

Monthly water situation report: Midlands

1 Summary - November 2024

Please see Section 7.3 for a map detailing the Midlands regional coverage of this report.

Rainfall - During November, the majority of Midlands' hydrological catchments received normal rainfall totals, ranging from 81% to 133% of the long term average (LTA).

Soil moisture deficit - By the end of November, all hydrological catchments in the Midlands recorded a soil moisture deficit (SMD) of less than or equal to 10mm. This means that soils are at field capacity.

River flows - In November, 10 flow monitoring sites in the Midlands recorded normal monthly mean flows ranging from 74% to 119% of the LTA. Seven flow monitoring sites recorded above normal monthly mean flows and 4 flow monitoring sites recorded notably high monthly mean flows.

Groundwater levels – As of the end of November, three monitoring sites recorded exceptionally high groundwater levels compared to the LTA. A further 3 recorded notably high groundwater levels relative to the LTA. Ram Hall and Southards Lane recorded above normal and normal groundwater levels, respectively.

Reservoir stocks - As of the end of November, all of the Midlands' reservoirs recorded above average storage for the time of year. Since October, storage levels for the majority of reservoirs have increased.

1.1 Rainfall

During November, the majority of Midlands' hydrological catchments received normal rainfall totals, ranging from 81% to 133% of the LTA. The Lower Wye and Lower Severn situated in the south of the Midlands were the only catchments receiving above normal rainfall totals of 143% and 148% of the LTA, respectively.

During the last 3 months, the majority of hydrological catchments in the Midlands have received exceptionally high rainfall totals ranging from 164% to 204% of the LTA. These were the Shropshire Plains, Mid Severn, Lower Wye, Lower Severn, Avon and Soar hydrological catchments. Three hydrological catchments, the Lower Trent, Tame and Upper Trent, received notably high rainfall totals compared to the LTA. A further two hydrological catchments, the Derwent and Dove, received above normal rainfall totals compared to the LTA. The remaining hydrological catchment, Welsh Mountains, received a normal rainfall total of 109% relative to the LTA.

Over the last 6 months, hydrological catchments in the Midlands received a variable amount of rainfall relative to the LTA. Six hydrological catchments received normal rainfall totals ranging from 101% and 120% of the LTA. These were the Upper Trent, Dove, Derwent, Tame, Lower Trent and Welsh Mountains. Five hydrological catchments received above normal rainfall totals compared to the LTA. These were the Soar, Avon, Shropshire Plains, Mid Severn and Lower Wye hydrological catchments. The remaining Lower Severn hydrological catchment received a notably high rainfall total of 143% of the LTA.

Over the last 12 months, the majority of Midlands' hydrological catchments received exceptionally high rainfall totals relative to the LTA. Only 3 hydrological catchments received notably high rainfall totals ranging from 123% to 132% of the LTA. These were the Welsh Mountains in the west of the Midlands and the Derwent and Lower Trent in the north-east of the Midlands.

1.2 Soil moisture deficit and recharge

By the end of November, all hydrological catchments in the Midlands recorded a SMD of less than or equal to 10mm. This means that soils are at field capacity. Compared to October, the majority of hydrological catchments in the Midlands remained at field capacity resulting in no change in SMD. The only exception is the Lower Trent hydrological catchment which became wetter since October meaning SMD decreased.

Compared to the LTA, the majority of hydrological catchments in November are wetter than expected for the time of year. The only exception is the Welsh Mountains hydrological catchment in the west of the Midlands which has a -5mm to 5mm difference from the LTA. This means that SMD is as expected in this area for the time of year.

1.3 River flows

In November, 10 flow monitoring sites in the Midlands recorded normal monthly mean flows ranging from 74% to 119% of the LTA. These were Auckley, Worksop, North Muskham, Whatstandwell, Derby St Marys, Marston on Dove, Clifton Hall, Llanyblodwel, Bewdley and Redbrook. Seven flow monitoring sites recorded above normal monthly mean flows ranging from 124% to 186% of the LTA. These were Great Bridgeford, Yoxall, Kegworth, Tenbury, Butts Bridge, Evesham and Deerhurst. A further 4 flow monitoring sites recorded notably high monthly mean flows ranging from 166% to 320% of the LTA. These were Walcot in the north-west, Stareton in the south-east and Wedderburn Bridge and Ebley Mill in the south of the Midlands.

1.4 Groundwater levels

As of the end of November, groundwater levels recorded at monitoring sites were normal or above compared to the LTA. Three monitoring sites, Coxmoor, Weir Farm and Anthony's Cross, recorded exceptionally high groundwater levels compared to the LTA. Crossley Hill and Rider Point in the north of the Midlands and Four Crosses in central Midlands recorded notably high groundwater levels relative to the LTA. Ram Hall in south-east of the Midlands and Southards Lane in the north of the Midlands recorded above normal and normal groundwater levels, respectively.

1.5 Reservoir stocks

As of the end of November, all of the Midlands' reservoirs recorded above average storage for the time of year.

Since October, storage levels for the majority of reservoirs have increased. The Carsington and Ogston reservoir group recorded a decrease in storage levels and the Dove reservoir storage levels remained the same since October.

1.6 River Severn operations

The River Severn is regulated to maintain a minimum flow at Bewdley gauging station. This ensures sufficient water flows along the river to support environmental and water supply requirements. Regulation is instigated when flows drop below a threshold. The 2024 regulation season has seen only 7 days of river regulation, which commenced on 28 June 2024. The last day of regulation was 9 September 2024.

1.7 River Wye operations

For all of November, storage in the Elan Valley reservoirs was above the release control line and the flows at Redbrook gauging station were above the regulation threshold. Therefore, regulation releases were not in operation.

For the majority of November, environmental releases were still in operation. However, towards the end of the month, the intense rainfall from Storm Bert resulted in high river flows with flood alerts issued on the Wye. Therefore, during that time, no environmental releases were requested.

As of 5th December 2024, storage in the Elan Valley reservoirs is above the release control line and the flows at Redbrook gauging station are above the regulation threshold. Therefore, regulation releases are not in operation.

1.8 Water abstraction restrictions

As of 3 December 2024, there are 4 restrictions in place across the Midlands affecting 5 licences.

Table 1.2: Water abstraction licence restrictions

Area	Rivers and stations restricted
West Midlands	River Leaddon at Wedderburn Bridge River Worfe at Burlington Weir Yazor Brook at Three Elms Garren Brook at Marstow Mill

Author: Midlands Hydrology, midlandshydrology@environment-agency.gov.uk

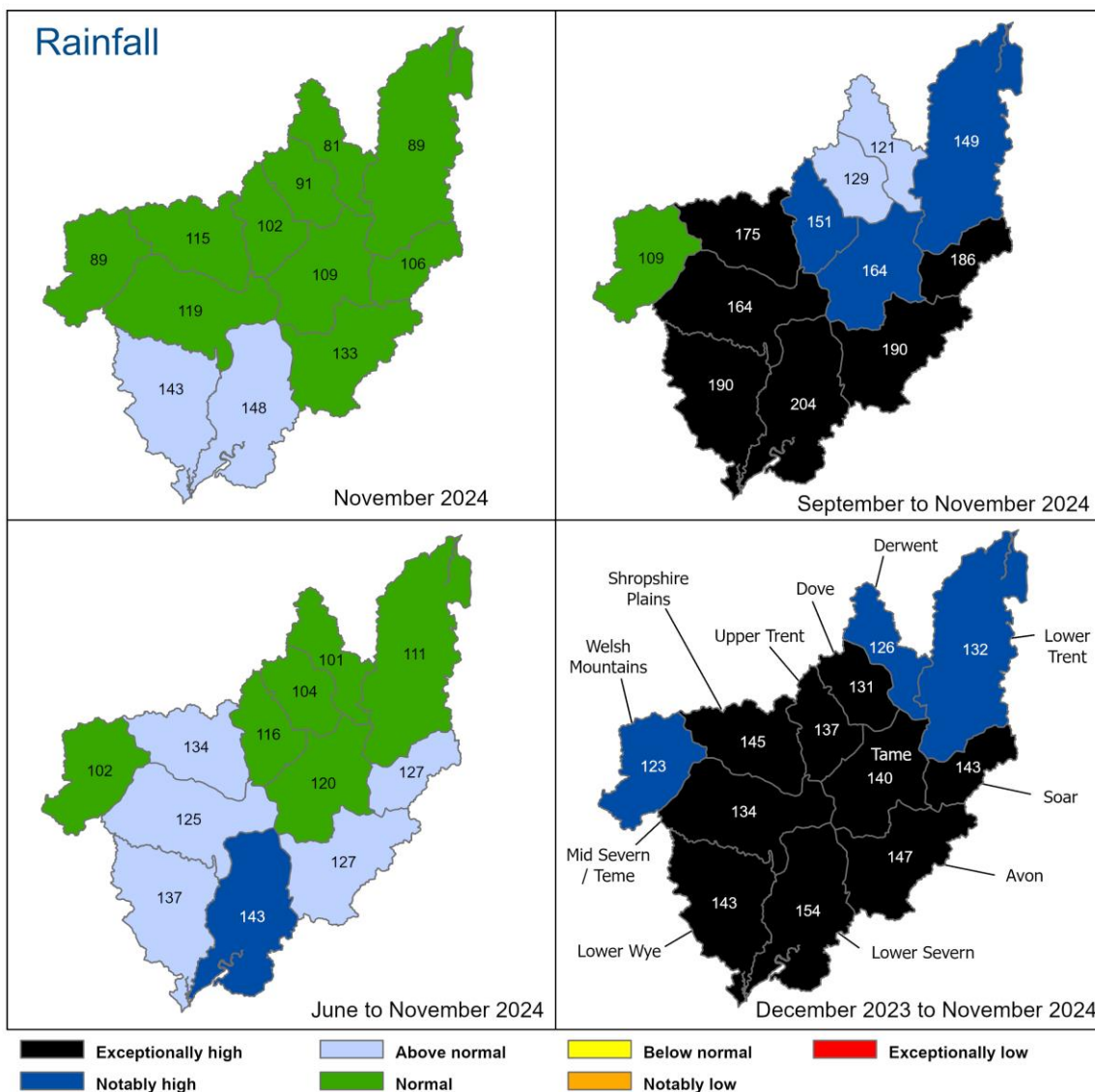
Contact Details: 03708 506 506

Disclaimer: All data are provisional and may be subject to revision. The views expressed in this document are not necessarily those of the Environment Agency. Its officers, servants or agents accept no liability for any 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

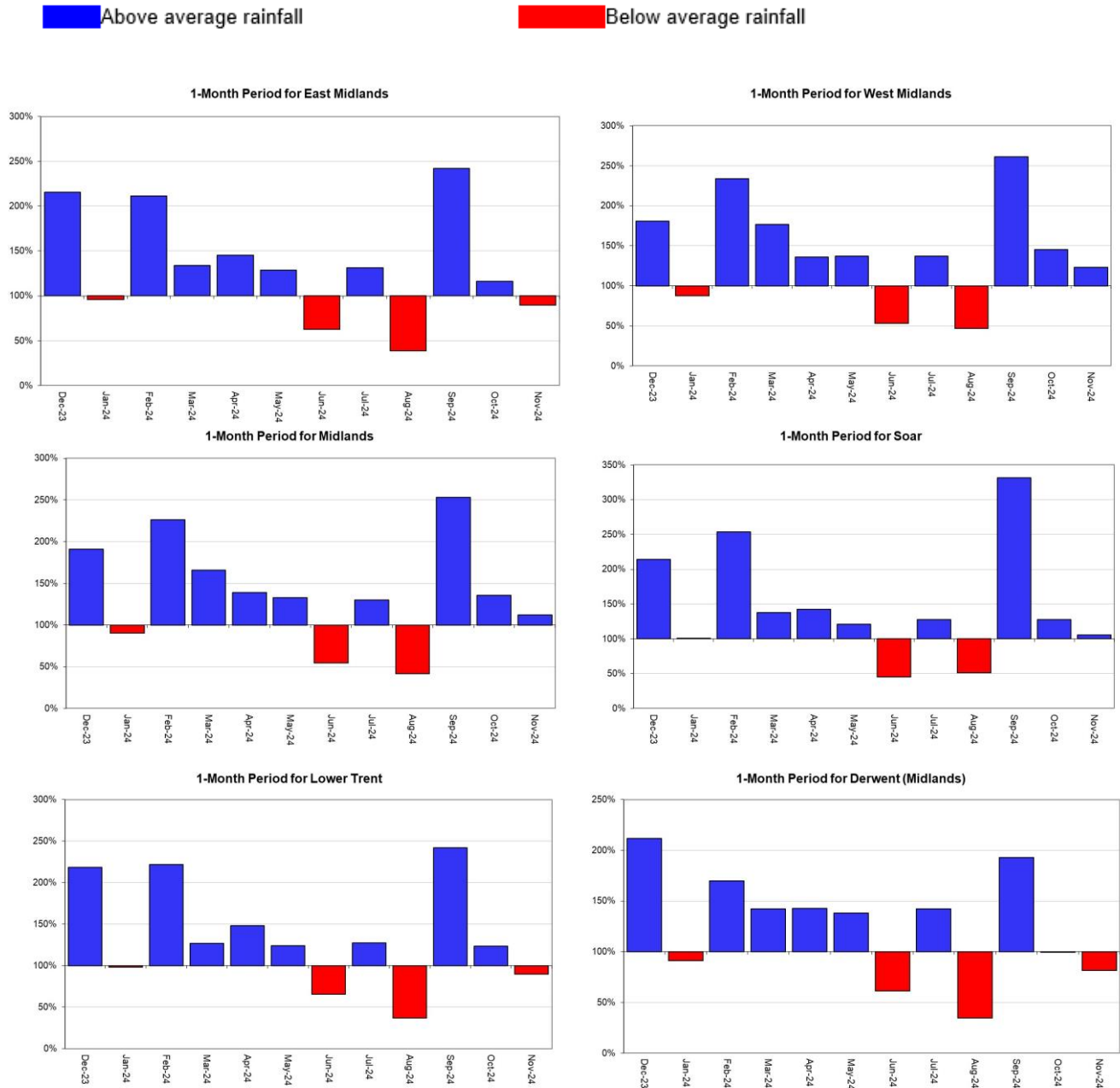
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 30 November 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information. The 12 month map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



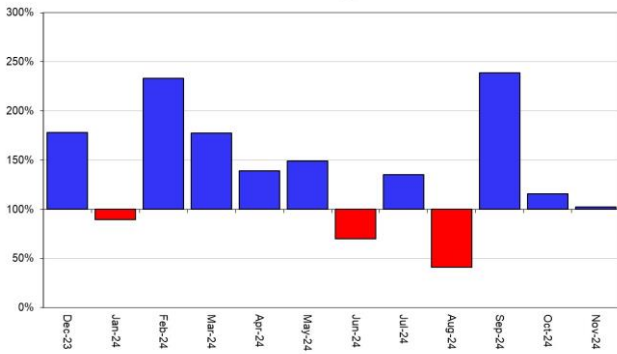
Rainfall data for 2023, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2024). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived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

2.2 Rainfall charts

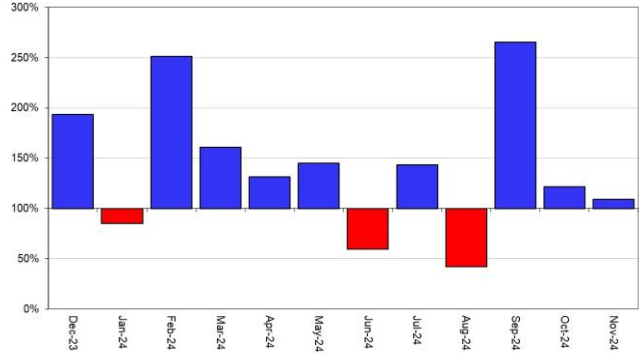
Figure 2.2: Monthly rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average for hydrological areas across the Midlands region.



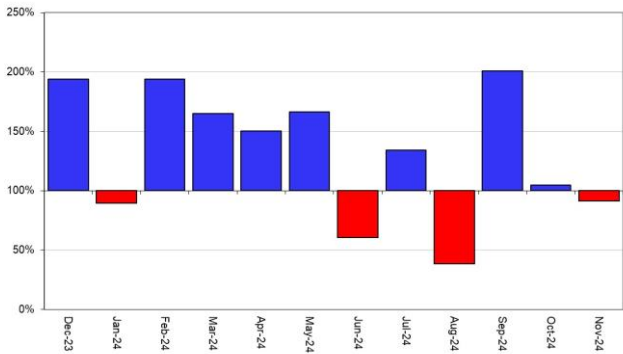
1-Month Period for Upper Trent



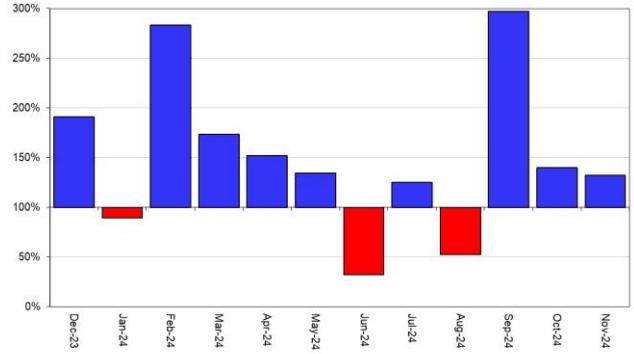
1-Month Period for Tame



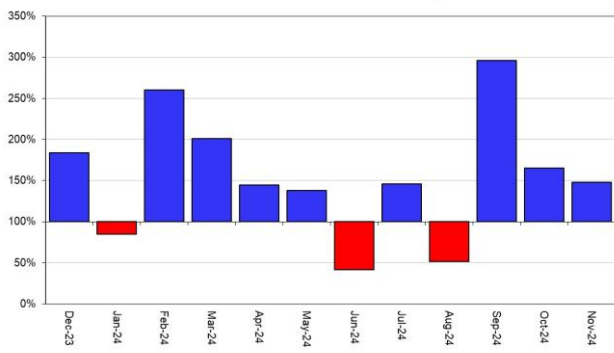
1-Month Period for Dove



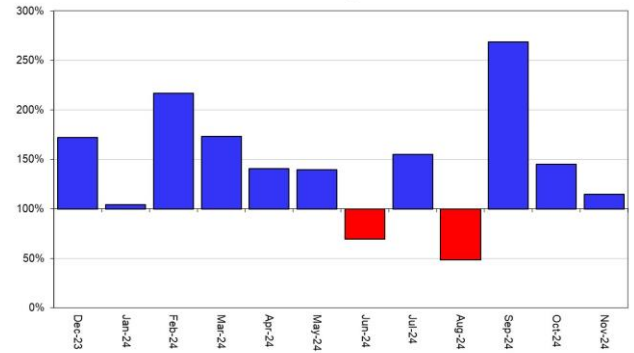
1-Month Period for Avon to Evesham

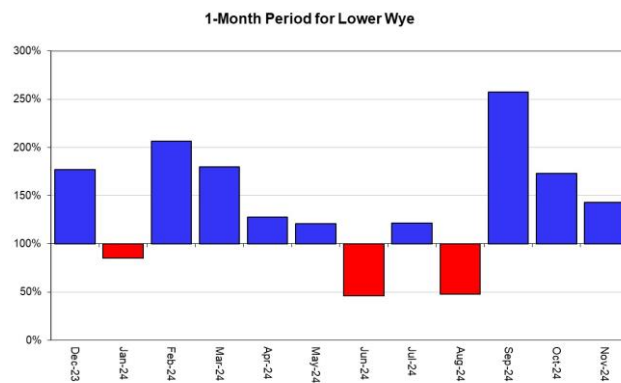
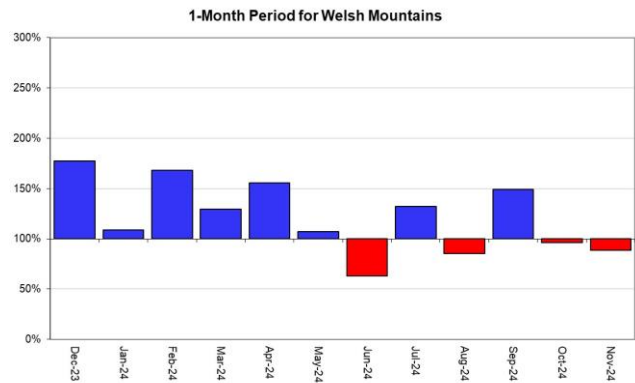
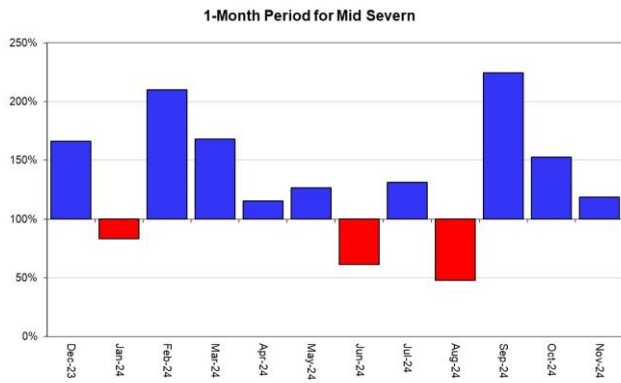


1-Month Period for Lower Severn Estuary



1-Month Period for Shropshire Plains



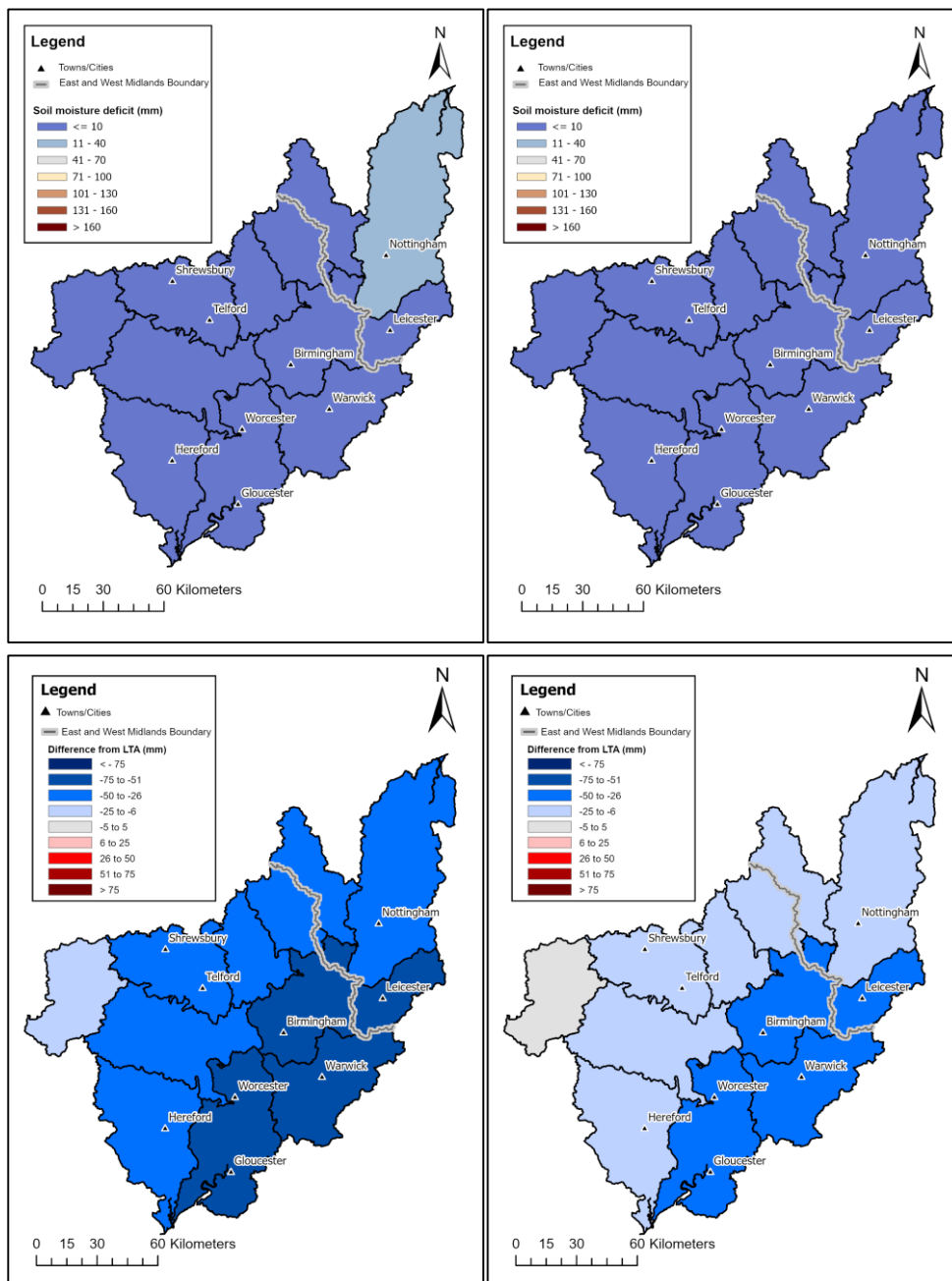


Daily Rainfall Tool data (from January 2023), final HadUK rainfall data until December 2022 (Source: Environment Agency/Met Office, Crown Copyright, 2024).

3 Soil moisture deficit

3.1 Soil moisture deficit map

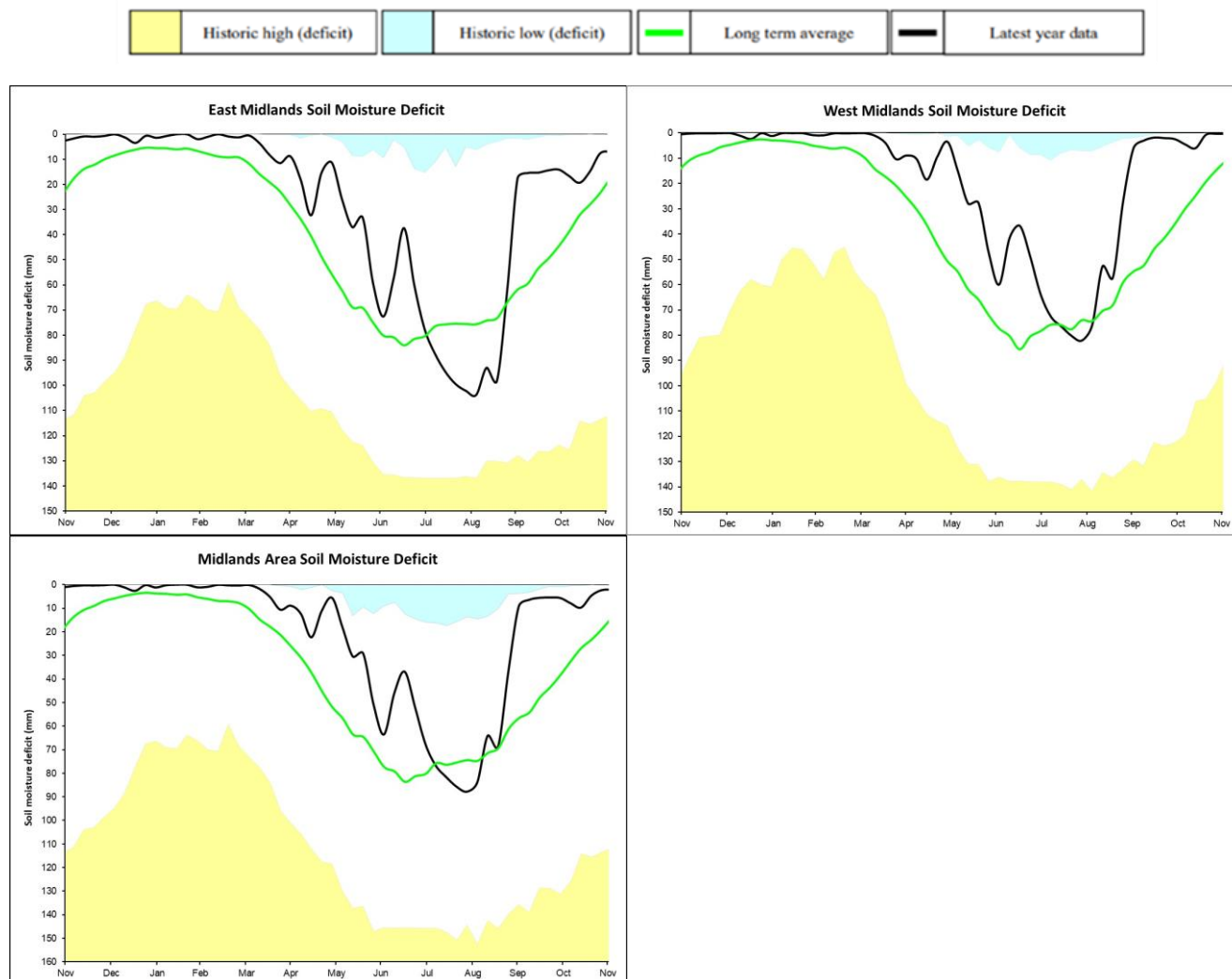
Figure 3.1: Soil moisture deficits for weeks ending 31 October 2024 (top left) and 30 November 2024 (top right). Shows the difference (mm) of the actual soil moisture deficit from the 1961 to 1990 long term average soil moisture deficits for October (bottom left) and November (bottom right). Calculated from 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 charts for selected areas across the Midlands.

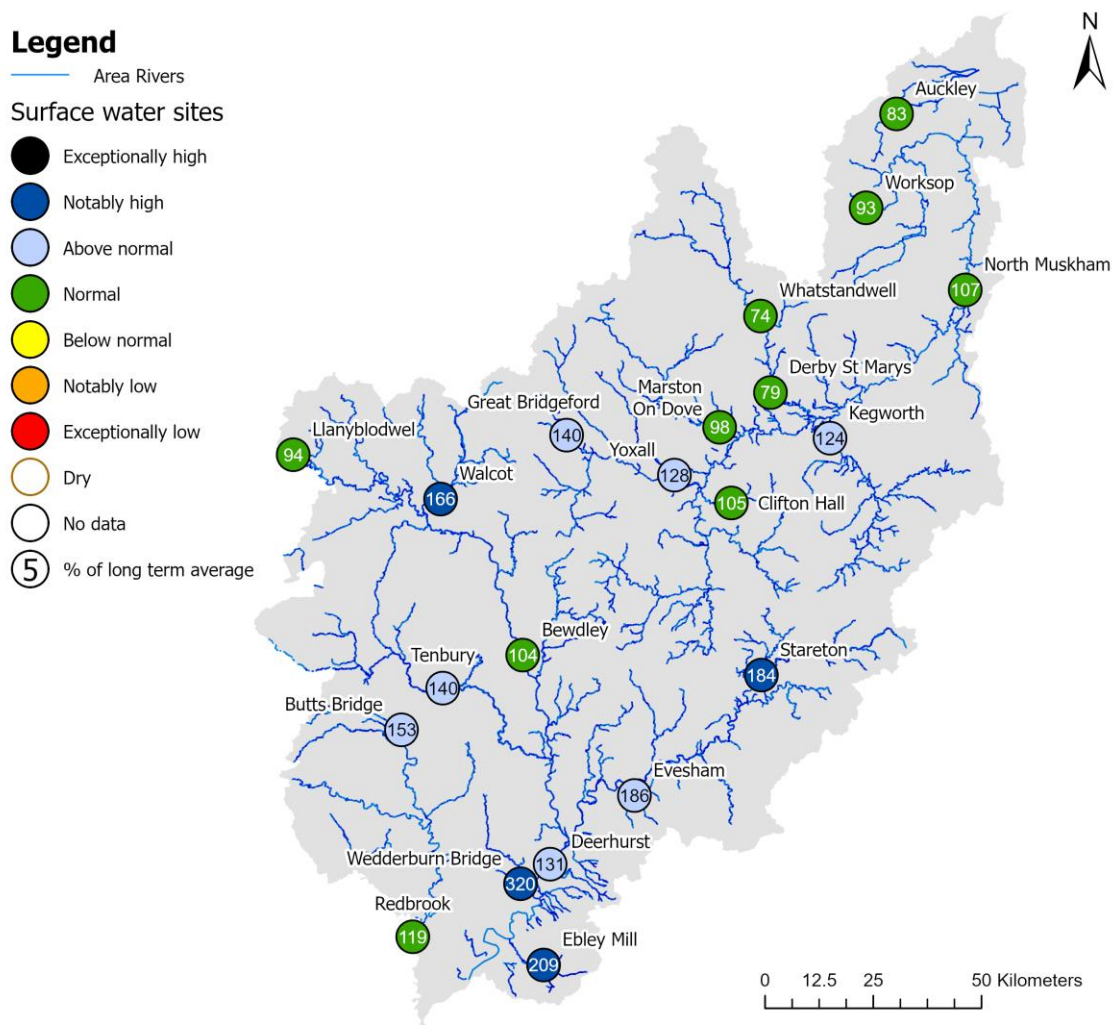


(Source: Met Office. Crown copyright, 2024). All rights reserved. Environment Agency, 100024198, 2024

4 River flows

4.1 River flows map

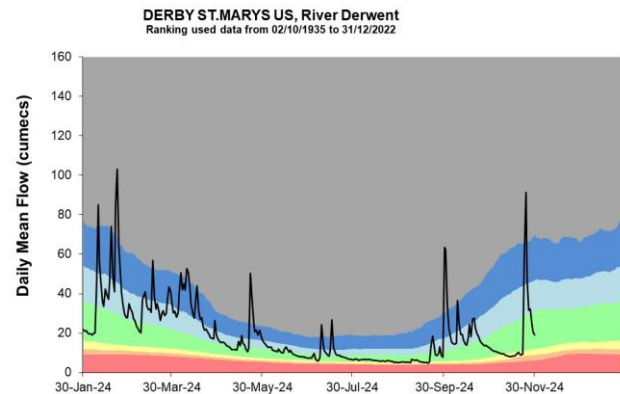
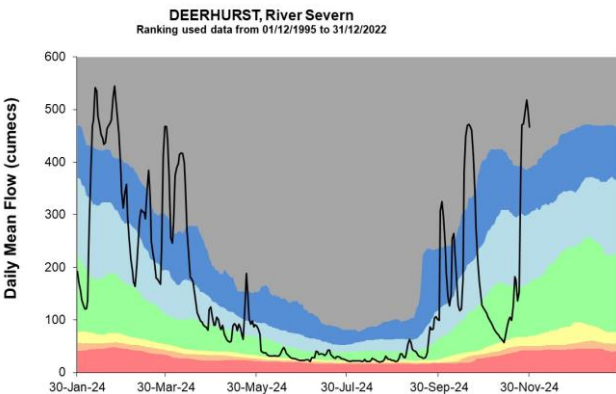
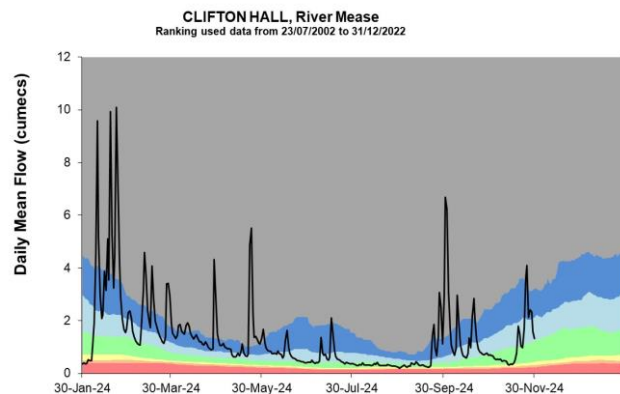
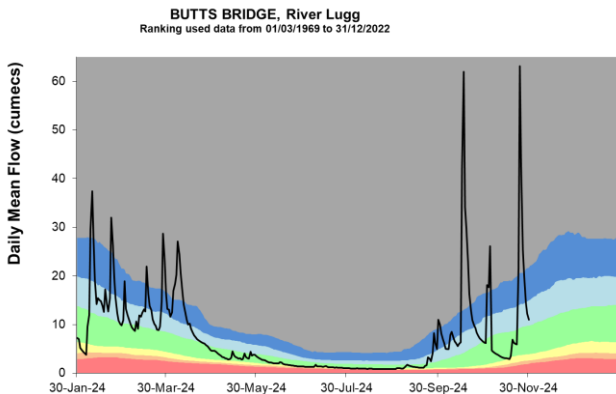
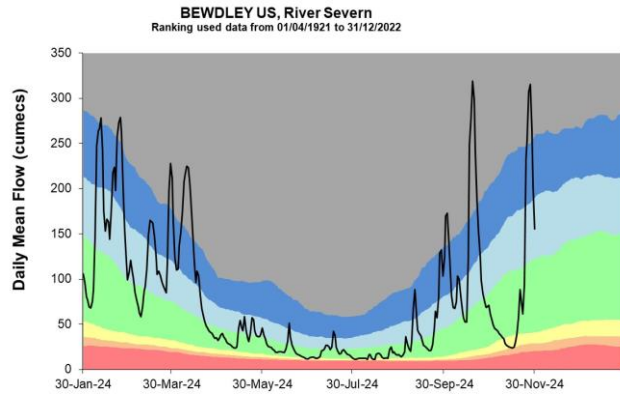
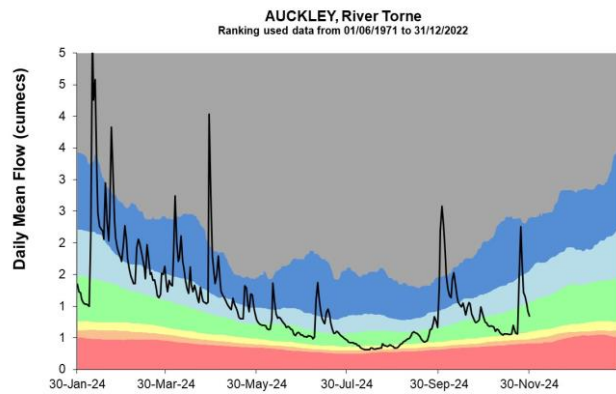
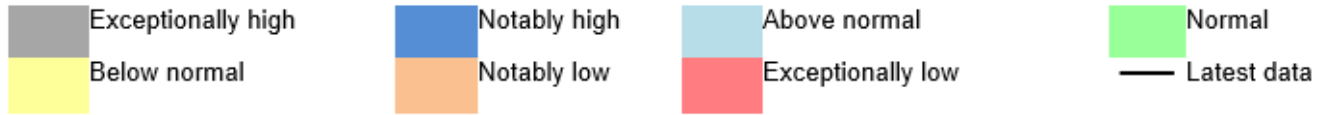
Figure 4.1: Monthly mean river flow for indicator sites for November 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic November monthly means. Table available in the appendices with detailed information.



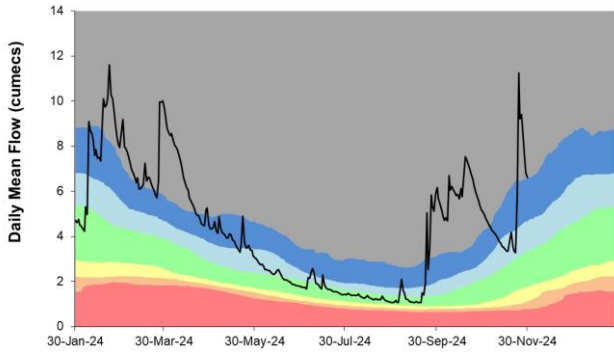
(Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

4.2 River flow charts

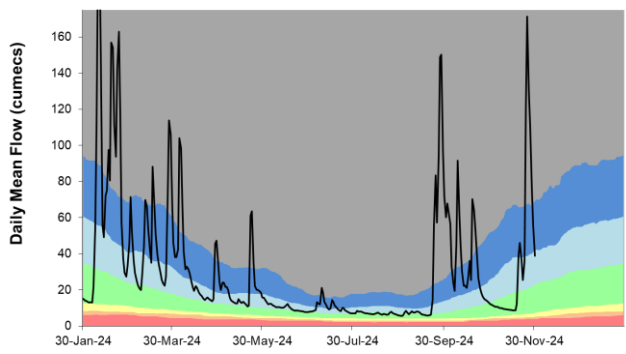
Figure 4.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.



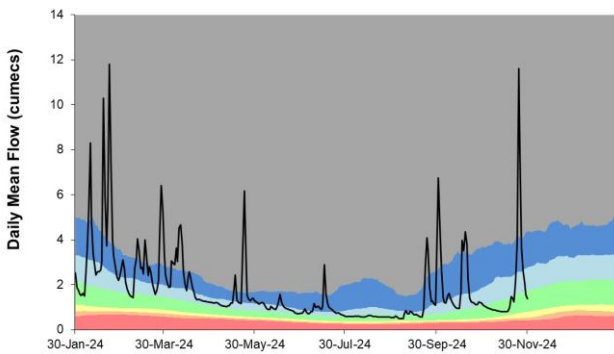
EBLEY MILL, River Frome
Ranking used data from 01/04/1969 to 31/12/2022



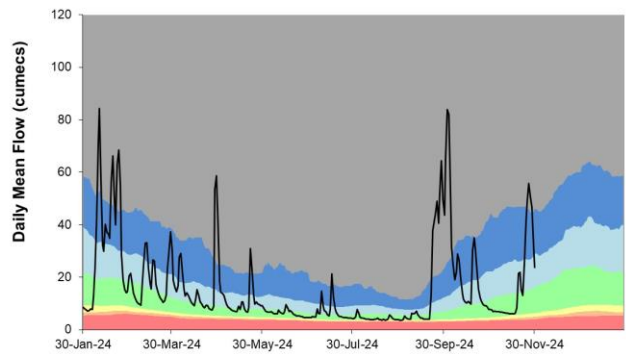
EVESHAM, River Avon
Ranking used data from 01/12/1936 to 31/12/2022



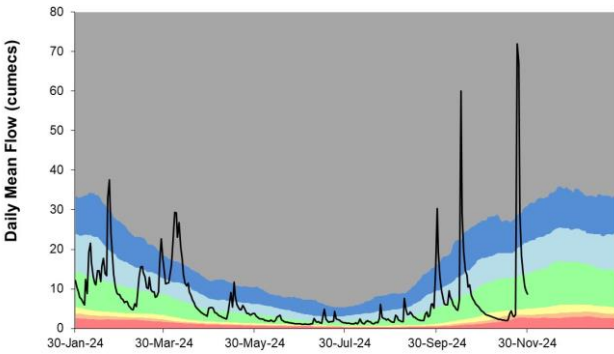
GREAT BRIDGFORD, River Sow
Ranking used data from 18/01/1971 to 31/12/2022



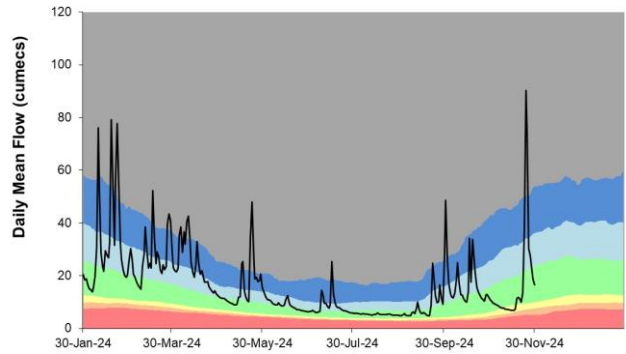
KEGWORTHUS, River Soar
Ranking used data from 01/12/1978 to 31/12/2022



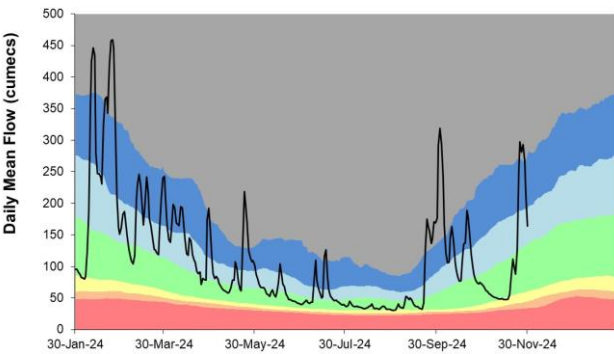
LLANYBLODWEL, Afon Tanat
Ranking used data from 01/06/1973 to 31/12/2022



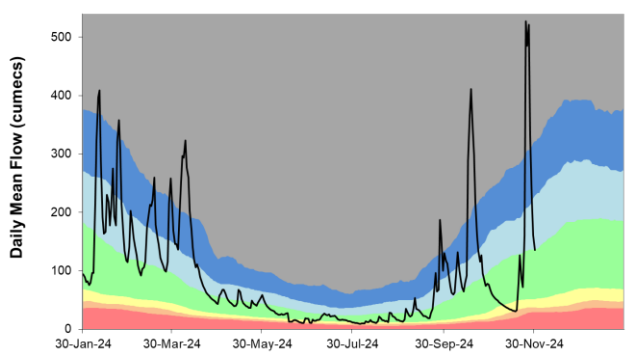
MARSTON ON DOVE, River Dove
Ranking used data from 01/07/1965 to 31/12/2022

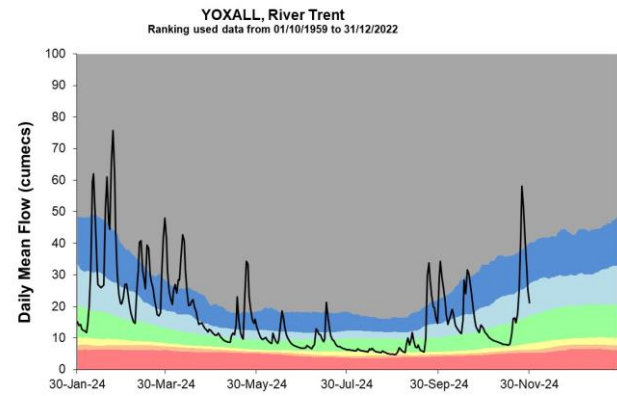
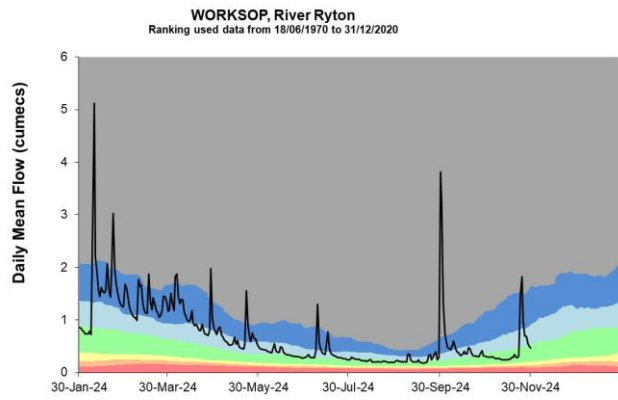
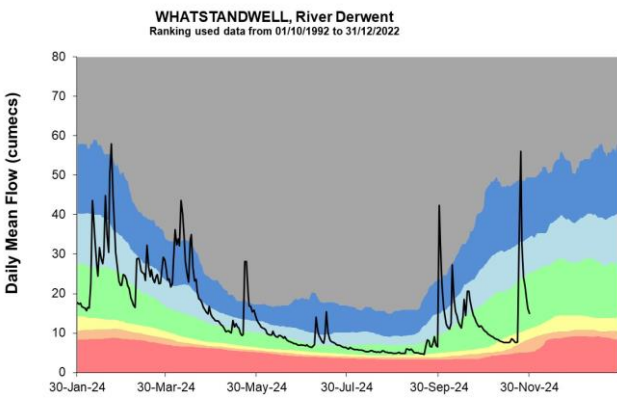
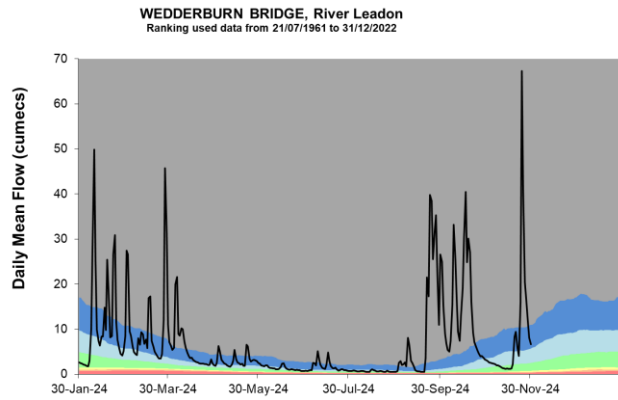
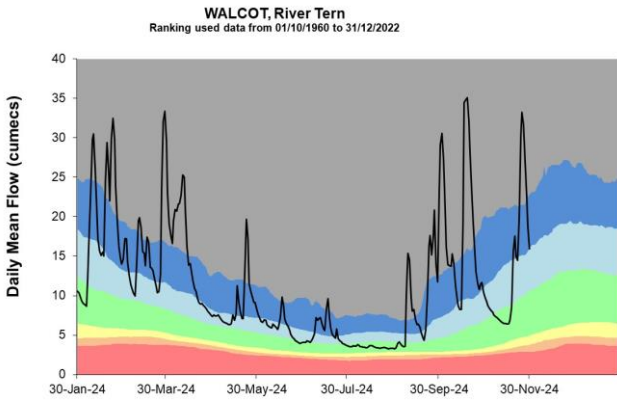
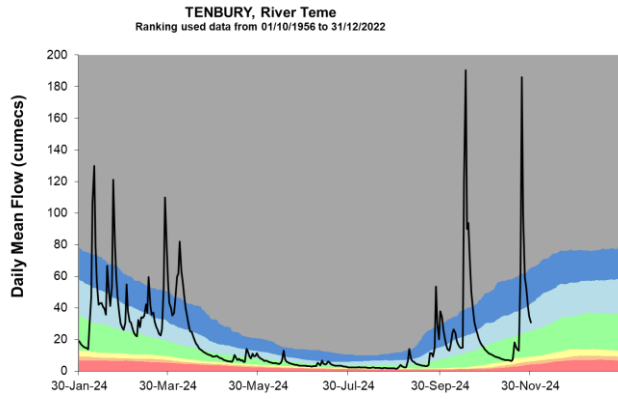
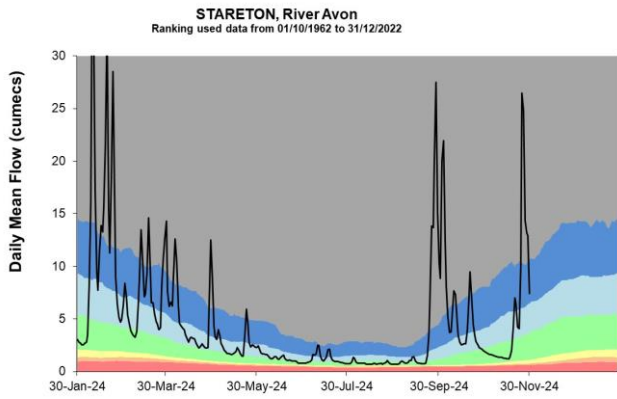


NORTH MUSKHAM, River Trent
Ranking used data from 03/10/1969 to 31/12/2022



REDBROOK, River Wye
Ranking used data from 01/10/1969 to 31/12/2022



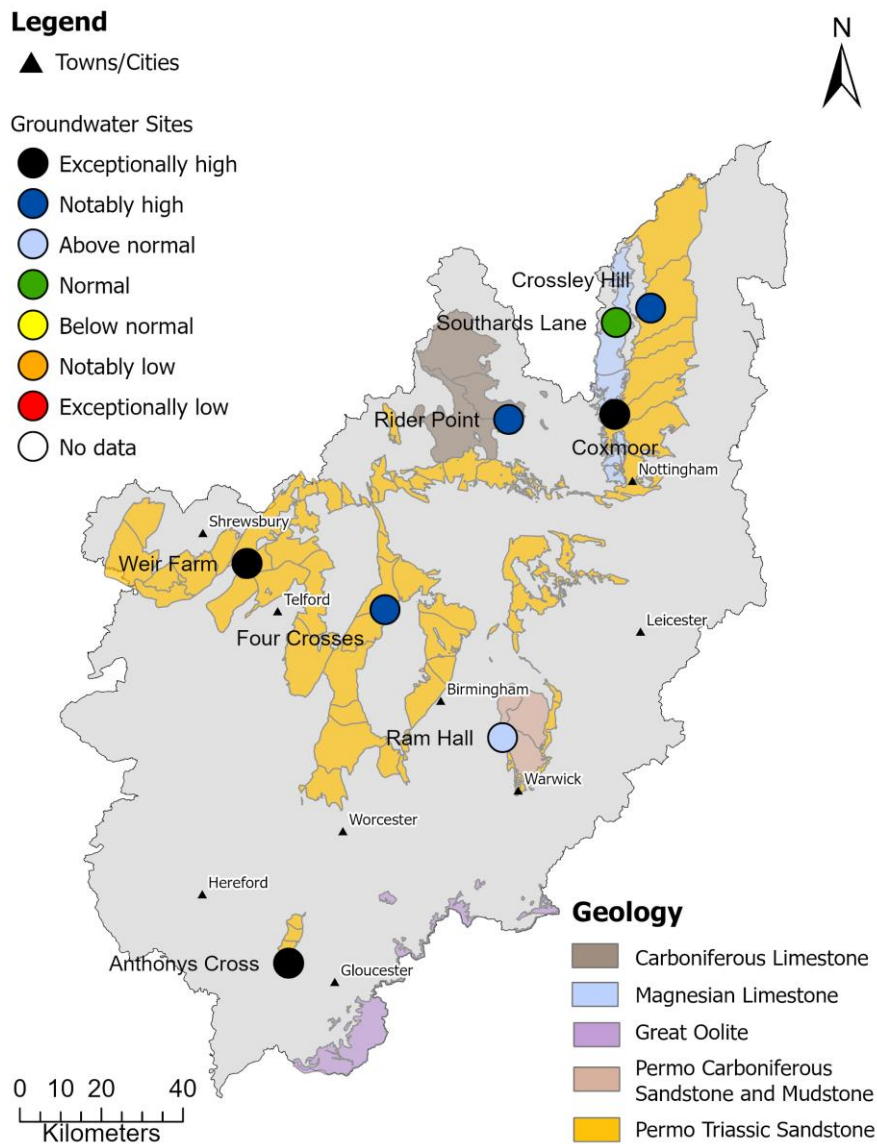


Source: Environment Agency.

5 Groundwater levels

5.1 Groundwater levels map

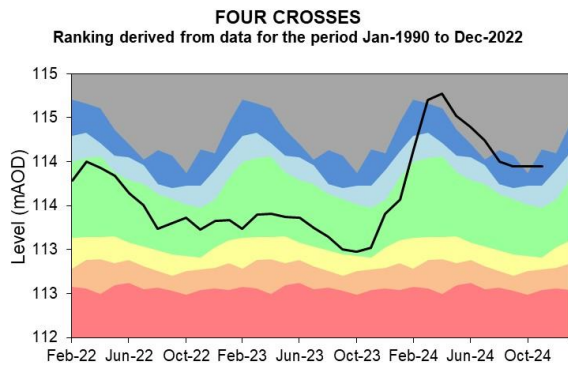
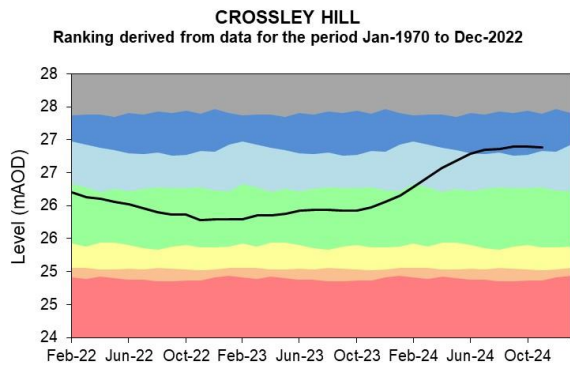
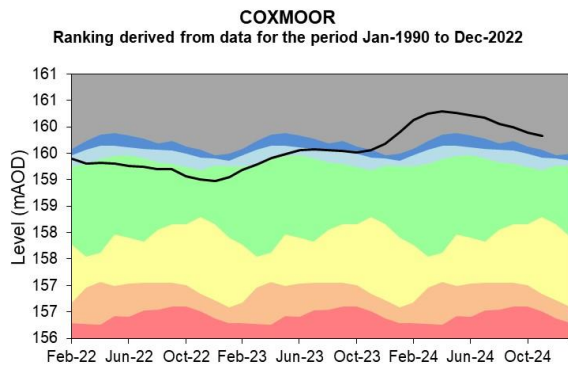
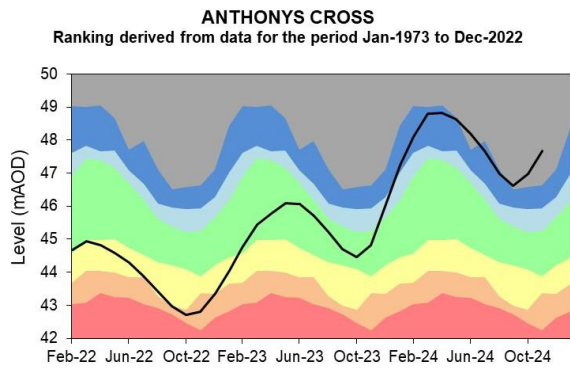
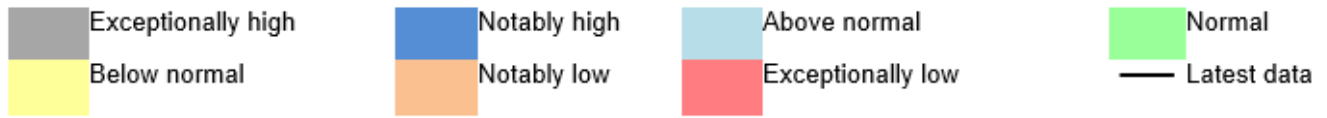
Figure 5.1: Groundwater levels for indicator sites at the end of November 2024, classed relative to an analysis of respective historic November levels. Table available in the appendices with detailed information.

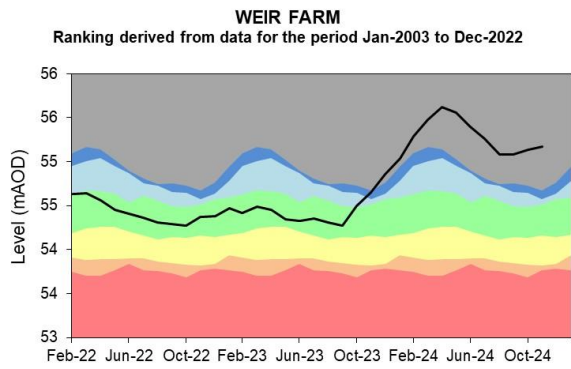
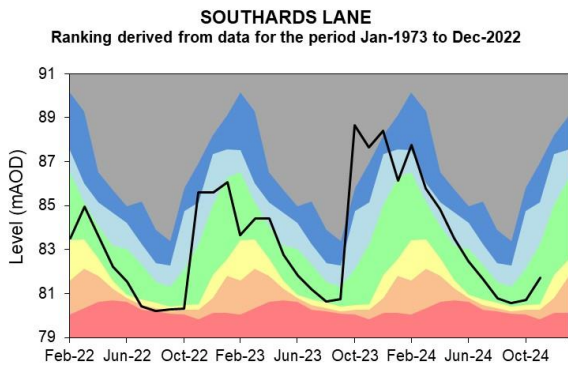
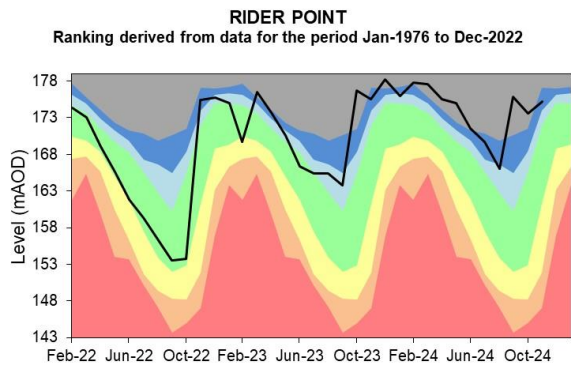
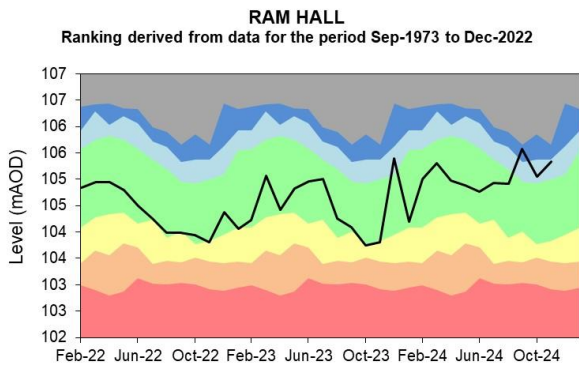


(Source: Environment Agency). Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

5.2 Groundwater level charts

Figure 5.2: End of month groundwater levels at index groundwater level sites for major aquifers. 34 months compared to an analysis of historic end of month levels.

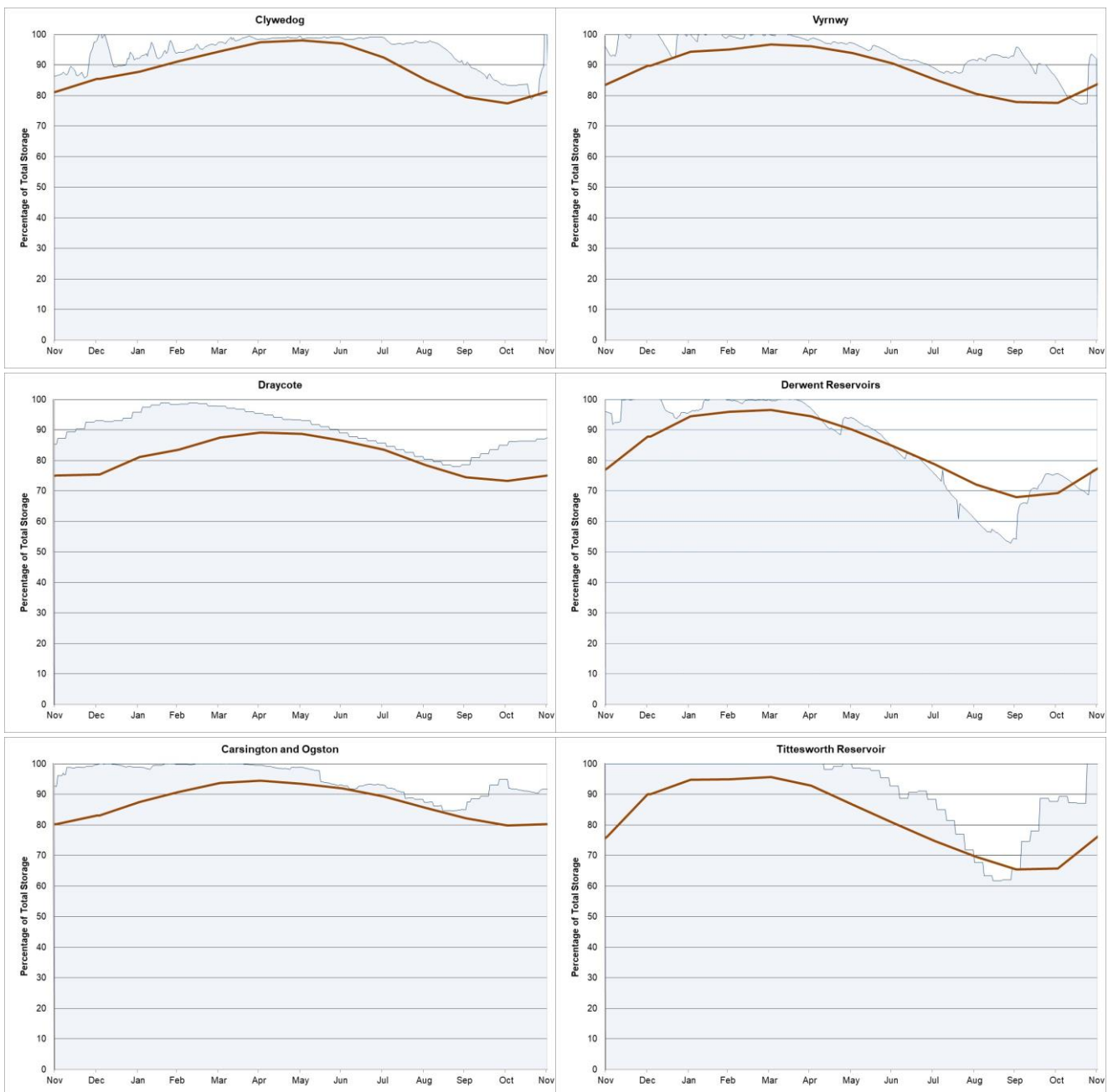


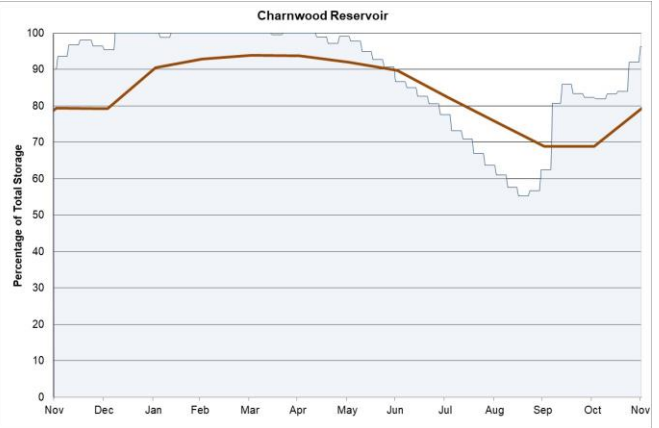
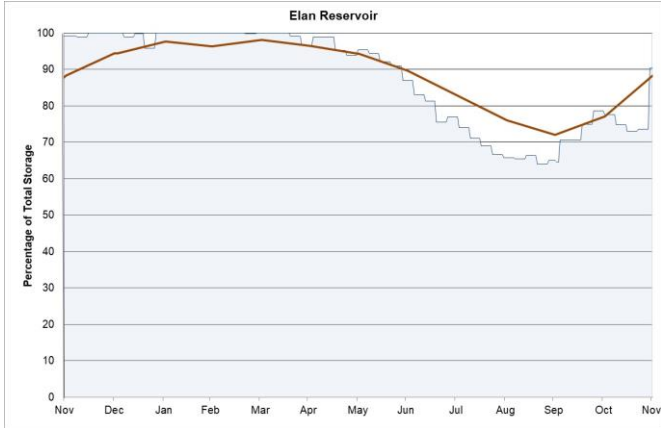
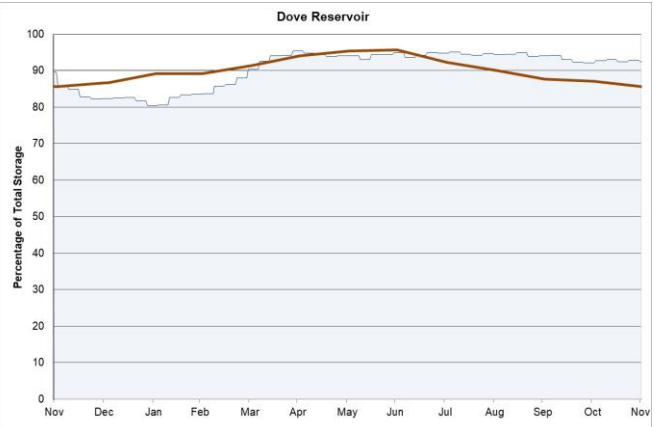
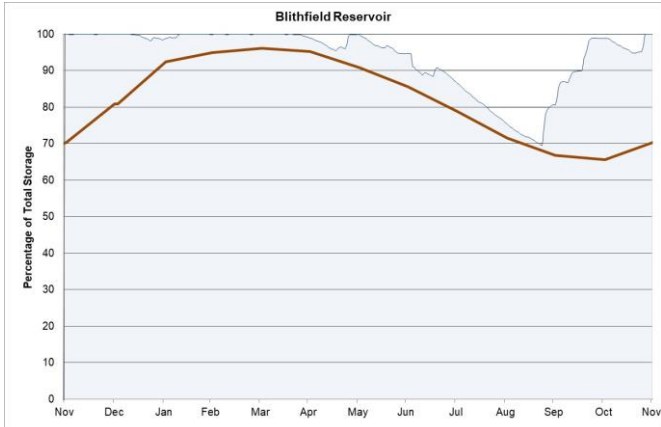


Source: Environment Agency, 2024.

6 Reservoir stocks

Figure 6.1: End of month regional reservoir stocks compared to long term average stocks. Note: Historic records of individual reservoirs and reservoir groups making up the regional values vary in length. Please see Section 7.4 for a map detailing the locality of the Midlands reservoirs reported on.





(Source: water companies).

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

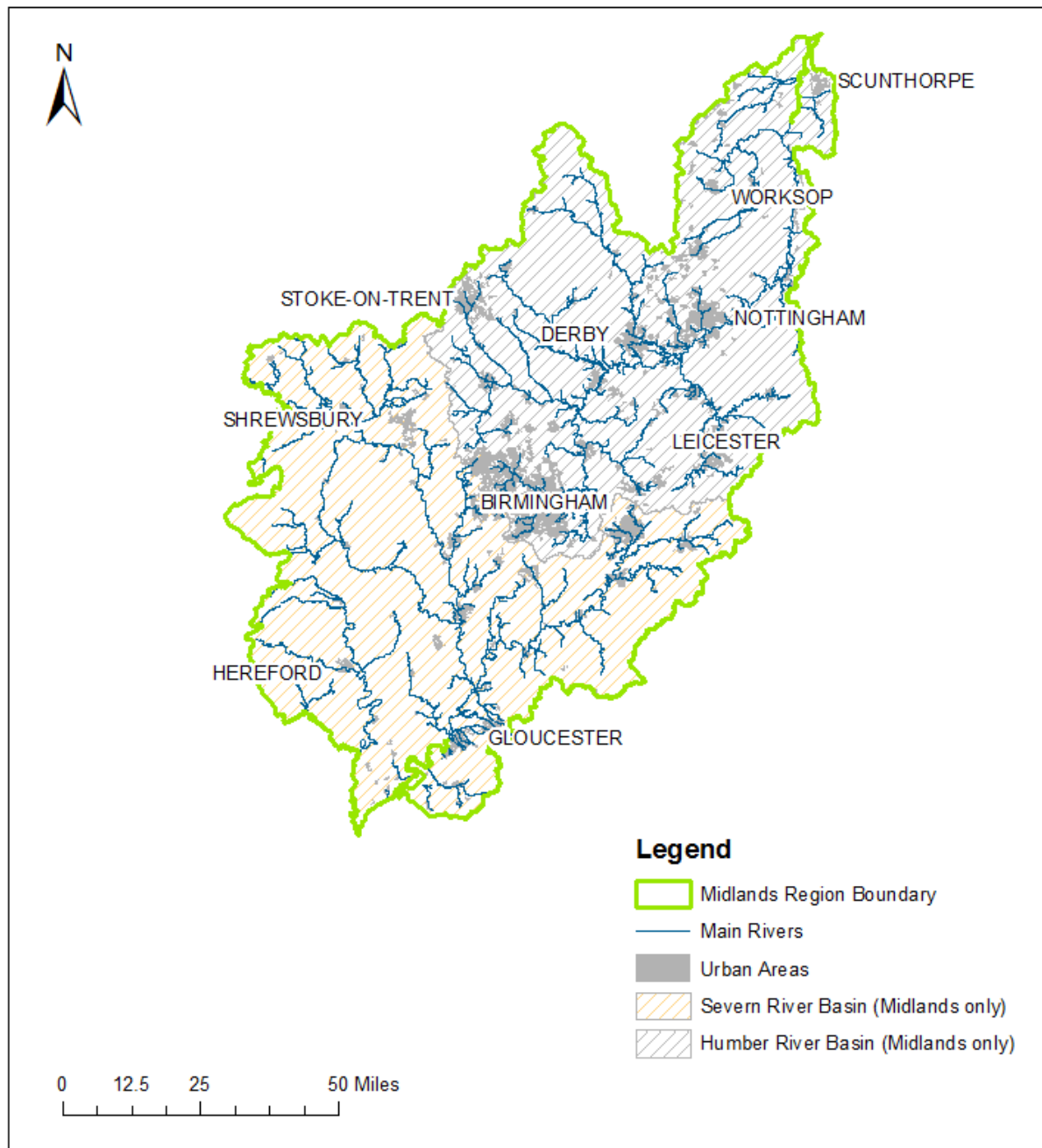
Value likely to fall within this band 8% of the time.

Exceptionally low

Value likely to fall within this band 5% of the time.

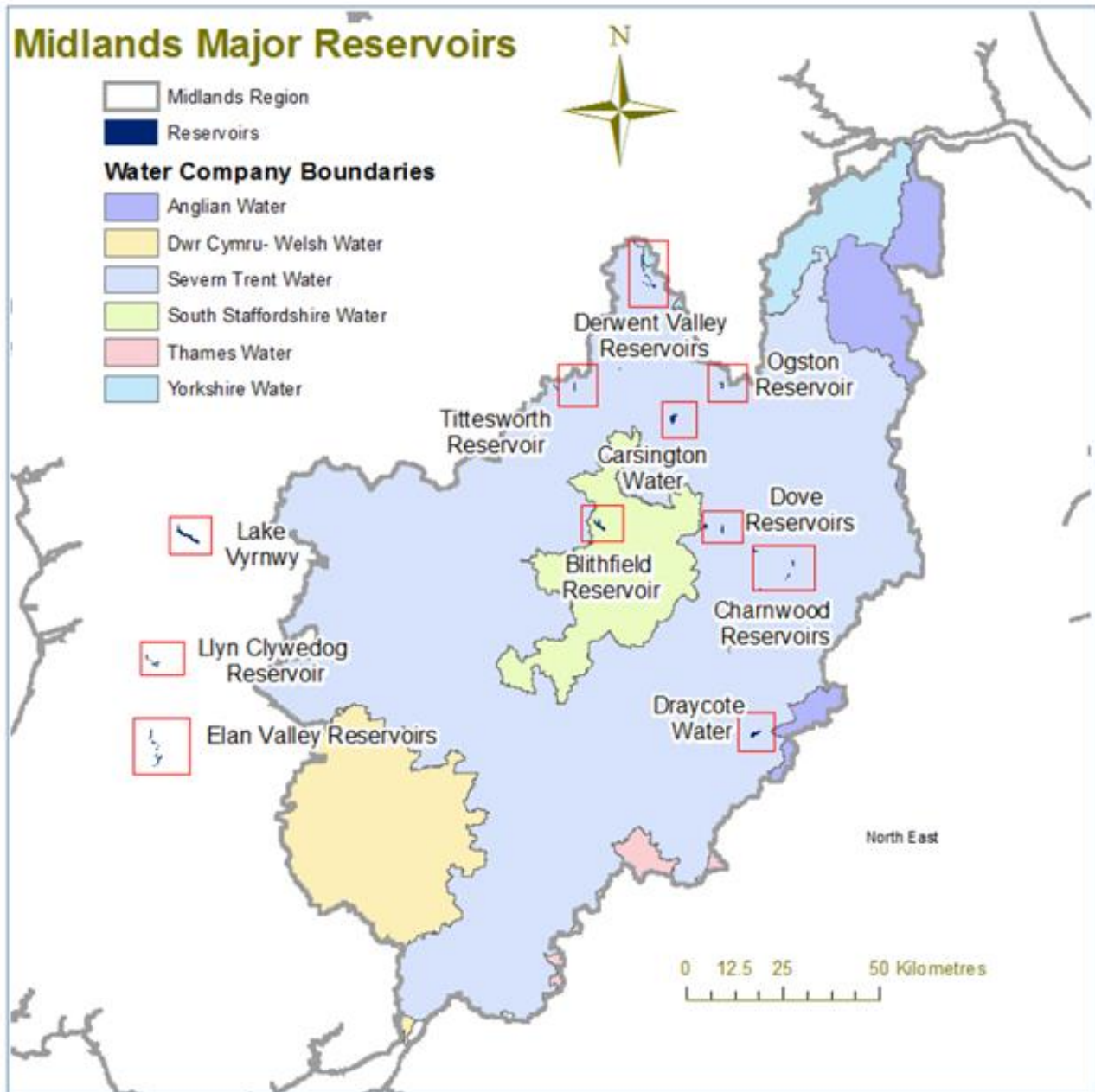
7.3 Midlands regional coverage

Figure 7.1: The Midlands regional boundary and the hydrological boundaries of the River Severn and River Trent.



7.4 Midlands major reservoirs

Figure 7.2: Location of major reservoirs in the Midlands.



Crown Copyright. All rights reserved. Environment Agency, 100024198, 2024.

8 Appendices

8.1 Rainfall table

Hydrological area	Nov 2024 rainfall % of long term average 1961 to 1990	Nov 2024 band	Sep 2024 to November cumulative band	Jun 2024 to November cumulative band	Dec 2023 to November cumulative band
Avon To Evesham	133	Normal	Exceptionally high	Above normal	Exceptionally high
Derwent (Midlands)	81	Normal	Above normal	Normal	Notably high
Dove	91	Normal	Above normal	Normal	Exceptionally high
Lower Severn Estuary	148	Above Normal	Exceptionally high	Notably high	Exceptionally high
Lower Trent	89	Normal	Notably high	Normal	Notably high
Lower Wye	143	Above Normal	Exceptionally high	Above normal	Exceptionally high
Mid Severn	119	Normal	Exceptionally high	Above normal	Exceptionally high
Shropshire Plains	115	Normal	Exceptionally high	Above normal	Exceptionally high
Soar	106	Normal	Exceptionally high	Above normal	Exceptionally high

Tame	109	Normal	Notably high	Normal	Exceptionally high
Upper Trent	103	Normal	Notably high	Normal	Exceptionally high
Welsh Mountains	89	Normal	Normal	Normal	Notably high

8.2 River flows table

Site name	River	Catchment	Nov 2024 band	Oct 2024 band
Auckley	Torne	Torne	Normal	Notably high
Bewdley	Severn	Severn Lower Mid	Normal	Exceptionally high
Butts Bridge	Lugg	Lugg	Above normal	Notably high
Clifton Hall	River Mease	Mease	Normal	Above normal
Deerhurst	Severn	Severn Lower	Above normal	Exceptionally high
Derby St.Marys	Derwent	Derwent Der to Markeaton confl.	Normal	Above normal
Ebley Mill	Frome (Gloucs.)	Frome Gloucs.	Notably high	Exceptionally high
Evesham	Avon (Midlands)	Avon Warwks. Lower	Above normal	Exceptionally high
Great Bridgeford	Sow	Sow Upper	Above normal	Notably high
Kegworth	Soar	Soar to Kingston Brook confl.	Above normal	Exceptionally high
Llanyblodwel	Tanat	Severn Upper River Tanat	Normal	Above normal
Marston On Dove	Dove (Midlands)	Dove Derb to Hilton Br confl.	Normal	Above normal

North Muskham	Trent	Trent to Cromwell	Normal	Notably high
Redbrook	Wye (Herefordshire)	Wye H and W d s Lugg	Normal	Exceptionally high
Stareton	Avon (Midlands)	Avon Warwks. Upper	Notably high	Exceptionally high
Tenbury	Teme	Teme	Above normal	Exceptionally high
Walcot	Tern	Tern	Notably high	Exceptionally high
Wedderburn Bridge	Leadon	Leadon	Notably high	Exceptionally high
Whatstandwell	Derwent	Derwent Derb to Amber confl.	Normal	Above normal
Worksop	Ryton	Ryton Upper to Oldcoates Dyke	Normal	Notably high
Yoxall	Trent	Trent to Tame Mease confl.	Above normal	Notably high

8.3 Groundwater table

Site name	Aquifer	End of Nov 2024 band	End of Oct 2024 band
Anthony's Cross	Severn Vale Permo Triassic Sandstone	Above normal	Exceptionally high
Coxmoor	Permo Triassic Sandstone	Exceptionally high	Exceptionally high
Crossley Hill	Permo Triassic Sandstone	Notably high	Notably high
Four Crosses	Grimsby Ancholme Louth Limestone	Notably high	Exceptionally high
Ram Hall, Meriden	Grimsby Ancholme Louth Limestone	Above normal	Above normal
Rider Point Via Gellia	Carboniferous Limestone	Notably high	Exceptionally high
Southards Lane, Bolsover	Magnesian Limestone	Normal	Normal
Weir Farm	Bridgnorth Sandstone Formation	Exceptionally high	Exceptionally high