

# Monthly water situation report: Midlands

## 1 Summary - April 2024

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

**Rainfall** - Four of the Midlands hydrological catchments received notably high rainfall totals relative to the long-term average (LTA). Six hydrological catchments received above normal rainfall totals. Two hydrological areas received normal rainfall totals relative to the LTA.

**Soil moisture deficit** - As of the end of April, the north-western and parts of the north-eastern Midlands recorded a soil moisture deficit (SMD) between 11mm to 40mm with the rest of the Midlands soils being saturated or at 'field capacity'.

**River flows** - Eight sites recorded exceptionally high monthly mean flows compared to the LTA. Eight sites recorded notably high monthly mean flows and a further 5 sites recorded above normal flows compared to the LTA.

**Groundwater levels** - As of the end of April, 4 sites recorded exceptionally high groundwater level compared to the LTA. Two sites recorded above normal groundwater levels compared to the LTA. One site recorded normal groundwater levels compared to the LTA. One site had no data.

**Reservoir stocks** - As of the end of April, all of the Midlands reservoirs in this report recorded above average storage compared to the LTA. All of reservoirs are at or near full capacity.

### 1.1 Rainfall

During April, 4 of the Midlands hydrological catchments recorded notably high rainfall totals relative to the LTA. These areas received rainfall totals ranging from 143% to 156% of the LTA. A further 6 hydrological areas recorded above normal rainfall totals relative to the LTA. Two hydrological areas recorded normal rainfall relative to the LTA. These areas are Mid Severn and Lower Wye.

In the last 3 months, all hydrological areas in the Midlands recorded exceptionally high rainfall totals, ranging from 150% to 202% of the 3-month 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 received rainfall totals ranging from 139% to 163% of the LTA respectively.

Over the last 12 months, all hydrological catchments with the exception of the Lower Wye and Mid Severn recorded exceptionally high rainfall totals compared to the 12-month LTA. The Mid

Severn hydrological catchment received 134% of the LTA and Lower Wye received 133% of the LTA.

## **1.2 Soil moisture deficit and recharge**

As of the end of April, SMD has remained 10mm or less for the majority of the Midlands. Parts of the Midlands in the north-western and north-eastern areas recorded SMD totals of 11mm to 40mm. Soils in the eastern, southern and part of the western areas of the Midlands were slightly wetter than the LTA for April.

## **1.3 River flows**

In April, 8 flow monitoring sites recorded exceptionally high monthly mean flows. These were located mainly in the western part of the Midlands ranging from 186% to 276% of the LTA. A further 8 sites recorded notably high monthly mean flows compared to the LTA. Five sites recorded above normal which were Auckley, Kegworth, North Muskham, Stareton and Worksop.

## **1.4 Groundwater levels**

As of the end of April, groundwater monitoring stations are of normal levels or above. Four sites; Weir Farm, Rider Point, Coxmoor and Four Crosses recorded exceptionally high groundwater levels compared to the LTA. Southards Lane and Crossley Hill in the north of the Midlands recorded above normal groundwater levels compared to the LTA. Ram Hall recorded normal groundwater levels compared to the LTA. Anthonys Cross had no data.

## **1.5 Reservoir stocks**

As of the end of April, all of the Midlands reservoirs in this report recorded storage levels above the LTA. Reservoir storage across the region ranged from 90% 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**

Throughout April, Elan storage was above the release control line up until the 26<sup>th</sup> April, after which point storage has fallen below the release control line. Flows at Redbrook were above the regulation threshold throughout April.

## 1.8 Water abstraction restrictions

As of 8 May 2024 there are 2 water abstraction licence restrictions in place across the Midlands affecting 1 licence 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](mailto:midlandshydrology@environment-agency.gov.uk)

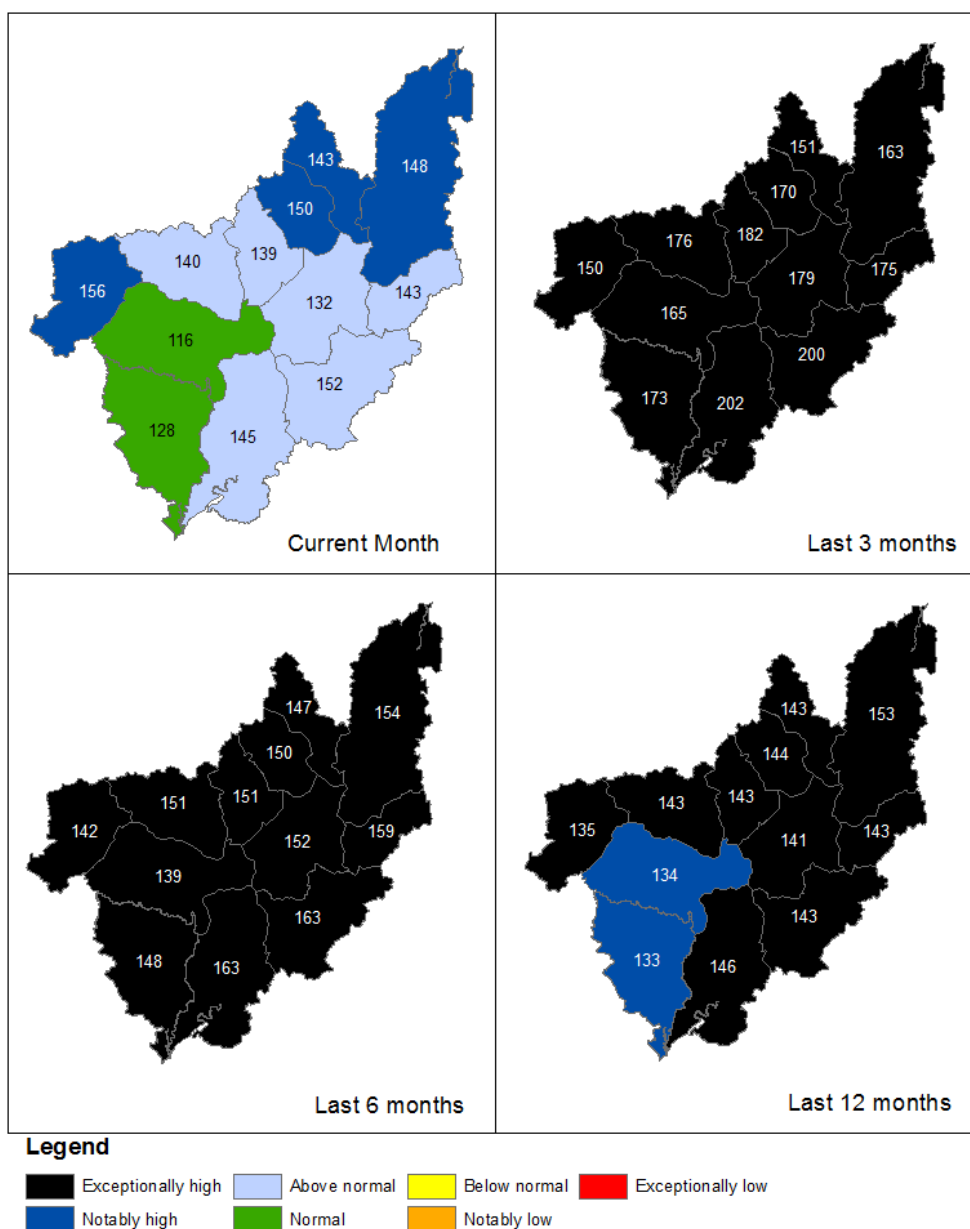
Contact details: 03708 506 506

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## 2 Rainfall

### 2.1 Rainfall map

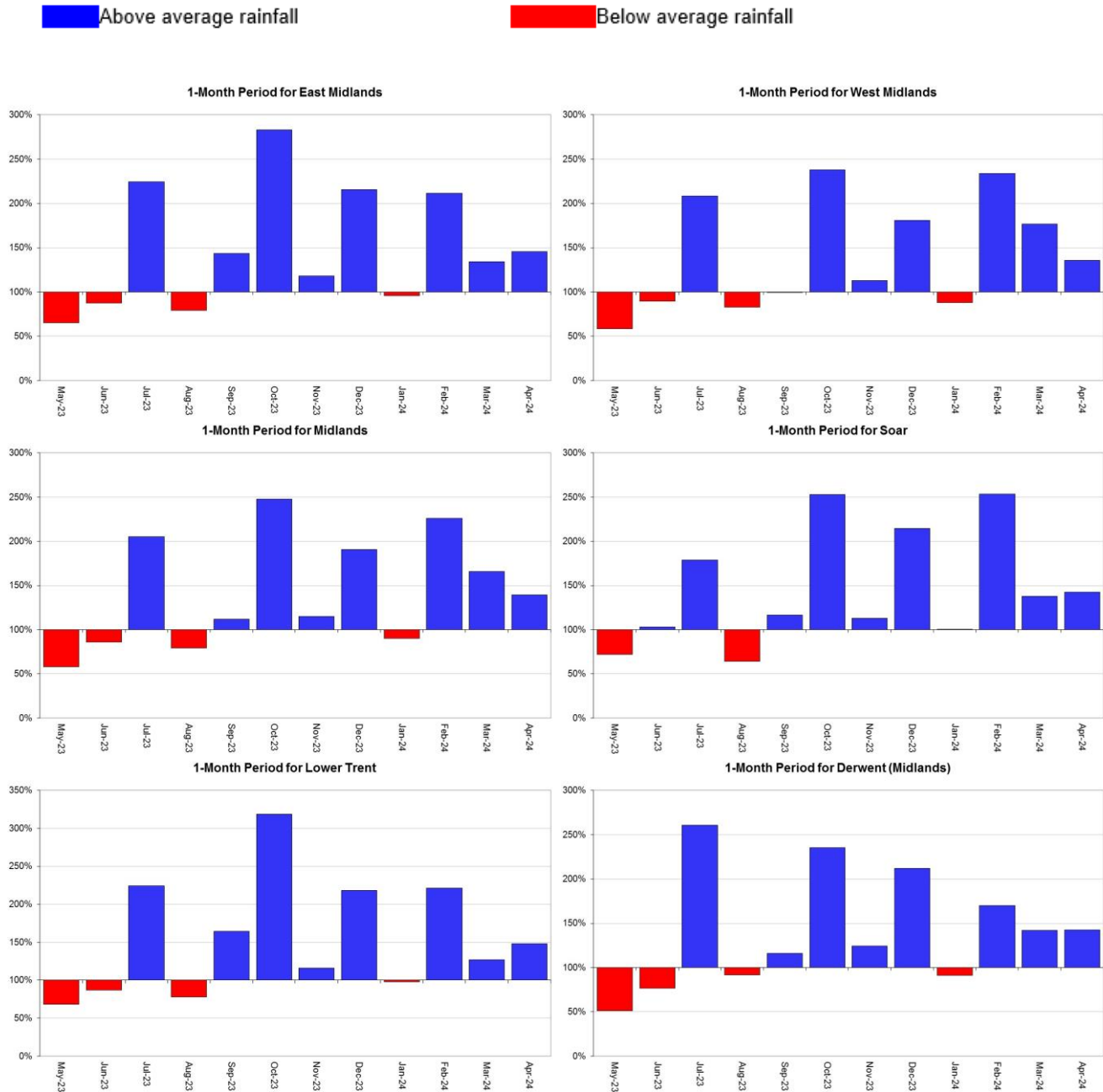
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 30 April 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information. Please see Section 7.4 for a map of the hydrological catchments for which rainfall is reported on.



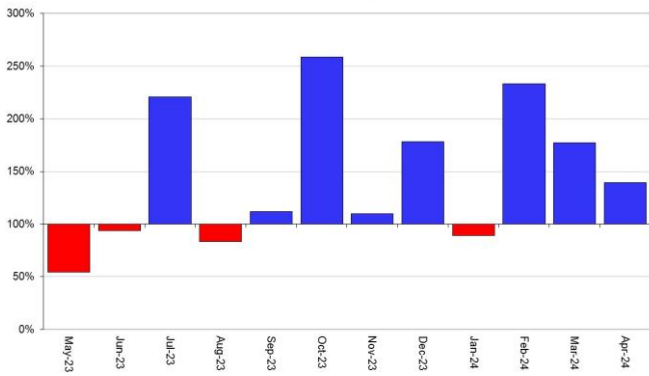
Rainfall data for 2023 and 2024, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2024). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset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

## 2.2 Rainfall charts

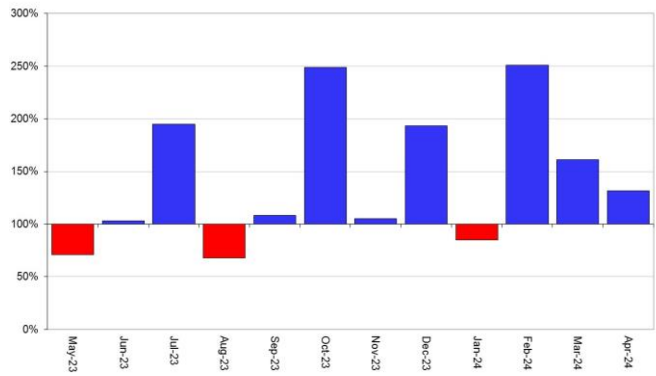
Figure 2.2: Monthly rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average for hydrological areas across the Midlands region.



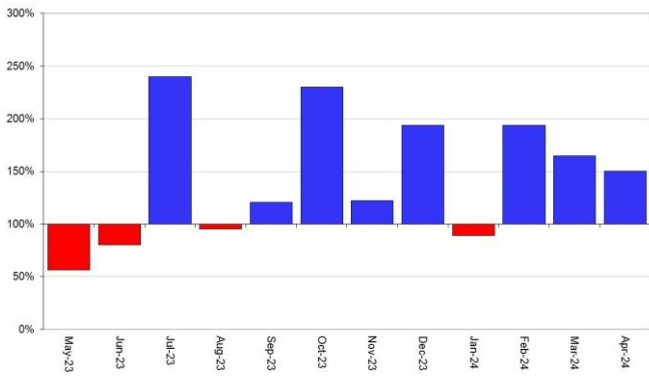
1-Month Period for Upper Trent



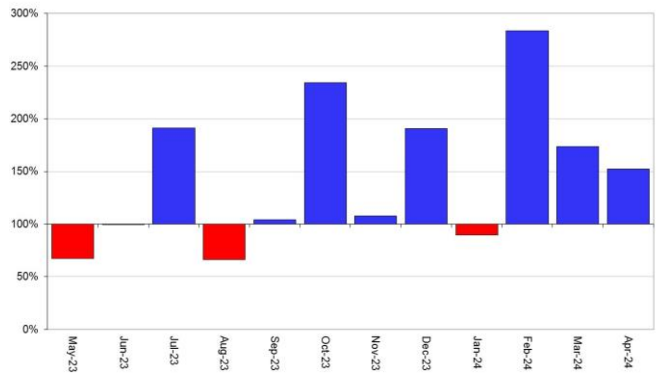
1-Month Period for Tame



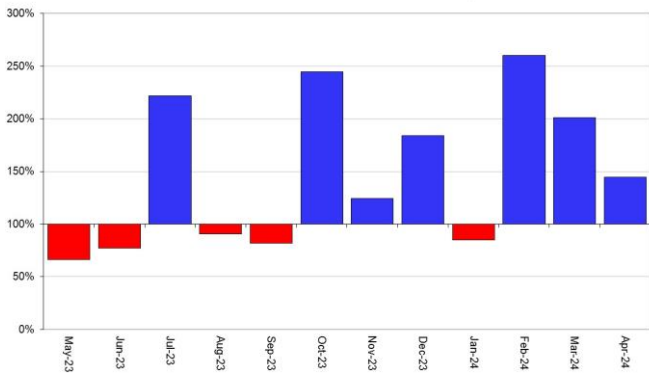
1-Month Period for Dove



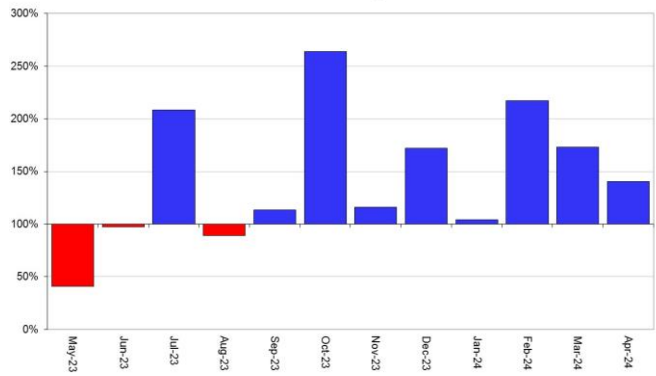
1-Month Period for Avon to Evesham



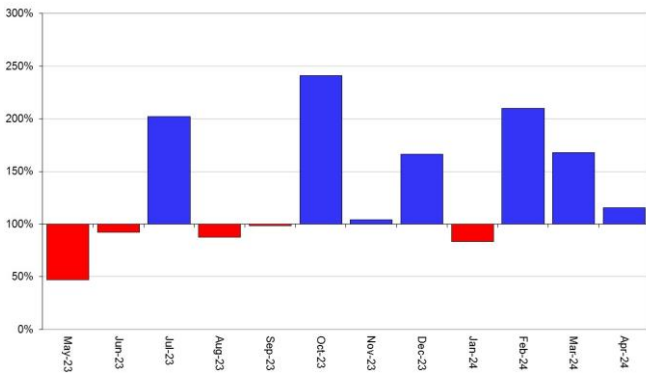
1-Month Period for Lower Severn Estuary



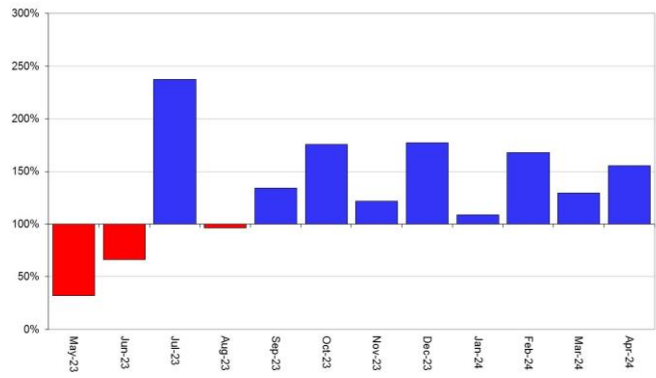
1-Month Period for Shropshire Plains



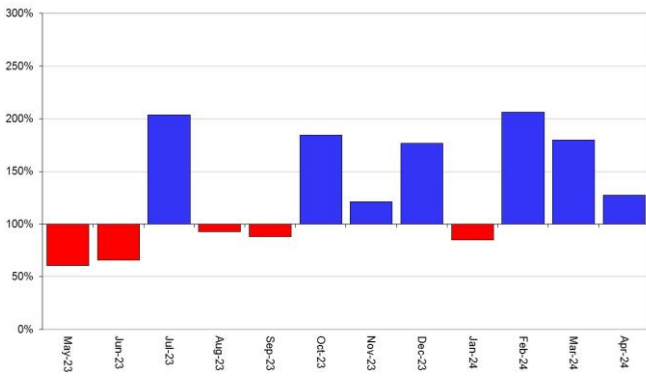
1-Month Period for Mid Severn



1-Month Period for Welsh Mountains



1-Month Period for Lower Wye



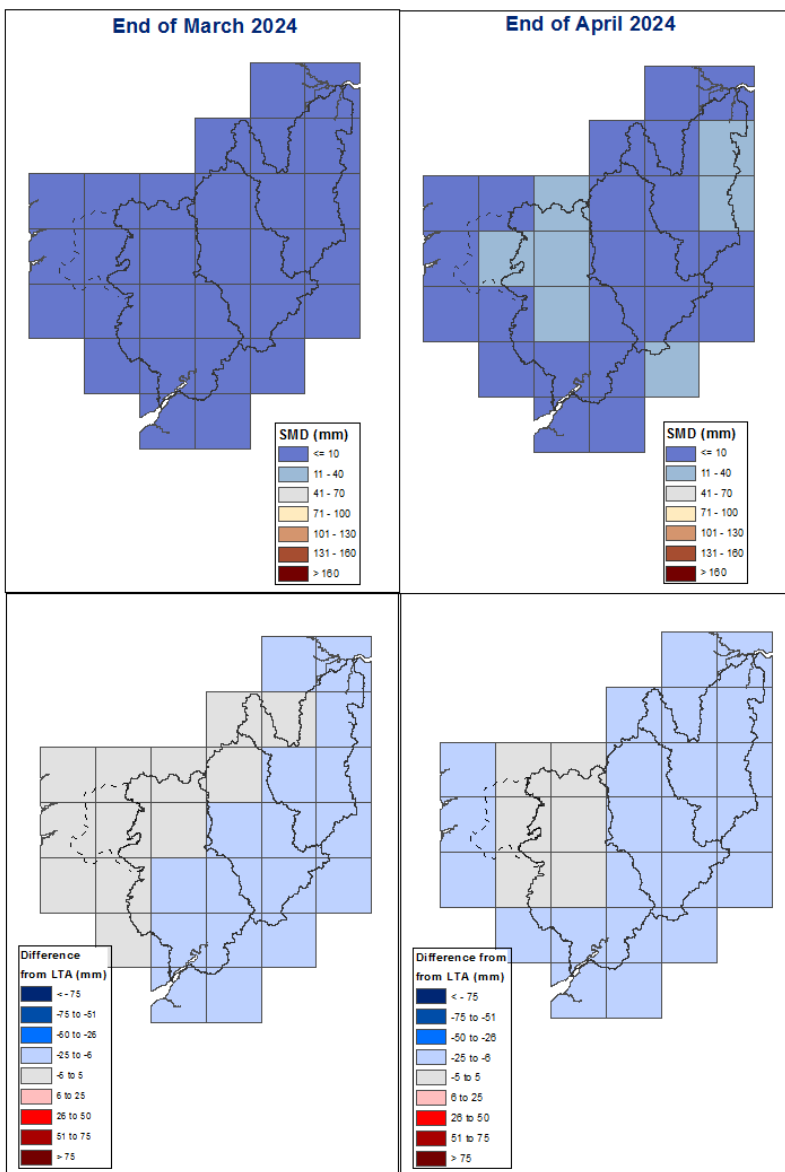
Daily Rainfall Tool data (from January 2023), final HadUK rainfall data until December 2022 (Source: Environment Agency/Met Office, Crown Copyright, 2024).



### 3 Soil moisture deficit

#### 3.1 Soil moisture deficit map

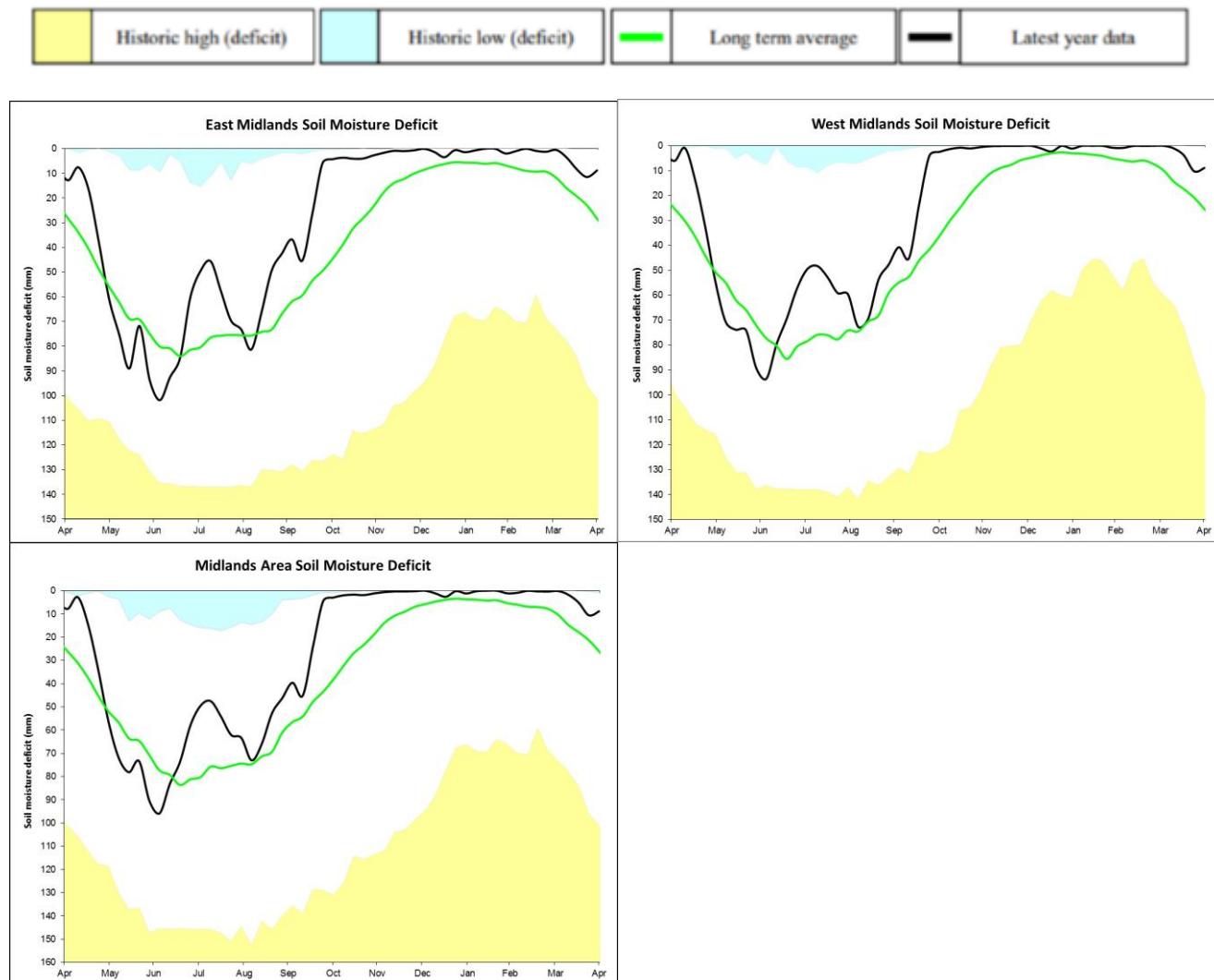
Figure 3.1: Soil moisture deficits for weeks ending 30 April 2024. Shows the difference (mm) of the actual soil moisture deficit from the 1961 to 1990 long term average soil moisture deficits. MORECS data for real land use.



(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.

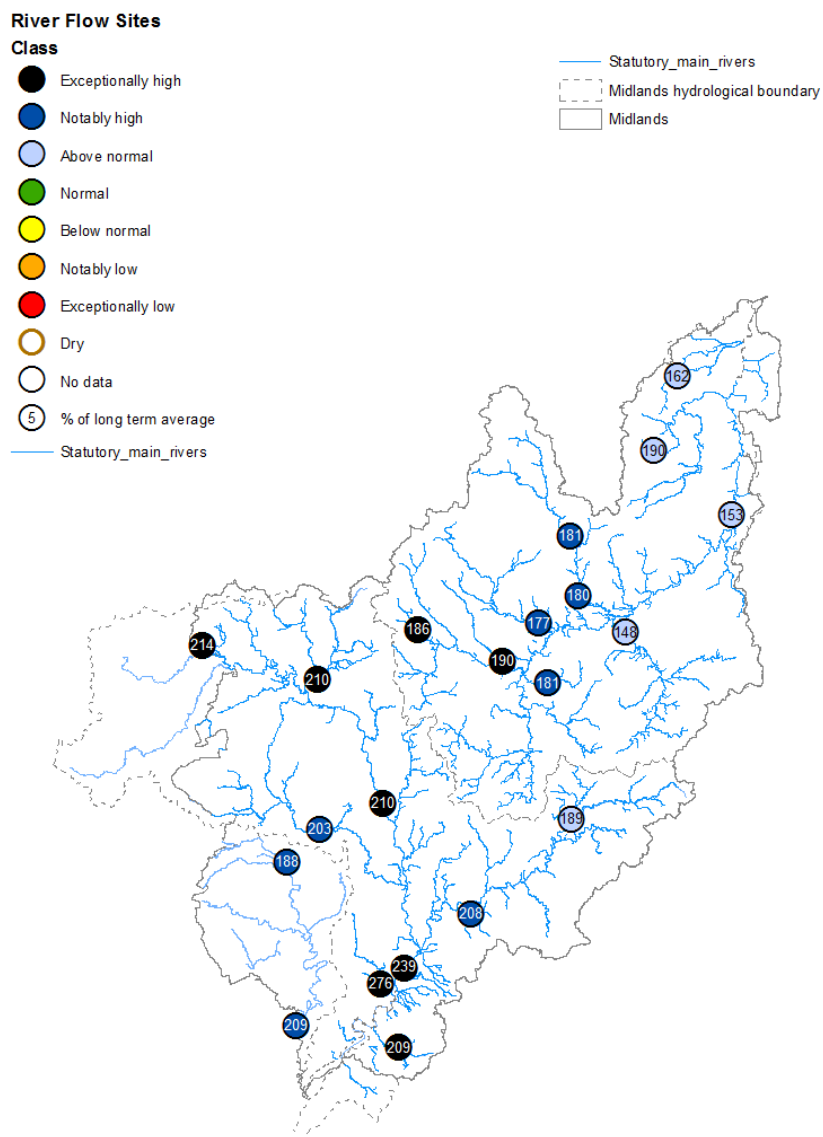


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## 4 River flows

### 4.1 River flows map

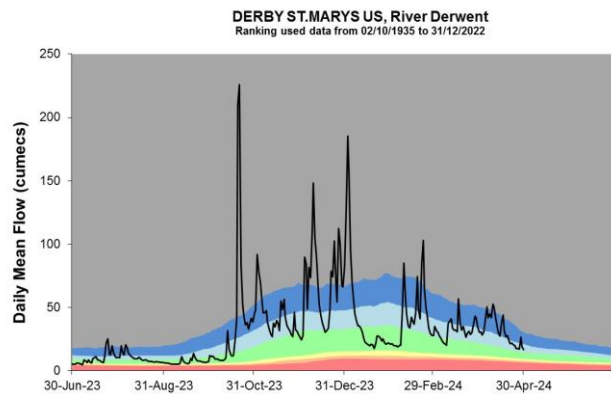
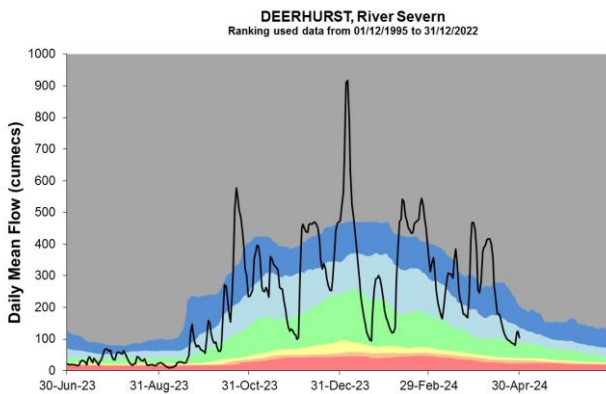
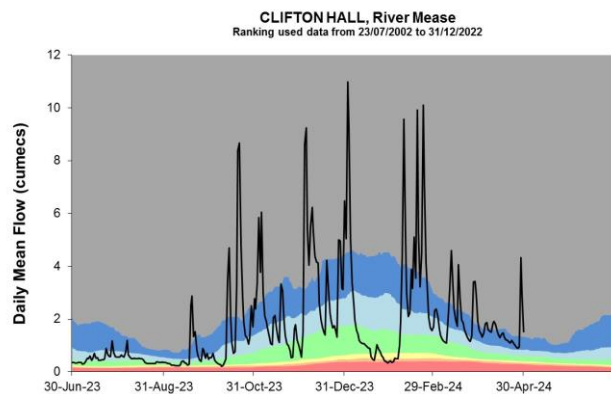
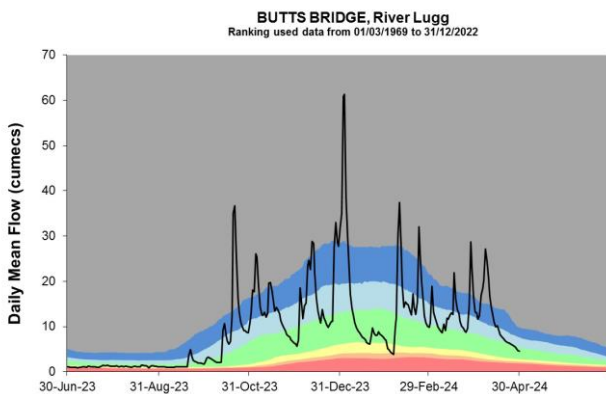
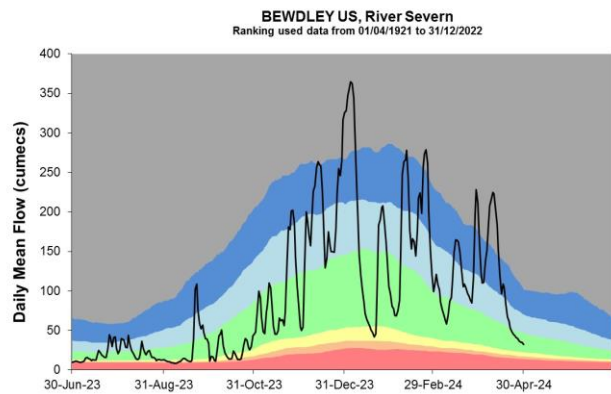
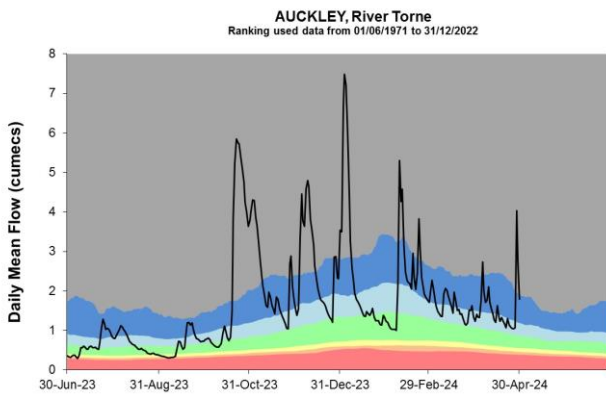
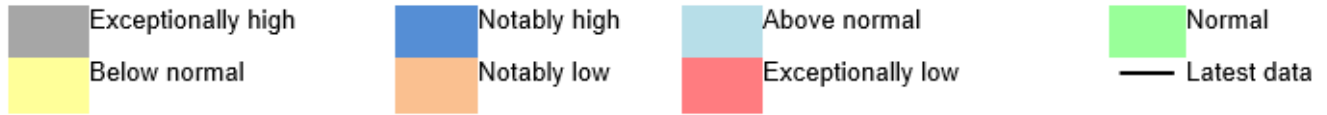
Figure 4.1: Monthly mean river flow for indicator sites for April 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic April monthly means. Table available in the appendices with detailed information.

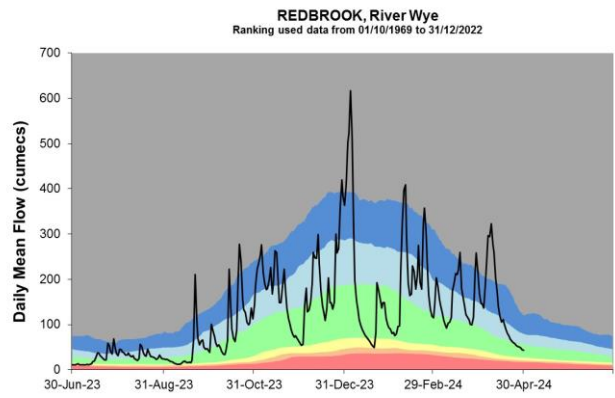
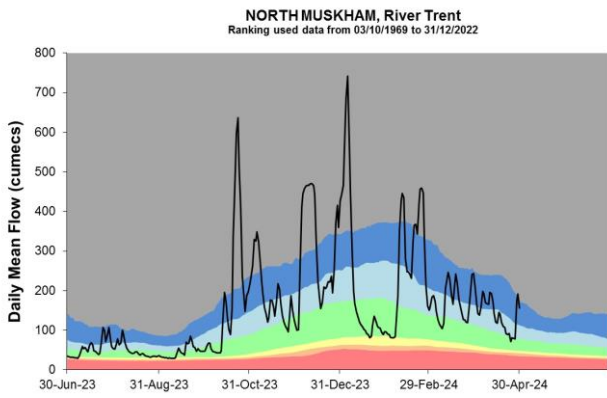
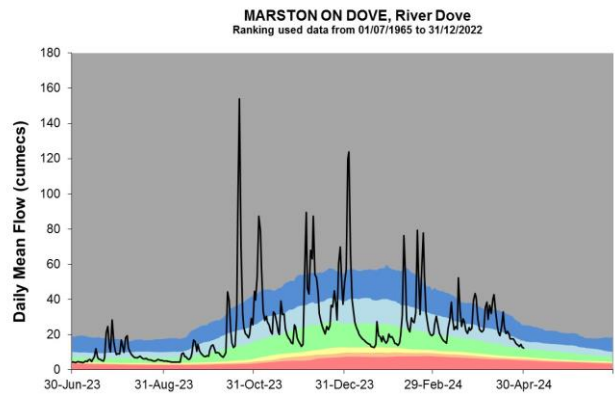
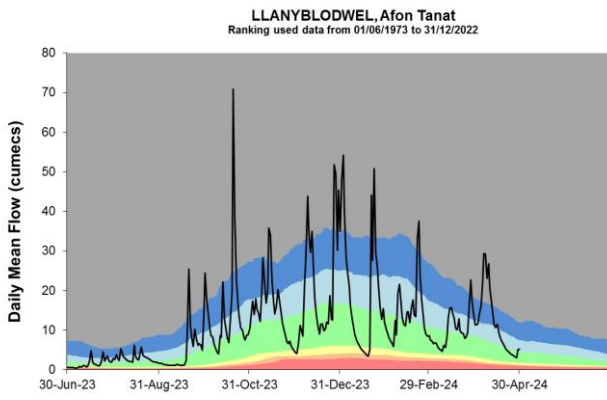
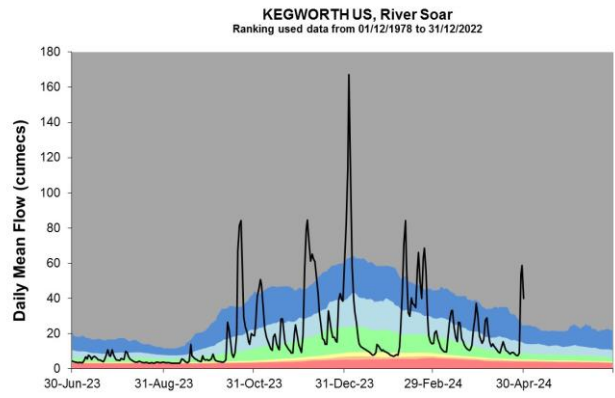
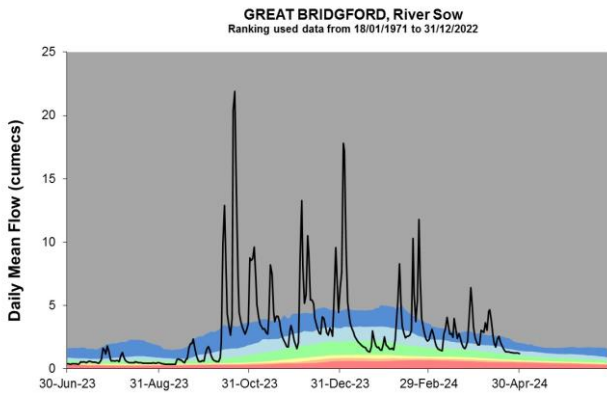
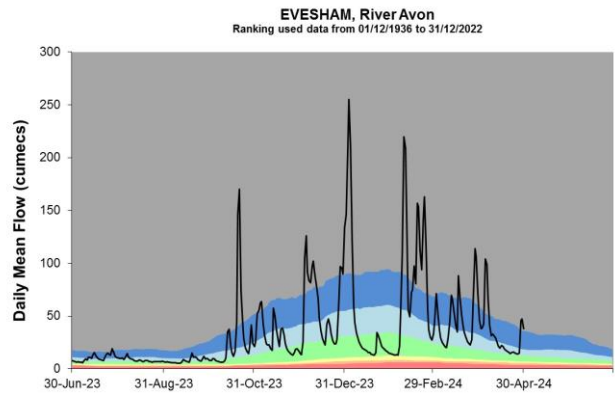
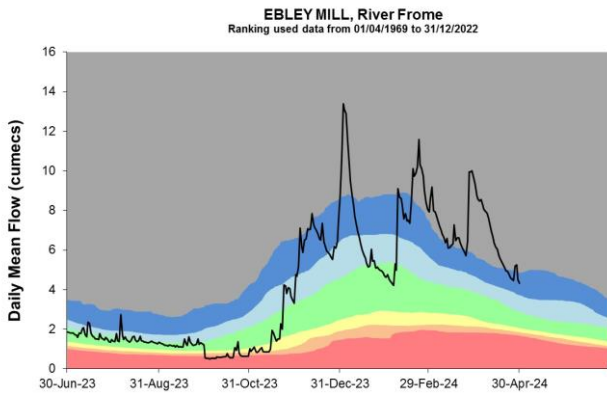


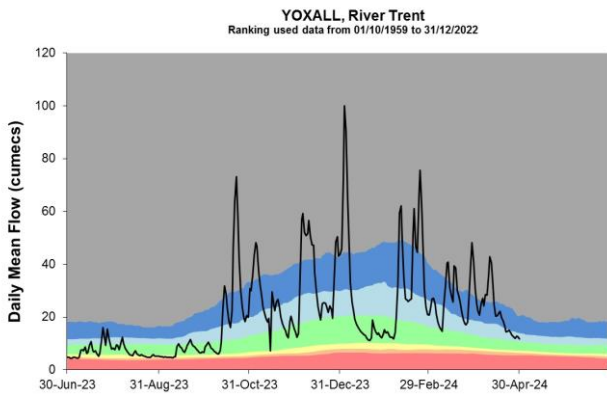
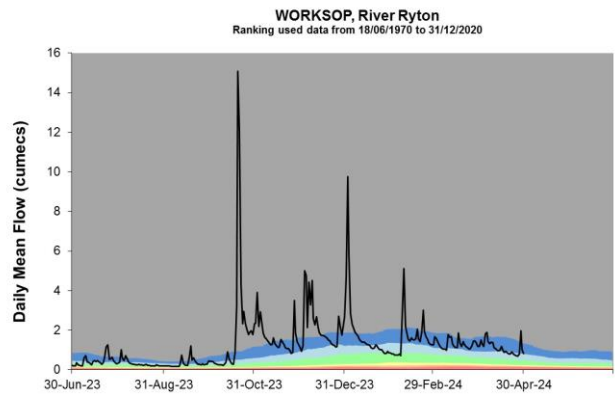
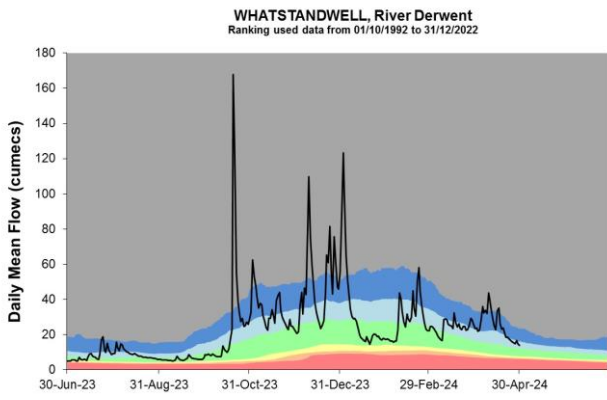
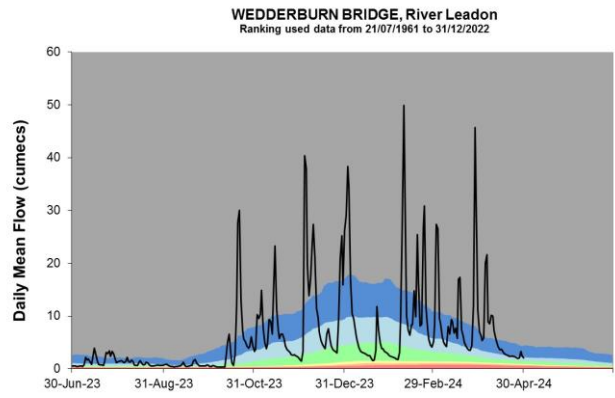
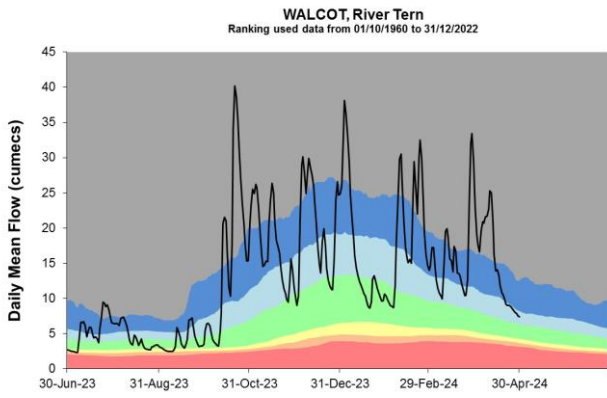
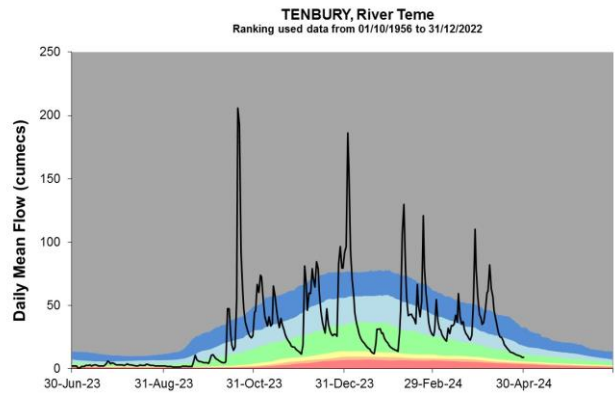
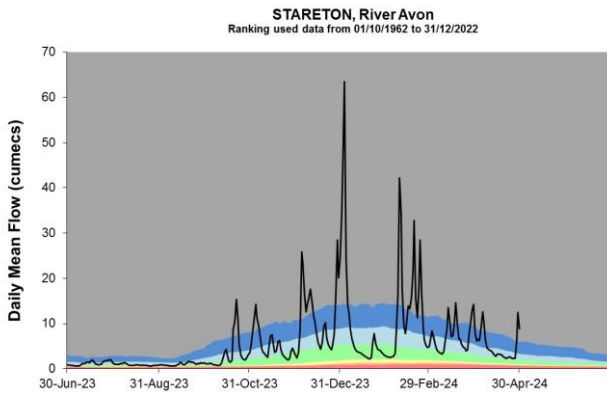
(Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

## 4.2 River flow charts

Figure 4.2: Daily mean river flow for index sites over the past 10 months, compared to an analysis of historic daily mean flows.







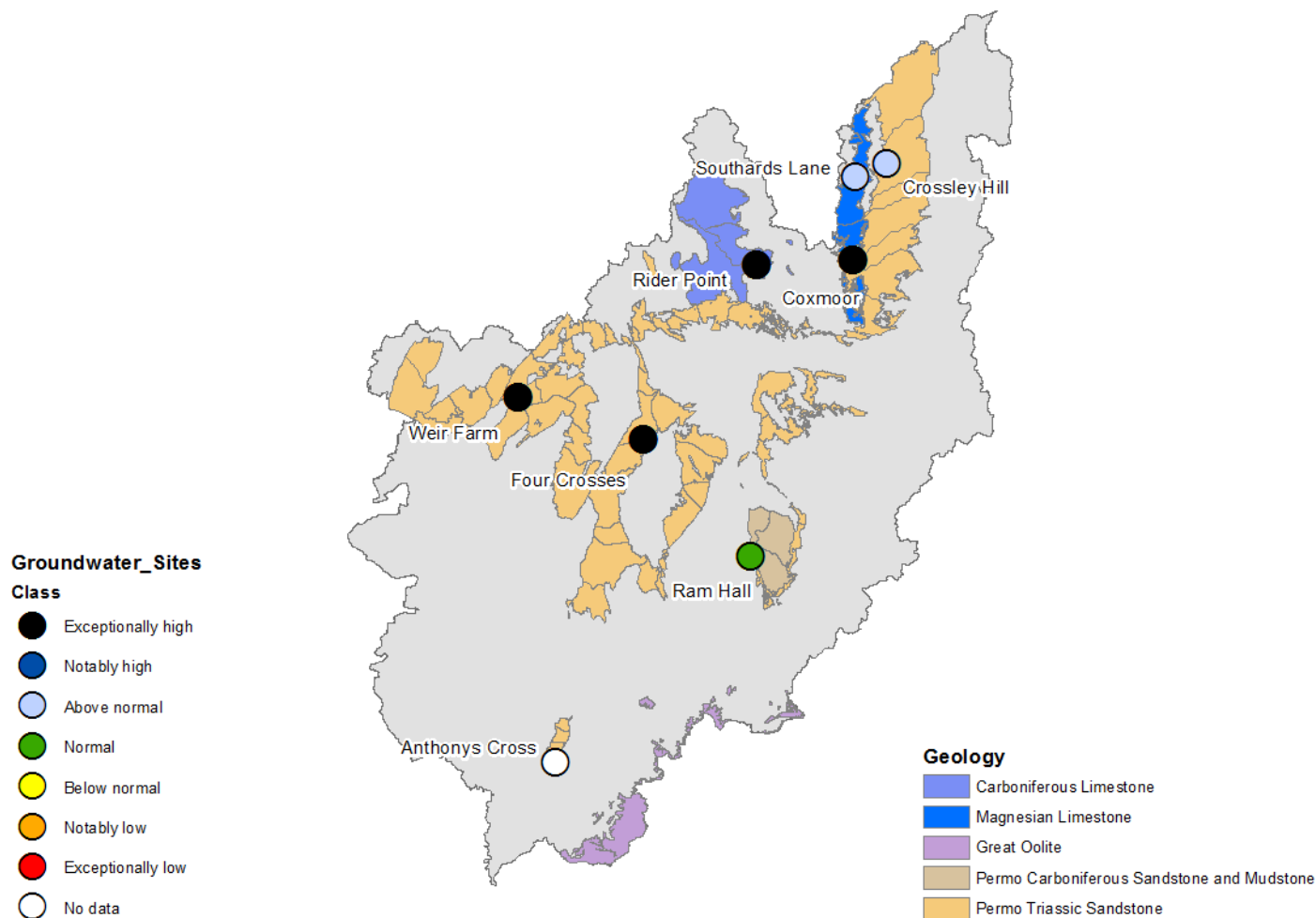
Source: Environment Agency.



## 5 Groundwater levels

### 5.1 Groundwater levels map

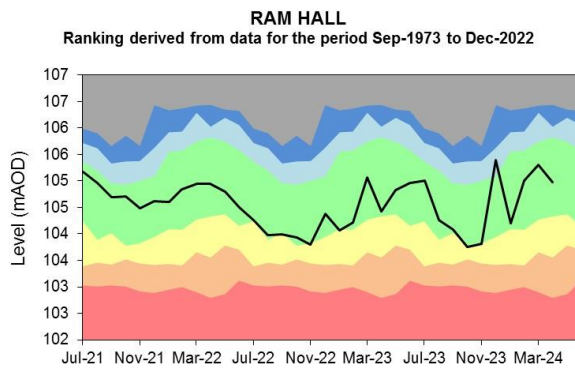
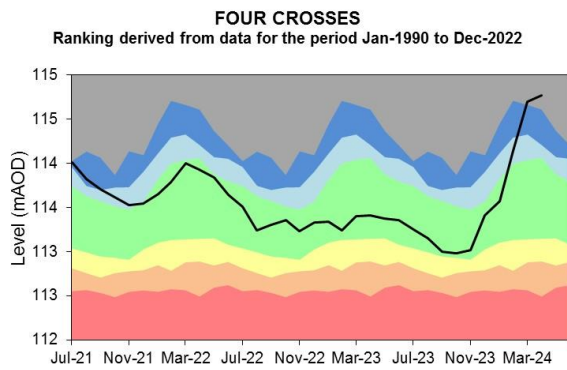
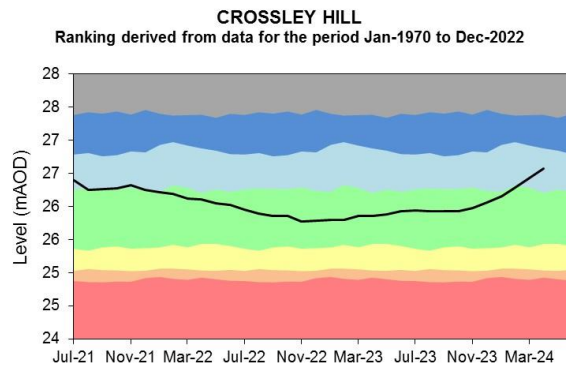
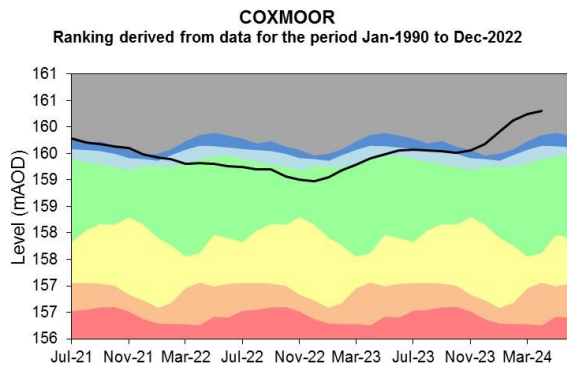
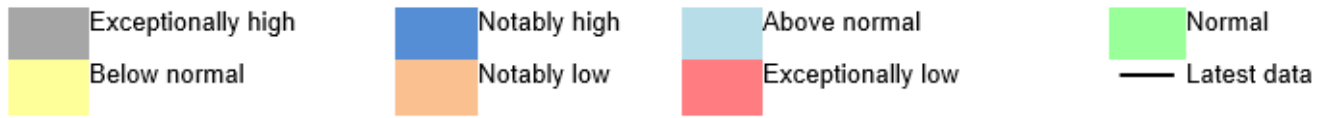
Figure 5.1: Groundwater levels for indicator sites at the end of April 2024, classed relative to an analysis of respective historic April levels. Table available in the appendices with detailed information.



(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

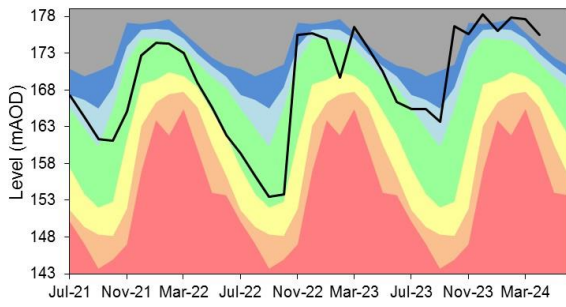
Figure 5.2: End of month groundwater levels at index groundwater level sites for major aquifers. 34 months compared to an analysis of historic end of month levels.





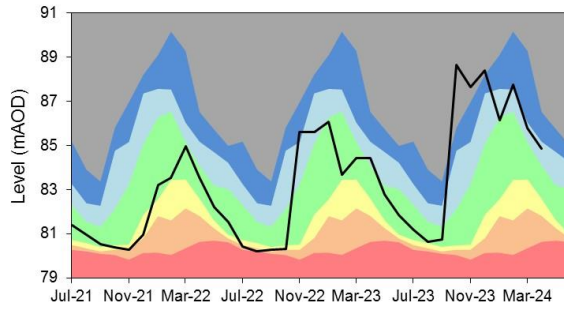
### RIDER POINT

Ranking derived from data for the period Jan-1976 to Dec-2022



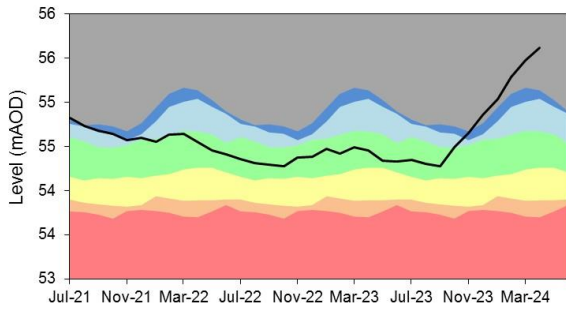
### SOUTHARDS LANE

Ranking derived from data for the period Jan-1973 to Dec-2022



### WEIR FARM

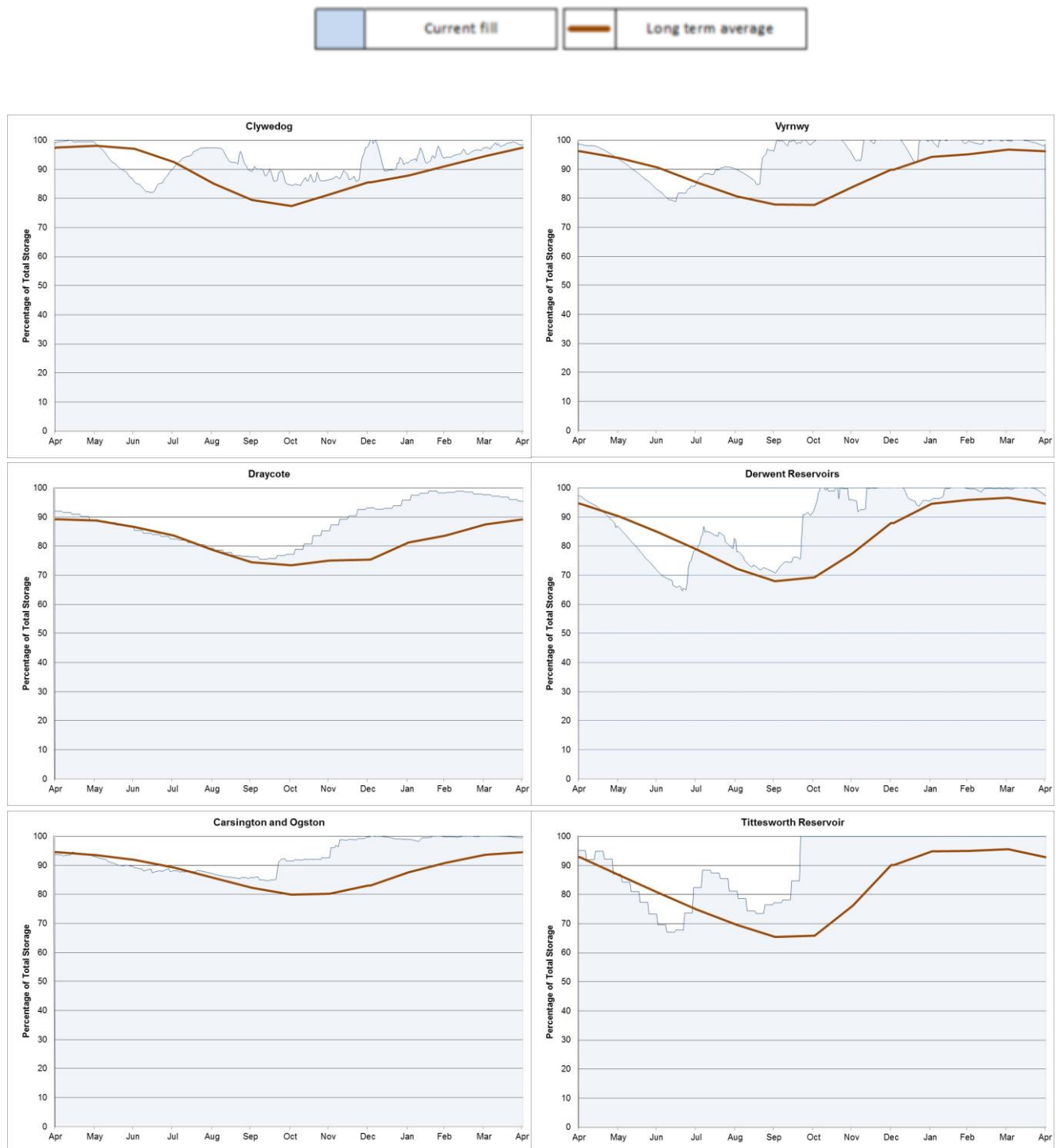
Ranking derived from data for the period Jan-2003 to Dec-2022

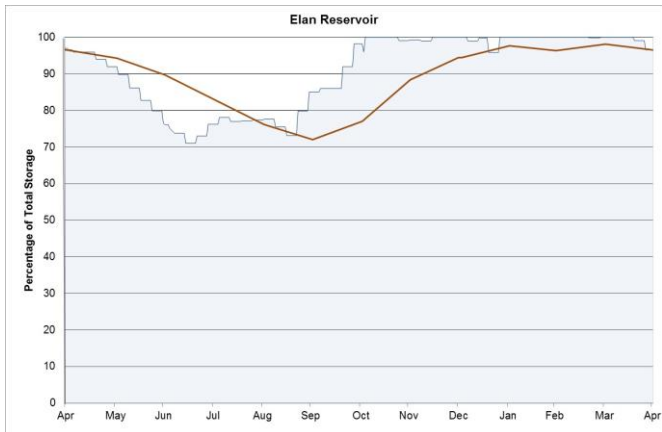
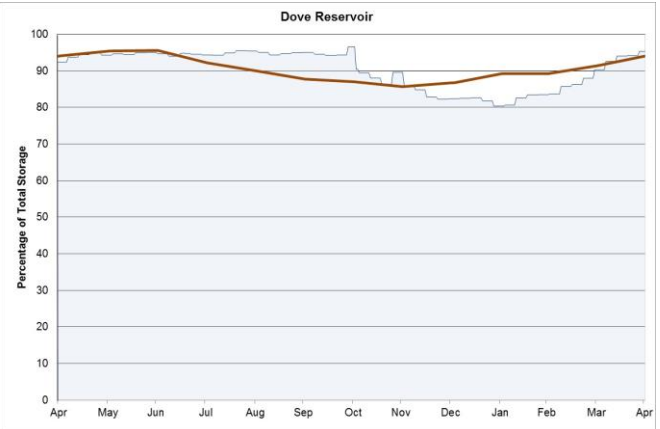
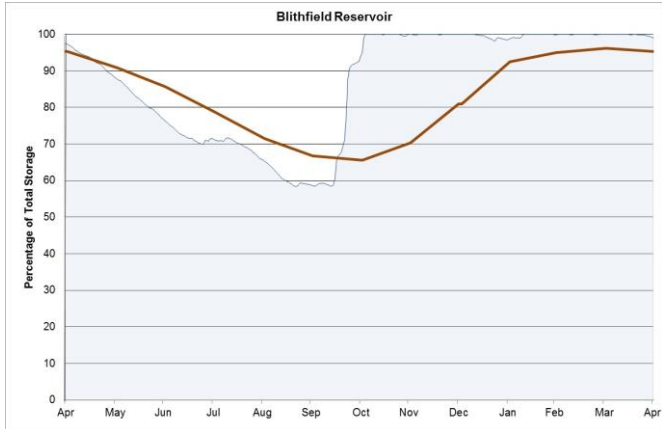


Source: Environment Agency, 2024.

## 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 ( $\text{m}^3\text{s}^{-1}$ ).

#### **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**

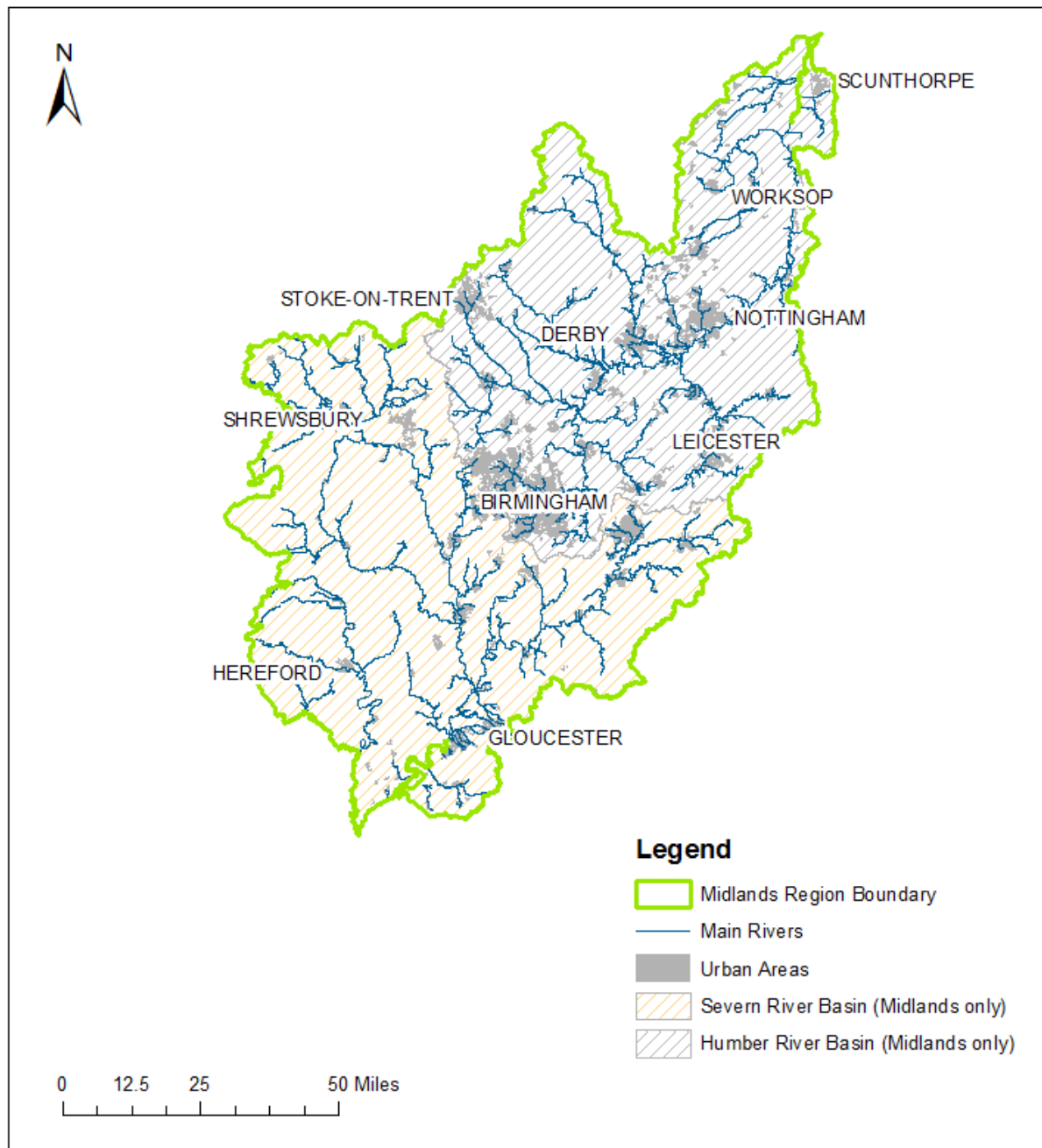
Value likely to fall within this band 8% of the time.

### **Exceptionally low**

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

### 7.3 Midlands regional coverage

Figure 7.3: The Midlands regional boundary and the hydrological boundaries of the River Severn and River Trent.



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## 7.4 Midlands hydrological areas

Figure 7.4: The 12 hydrological areas that make up the Midlands region. Natural Resources Wales are not currently producing a monthly water situation report.

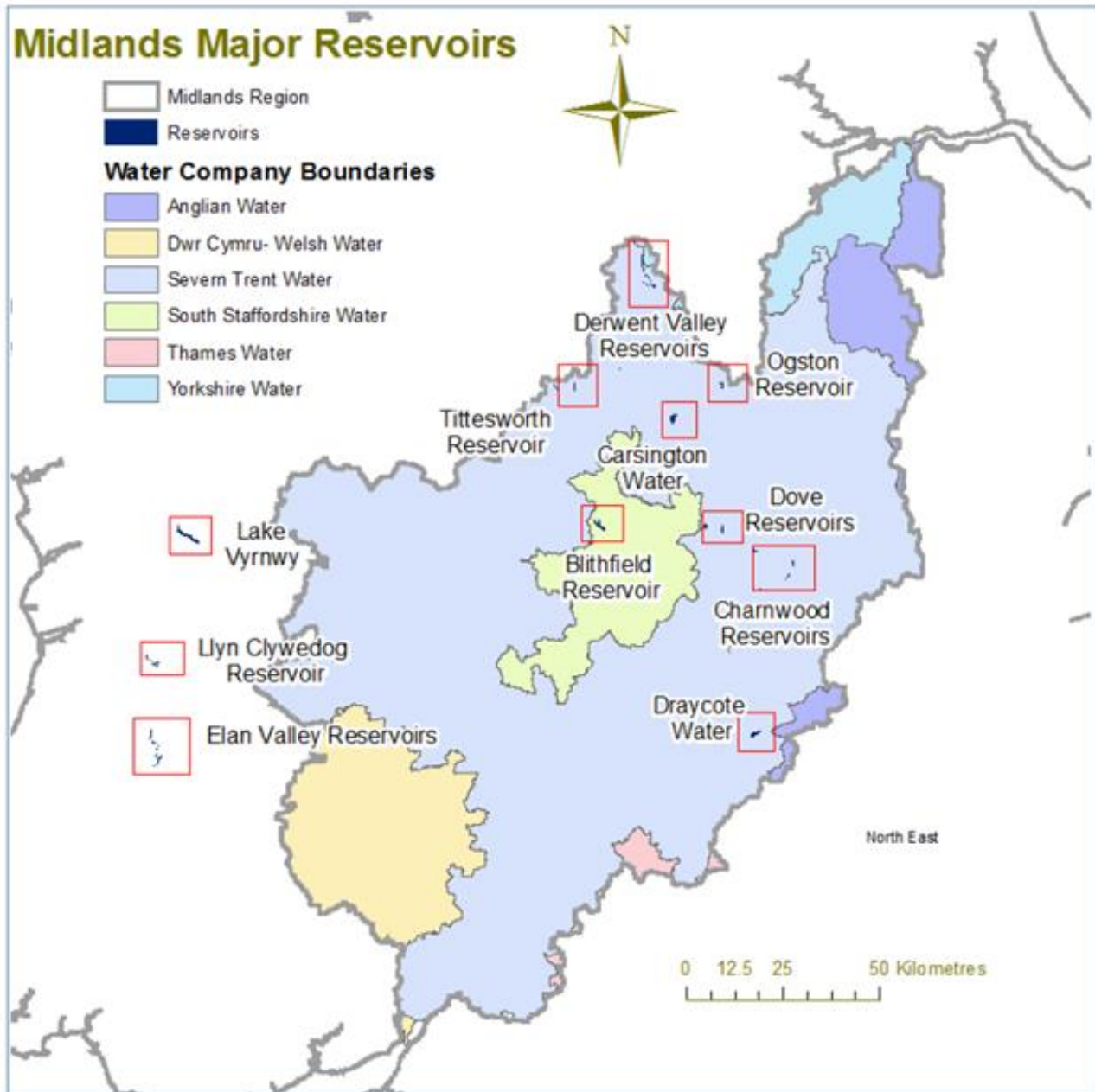


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## 7.5 Midlands major reservoirs

Figure 7.5: Location of major reservoirs in the Midlands.



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## 8 Appendices

### 8.1 Rainfall table

Hydrological area	Apr 2024 rainfall % of long term average 1961 to 1990	Apr 2024 band	Feb 2024 to April cumulative band	Nov 2023 to April cumulative band	May 2023 to April cumulative band
Avon To Evesham	152	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Derwent (midlands)	143	Notably High	Exceptionally high	Exceptionally high	Exceptionally high
Dove	150	Notably High	Exceptionally high	Exceptionally high	Exceptionally high
Lower Severn Estuary	145	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Lower Trent	148	Notably High	Exceptionally high	Exceptionally high	Exceptionally high
Lower Wye	128	Normal	Exceptionally high	Exceptionally high	Notably high
Mid Severn	116	Normal	Exceptionally high	Exceptionally high	Notably high
Shropshire Plains	141	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Soar	143	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high

Tame	132	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Upper Trent	139	Above Normal	Exceptionally high	Exceptionally high	Exceptionally high
Welsh Mountains	156	Notably High	Exceptionally high	Exceptionally high	Exceptionally high

## 8.2 River flows table

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

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

### 8.3 Groundwater table

Site name	Aquifer	End of Apr 2024 band	End of Mar 2024 band
Coxmoor	Permo Triassic Sandstone	Exceptionally high	Exceptionally high
Anthony's Cross	Severn Vale Permo Triassic Sandstone	No data	Notably 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