

Monthly water situation report: Midlands

1 Summary - May 2024

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

Rainfall - As of the end of May, 3 sites recorded normal rainfall totals relative to the long-term average (LTA). One site recorded notably high rainfall totals and the other 8 recorded above normal rainfall totals.

Soil moisture deficit - As of the end of May, the east and a central part of the Midlands recorded a soil moisture deficit (SMD) between 11mm and 40mm. The rest of the Midlands soils were saturated or at 'field capacity'.

River flows - Nine sites recorded notably high monthly mean flows compared to the LTA. Six sites recorded above normal and a further 6 sites recorded normal flows compared to the LTA.

Groundwater levels - As of the end of May, all groundwater monitoring stations recorded normal groundwater levels or above compared to the LTA. Four of the sites recorded exceptionally high. One site recorded notably high ground water levels. Two sites recorded above normal groundwater levels and one site recorded normal groundwater levels.

Reservoir stocks - As of the end of May, the Dove recorded below average storage compared to the LTA. All other Midlands reservoirs in this report recorded above average storage compared to the LTA.

1.1 Rainfall

During May, all the Midlands hydrological catchments received normal or above rainfall totals relative to the LTA. The Lower Wye and Welsh Mountains in the west of the Midlands and the Soar in the east received normal rainfall totals ranging from 107% to 121% of the LTA. The Dove in the north of the catchment received a notably high rainfall total at 166% of the LTA. The other 8 Midlands hydrological catchments recorded above normal rainfall totals ranging from 124% to 149% of the LTA. In the last 3 months, 5 hydrological catchments recorded exceptionally high rainfall totals relative to the LTA. These were Upper Trent, Dove and Derwent in the north and Lower Severn and Avon in the south. All other hydrological catchments recorded notably high rainfall totals ranging from 130% to 151% of the LTA. Looking at the last 6 months, all of the Midlands hydrological areas recorded exceptionally high rainfall totals compared to the 6 month LTA. These areas all recorded rainfall totals, ranging from 142% to 168% of LTA respectively. Over the last 12 months, all hydrological catchments with the exception of the Lower Wye recorded exceptionally high rainfall totals compared to the 12-month LTA. The Lower Wye recorded notably high rainfall at 137% of the LTA.

1.2 Soil moisture deficit and recharge

As of the end of May, SMD has remained 10mm or less for the majority of the Midlands. Parts of the Midlands in the east and a central area recorded SMD totals of 11mm to 40mm. Soils across all of the Midlands were wetter than the LTA for May.

1.3 River flows

River flows in May show that all flow sites in the Midlands hydrological area recorded normal or above monthly mean flows compared to the LTA. Nine sites recorded notably high monthly mean flows compared to the LTA. They were located mainly in the north and the south of the Midlands and ranged from 146% to 211%. Six sites recorded above normal monthly mean flows in the north and south-east of the region. A further 6 sites recorded normal monthly mean flows ranging between 87% and 126% in the north and south-west of the Midlands.

1.4 Groundwater levels

As of the end of May, groundwater monitoring stations are of normal groundwater levels or above. Four of the sites recorded exceptionally high groundwater levels compared to the LTA. They were Weir Farm, Four Crosses, Coxmoor and Rider Point in the north of the Midlands. Anthonys Cross in the south-west of the Midlands recorded notably high groundwater levels compared to the LTA. Crossley Hill and Southards Lane in the north-east of the region recorded above normal. Ram Hall received normal groundwater levels.

1.5 Reservoir stocks

As of the end of May, all of the Midlands reservoirs with the exception of the Dove recorded storage levels above the LTA. Reservoir storage across the region ranged from 93% to 100%. Furthermore, all reservoirs are at or near full capacity.

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. Regulation has not yet been instigated for 2024.

1.7 River Wye operations

Elan storage was below the release control line up until 2 May, after which point storage had risen above the release control line. Elan storage then dropped below the release control line

on 20 May up until 24 May, where storage raised above the release control line. Flows at Redbrook were above the regulation threshold throughout May.

1.8 Water abstraction restrictions

As of 4 June 2024 there are 2 water abstraction licence restrictions in place across the Midlands affecting 2 licences in total.

Table 1.1: Water abstraction licence restrictions

Area	Rivers and stations restricted
East Midlands	N/A
West Midlands	Stour at Puxton Trent at Darlaston

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

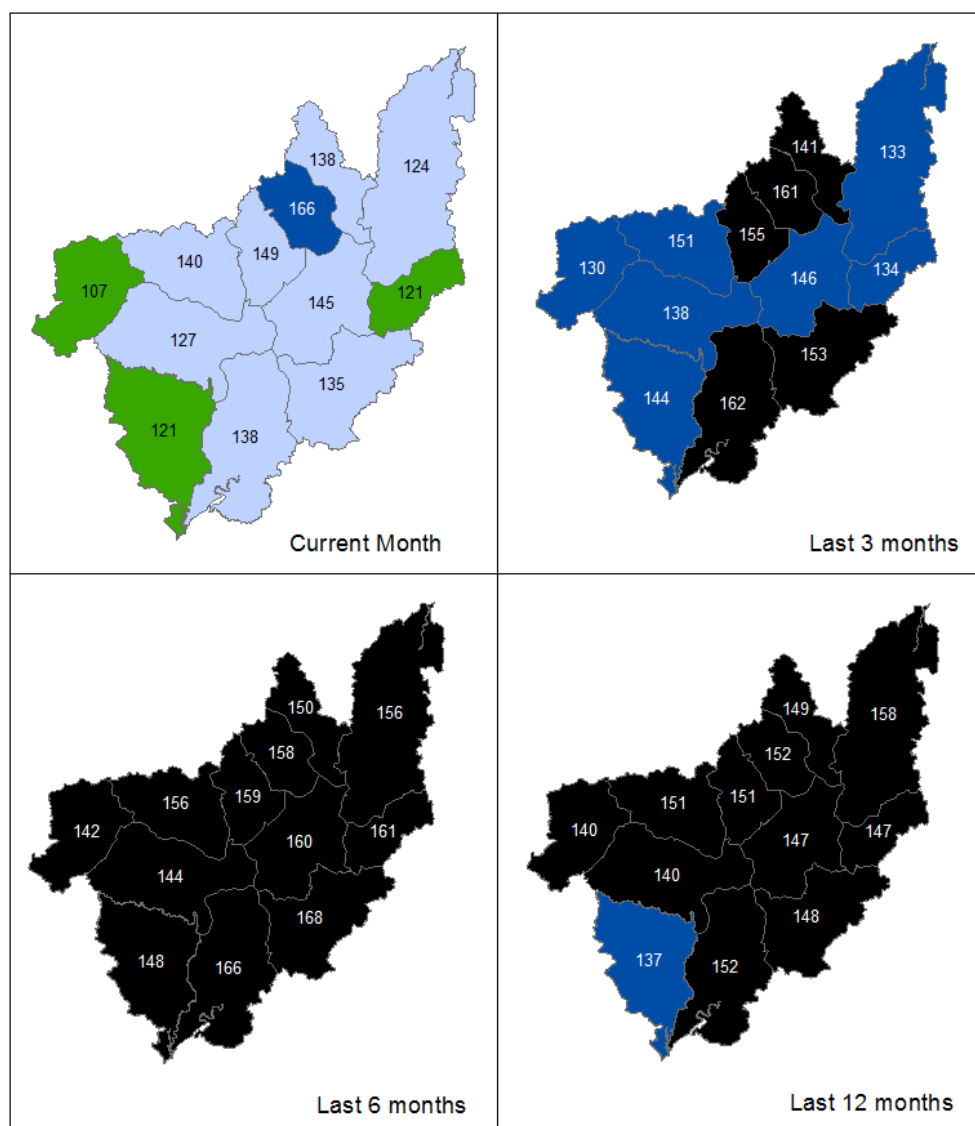
Contact Details: 03708 506 506

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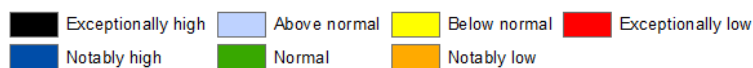
2 Rainfall

2.1 Rainfall map

Figure 2.1: Total rainfall for hydrological areas for the current month (up to 31 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. Please see Section 7.4 for a map of the hydrological catchments for which rainfall is reported on.



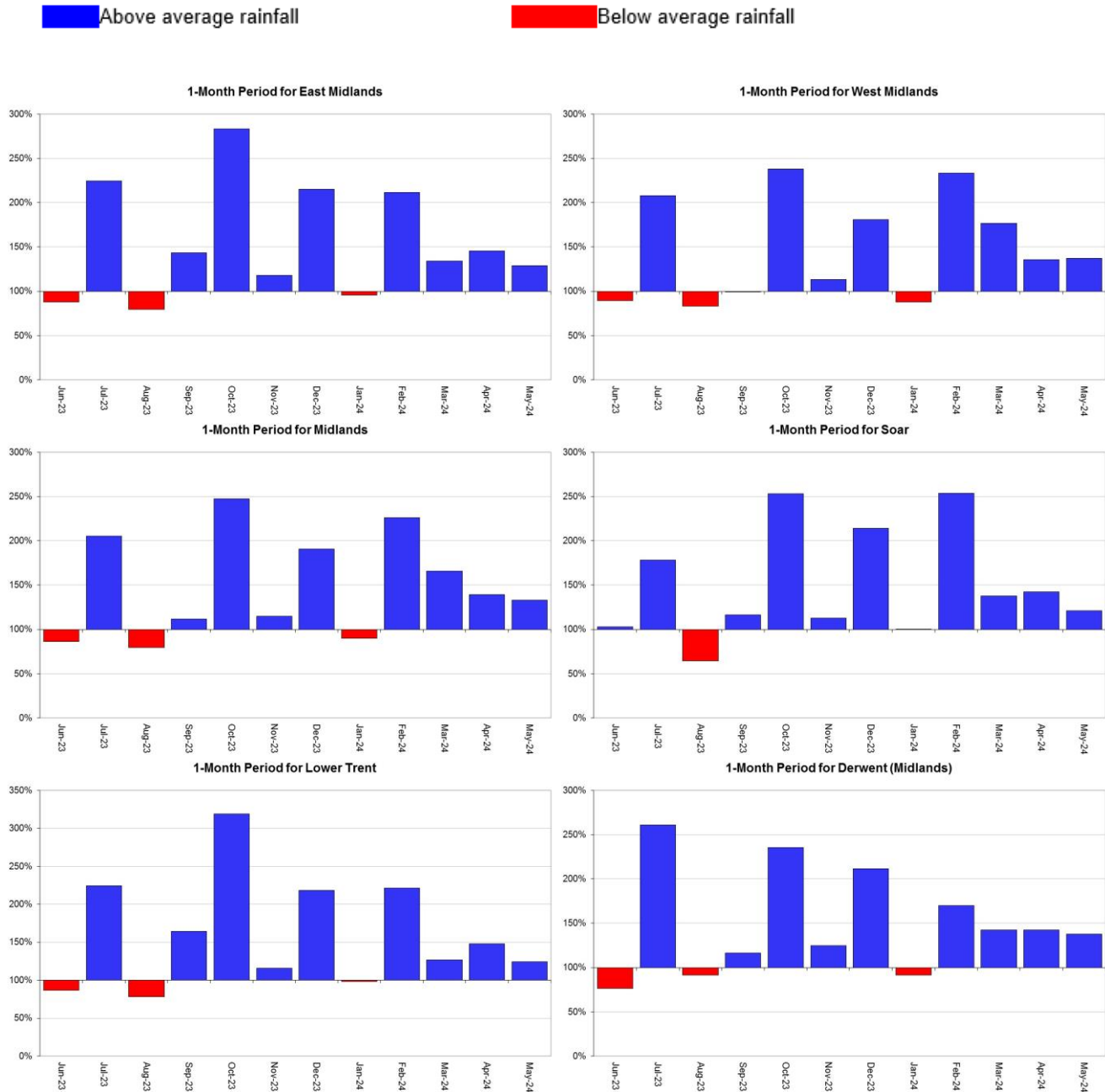
Legend



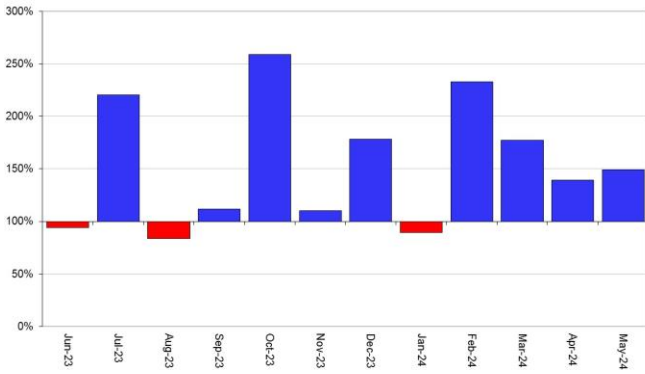
Rainfall data for 2023 and 2024, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2024). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset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

2.2 Rainfall charts

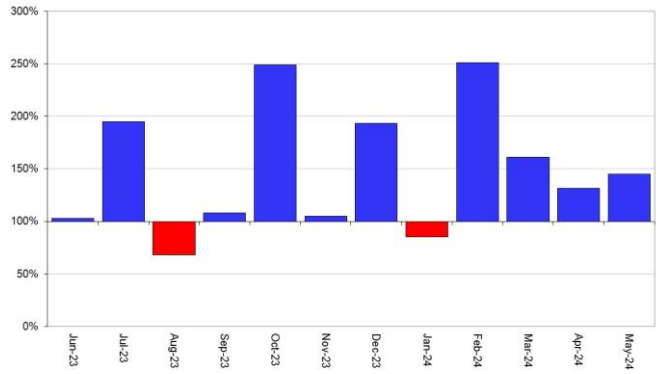
Figure 2.2: Monthly rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average for hydrological areas across the Midlands region.



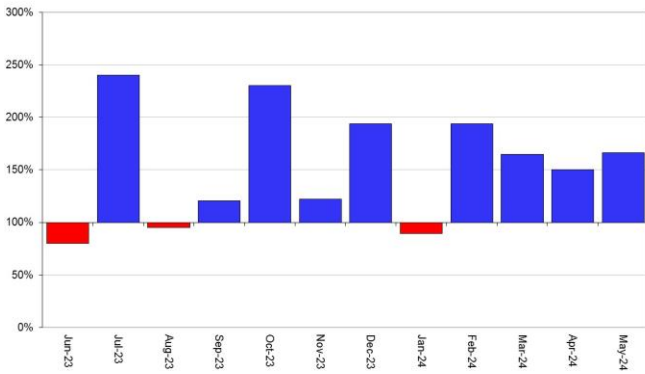
1-Month Period for Upper Trent



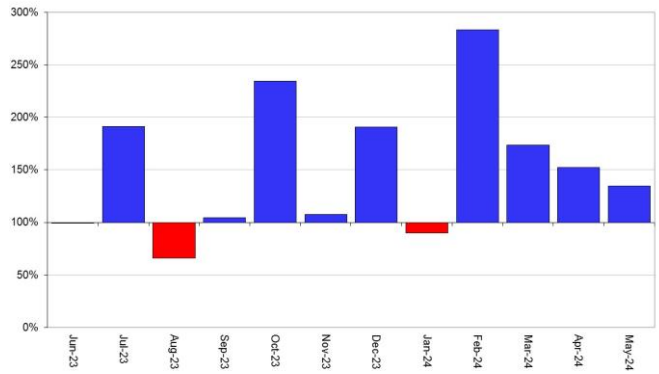
1-Month Period for Tame



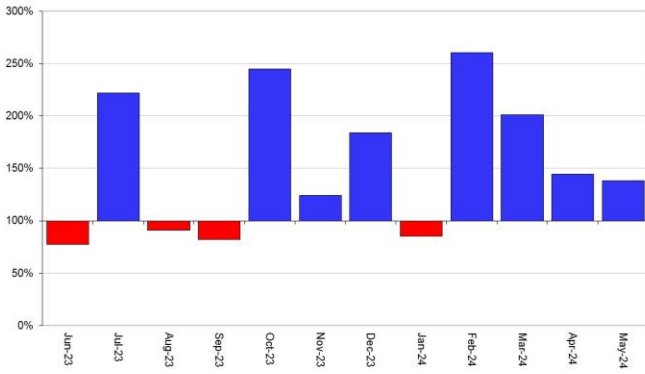
1-Month Period for Dove



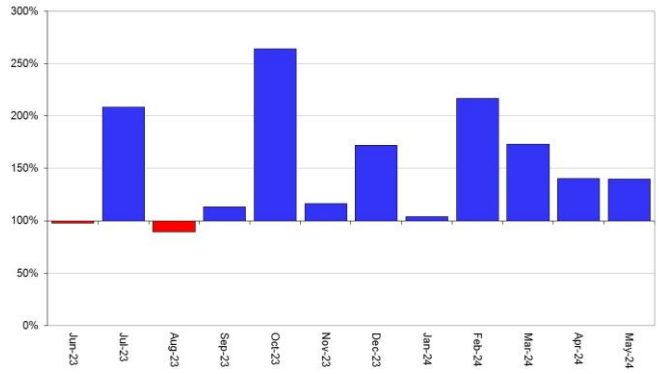
1-Month Period for Avon to Evesham



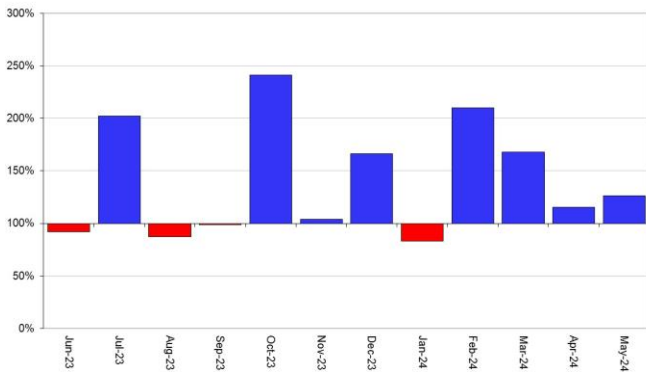
1-Month Period for Lower Severn Estuary



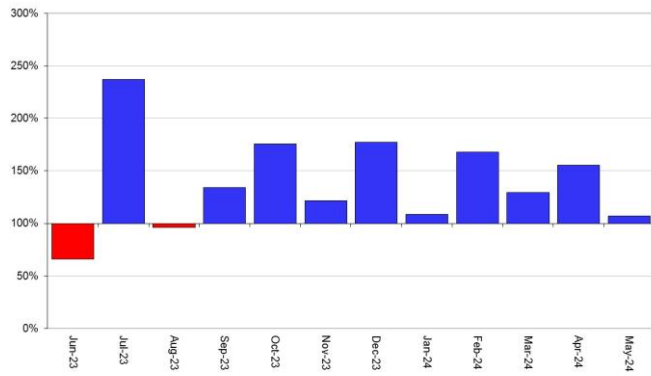
1-Month Period for Shropshire Plains



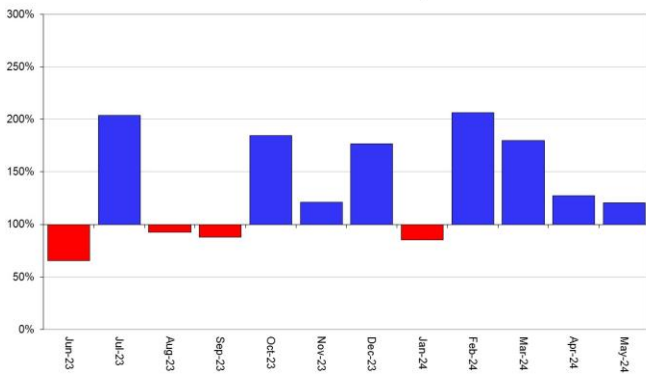
1-Month Period for Mid Severn



1-Month Period for Welsh Mountains



1-Month Period for Lower Wye

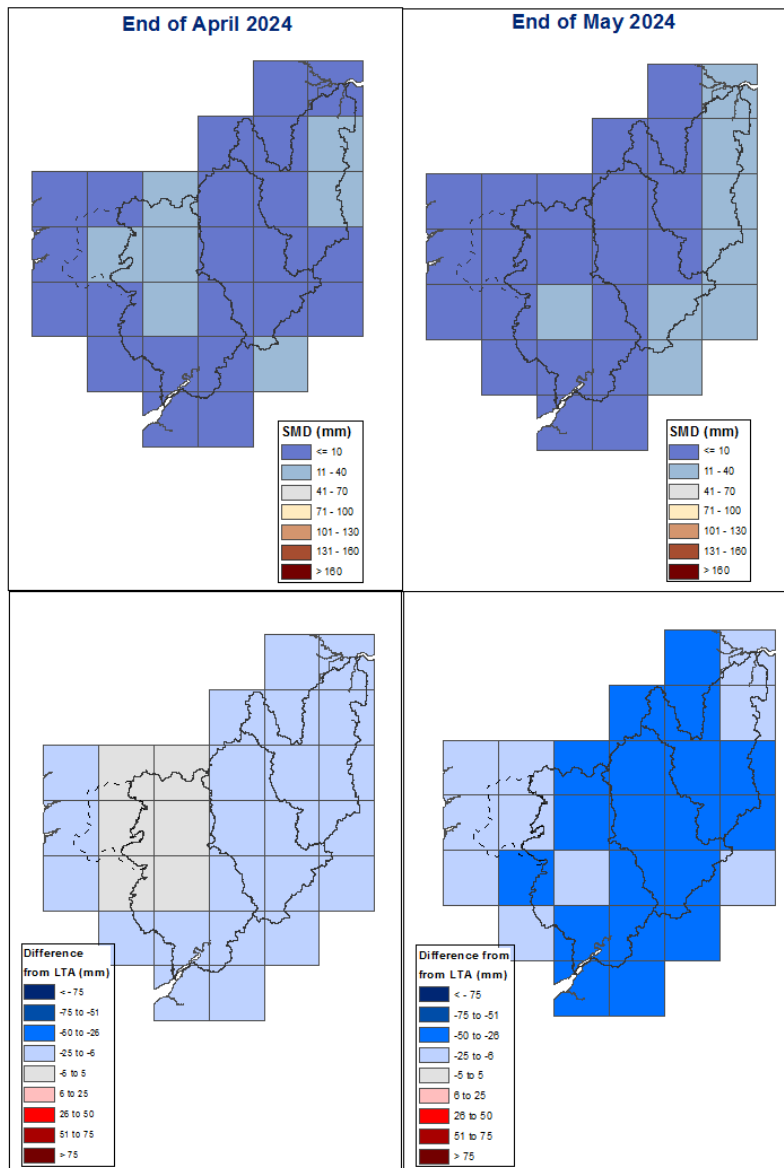


Daily Rainfall Tool data (from January 2023), final HadUK rainfall data until December 2022 (Source: Environment Agency/Met Office, Crown Copyright, 2024).

3 Soil moisture deficit

3.1 Soil moisture deficit map

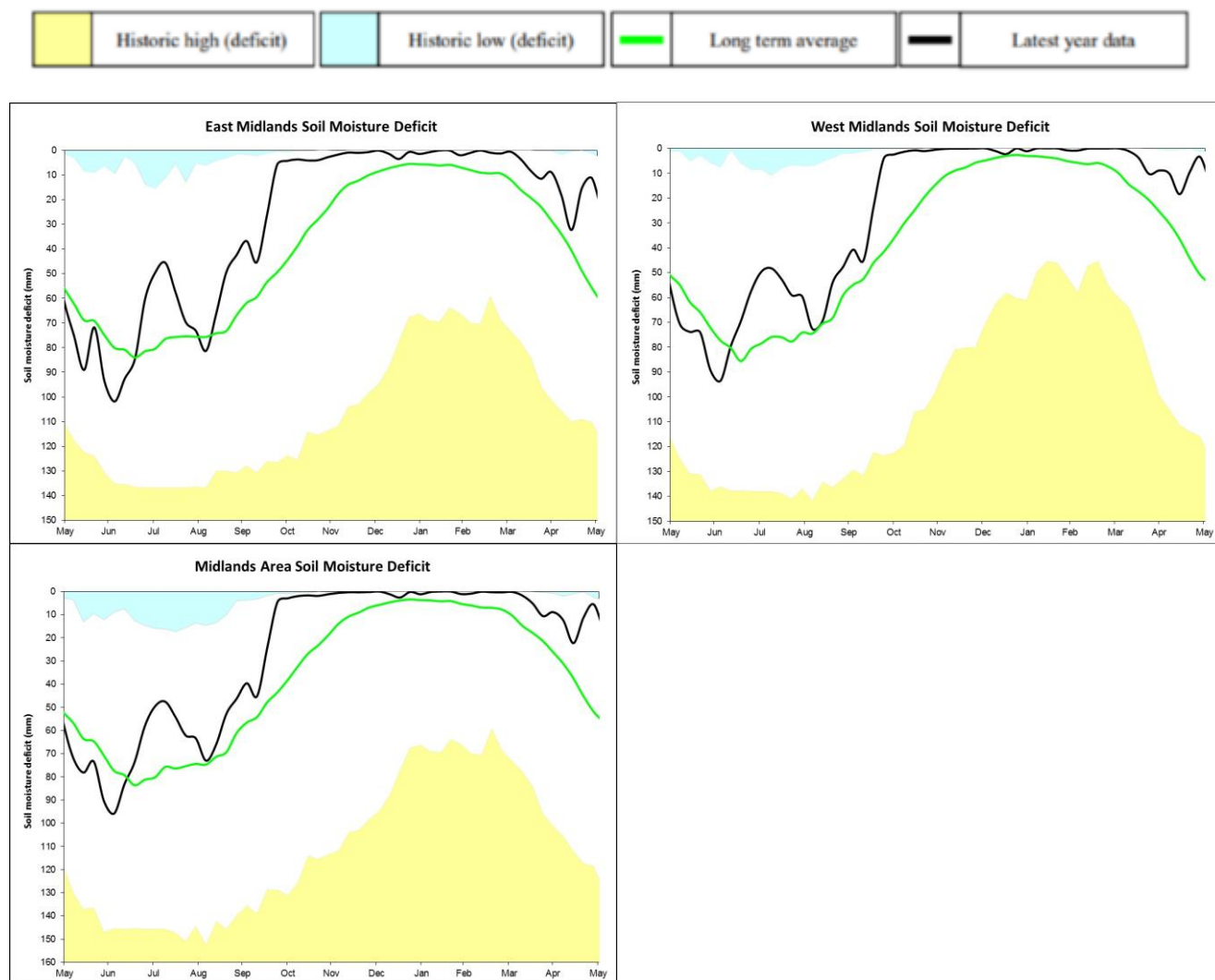
Figure 3.1: Soil moisture deficits for weeks ending 31 May 2024. Shows the difference (mm) of the actual soil moisture deficit from the 1961 to 1990 long term average soil moisture deficits. MORECS data for real land use.



(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 charts for selected areas across the Midlands.

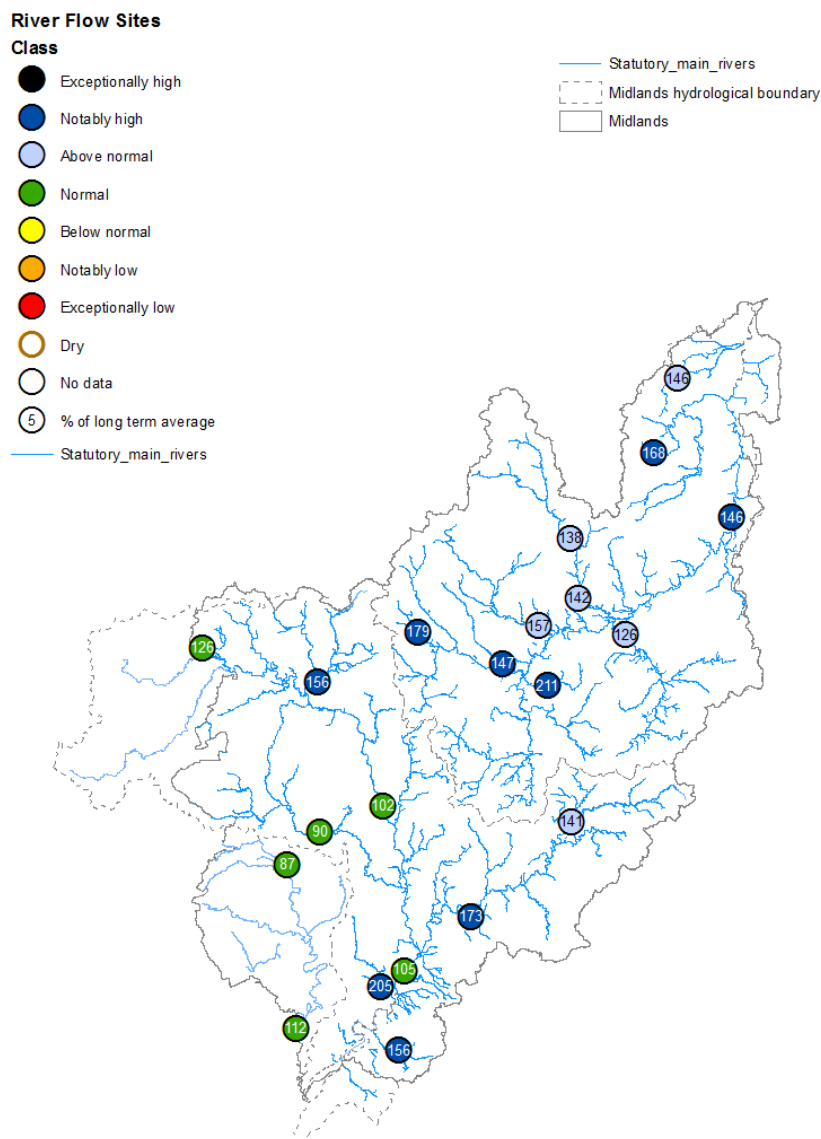


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4 River flows

4.1 River flows map

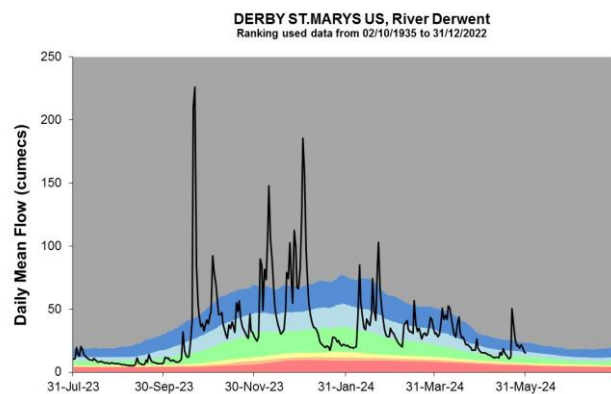
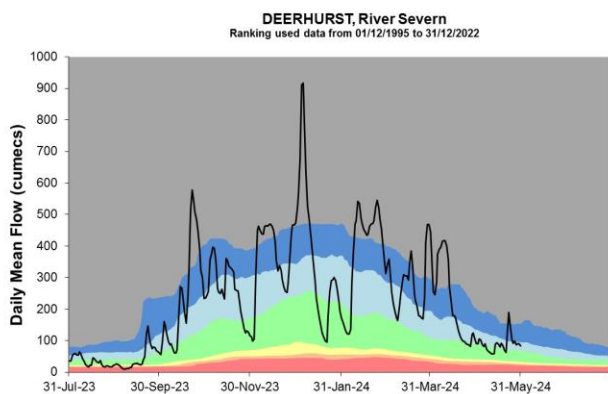
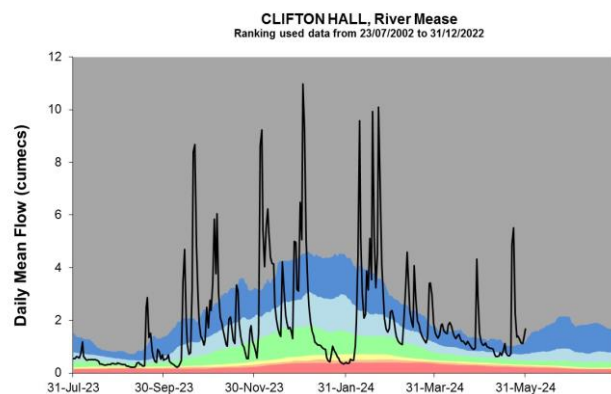
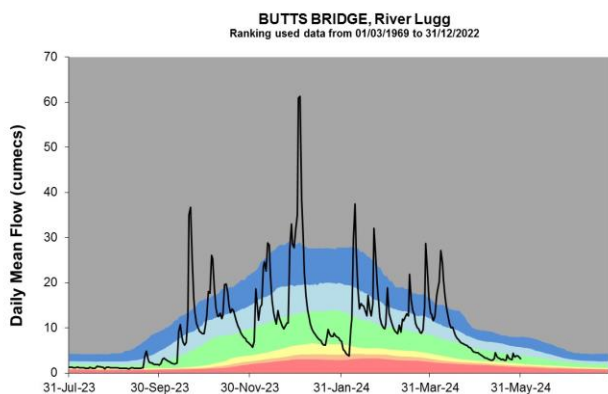
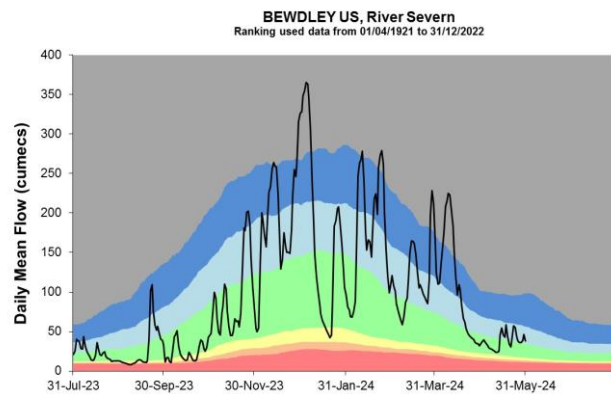
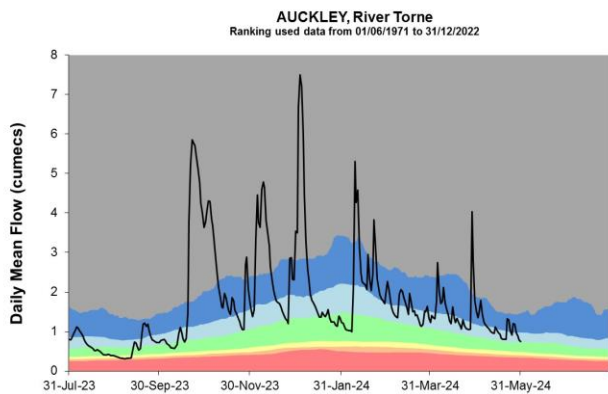
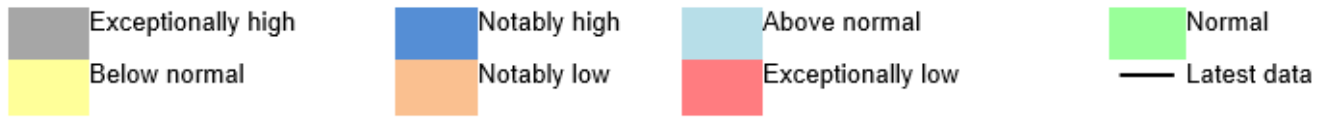
Figure 4.1: Monthly mean river flow for indicator sites for May 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic May monthly means. Table available in the appendices with detailed information.

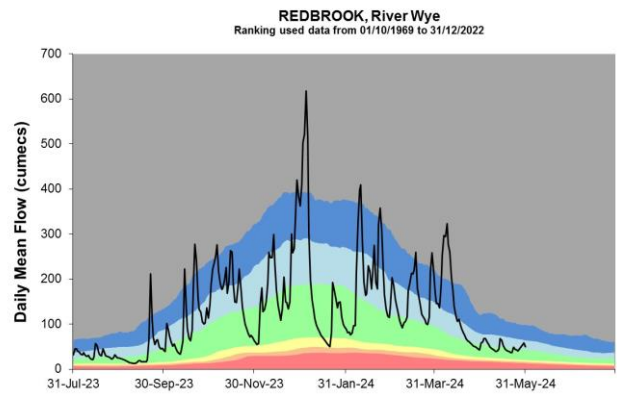
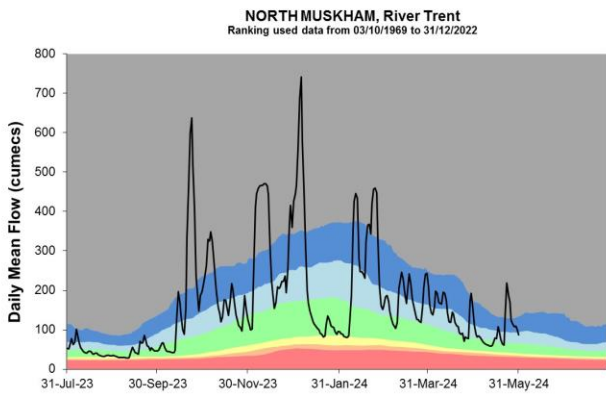
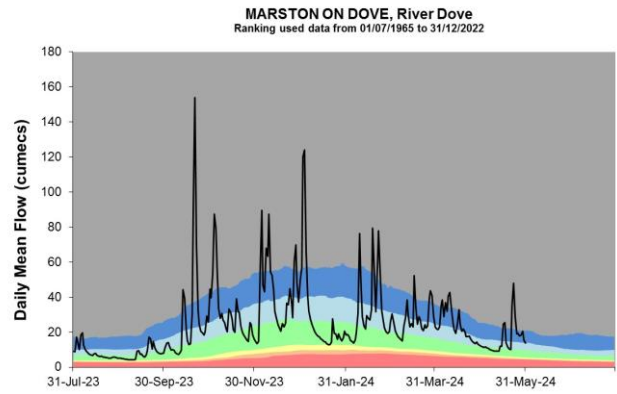
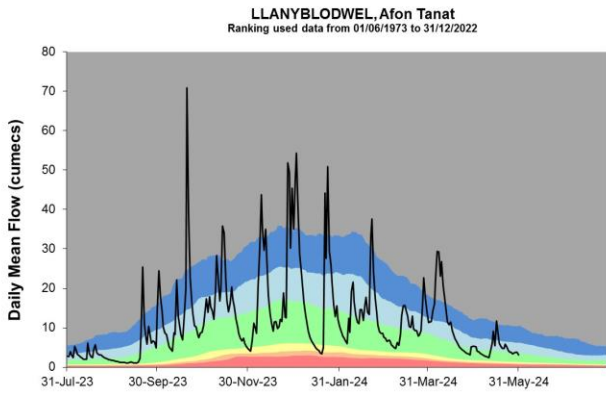
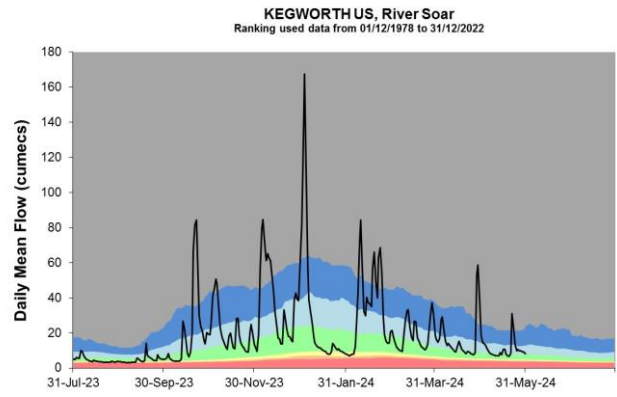
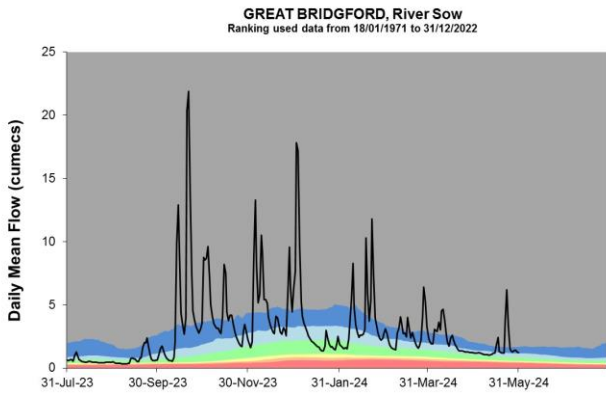
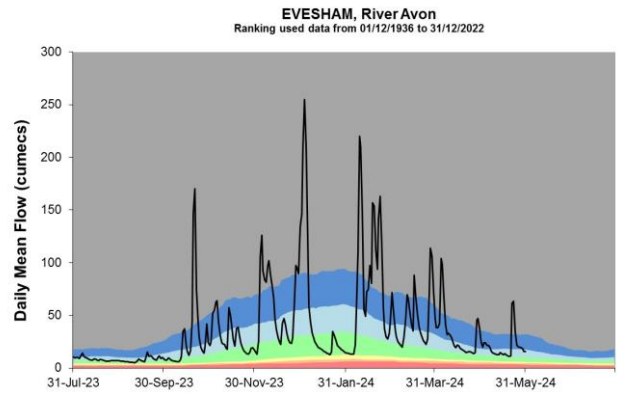
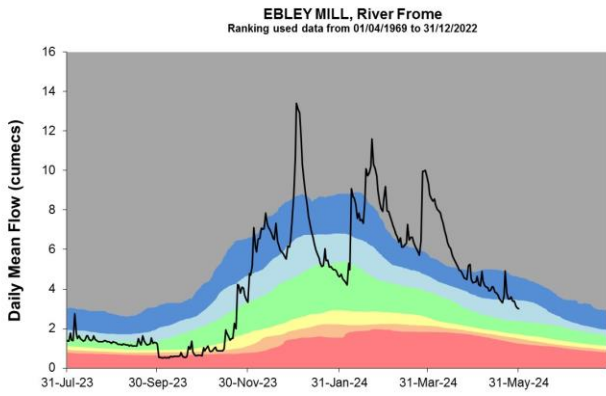


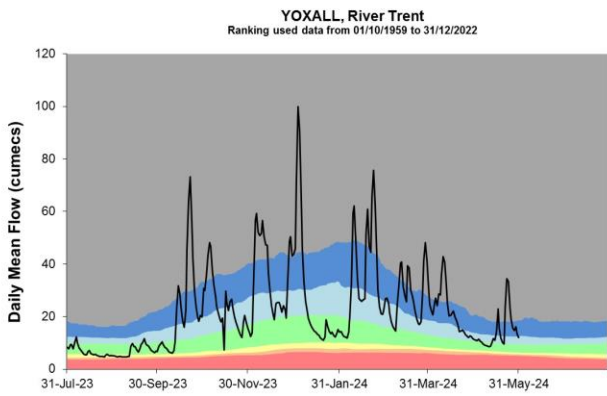
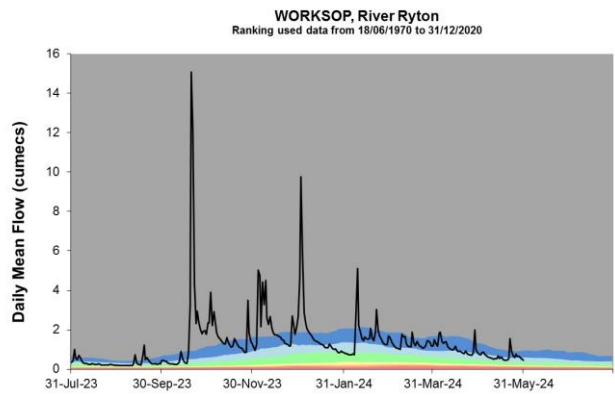
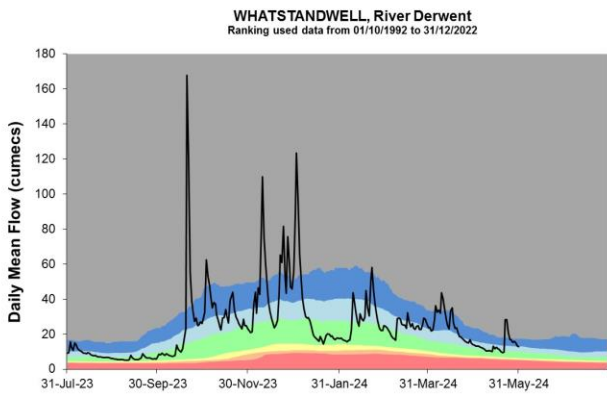
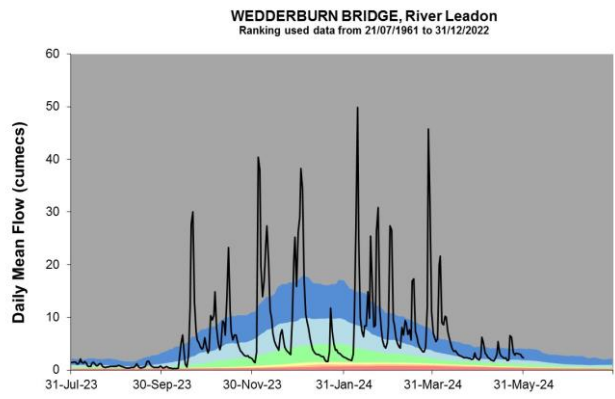
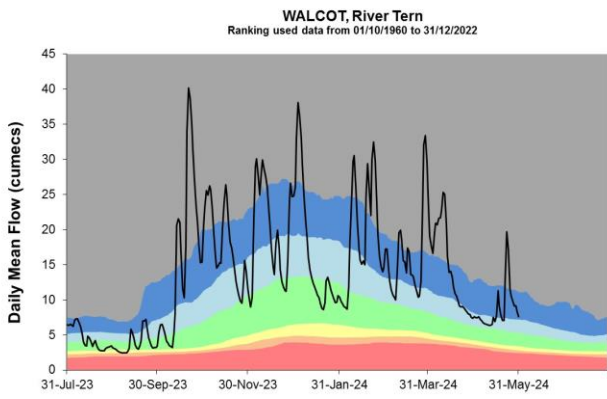
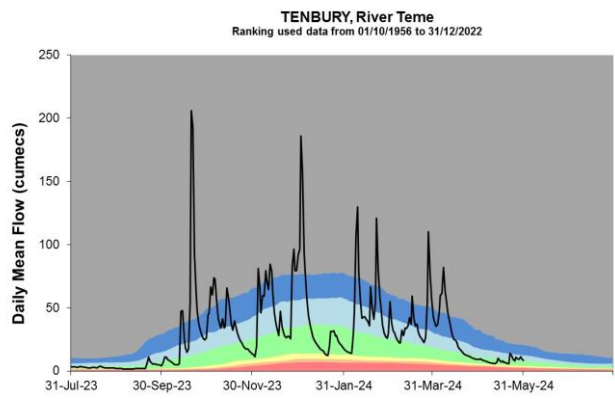
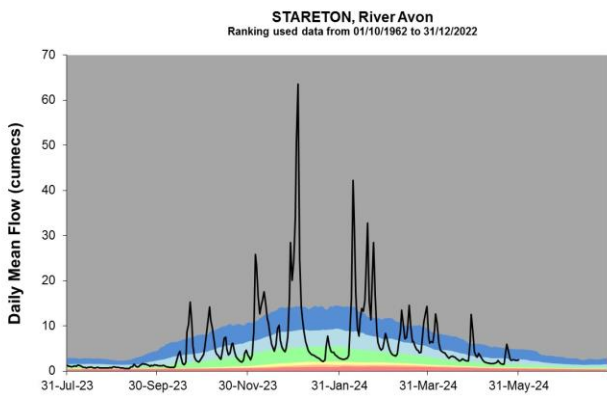
(Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

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.





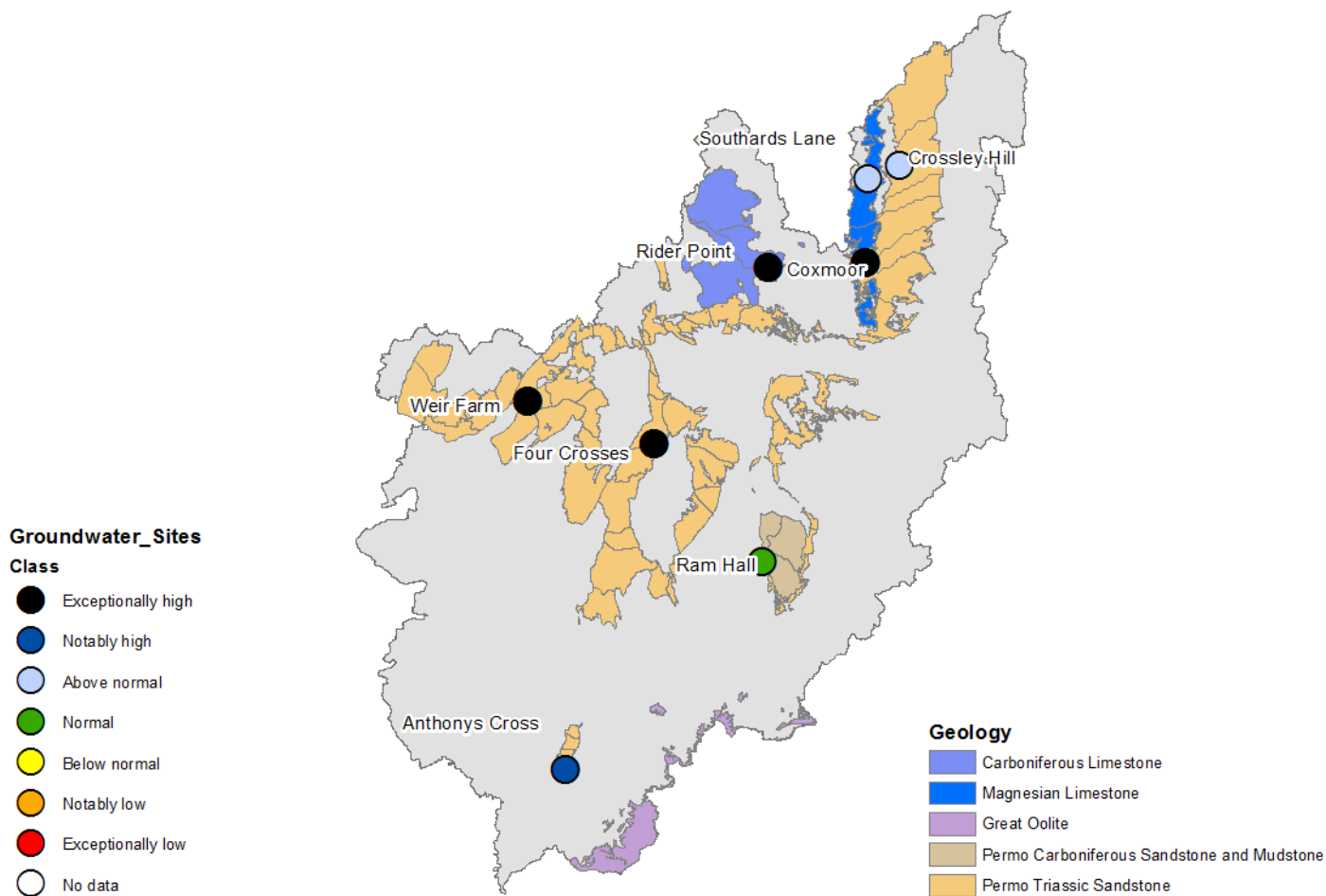


Source: Environment Agency.

5 Groundwater levels

5.1 Groundwater levels map

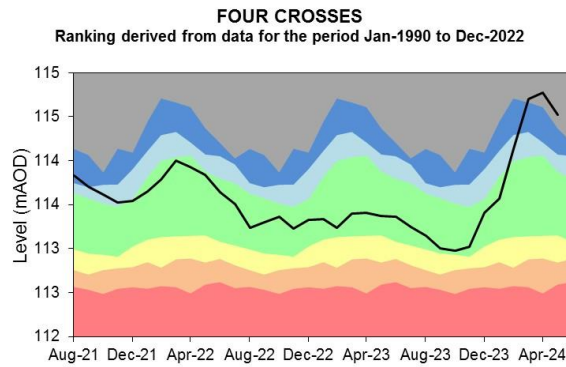
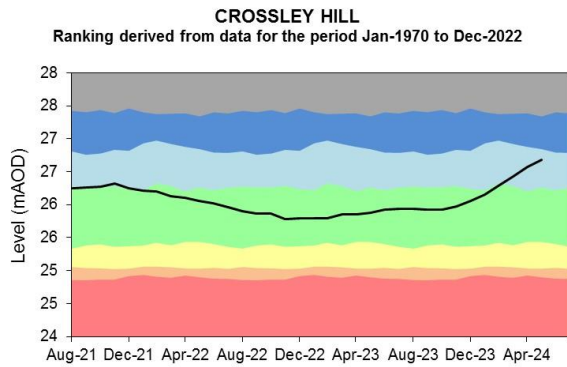
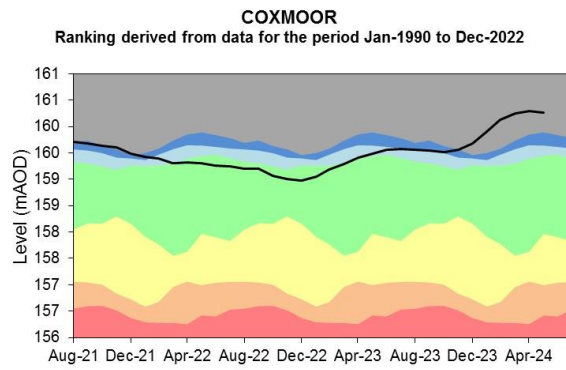
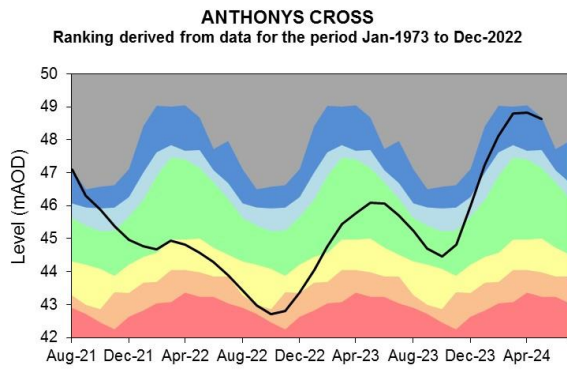
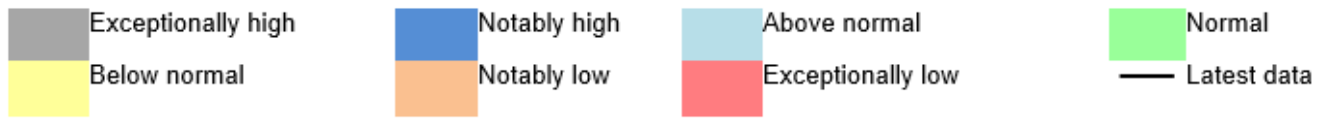
Figure 5.1: Groundwater levels for indicator sites at the end of May 2024, classed relative to an analysis of respective historic May levels. Table available in the appendices with detailed information.

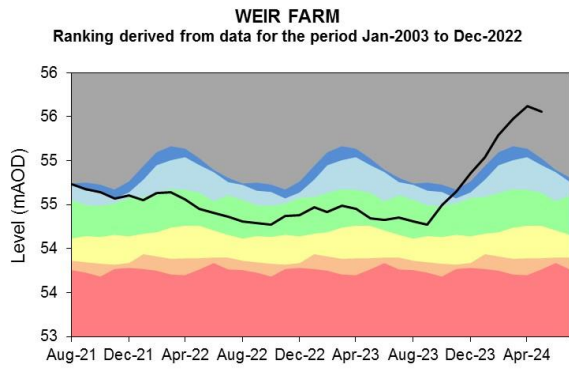
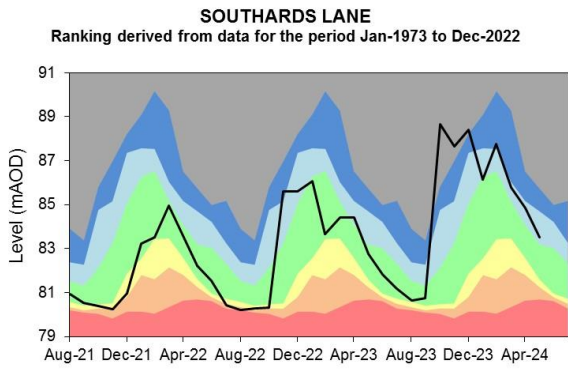
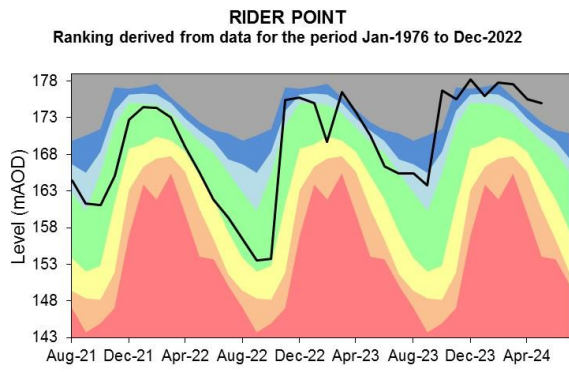
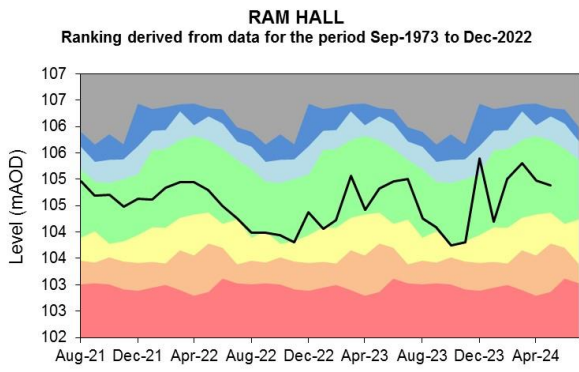


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5.2 Groundwater level charts

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.

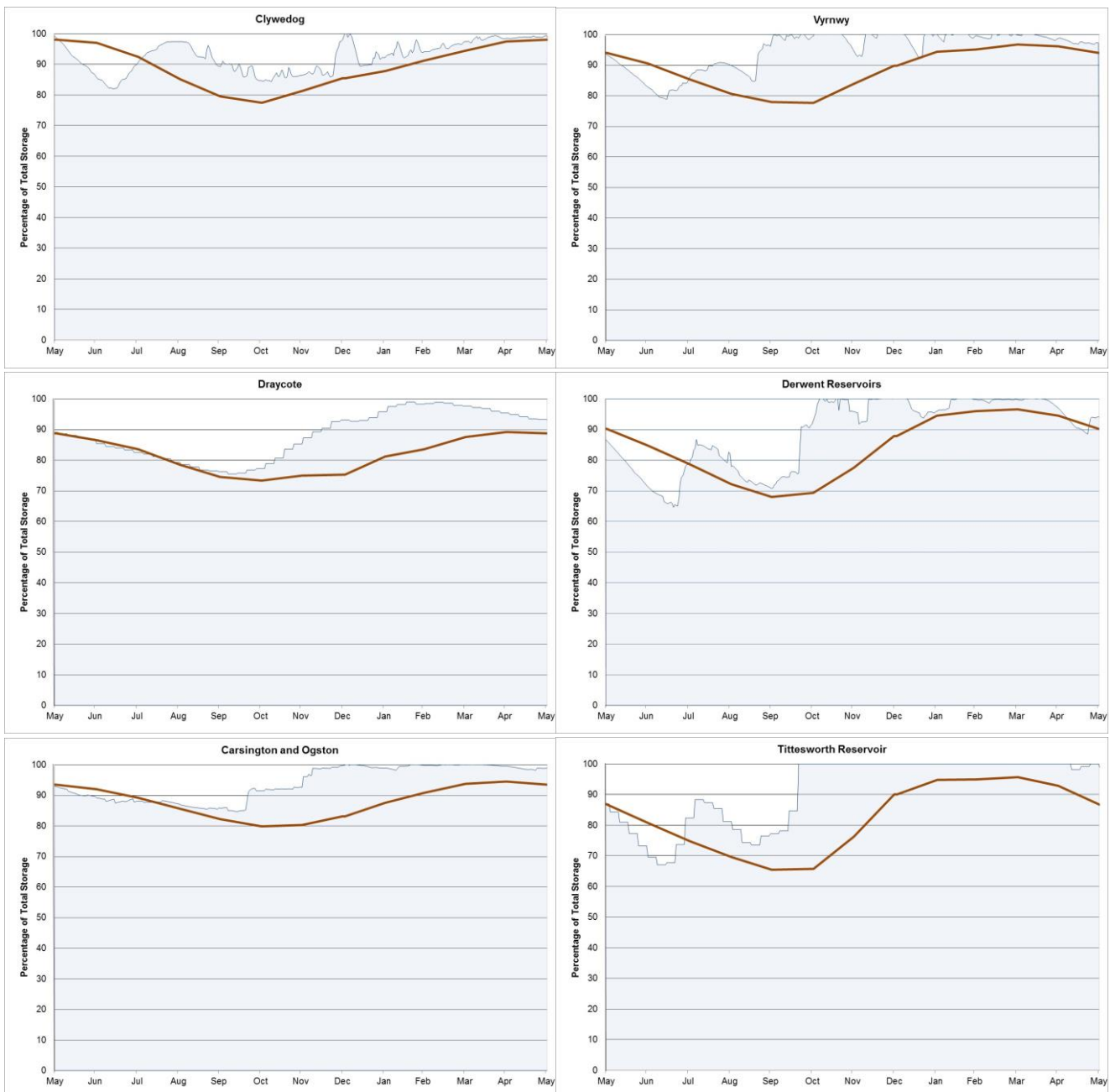


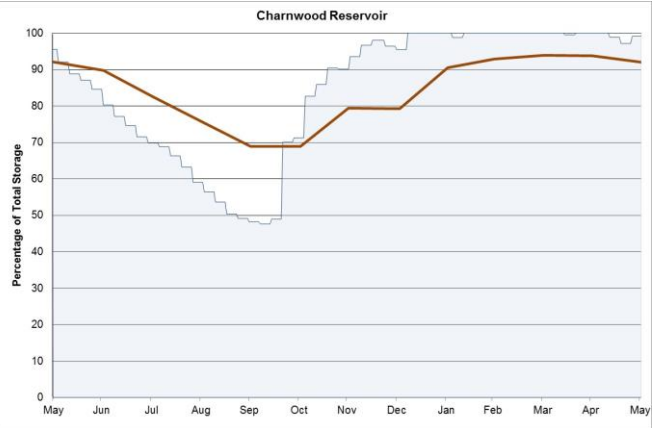
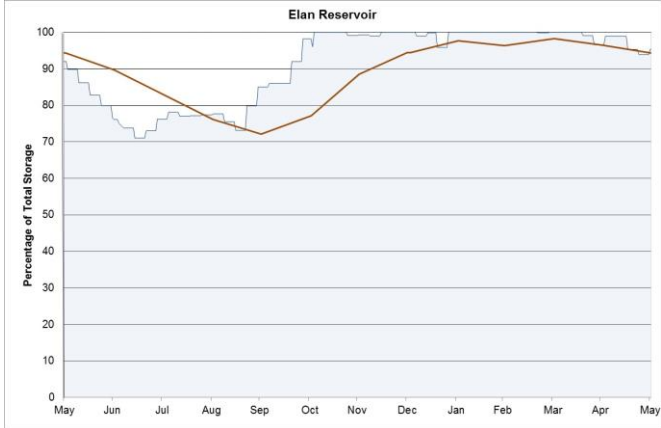
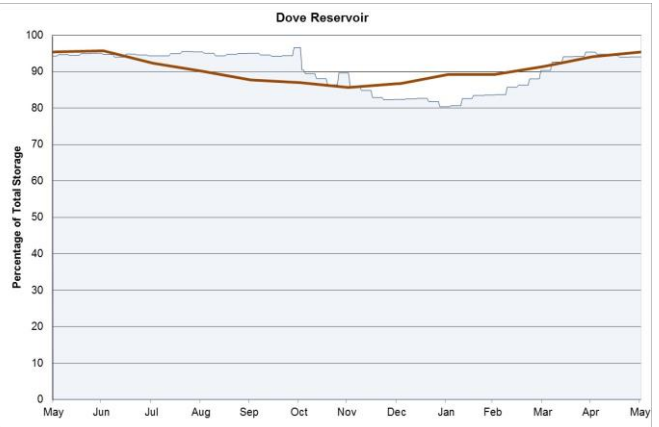
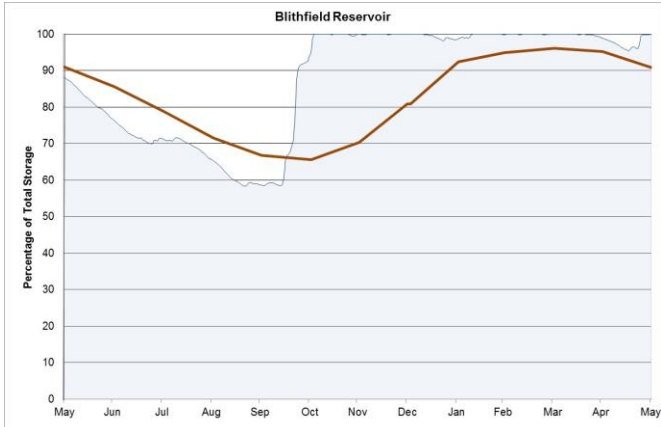


Source: Environment Agency, 2024.

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 7.5 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

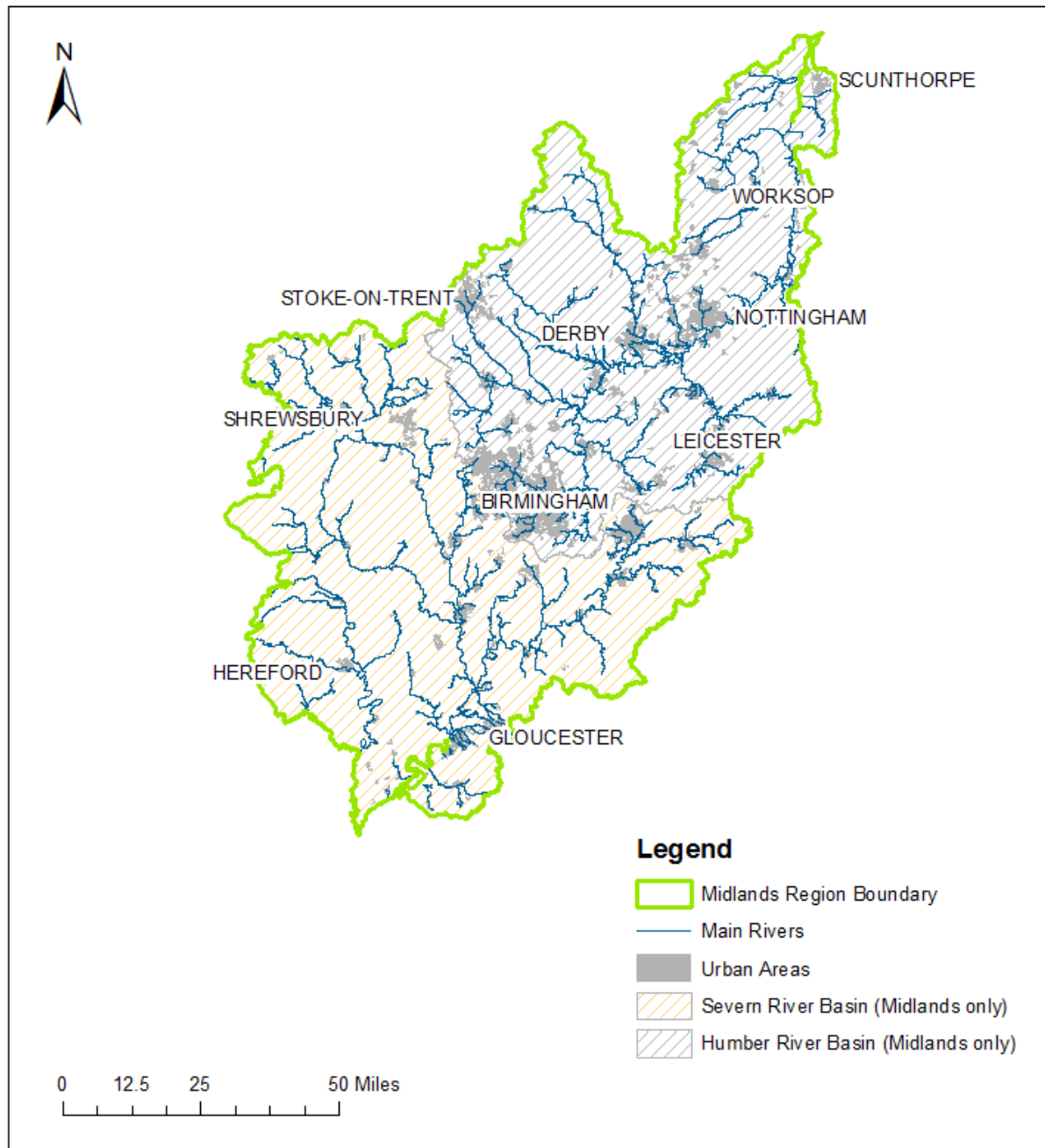
Value likely to fall within this band 8% of the time.

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 hydrological areas

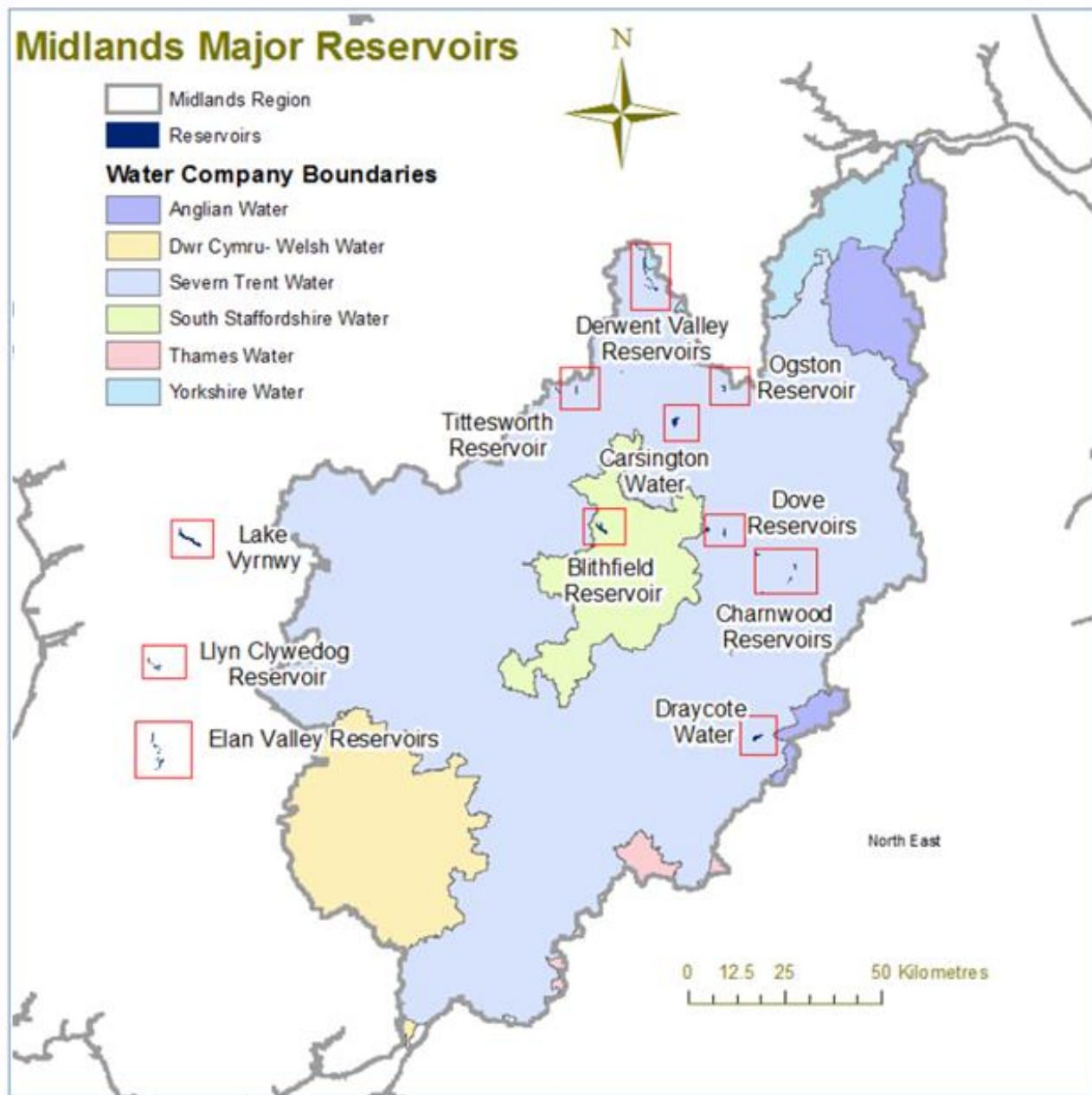
Figure 7.2: The 12 hydrological areas that make up the Midlands region. Natural Resources Wales are not currently producing a monthly water situation report.



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7.5 Midlands major reservoirs

Figure 7.3: Location of major reservoirs in the Midlands.



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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 To Evesham	135	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Derwent (Midlands)	138	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Dove	166	Notably High	Exceptionally high	Exceptionally high	Exceptionally high
Lower Severn Estuary	138	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Lower Trent	124	Above Normal	Notably high	Exceptionally high	Exceptionally high
Lower Wye	121	Normal	Notably high	Exceptionally high	Notably high
Mid Severn	127	Above Normal	Notably high	Exceptionally high	Exceptionally high
Shropshire Plains	140	Above Normal	Notably high	Exceptionally high	Exceptionally high
Soar	121	Normal	Notably high	Exceptionally high	Exceptionally high

Tame	145	Above Normal	Notably high	Exceptionally high	Exceptionally high
Upper Trent	149	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Welsh Mountains	107	Normal	Notably high	Exceptionally high	Exceptionally high

8.2 River flows table

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

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

8.3 Groundwater table

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