

Monthly water situation report: Midlands

1 Summary - June 2024

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

Rainfall - During June, the majority of hydrological catchments in the Midlands received below normal rainfall amounts compared to the long term average (LTA). Four hydrological catchments received normal and one received notably low rainfall totals compared to the LTA.

Soil moisture deficit - Due to below average rainfall totals in June, soil moisture deficit (SMD) increased across the whole of the Midlands. However, SMD in the majority of the Midlands area is less than the LTA meaning that most soils are wetter than usual for this time of year.

River flows - In June, the majority of flow monitoring sites recorded normal monthly mean flows compared to the LTA. Three sites, Great Bridgeford, Walcot and Wedderburn Bridge, recorded above normal flows compared to the LTA.

Groundwater levels – As of the end of June, 5 sites recorded exceptionally high groundwater levels compared to the LTA. The remaining 3 sites recorded normal (Ram Hall and Southards Lane) and above normal (Crossley Hill) groundwater levels compared to the LTA.

Reservoir stocks - As of the end of June, the majority of the Midlands reservoirs in this report recorded near average storage compared to the LTA. Since May, storage in all reservoirs have decreased, with the exception of the Dove.

1.1 Rainfall

During June, the majority of hydrological catchments in the Midlands received below normal rainfall amounts compared to the LTA. Four hydrological catchments received normal rainfall totals ranging from 61% to 70% of the LTA. These were the Shropshire Plains, Upper Trent, Derwent and Lower Trent hydrological catchments. The Avon was the only hydrological catchment that received a notably low rainfall total, with only 32% of the LTA.

Over the last 3 months, all hydrological catchments in the Midlands received either normal or above normal cumulative rainfall totals compared to the 3-month LTA. Five hydrological catchments received above normal cumulative rainfall totals compared to the LTA. These were the Shropshire Plains, Upper Trent, Tame, Dove and Derwent hydrological catchments situated in northern half of the Midlands. The remaining 7 hydrological catchments received normal cumulative rainfall totals compared to the LTA.

Looking at the last 6 months, all hydrological catchments in the Midlands received either exceptionally high or notably high cumulative rainfall totals compared to the 6-month LTA. Six

hydrological catchments received exceptionally high cumulative rainfall totals compared to the LTA. These were the Shropshire Plains, Upper Trent, Dove, Tame, Avon and Lower Severn. The remaining 6 hydrological catchments received notably high cumulative rainfall totals compared to the LTA. These were situated in the north-east and south-west of the Midlands.

Over the last 12 months, the majority of hydrological catchments in the Midlands received exceptionally high cumulative rainfall totals compared to the 12-month LTA. These catchments received rainfall totals between 138% and 156% of the LTA. Only one hydrological catchment, the Lower Wye, received a notably high cumulative rainfall total of 136% of the LTA.

1.2 Soil moisture deficit and recharge

Due to below average rainfall totals in June, SMD has increased across the whole of the Midlands. In general, by the end of the month the eastern border of the Midlands had the highest SMD values ranging from 71mm to 100mm. Some patches in the south, central and north-east of the Midlands had a SMD ranging between 41mm and 70mm. The remaining areas had SMD values between 11mm and 40mm.

The majority of the Midlands area had a lower SMD than the LTA. This means that soils are wetter than usual for this time of the year. Some areas scattered in the east, south and west of the Midlands have a -5mm to 5mm difference in SMD from the LTA meaning that soils are as expected for this time of the year. The only patch that is drier than usual for this time of the year is located in the south-east of the Midlands. This patch has a 6mm to 25mm difference in SMD from the LTA.

1.3 River flows

River flows in June show that all flow sites in the Midlands either recorded normal or above normal monthly mean flows compared to the LTA. The majority of flow sites in the Midlands recorded normal monthly mean flows ranging from 66% to 109% of the LTA. The remaining 3 sites recorded above normal flows compared to the LTA. These were Great Bridgeford and Walcot in the north-west of the Midlands and Wedderburn Bridge in the south-west of the Midlands.

1.4 Groundwater levels

As of the end of June, all groundwater monitoring stations were recording normal or above groundwater levels compared to the LTA. Five sites recorded exceptionally high groundwater levels compared to the LTA. These were Coxmoor, Four Crosses, Rider Point, Weir Farm and Anthony's Cross. Crossley Hill recorded above normal groundwater levels compared to the LTA. Ram Hall and Southards Lane recorded normal groundwater levels.

1.5 Reservoir stocks

By the end of June, all of the Midlands reservoirs in this report had 84% or above storage. Four reservoirs recorded slightly below average storage levels compared to the LTA. These are the Derwent, Dove, Elan and Charnwood reservoirs. Since May, storage in all reservoirs have decreased, with the exception of the Dove reservoirs where there was a slight increase in storage.

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 additional water is needed to maintain flows at Bewdley.

River Severn regulation releases started on 28 June 2024. Regulation releases continued for four days but as of 2 July 2024, regulation releases have been paused.

1.7 River Wye operations

Up to 12 June 2024, storage in the Elan Valley reservoirs were above the release control line and the flows at Redbrook gauging station remained above the regulation threshold. Therefore, regulation releases were not in operation.

Due to planned engineering works in the Elan Valley, Dŵr Cymru Welsh Water have been releasing up to 500 megalitres per day out of the Caban Coch reservoir between 12 June 2024 and 31 June 2024. This release was consented by Natural Resources Wales. During this period, the River Wye regulation was temporarily suspended. On 1 July 2024, it was notified that that reservoir levels have reached the required levels for safe working. Therefore, no additional releases were required for the planned engineering works in the Elan Valley and the River Wye regulation resumed.

On 1 July 2024, storage in the Elan Valley reservoirs remained above the release control line and flows at Redbrook were below the regulation threshold, therefore, regulation releases were in operation. This is currently the case for 2 July 2024.

1.8 Water abstraction restrictions

As of 3 July 2024 there are 23 water abstraction licence restrictions in place across the Midlands affecting 35 licences in total.

Table 1.1: Water abstraction licence restrictions

Area	Rivers and stations restricted
East Midlands	River Derwent at Derby St Mary's Rotherley Brook at Rothley
West Midlands	Badsey Brook at Offenham River Dene at Wellsbourne River Severn at Bewdley River Tern at Walcot River Sow at Great Bridgford River Trent at Darlaston River Cole at Coleshill Mor Brook at Dowles Brook at Oak Cottage River Stour at Puxton River Wye at Belmont River Garren at Marstow Mill River Wye at Redbrook River Lugg at Butts Bridge

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

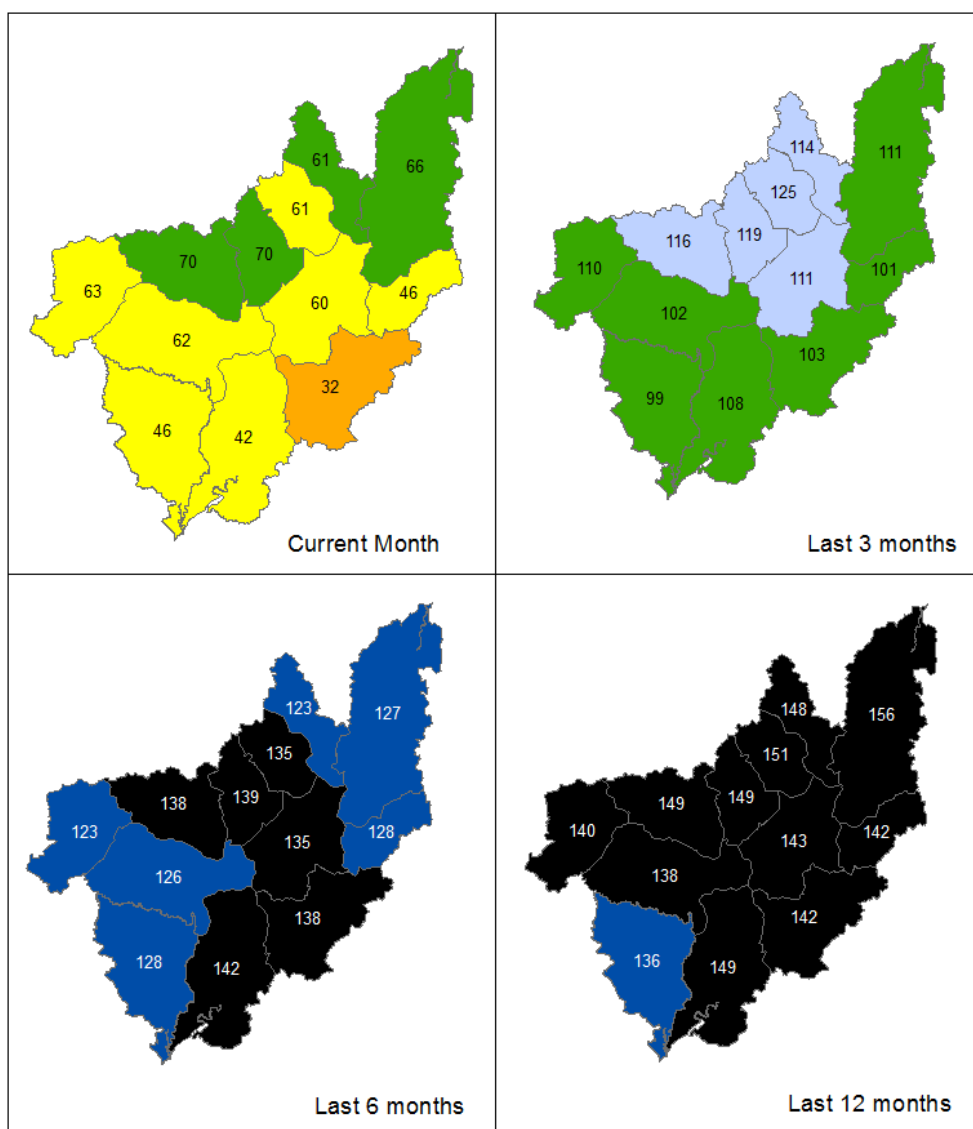
Contact Details: 03708 506 506

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2 Rainfall

2.1 Rainfall map

Figure 2.1: Total rainfall for hydrological areas for the current month (up to 30 June 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.



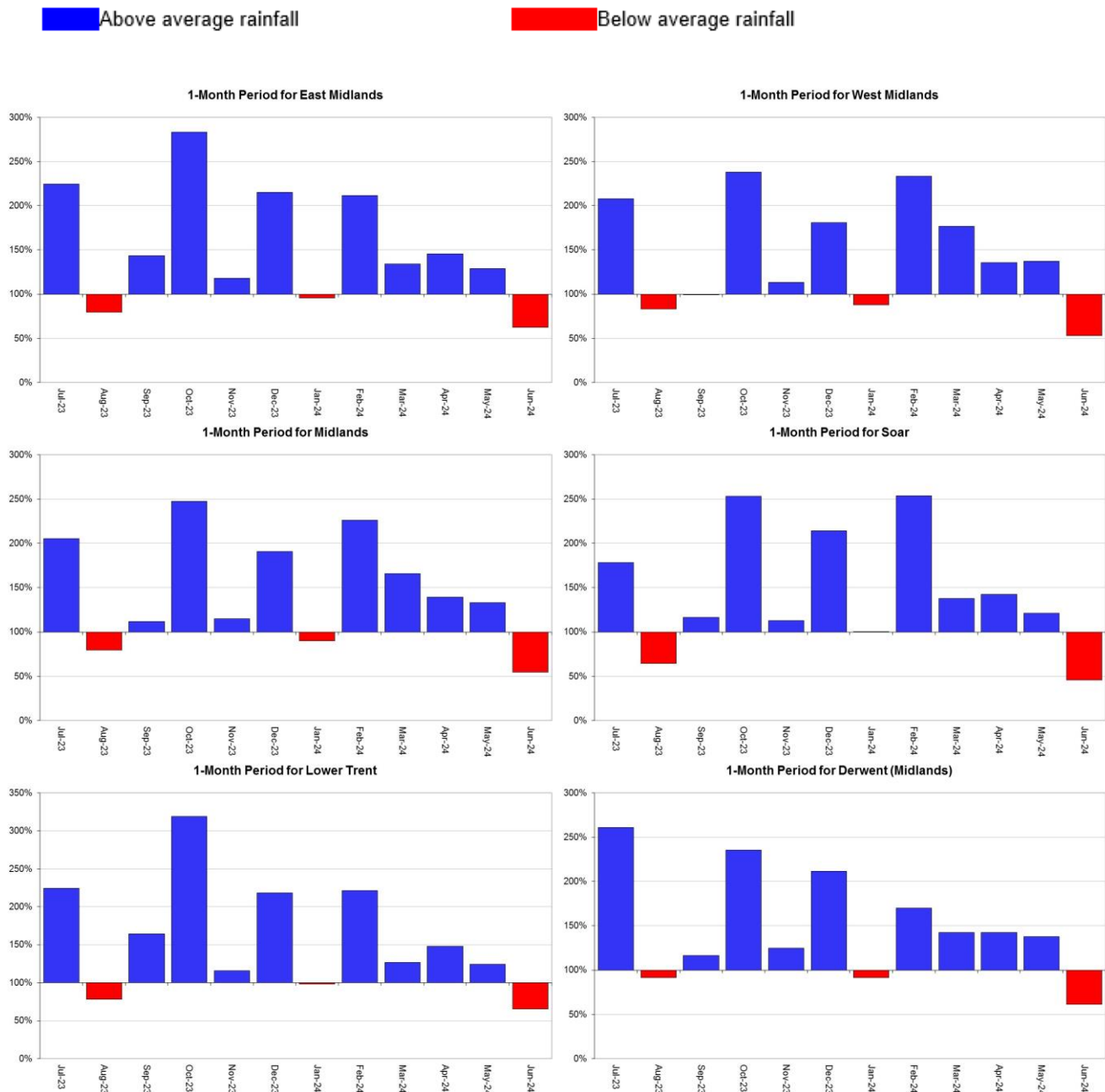
Legend



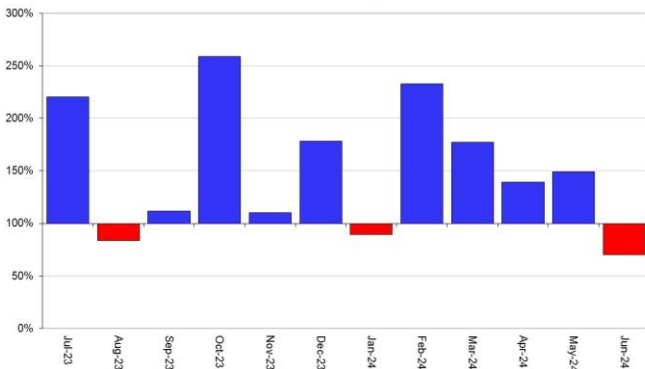
Rainfall data from 2023, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges (Source: Environment Agency. Crown Copyright, 100024198, 2024). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived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

2.2 Rainfall charts

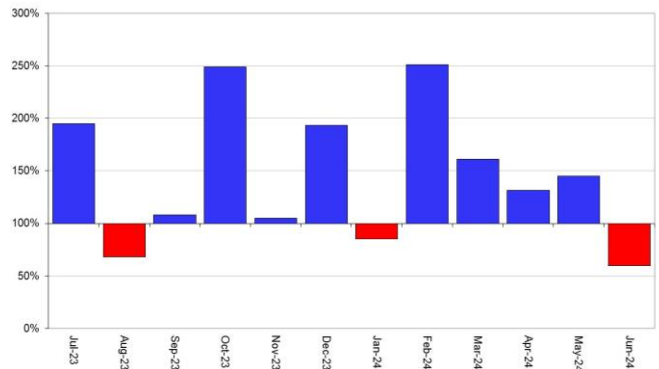
Figure 2.2: Monthly rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average for hydrological areas across the Midlands region.



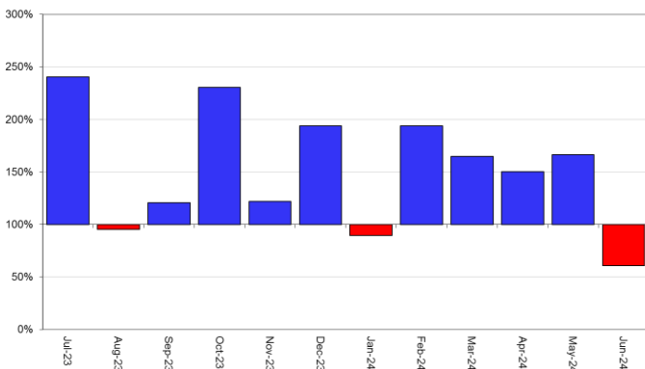
1-Month Period for Upper Trent



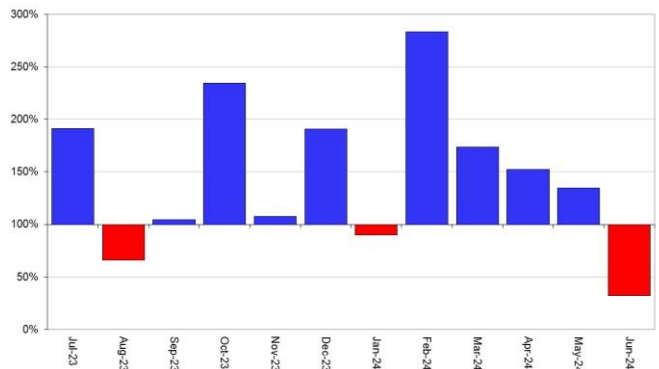
1-Month Period for Tame



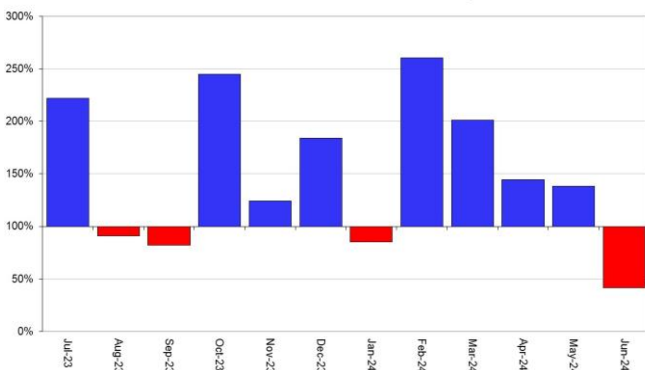
1-Month Period for Dove



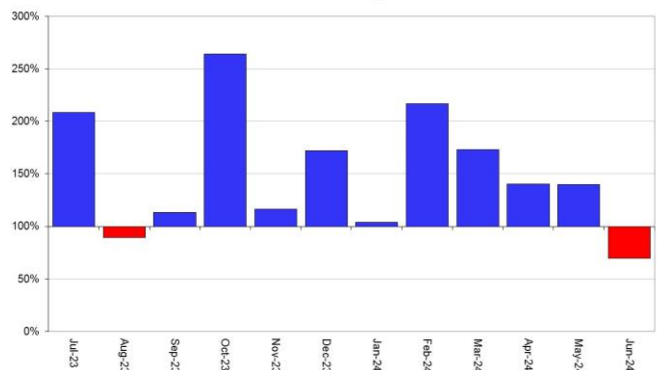
1-Month Period for Avon to Evesham

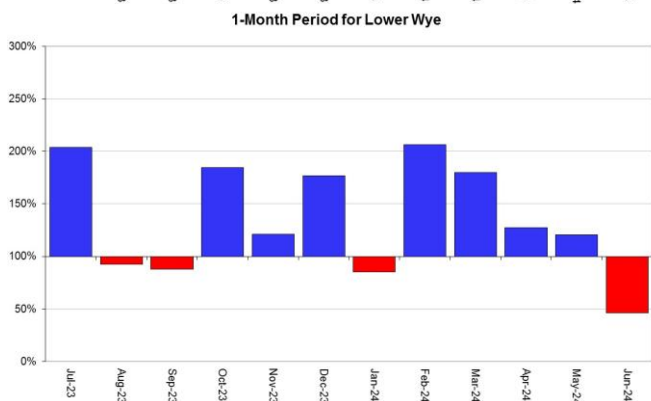
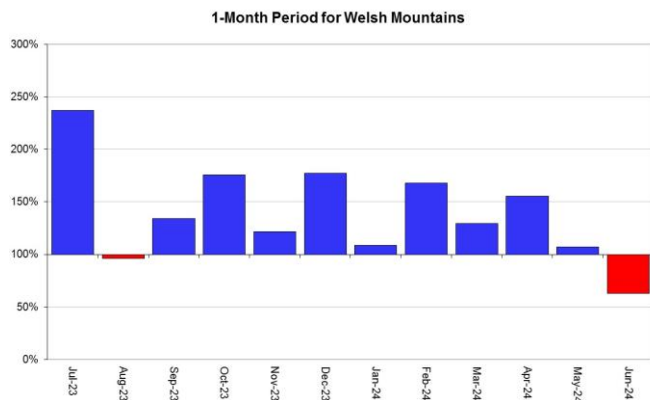
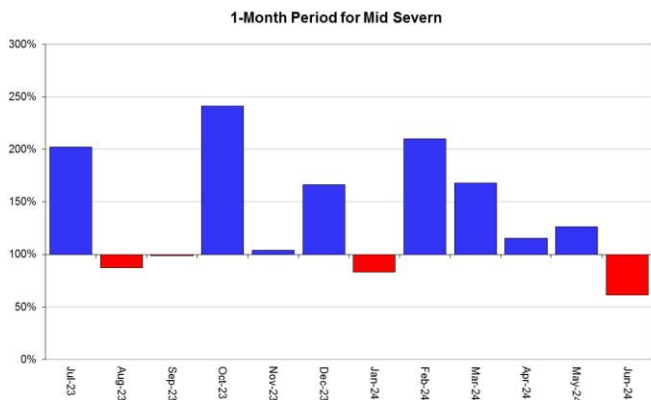


1-Month Period for Lower Severn Estuary



1-Month Period for Shropshire Plains



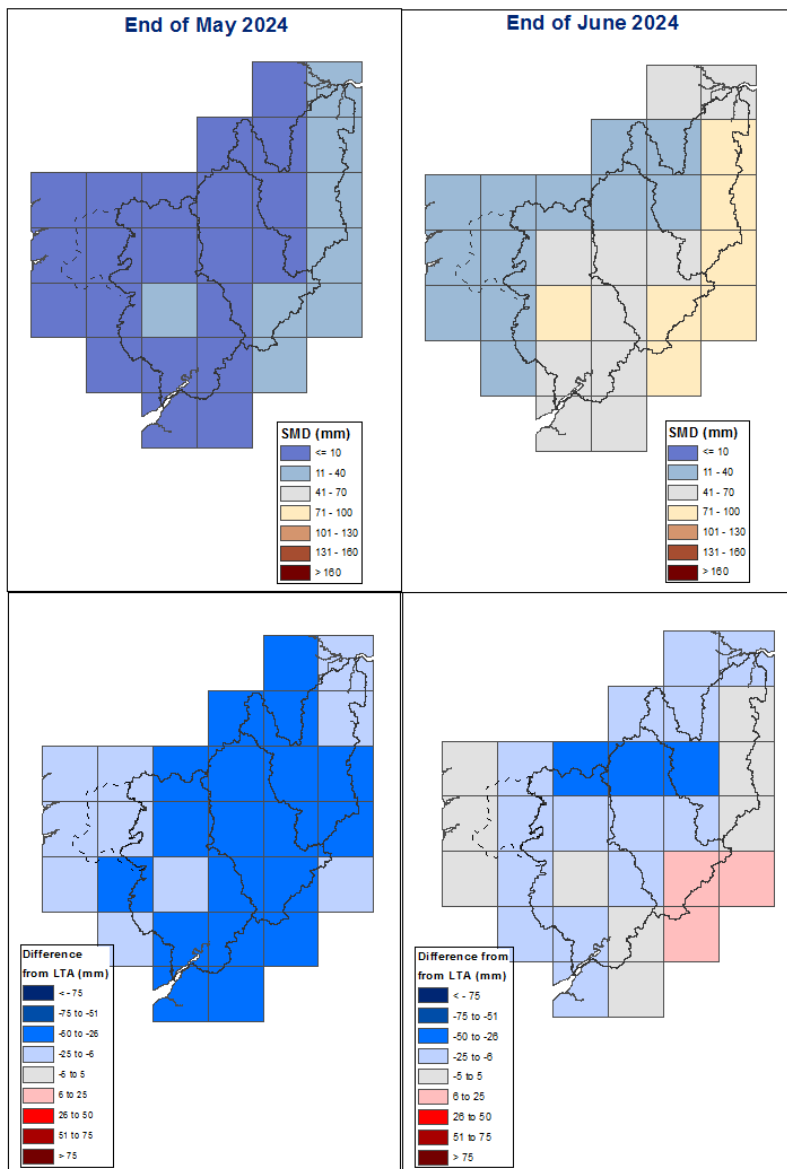


Rainfall data from 2023, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges (Source: Environment Agency. Crown Copyright, 100024198, 2024). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived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

3 Soil moisture deficit

3.1 Soil moisture deficit map

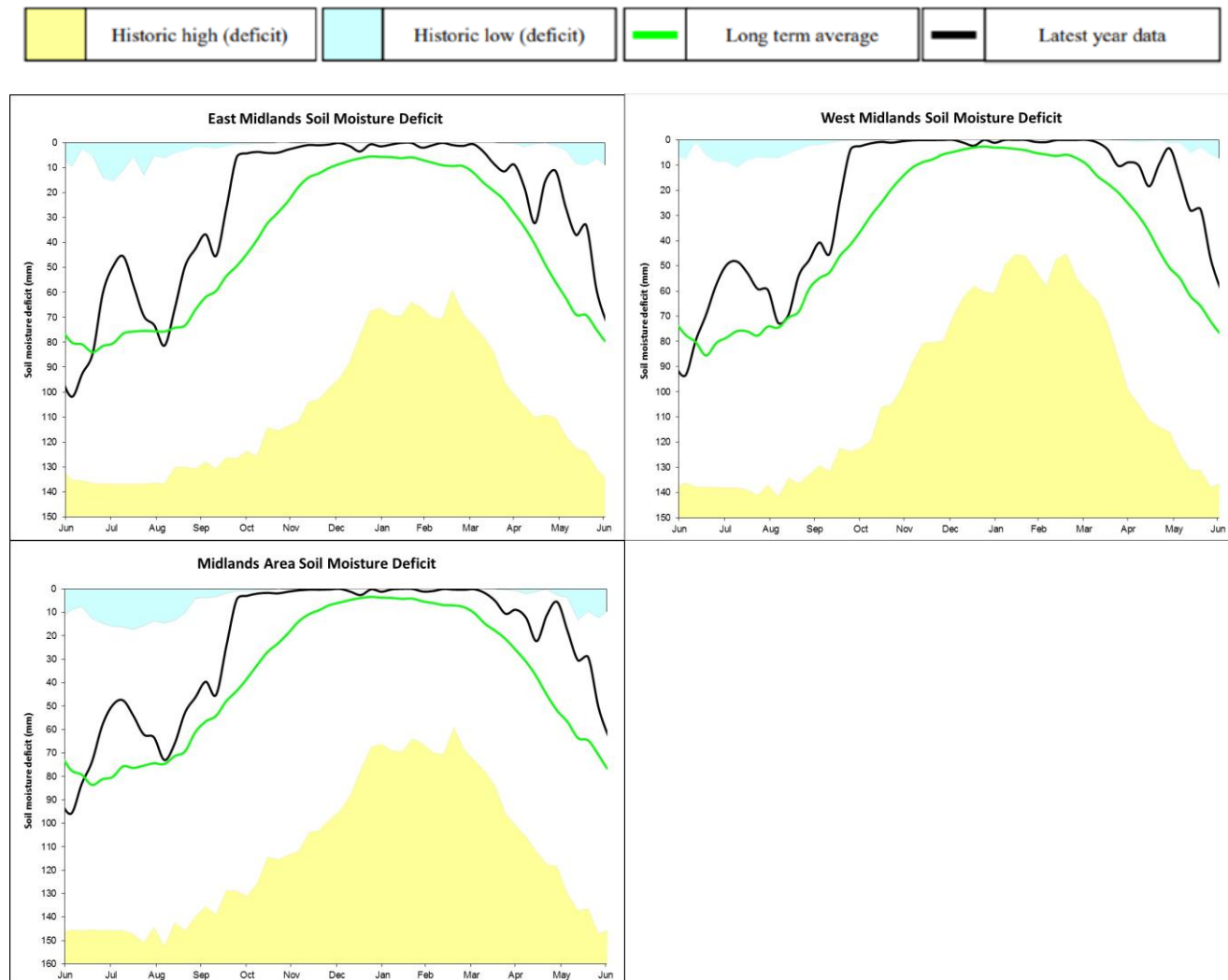
Figure 3.1: Soil moisture deficits for weeks ending 31 May 2024 and 30 June 2024. Shows the difference (mm) of the actual soil moisture deficit from the 1961 to 1990 long term average soil moisture deficits. MORECS (Meteorological Office Rainfall and Evaporation Calculation System) data for real land 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.

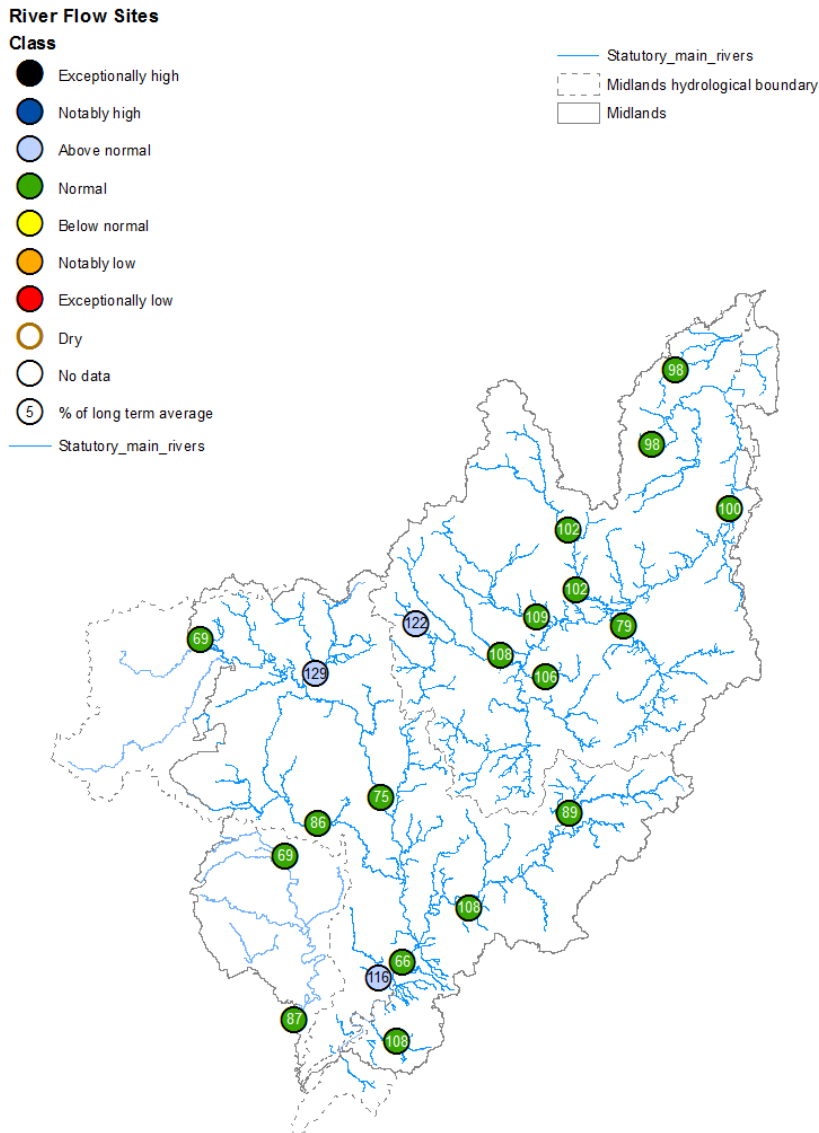


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4 River flows

4.1 River flows map

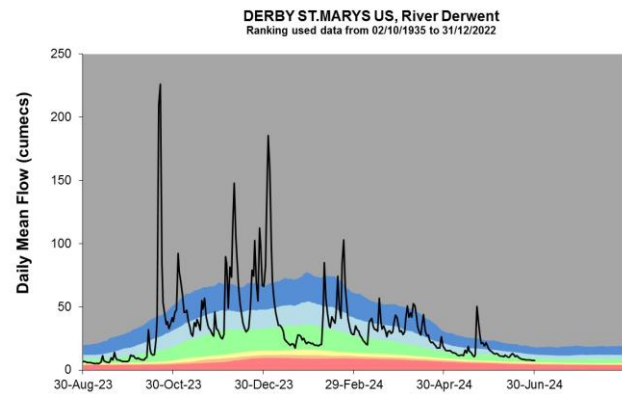
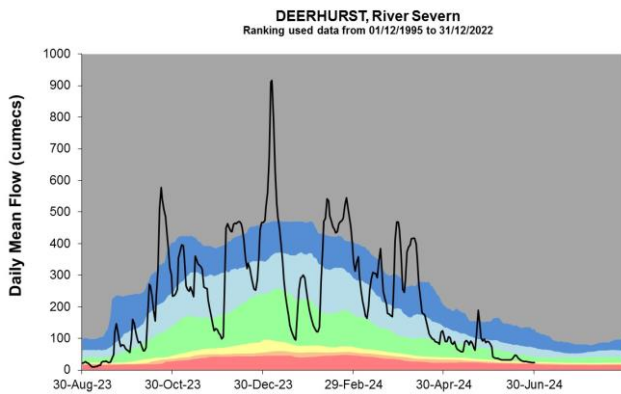
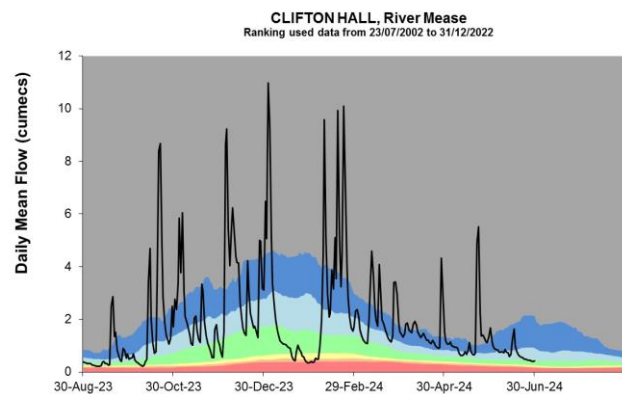
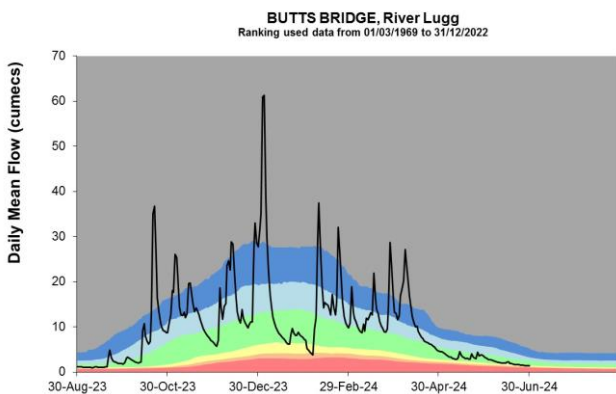
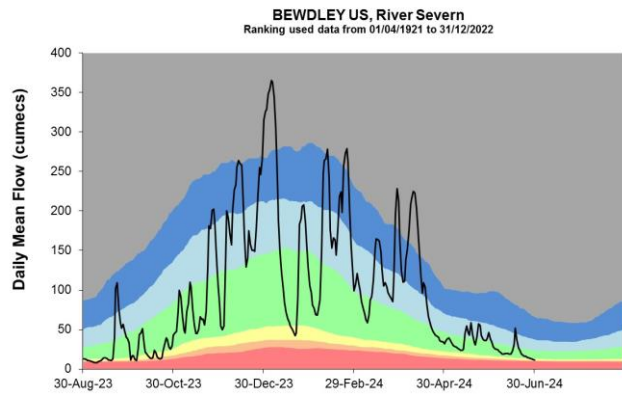
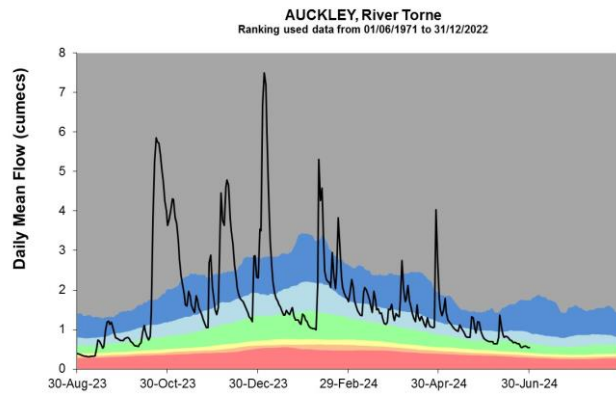
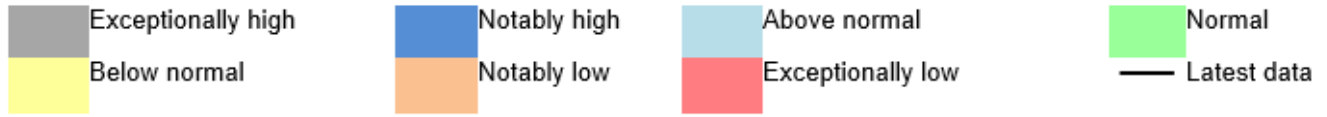
Figure 4.1: Monthly mean river flow for indicator sites for June 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic June monthly means. Table available in the appendices with detailed information.

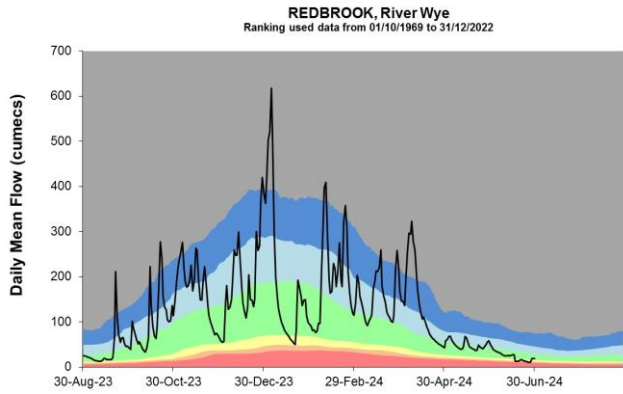
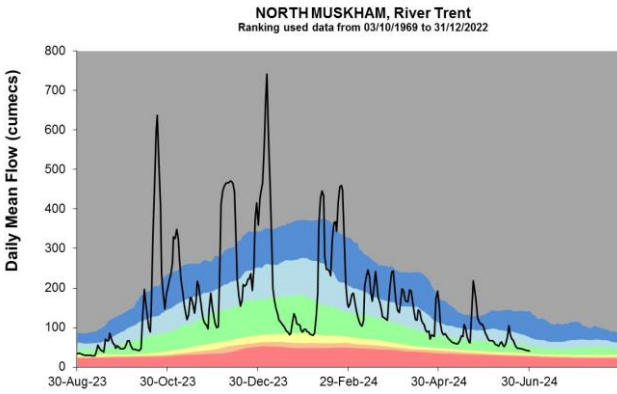
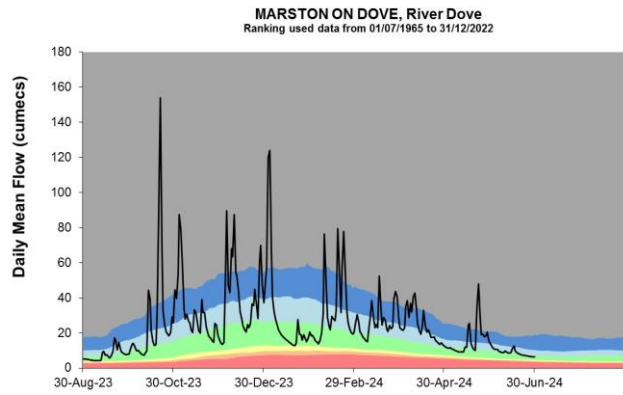
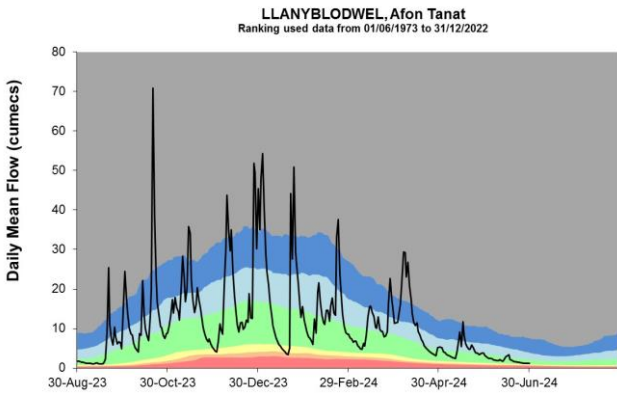
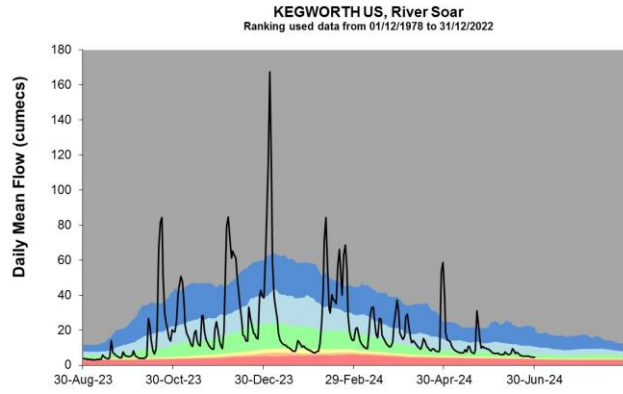
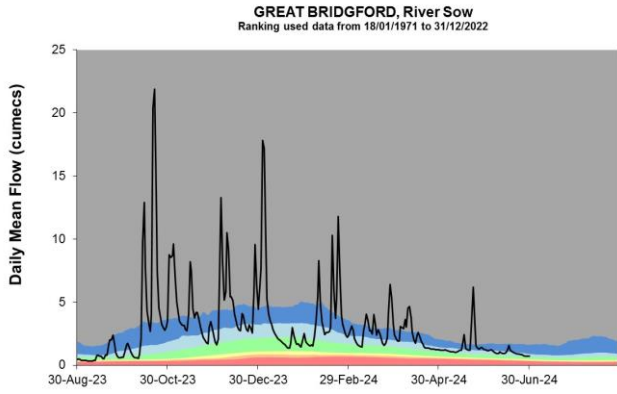
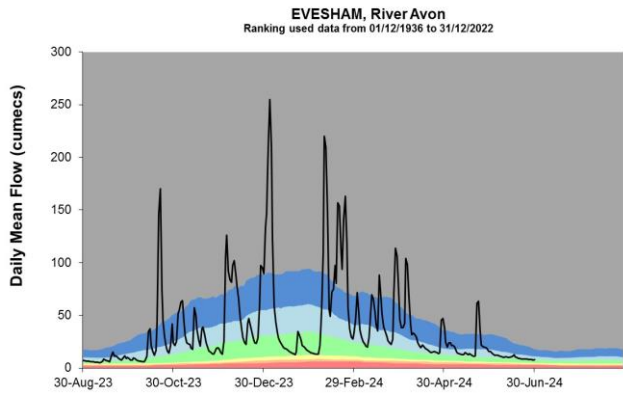
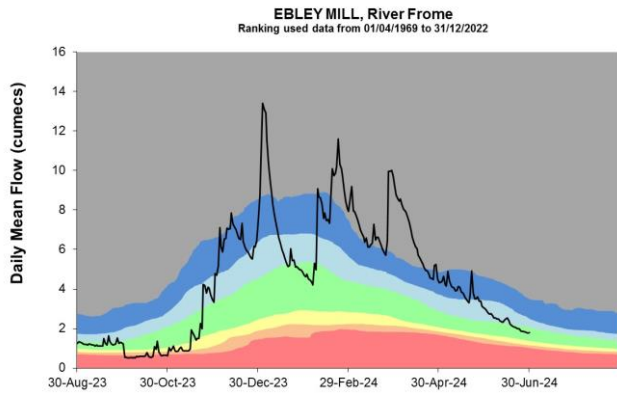


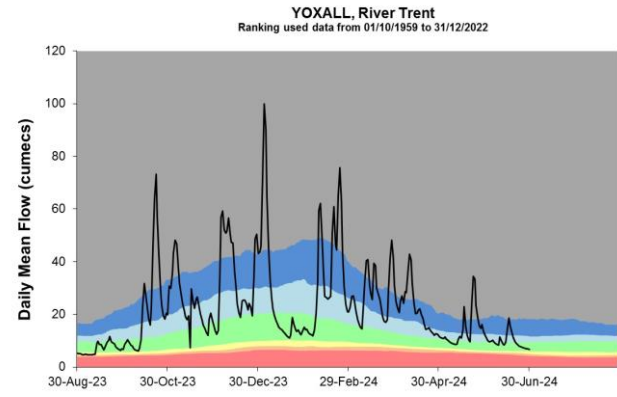
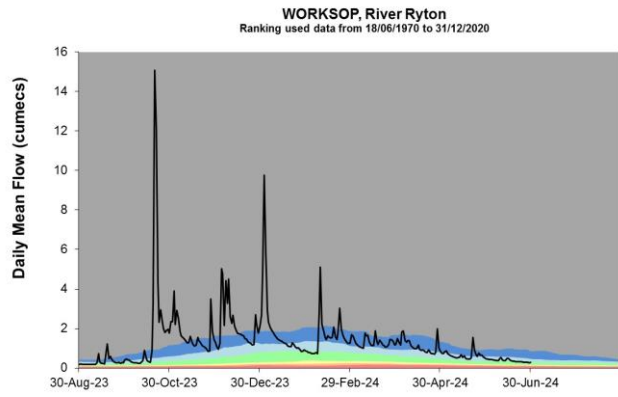
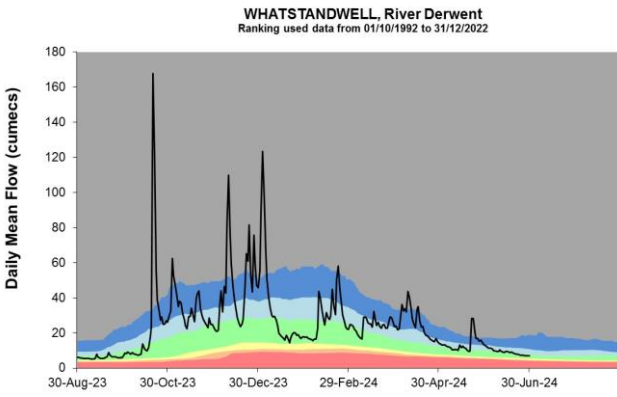
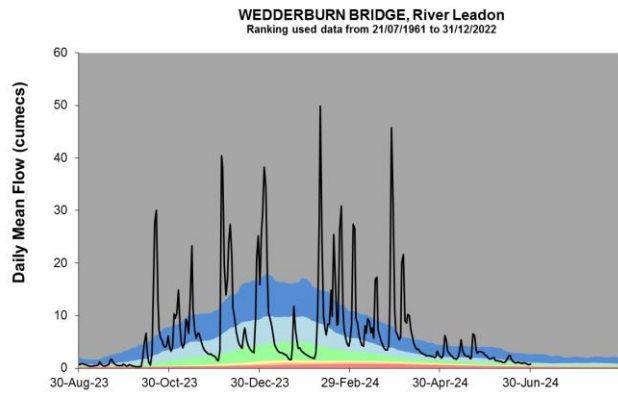
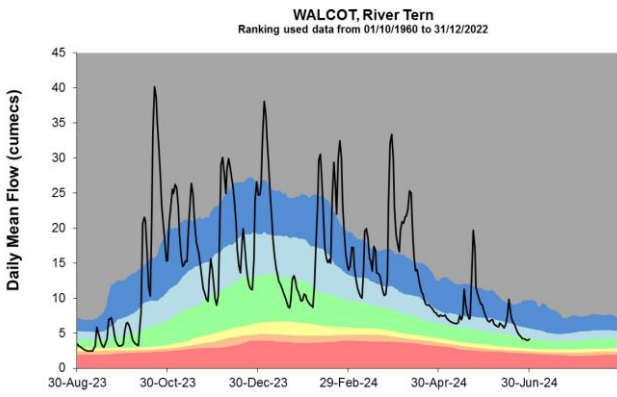
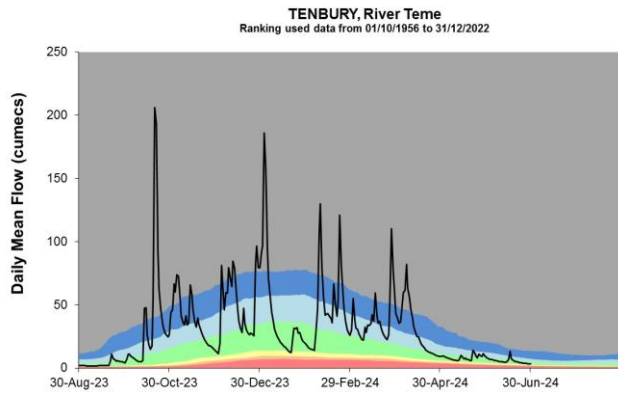
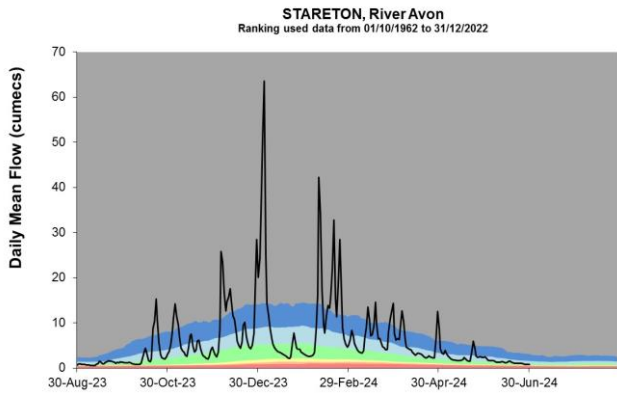
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4.2 River flow charts

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.





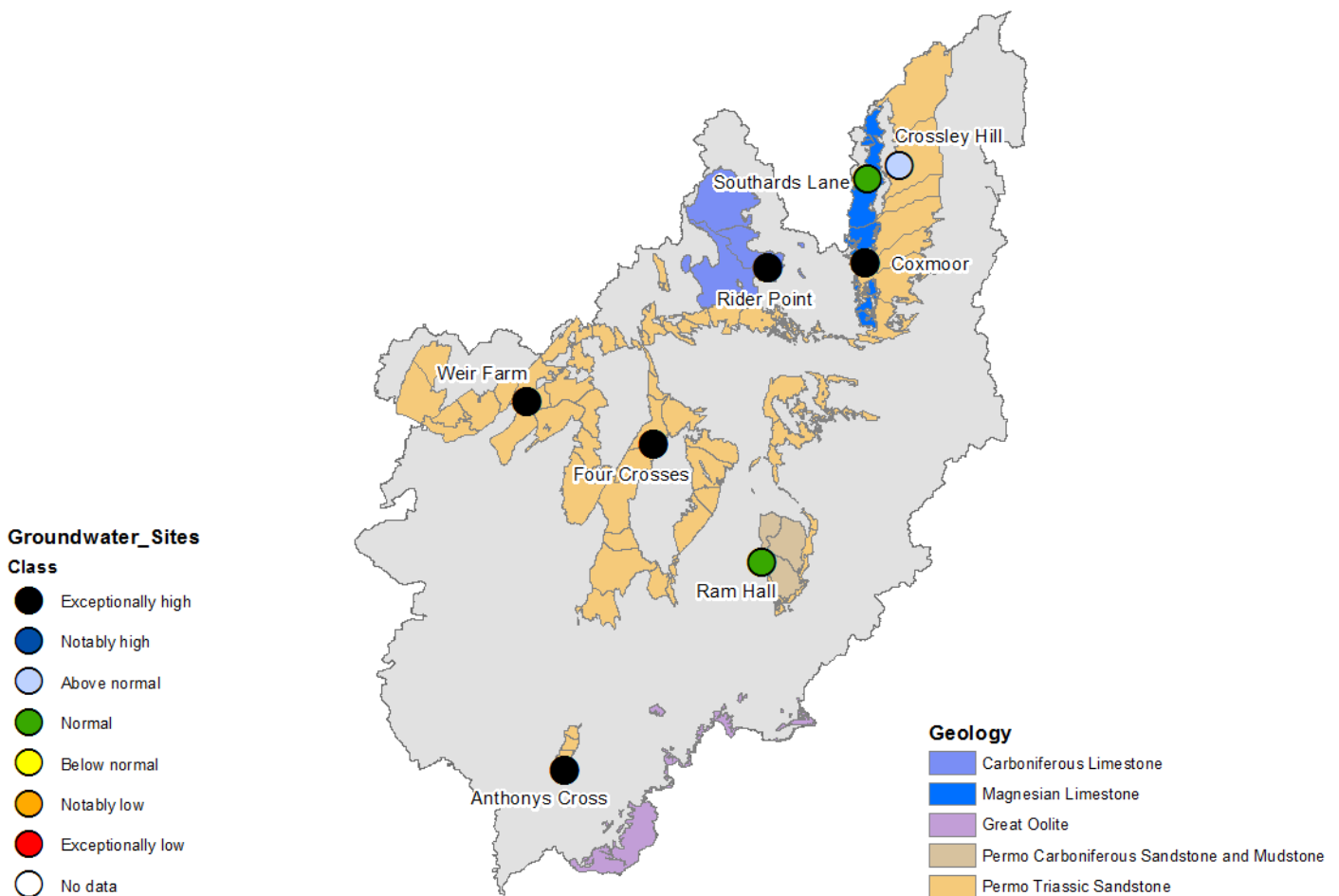


Source: Environment Agency.

5 Groundwater levels

5.1 Groundwater levels map

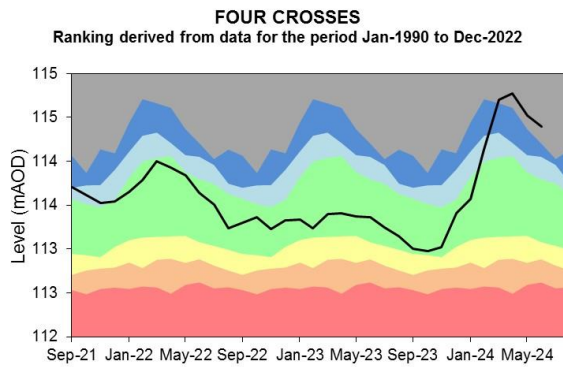
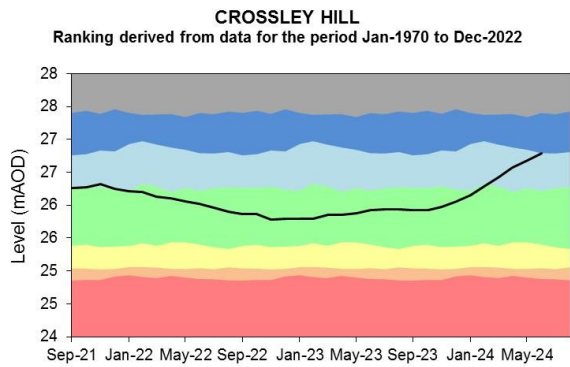
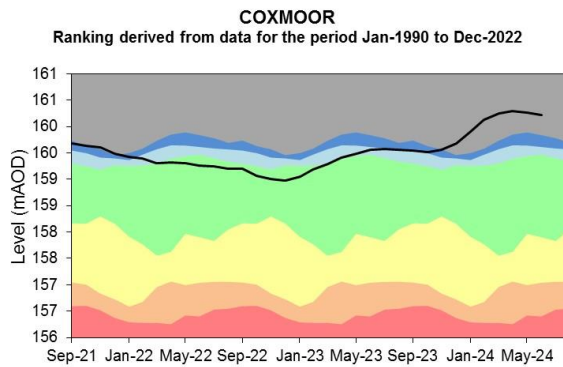
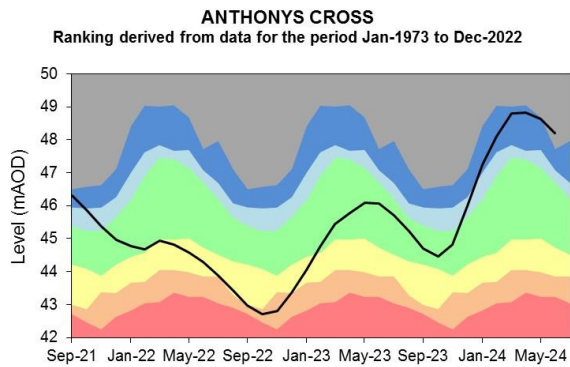
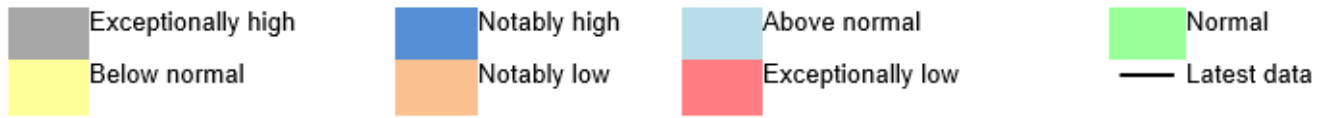
Figure 5.1: Groundwater levels for indicator sites at the end of June 2024, classed relative to an analysis of respective historic June levels. Table available in the appendices with detailed information.

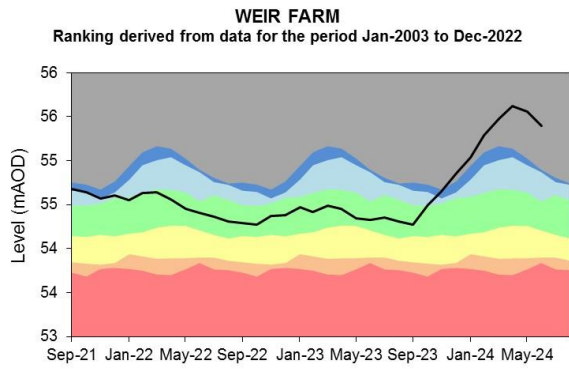
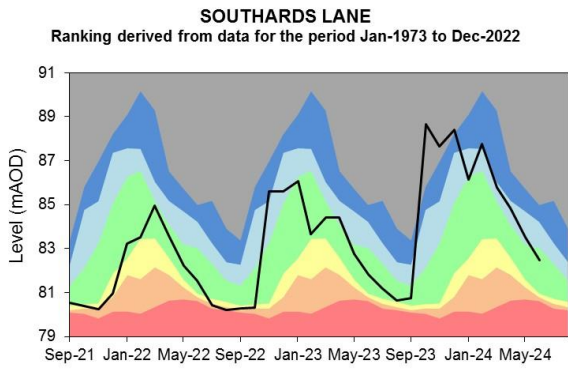
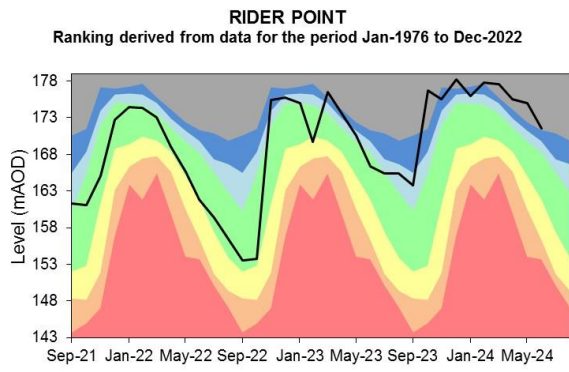
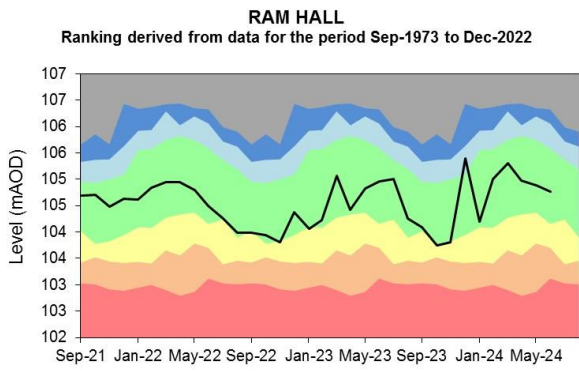


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5.2 Groundwater level charts

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.

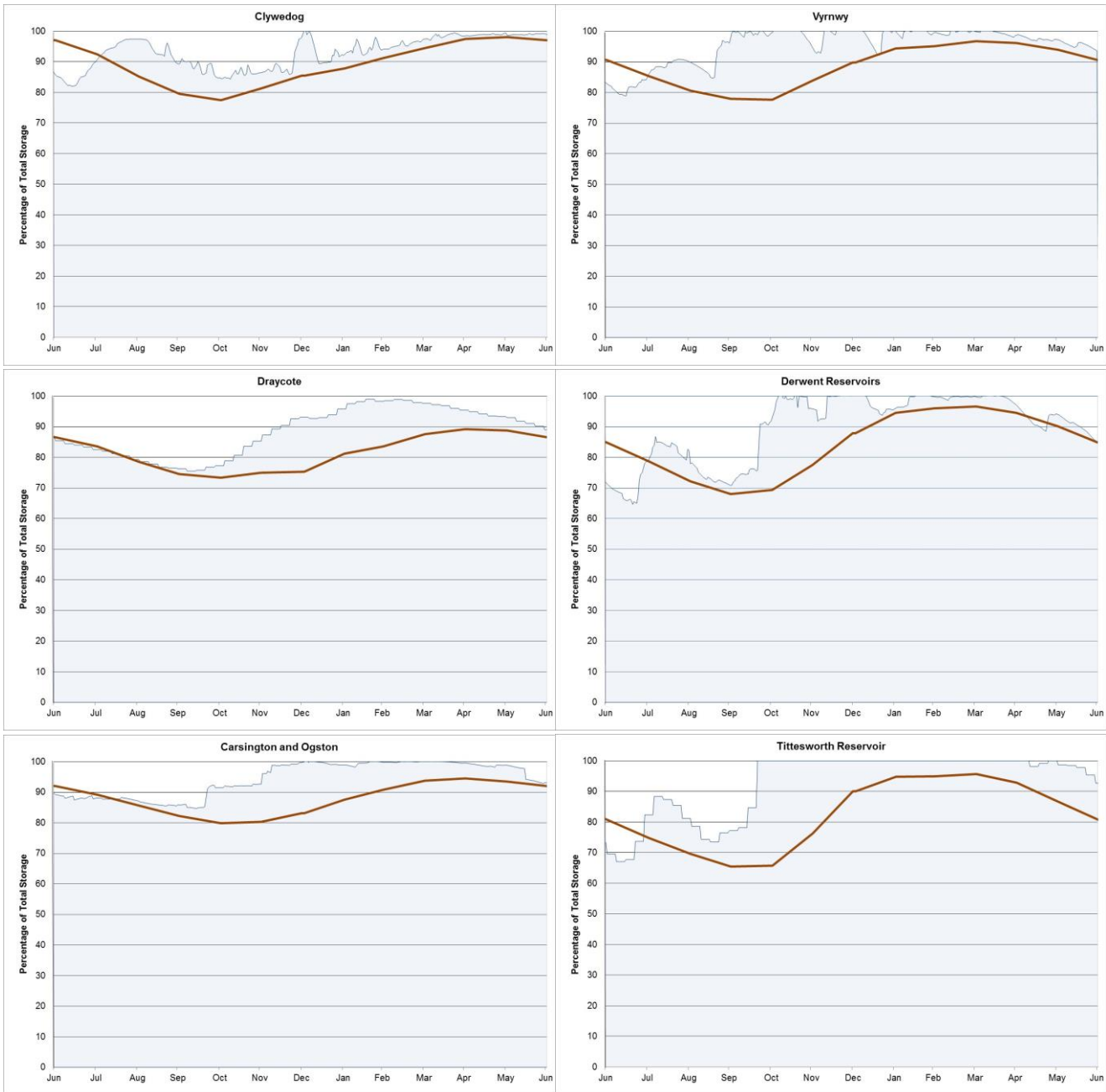


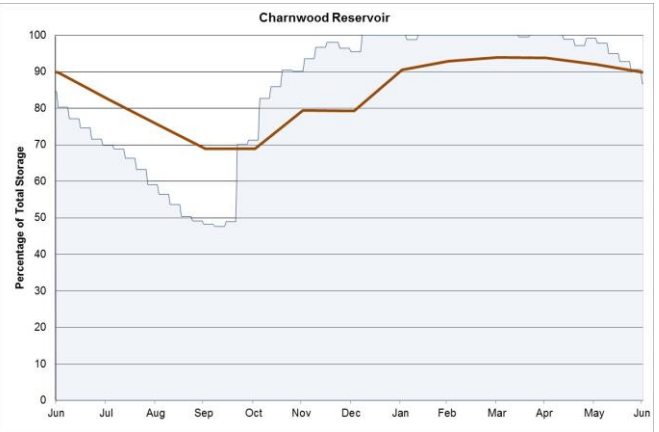
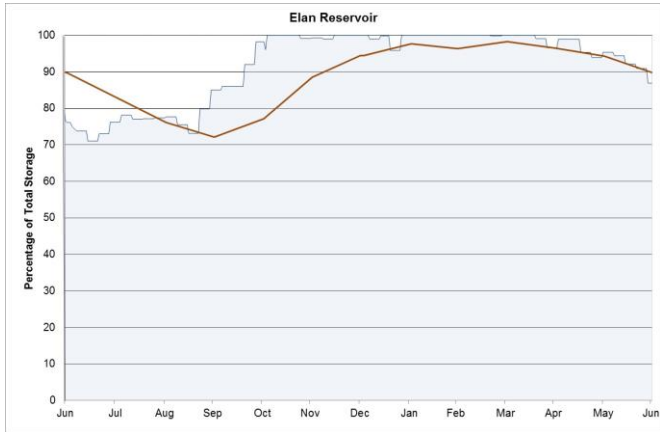
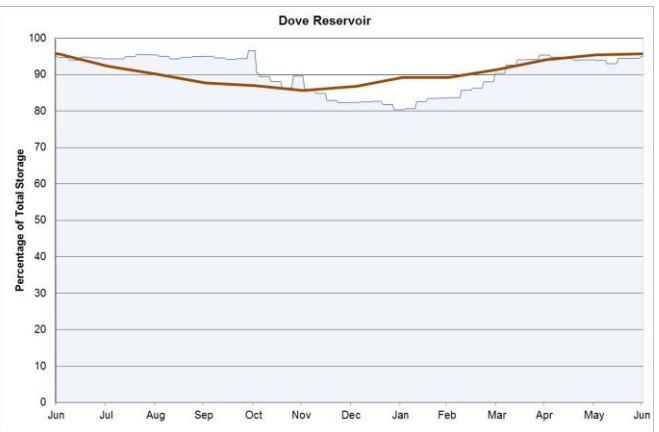
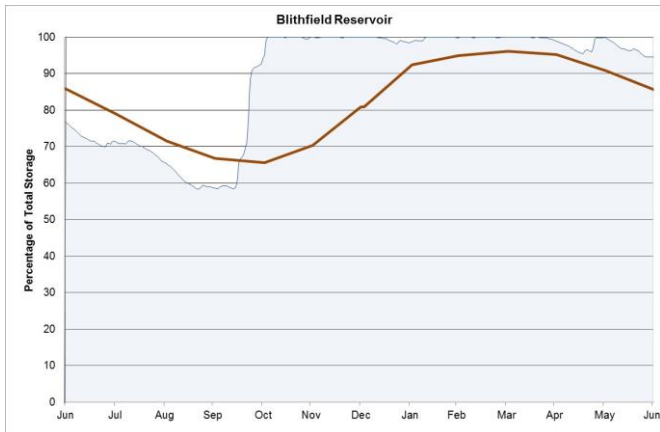


Source: Environment Agency, 2024.

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

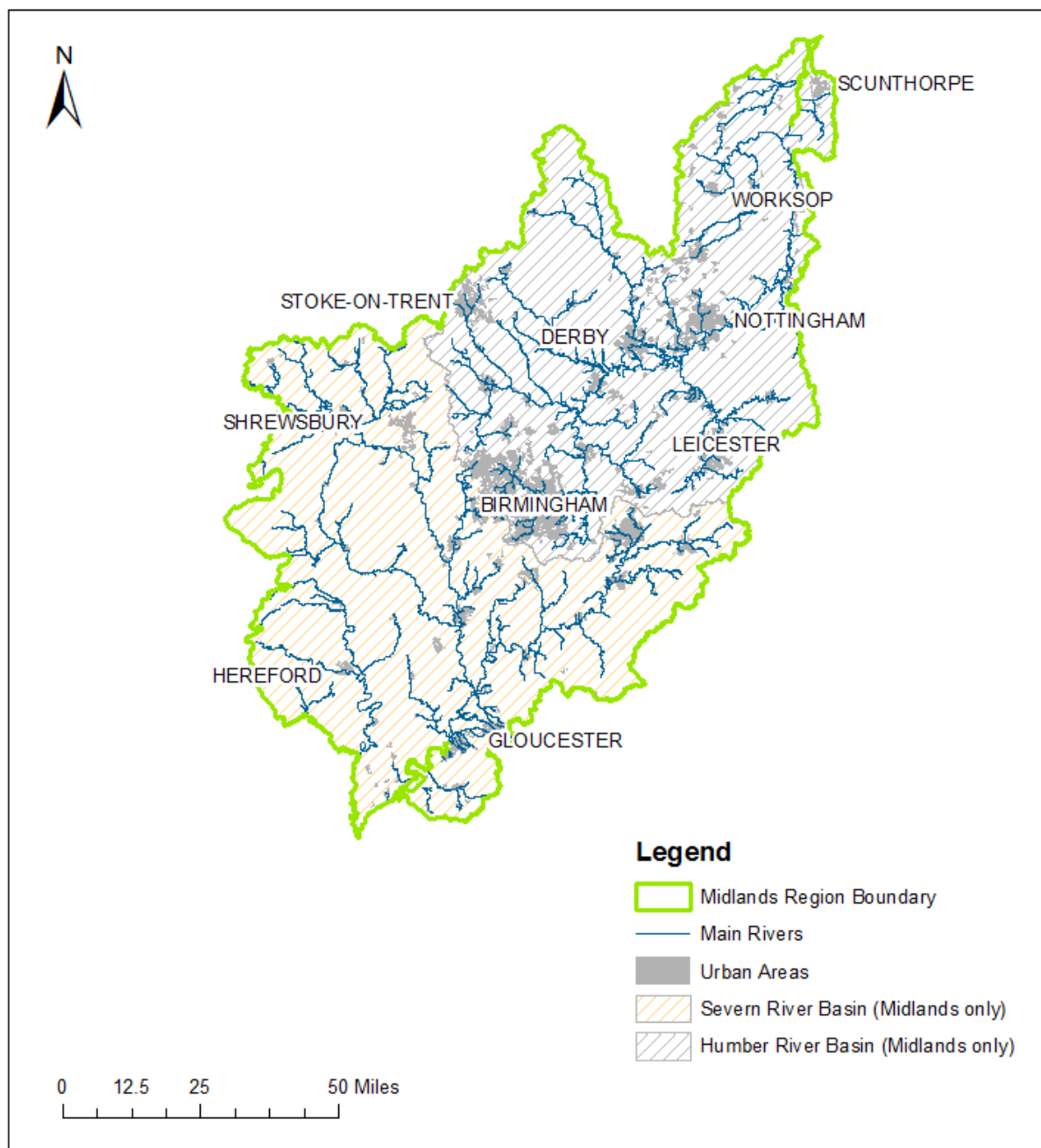
Value likely to fall within this band 8% of the time.

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

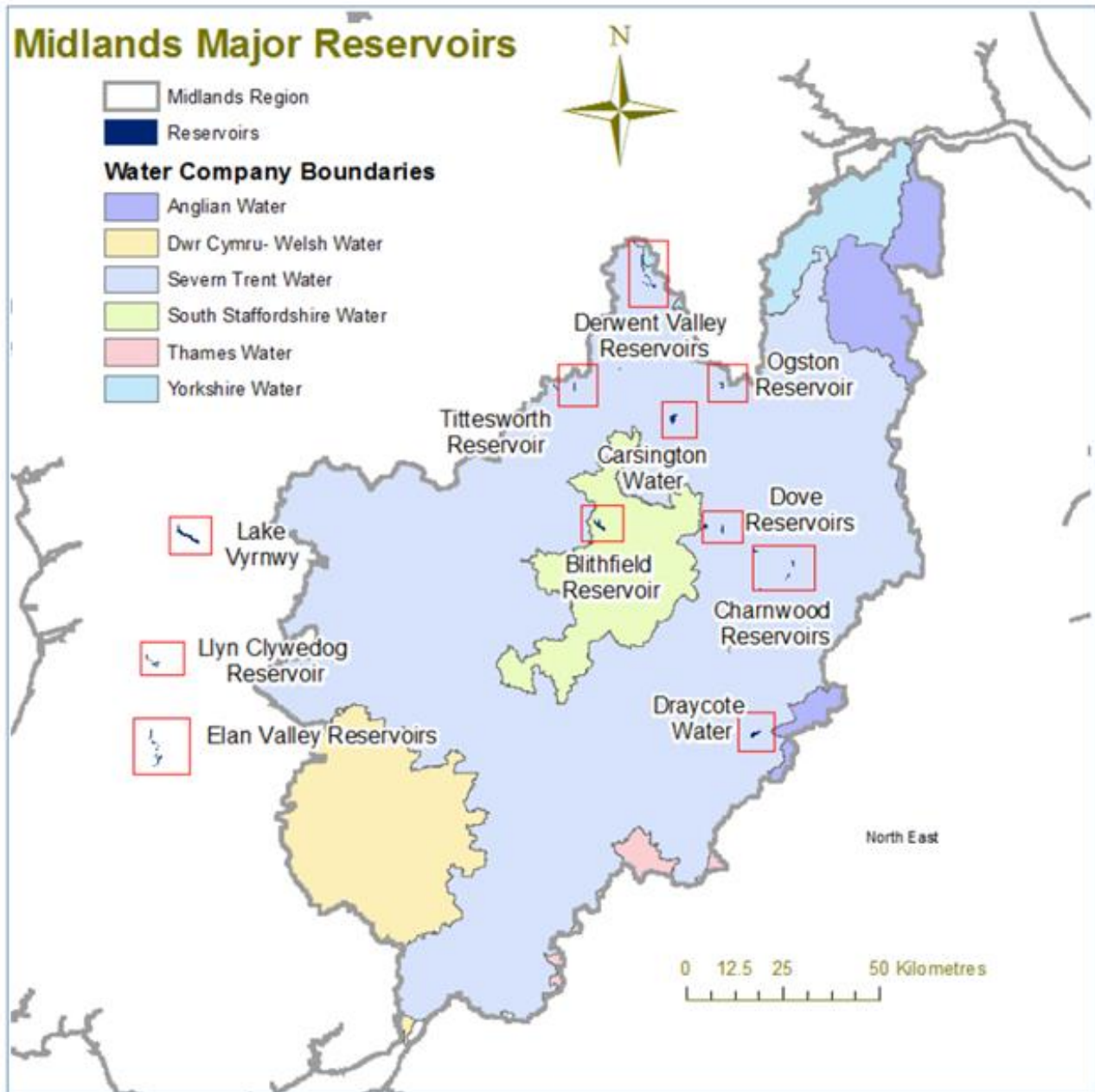
Figure 7.2: The 12 hydrological areas that make up the Midlands region. Natural Resources Wales are not currently producing a monthly water situation report.



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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	Jun 2024 rainfall % of long term average 1961 to 1990	Jun 2024 band	Apr 2024 to June cumulative band	Jan 2024 to June cumulative band	Jul 2023 to June cumulative band
Avon To Evesham	32	Notably Low	Normal	Exceptionally high	Exceptionally high
Derwent (Midlands)	61	Normal	Above normal	Notably high	Exceptionally high
Dove	61	Below Normal	Above normal	Exceptionally high	Exceptionally high
Lower Severn Estuary	42	Below Normal	Normal	Exceptionally high	Exceptionally high
Lower Trent	66	Normal	Normal	Notably high	Exceptionally high
Lower Wye	46	Below Normal	Normal	Notably high	Notably high
Mid Severn	62	Below Normal	Normal	Notably high	Exceptionally high
Shropshire Plains	70	Normal	Above normal	Exceptionally high	Exceptionally high
Soar	46	Below Normal	Normal	Notably high	Exceptionally high

Tame	60	Below Normal	Above normal	Exceptionally high	Exceptionally high
Upper Trent	70	Normal	Above normal	Exceptionally high	Exceptionally high
Welsh Mountains	63	Below Normal	Normal	Notably high	Exceptionally high

8.2 River flows table

Site name	River	Catchment	Jun 2024 band	May 2024 band
Auckley	Torne	Torne	Normal	Above normal
Bewdley	Severn	Severn Lower Mid	Normal	Normal
Butts Bridge	Lugg	Lugg	Normal	Normal
Clifton Hall	River Mease	Mease	Normal	Notably high
Deerhurst	Severn	Severn Lower	Normal	Normal
Derby St.Marys	Derwent	Derwent Der to Markeaton confl.	Normal	Above normal
Ebley Mill	Frome (Gloucs.)	Frome Gloucs.	Normal	Notably high
Evesham	Avon (Midlands)	Avon Warwks. Lower	Normal	Notably high
Great Bridgford	Sow	Sow Upper	Above normal	Notably high
Kegworth	Soar	Soar to Kingston Brook confl.	Normal	Above normal
Llanyblodwel	Tanat	Severn Upper River Tanat	Normal	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	Normal
Stareton	Avon (Midlands)	Avon Warwks. Upper	Normal	Above normal
Tenbury	Teme	Teme	Normal	Normal
Walcot	Tern	Tern	Above normal	Notably high
Wedderburn Bridge	Leadon	Leadon	Above normal	Notably 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.	Normal	Notably high

8.3 Groundwater table

Site name	Aquifer	End of Jun 2024 band	End of May 2024 band
Anthony's Cross	Severn Vale Permo Triassic Sandstone	Exceptionally 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	Normal	Above normal
Weir Farm	Bridgnorth Sandstone Formation	Exceptionally high	Exceptionally high