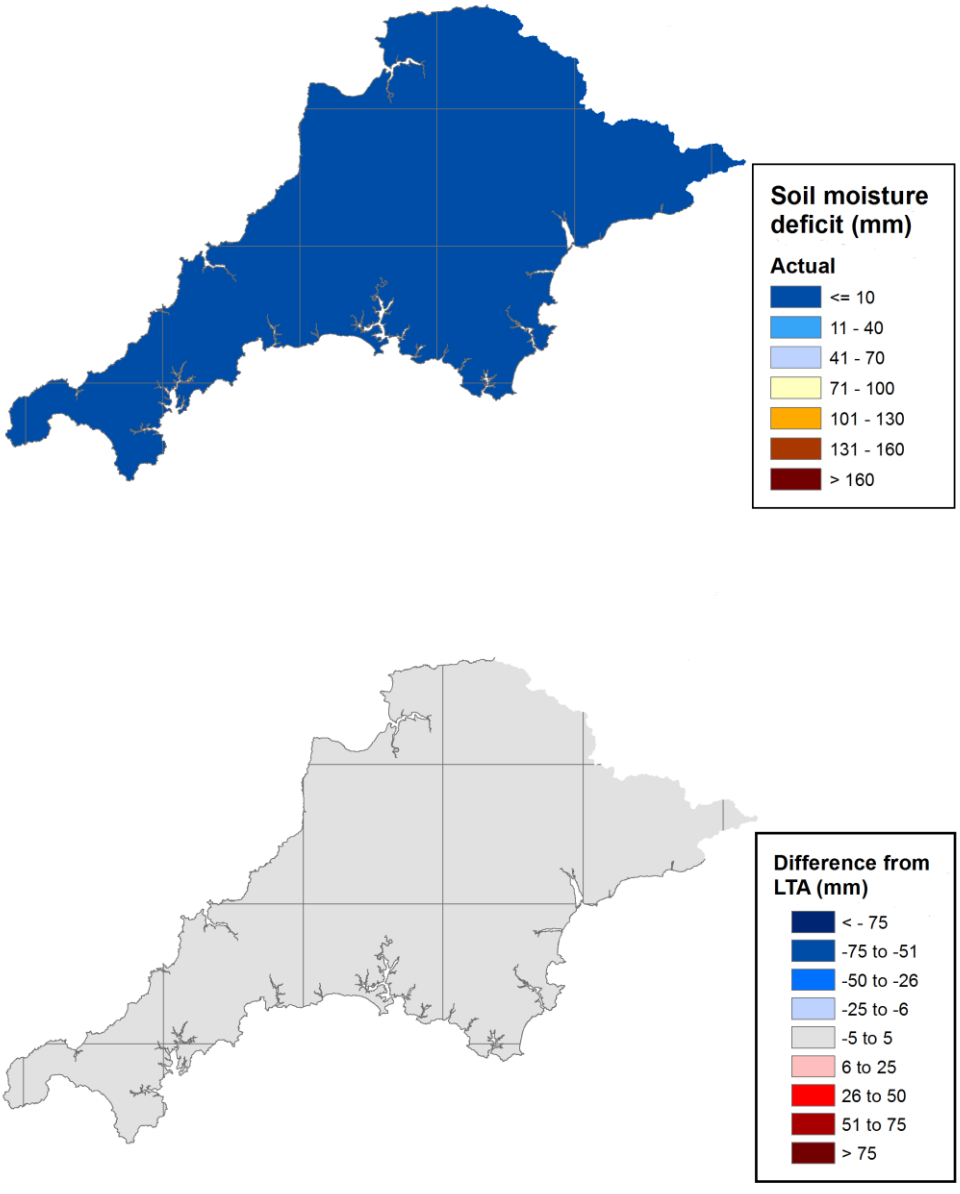


Rainfall data for 2023, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2024). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived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

3 Soil moisture deficit

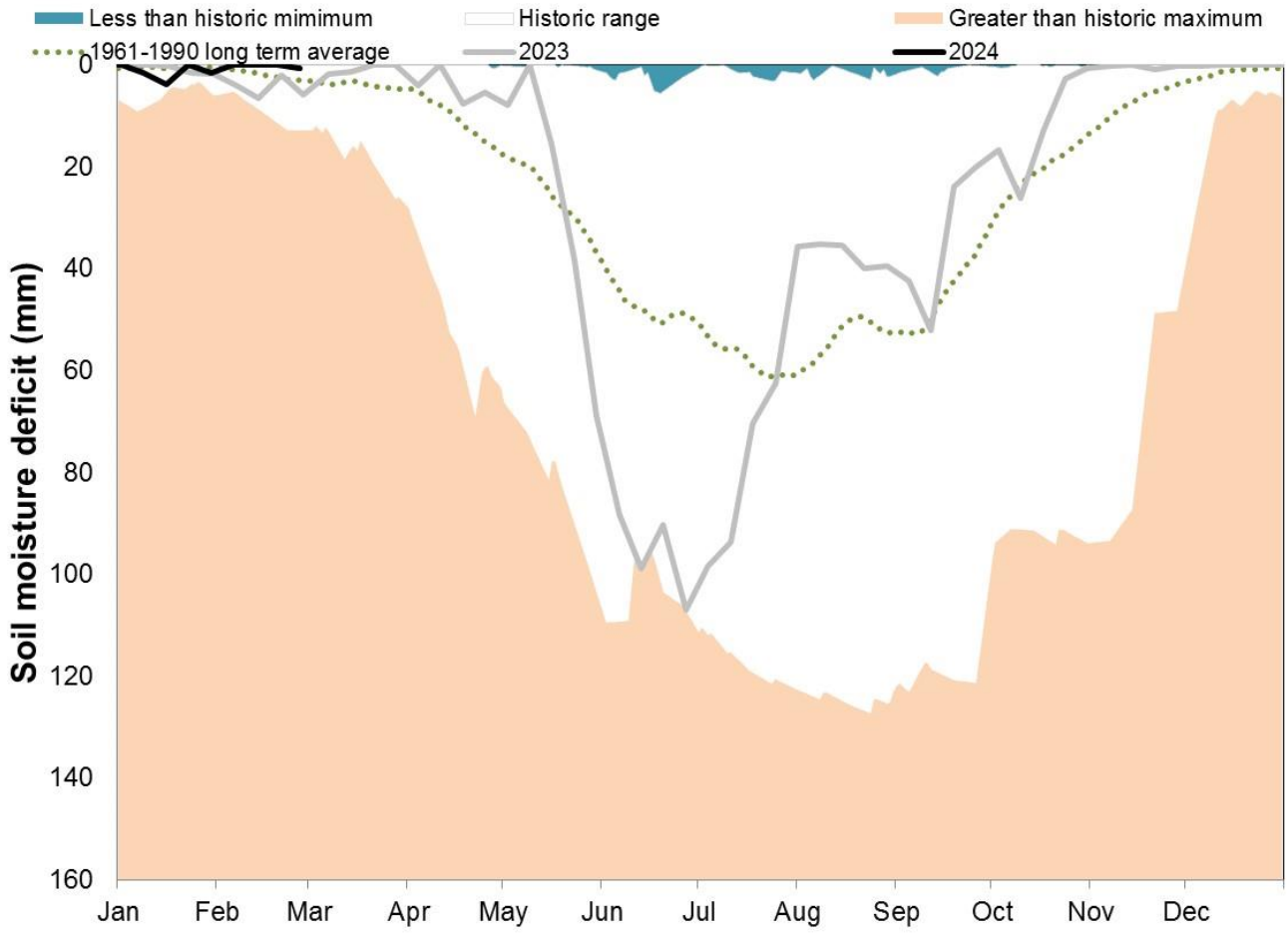
3.1 Soil moisture deficit map

Figure 3.1: Top map shows soil moisture deficit for week ending 27 February 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

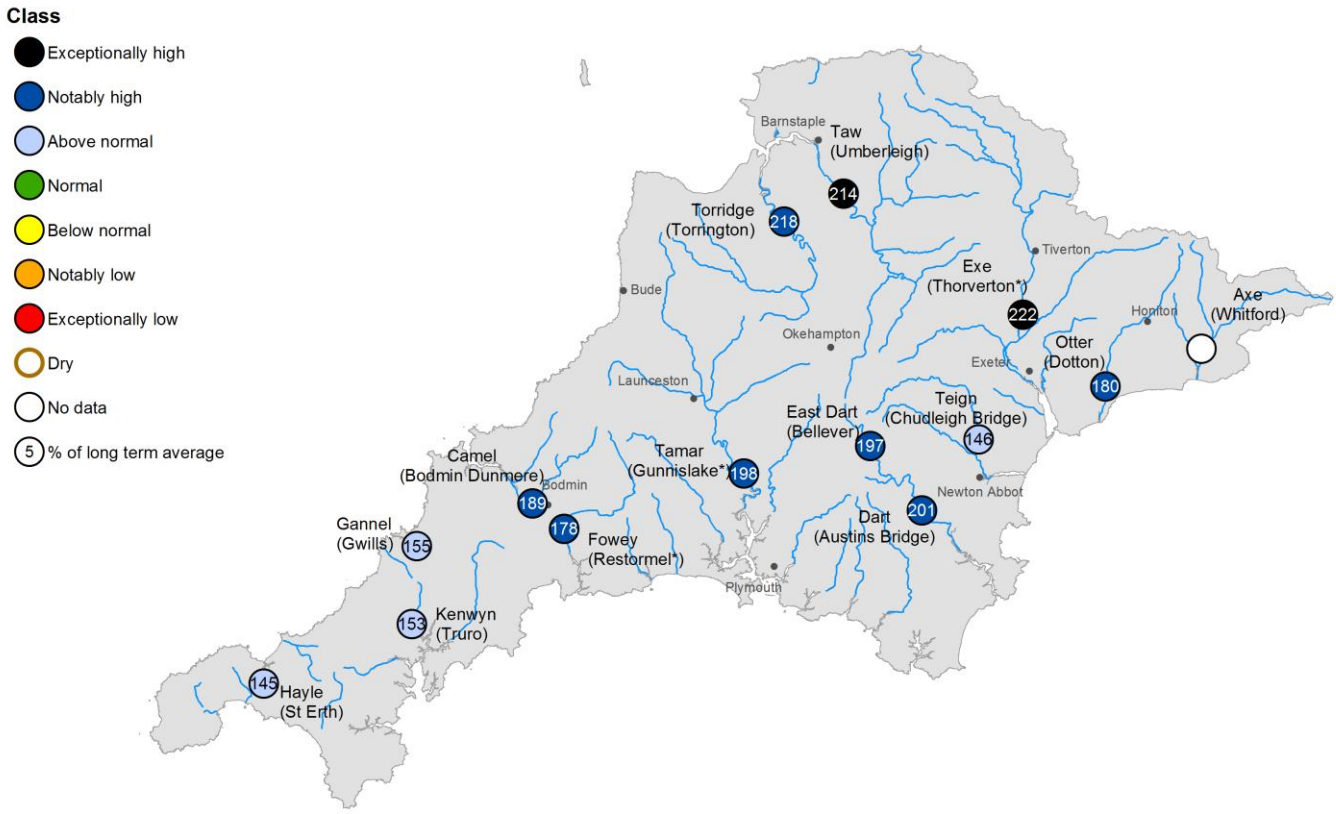
Figure 3.2: Latest soil moisture deficit compared to previous year, maximum, minimum, and 1961 to 1990 long term average. Weekly MORECS data for real land use.



4 River flows

4.1 River flows map

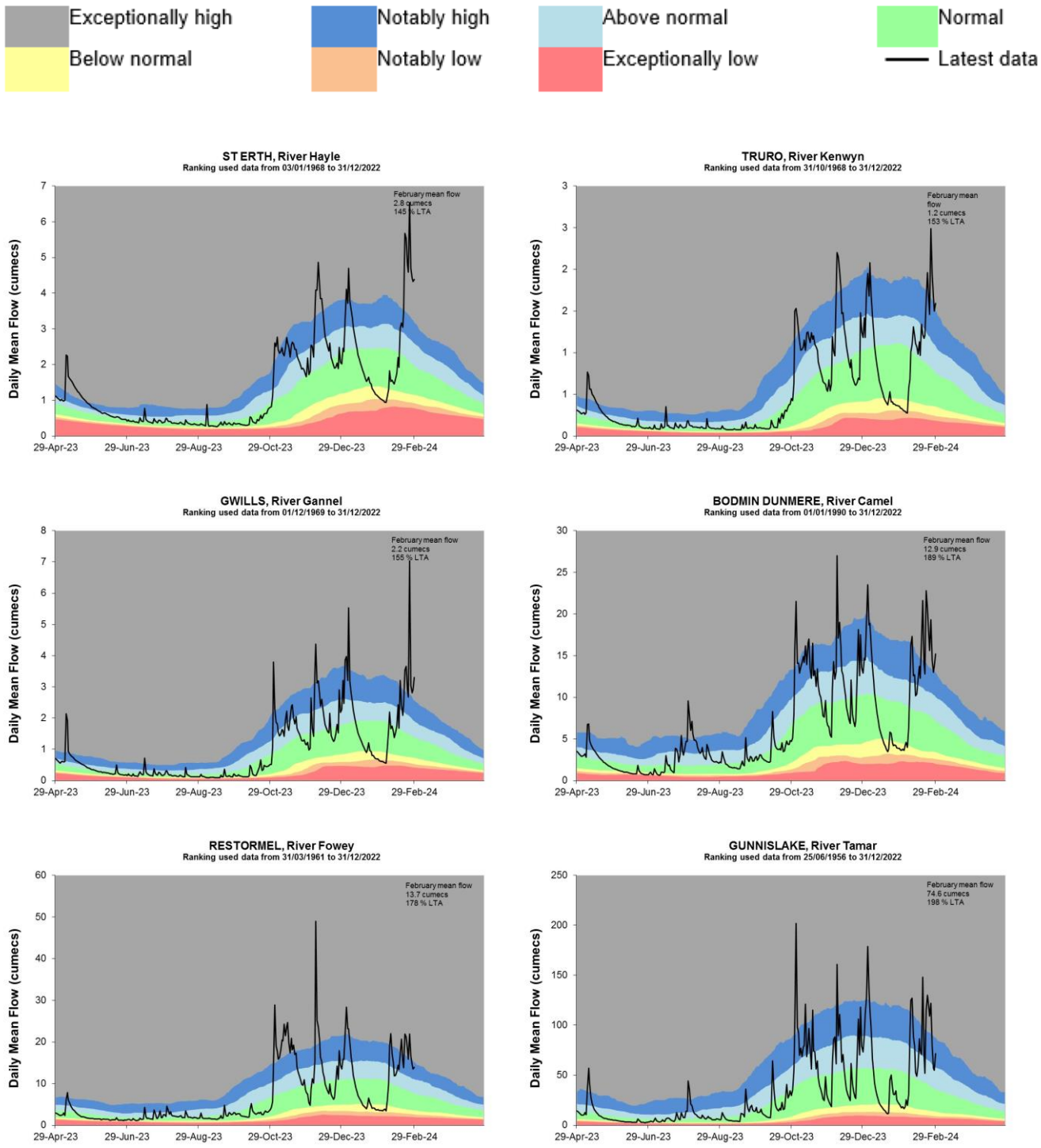
Figure 4.1: Monthly mean river flow for indicator sites for February 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic February monthly means. Table available in the appendices with detailed information.

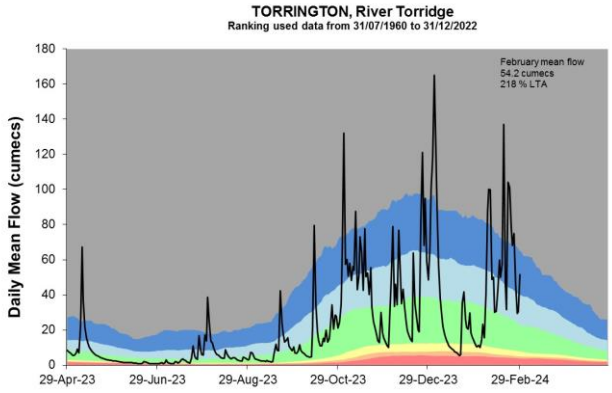


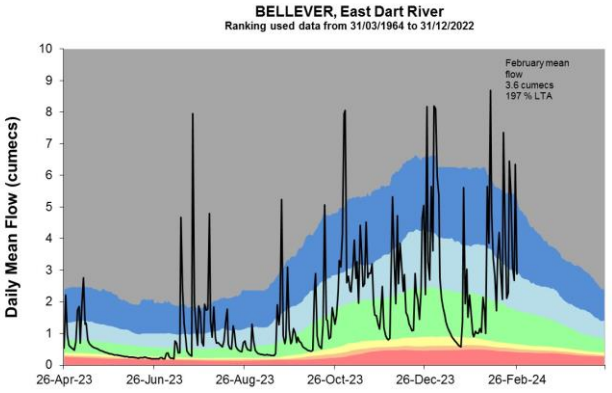
(Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

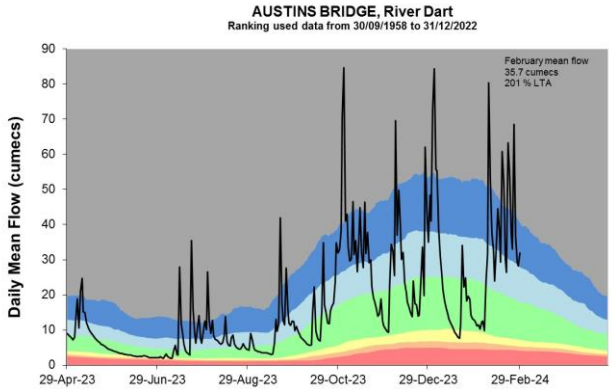
4.2 River flow charts

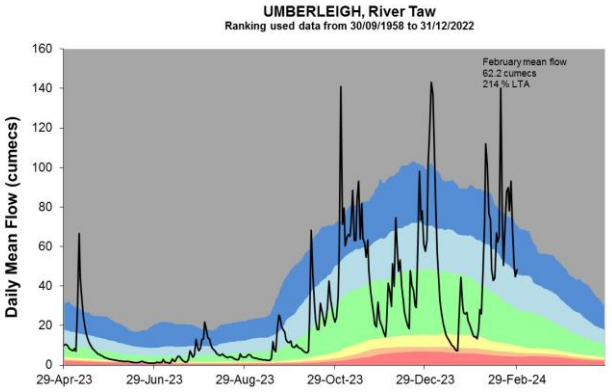
Figure 4.2: Daily mean river flow for indicator sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.

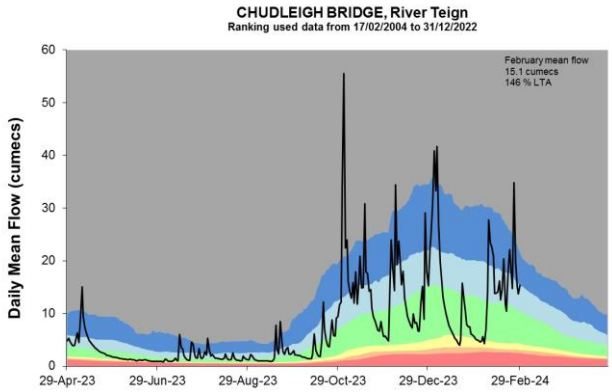


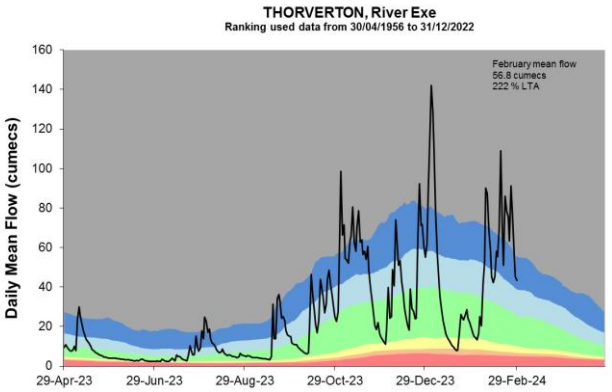


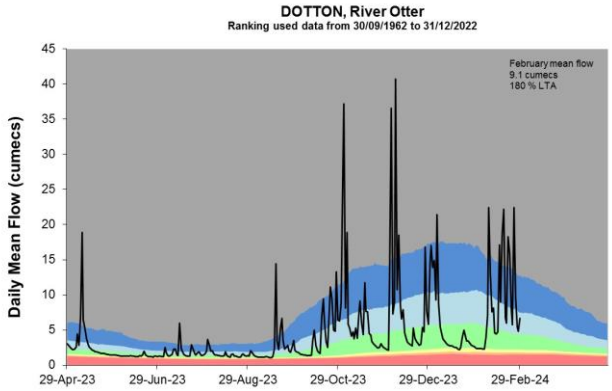










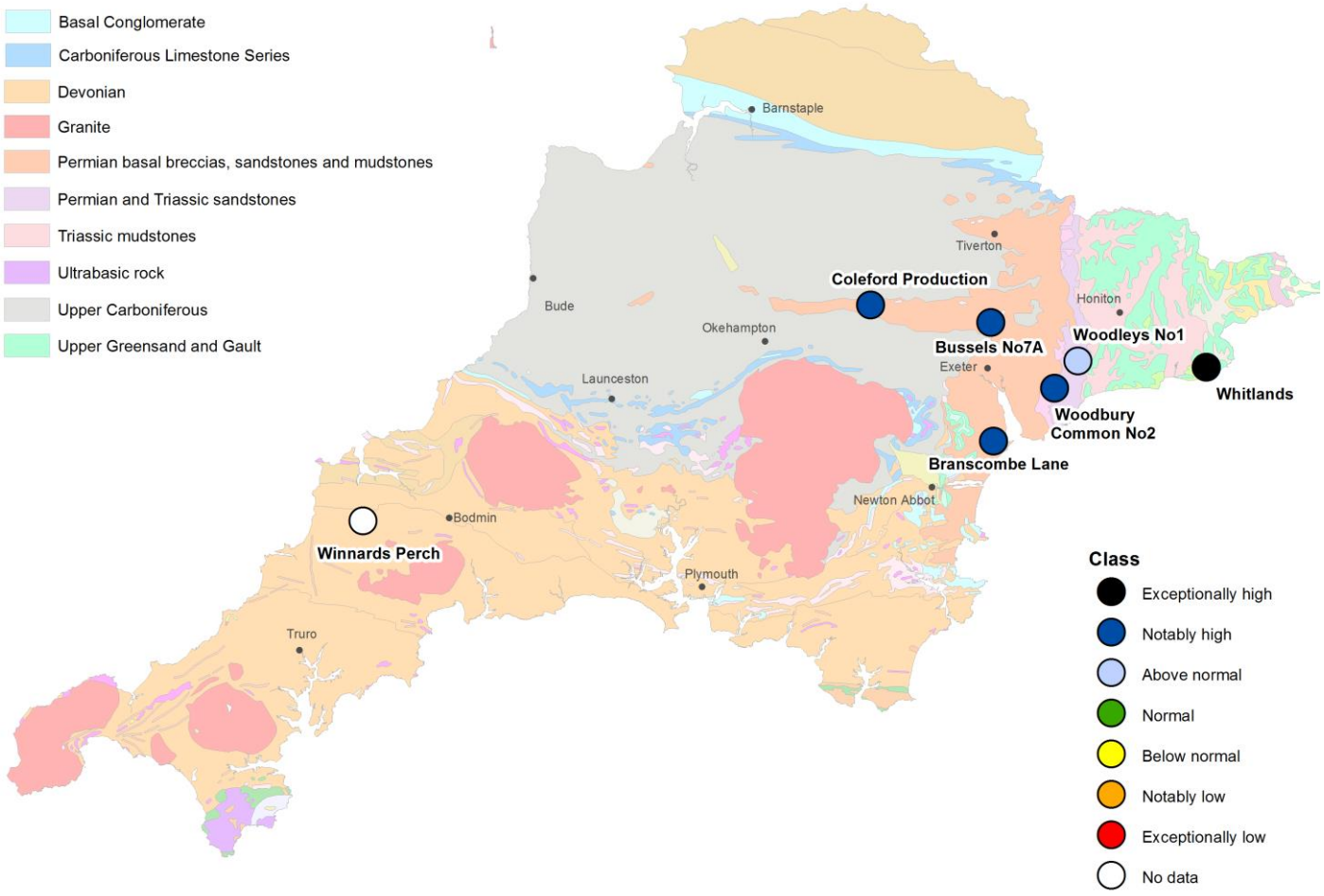


Source: Environment Agency.

5 Groundwater levels

5.1 Groundwater levels map

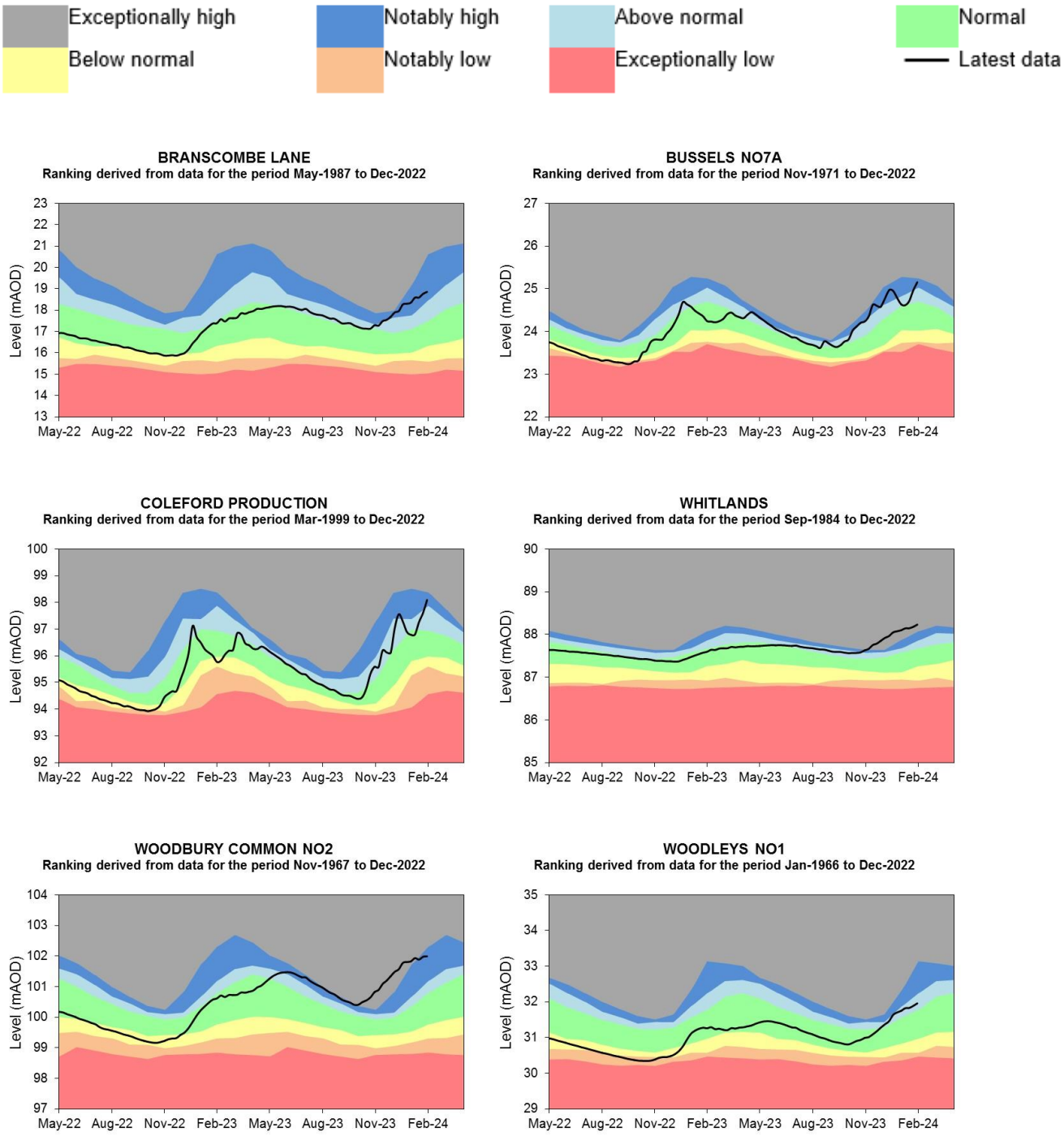
Figure 5.1: Groundwater levels for indicator sites at the end of February 2024, classed relative to an analysis of respective historic February levels. Table available in the appendices with detailed information.



(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

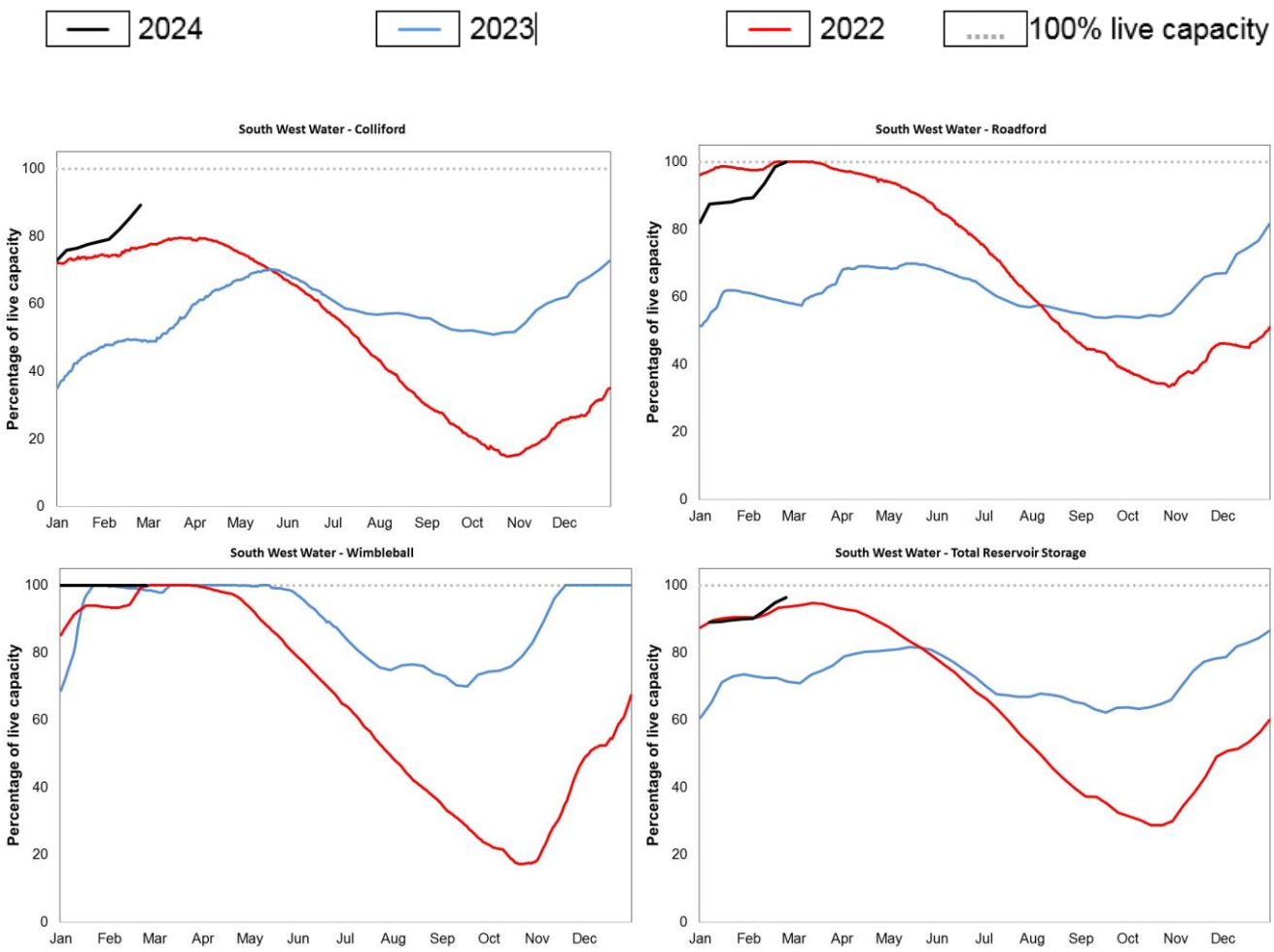
Figure 5.2: End of month groundwater levels at index groundwater level sites for major aquifers. 22 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.



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	Feb 2024 rainfall % of long term average 1961 to 1990	Feb 2024 band	Dec 2023 to February cumulative band	Sep 2023 to February cumulative band	Mar 2023 to February cumulative band
Avon Dart And Erme	252	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high
Exe	228	Exceptionally High	Notably high	Exceptionally high	Exceptionally high
Fal And St Austell	223	Exceptionally High	Notably high	Notably high	Exceptionally high
North Cornwall	250	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high
Otter Sid Axe And Lim	232	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high
Seaton Looe And Fowey	250	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high
Tamar	257	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high
Taw And North Devon Streams	270	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high
Teign And Torbay	195	Notably High	Notably high	Notably high	Exceptionally high

Torridge And Hartland Streams	266	Exceptionally High	Exceptionally high	Exceptionally high	Exceptionally high
West Cornwall	230	Exceptionally High	Notably high	Notably high	Exceptionally high

8.2 River flows table

Site name	River	Catchment	Feb 2024 band	Jan 2024 band
Austins Bridge	River Dart	Dart	Notably high	Normal
Bellever	East Dart	Dart	Notably high	Normal
Bodmin Dunmere	River Camel	Camel	Notably high	Normal
Chudleigh Bridge	River Teign	Teign	Above normal	Normal
Dotton	River Otter	Otter	Notably high	Normal
Gunnislake	River Tamar	Tamar	Notably high	Normal
Gwills	River Gannel	Gannel	Above normal	Normal
Restormel	River Fowey	Fowey	Notably high	Normal
St Erth	River Hayle	Hayle	Above normal	Normal
Thorverton	River Exe	Exe	Exceptionally high	Normal
Torrington	River Torridge	Torridge	Notably high	Normal
Truro	River Kenwyn	Tresillian Trevella Kenwyn	Above normal	Normal
Umberleigh	River Taw	Taw	Exceptionally high	Normal
Whitford	River Axe	Axe Devon	No data	No data

8.3 Groundwater table

Site name	Aquifer	End of Feb 2024 band	End of Jan 2024 band
Branscombe Lane	Dawlish Sandstone	Notably high	Notably high
Bussels No7a	Dawlish Sandstone	Notably high	Above normal
Coleford Production	Permian Breccias And Sandstones	Notably high	Normal
Whitlands	Upper Greensand	Exceptionally high	Exceptionally high
Winnards Perch B.h.	Staddon Formation	No data	No data
Woodbury Common No2	Budleigh Salterton Pebble Beds	Notably high	Exceptionally high
Woodleys No1	Otterton Sandstone Formation	Above normal	Above normal