Midlands water situation report: July 2024

1 Summary - July 2024

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

Rainfall - During July, all hydrological catchments in the Midlands, except Shropshire Plains, received normal rainfall amounts compared to the long term average (LTA). Shropshire Plains received above normal rainfall.

Soil moisture deficit – At the end of July, soil moisture deficit (SMD) increased across the whole of the Midlands from the previous month, meaning soils are drier than in June. However SMD in the Midlands area is less than the LTA, meaning that most soils are still wetter than usual for this time of year.

River flows - In July, the majority of flow monitoring sites recorded above normal monthly mean flows compared to the LTA. Seven sites, Bewdley, Butts Bridge, Deerhurst, Ebley Mill, Redbrook, Tenbury, and Yoxall, recorded normal flows compared to the LTA. Four sites, Evesham, Great Bridgford, Walcot, and Wedderburn Bridge, recorded notably high flows compared to the LTA.

Groundwater levels – As of the end of July, 3 sites, Coxmoor, Four Crosses, and Weir Farm, recorded exceptionally high groundwater levels compared to the LTA. Three sites, Anthony's Cross, Crossley Hill, and Rider Point, recorded notably high groundwater levels compared to the LTA. The remaining 2 sites, Ram Hall and Southards Lane, recorded normal groundwater levels compared to the LTA.

Reservoir stocks - As of the end of July, the majority of Midlands reservoirs in this report recorded above average storage and 3 reservoirs recorded below average storage. These are Elan, Charnwood, and Derwent reservoirs.

1.1 Rainfall

During July, all hydrological catchments in the Midlands except Shropshire Plains received normal rainfall totals compared to the LTA. These areas received rainfall totals ranging from 121% to 146% of the LTA. Shropshire Plains received above normal rainfall, with totals of 155% of the LTA.

In the last 3 months, all hydrological catchments in the Midlands except Shropshire Plains, received normal rainfall amounts compared to the LTA. These areas received rainfall totals ranging from 96% to 119% of the LTA. Shropshire Plains received above normal rainfall with totals of 121% of 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. Eight hydrological catchments received exceptionally high rainfall totals, ranging from 128% to 154% of the LTA. The remaining 4 hydrological catchments received notably high cumulative rainfall totals compared to the LTA. These were the Soar, Lower Trent, Lower Wye, and Mid Severn.

Over the last 12 months, all hydrological catchments, with the exception of the Lower Wye, received exceptionally high rainfall totals compared to the 12-month LTA. The Lower Wye hydrological catchment received a notably high rainfall total of 131% of the LTA.

1.2 Soil moisture deficit and recharge

By the end of July, SMD has increased across the whole of the Midlands, meaning that soils are drier than they were in June. In general, by the end of the month the northern and western borders of the Midlands had the lowest SMD values ranging from 11mm to 70mm. This means they have comparatively wetter soils then the more eastern, southern and central parts of the region, which have a SMD ranging between 71mm and 100mm. Compared to the LTA, most of the region experienced less SMD than is typical for the time of year, as a result of greater than usual rainfall. This means that although soils are drier than they were in June, they are still wetter than is typical for the time of year. Most of the region has a difference in SMD of between -6mm and -50mm compared to the LTA. The more easterly part of the region has a difference in SMD of between -5mm and 25mm compared to the LTA. This means that SMD in the east is either the same, or greater than the LTA, so soils are as expected, or drier.

1.3 River flows

In July, the majority of flow monitoring sites in the Midlands recorded above normal monthly mean flows ranging from 96% to 131% of the LTA. These sites are mainly located in the north-east part of the Midlands. Seven sites recorded normal compared to the LTA. These sites are Bewdley, Butts Bridge, Deerhurst, Ebley Mill, Redbrook, Tenbury, and Yoxall, and they recorded flow ranging from 55% to 105% of the LTA. Four sites, Evesham, Great Bridgford, Walcot, Wedderburn Bridge recorded notably high flows, ranging from 133% to 171% of the LTA. This corresponds with these areas receiving higher monthly rainfall totals in July compared to other areas.

1.4 Groundwater levels

As of the end of July, groundwater monitoring sites are at exceptionally high, above normal, or normal status. Three sites recorded exceptionally high groundwater levels compared to the LTA. These sites are Coxmoor, Four Crosses, and Weir Farm. Three sites recorded notably high groundwater levels compared to the LTA and these sites are Anthony’s Cross, Crossley Hill, and Rider Point. The remaining 2 sites, Ram Hall and Southards Lane, recorded normal groundwater levels compared to the LTA.

1.5 Reservoir stocks

As of the end of July, the majority of Midlands reservoirs in this report recorded above average storage and 3 reservoirs recorded below average storage. These three reservoirs are Elan, Charnwood, and Derwent reservoirs.

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 was instigated when flows dropped below the threshold on 28 June 2024 and there have been 6 days of Regulation so far.

Table 1.1: River Severn Operational Releases as of 05-08-2024.

Water supply (Ml/d)	Total releases	Normal releases	Regulation releases	Flood drawdown releases
Llyn Clywedog	100	18	82	0
Lake Vyrnwy	42	42	0	0
Shropshire Groundwater Scheme	0	0	0	0

1.7 River Wye operations

As of 5 August 2024, River Wye regulation continues because flows at Redbrook remain below the regulation threshold.

1.8 Water abstraction restrictions

As of 6 August 2024, there are 28 water abstraction licence restrictions in place across the Midlands affecting 114 licences in total.

Table 1.2: Water abstraction licence restrictions

Area	Rivers and stations restricted

East Midlands	River Derwent at Derby St Mary's River Sence at South Wigston River Torne at Auckley River Devon at Wensor Bridge River Derwent at Derby St Mary's Rothley Brook at Rothley
West Midlands	Arrow at Broom Avon at Stareton Badsey Brook at Offenham Bow Brook at Besford Bridge Dove at Marston on Dove Severn at Bewdley Leadon at Wedderburn Bridge Perry at Yeaton Roden at Rodington Tern at Walcot Sow at Great Bridgford Trent at Darlaston Cole at Coleshill (Bacons End) Teme at Tenbury Dick Brook at Dowles Brook at Oak Cottage Mor Brook at Dowles Brook at Oak Cottage Stour at Puxton

	Wye at Belmont Lugg at Lugwardine Garren at Marstow Mill Wye at Redbrook Arrow at Titley Mill Lugg at Butts Bridge

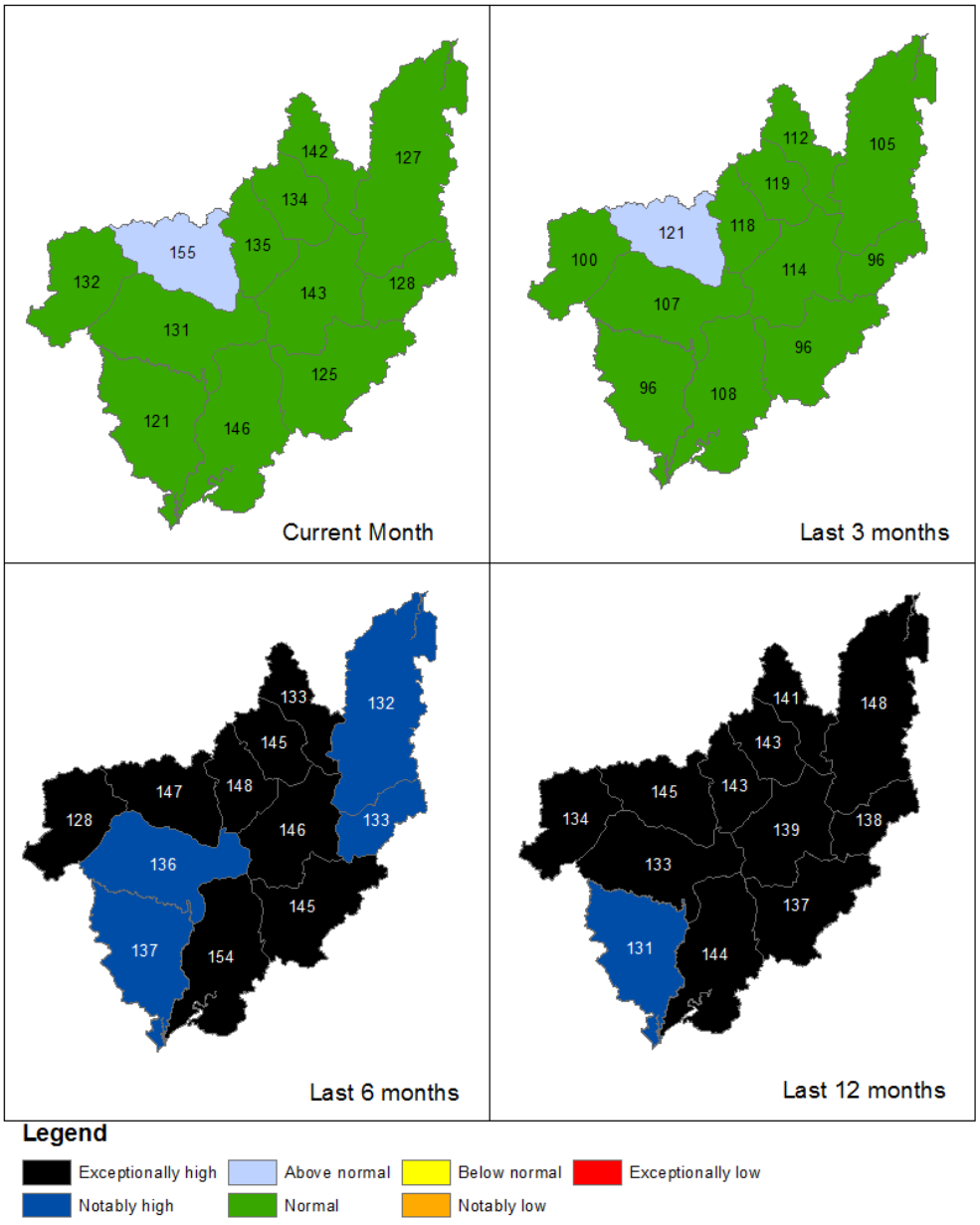
Author: Environment Agency, midlandshydrology@environment-agency.gov.uk

Contact details: 03708 506 506

2 Rainfall

2.1 Rainfall map

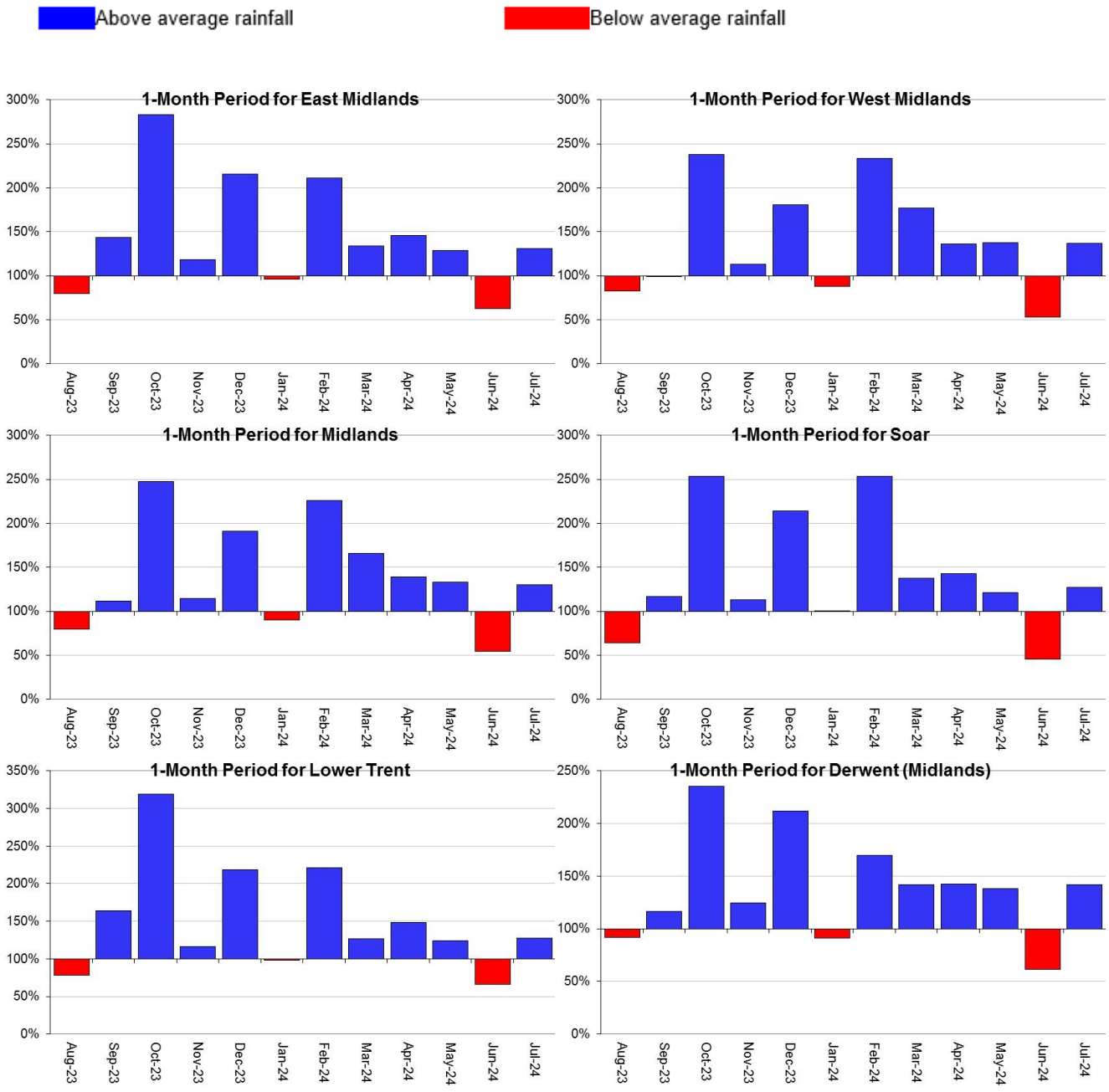
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 31 July 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. Table available in the appendices with detailed information. Please see Section 7.4 for a map of the hydrological catchments for which rainfall is reported on.

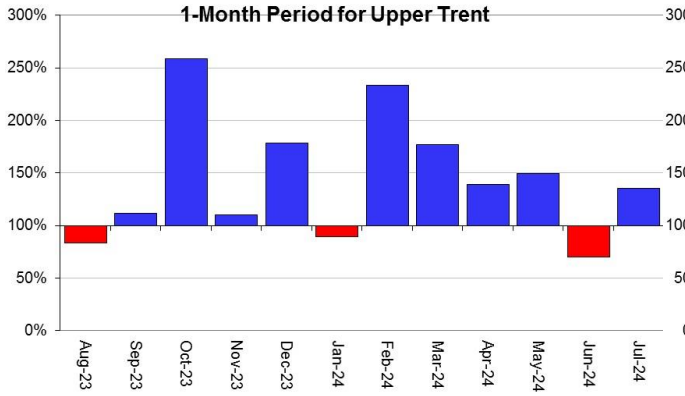


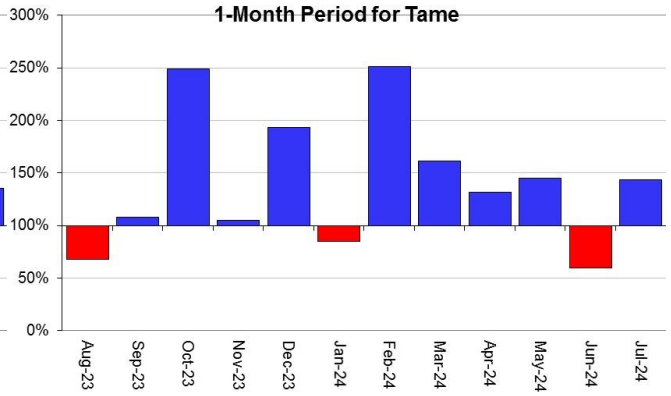
Rainfall data for 2023, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown Copyright, 100024198, 2024). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived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

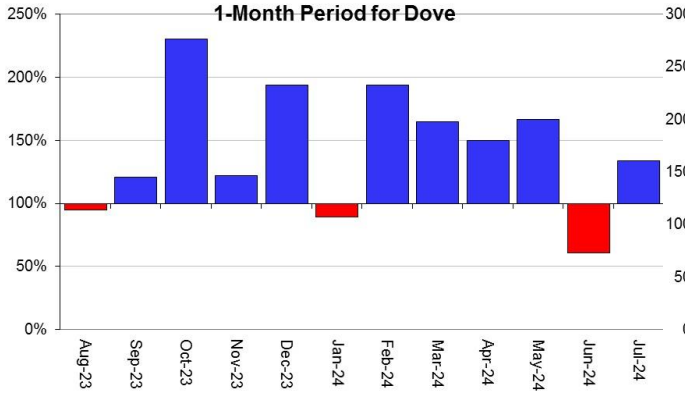
2.2 Rainfall charts

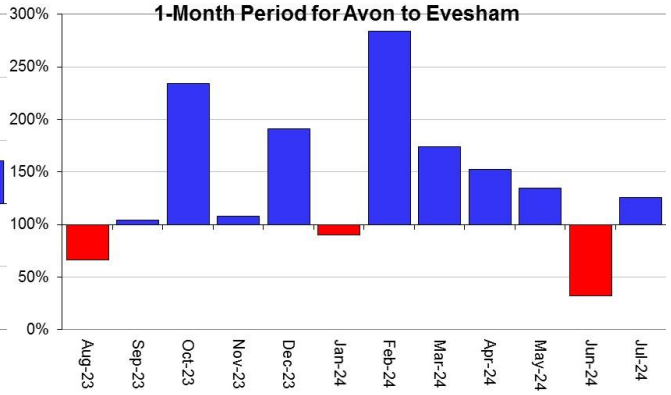
Figure 2.2: Monthly rainfall totals for the past 12 months as a percentage of the 1961 to 1990 long term average for hydrological areas across the Midlands region.

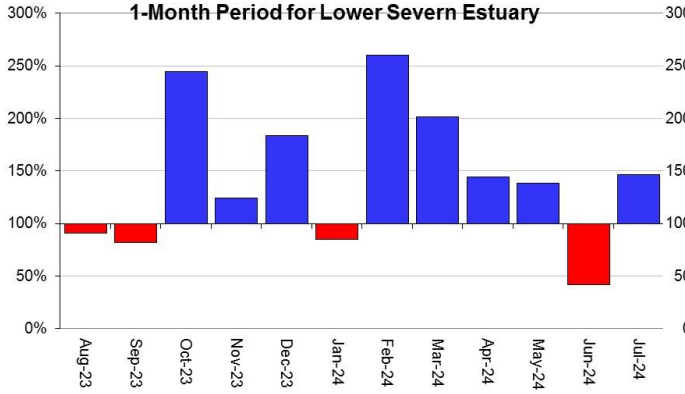


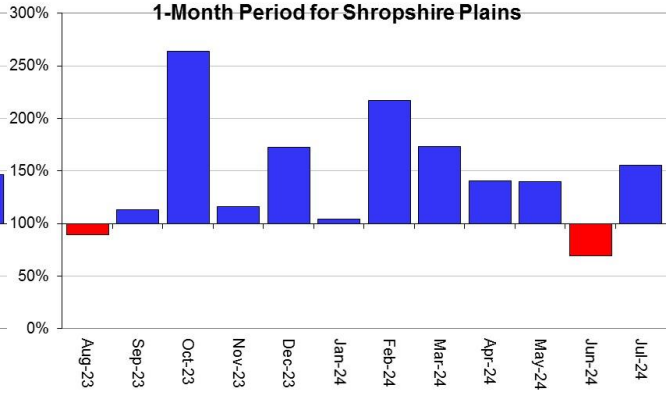

1-Month Period for Upper Trent
300%
250%
200%
150%
100%
50%
0%
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24
Jun-24
Jul-24

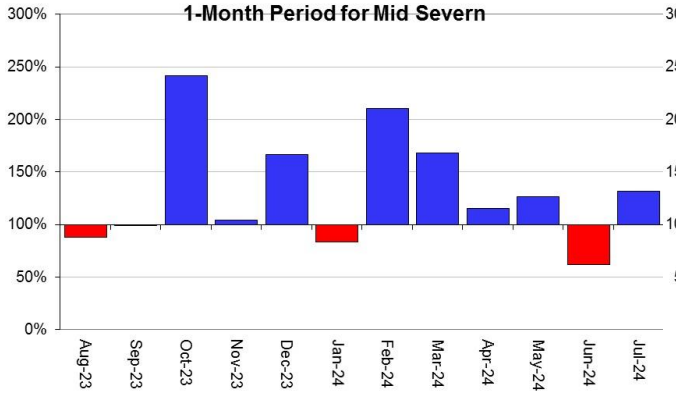

1-Month Period for Tame
300%
250%
200%
150%
100%
50%
0%
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24
Jun-24
Jul-24

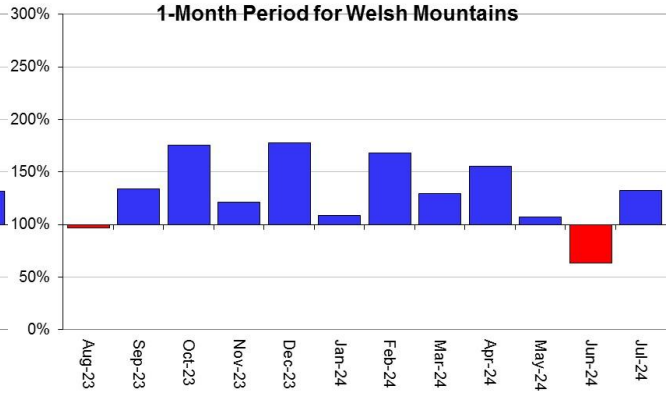

1-Month Period for Dove
250%
200%
150%
100%
50%
0%
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24
Jun-24
Jul-24

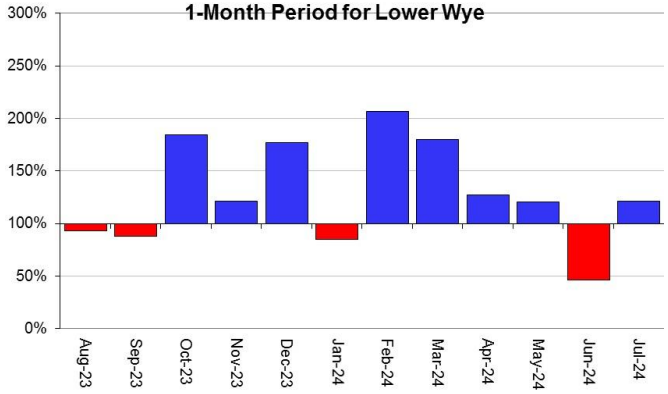

1-Month Period for Avon to Evesham
300%
250%
200%
150%
100%
50%
0%
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24
Jun-24
Jul-24


1-Month Period for Lower Severn Estuary
300%
250%
200%
150%
100%
50%
0%
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24
Jun-24
Jul-24


1-Month Period for Shropshire Plains
300%
250%
200%
150%
100%
50%
0%
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23
Jan-24
Feb-24
Mar-24
Apr-24
May-24
Jun-24
Jul-24





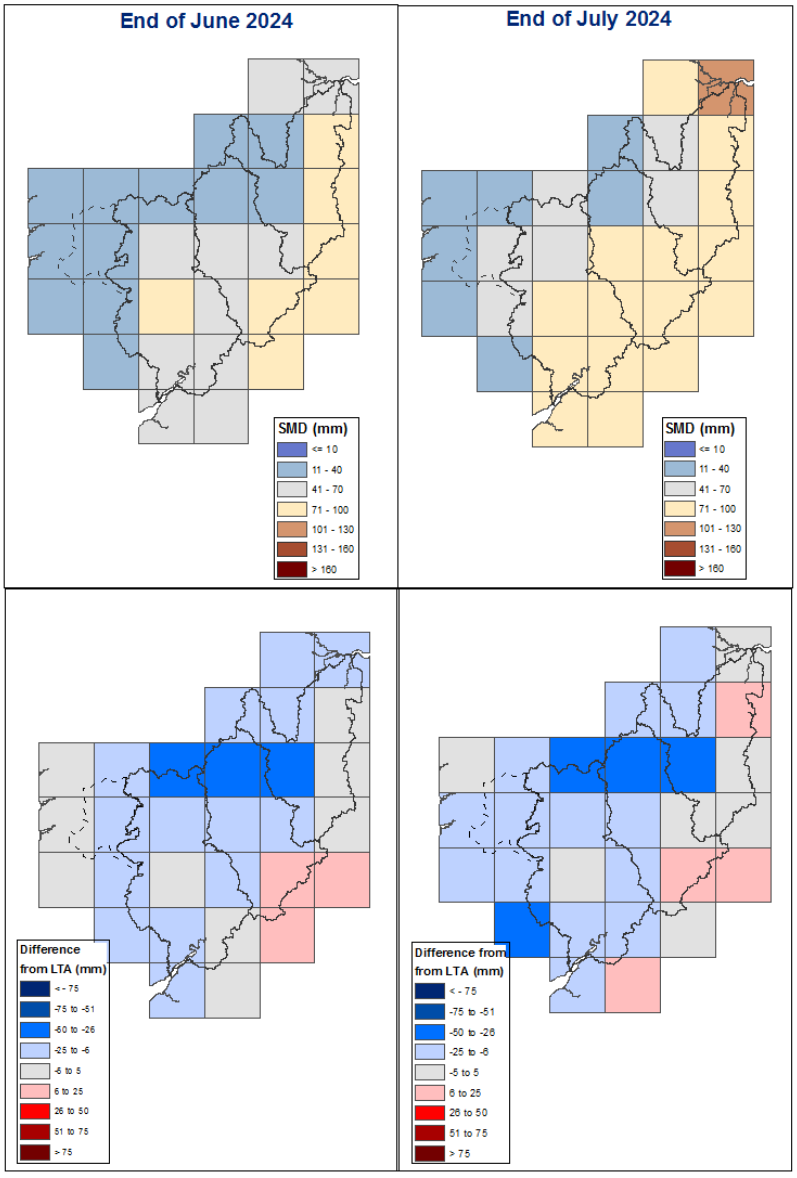


Daily Rainfall Tool data (from January 2023), final HadUK rainfall data until December 2022 (Source: Environment Agency/Met Office, Crown Copyright, 2024).

3 Soil moisture deficit

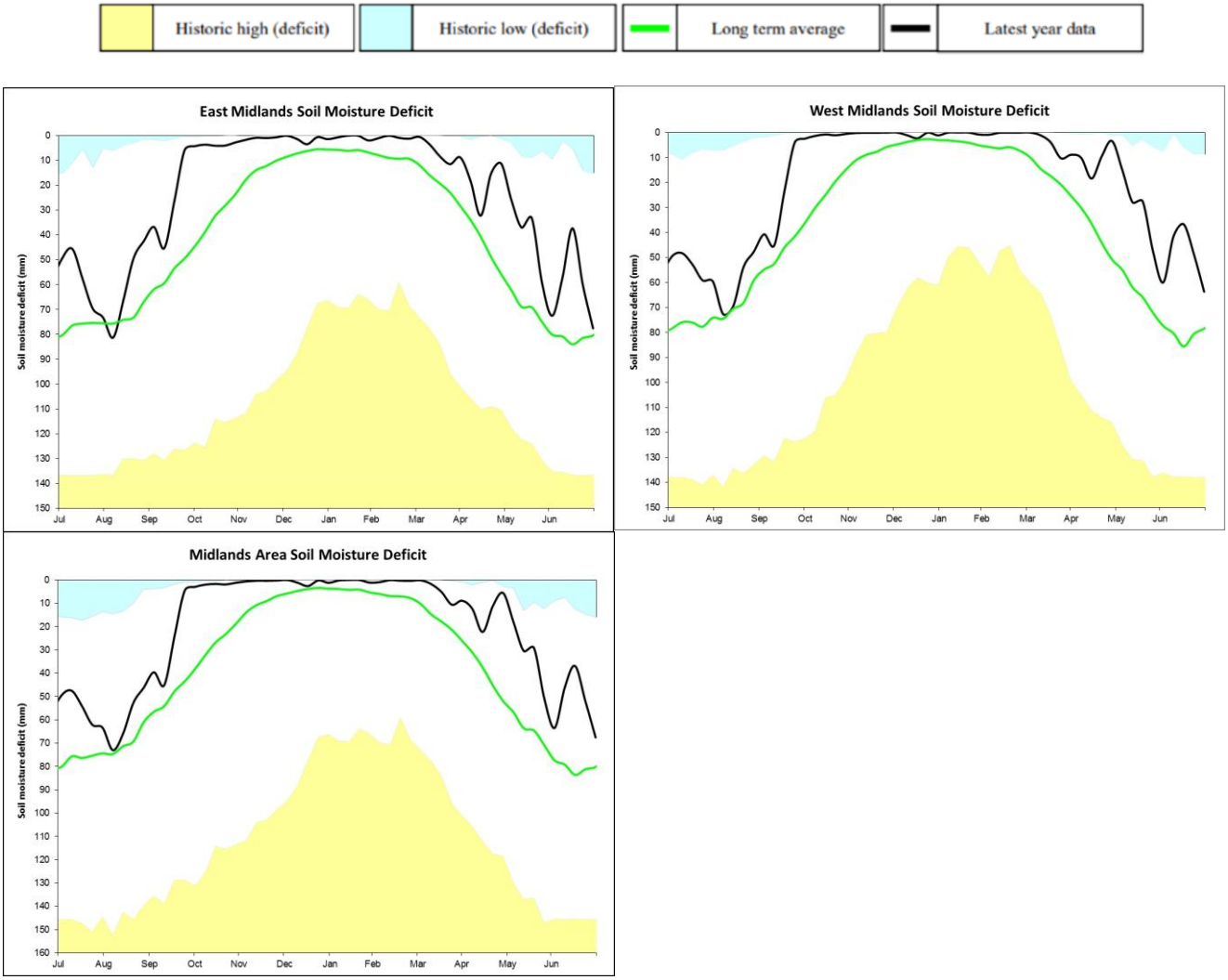
3.1 Soil moisture deficit map

Figure 3.1: Soil moisture deficits for weeks ending 31 July 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.



3.2 Soil moisture deficit charts

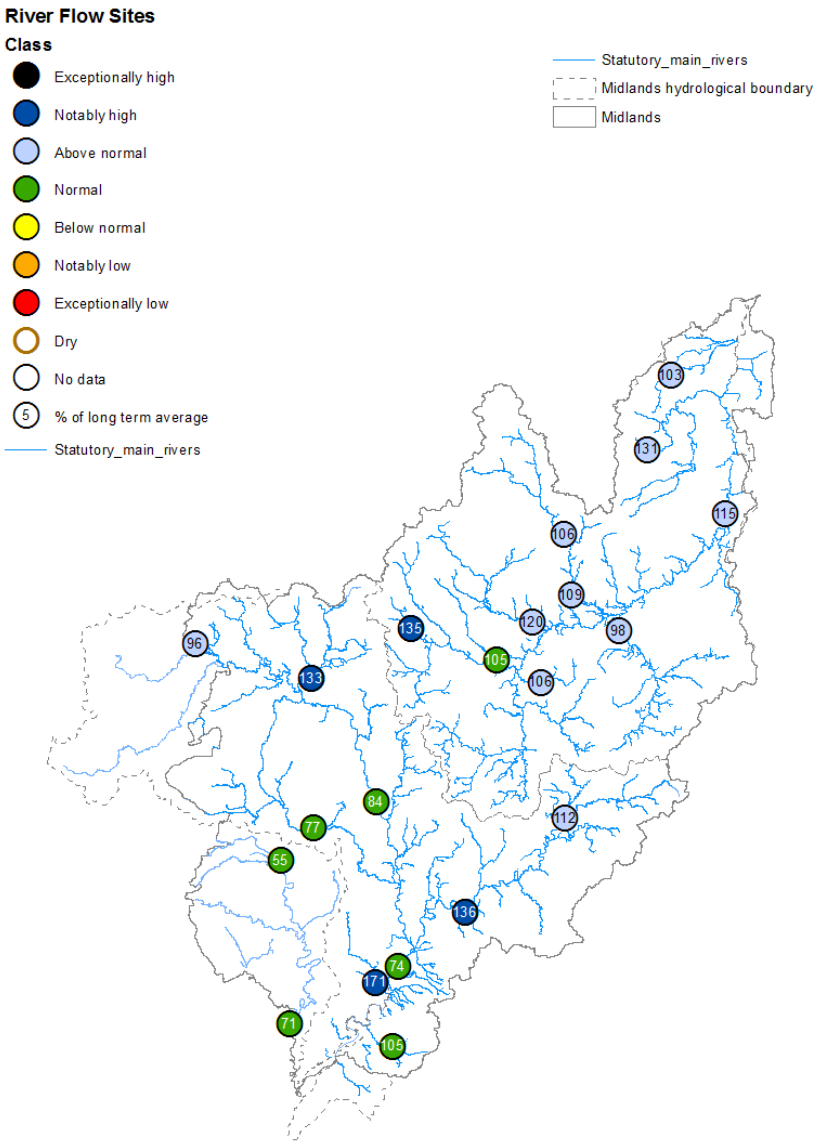
Figure 3.2: Latest soil moisture deficit charts for selected areas across the Midlands.



4 River flows

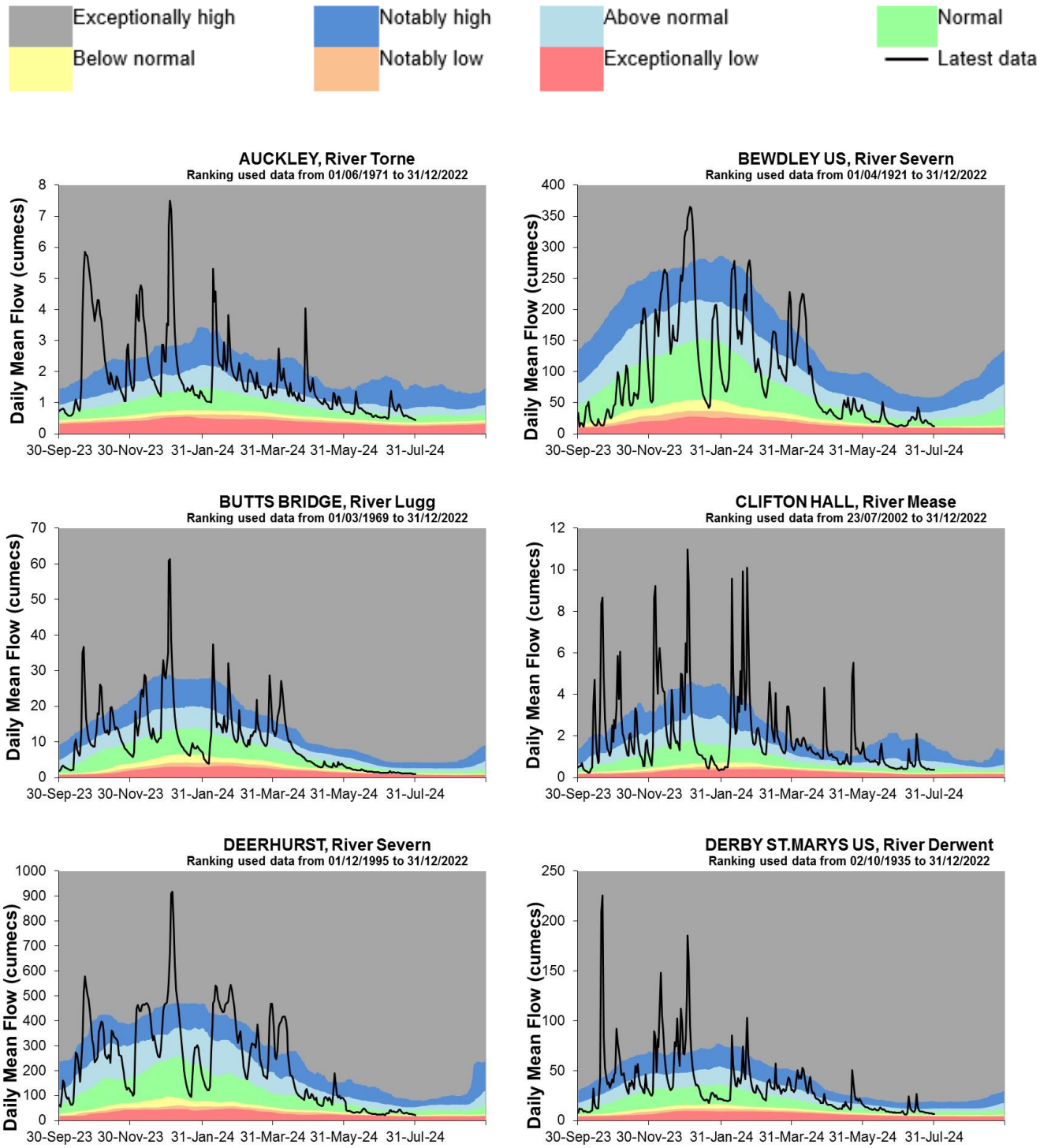
4.1 River flows map

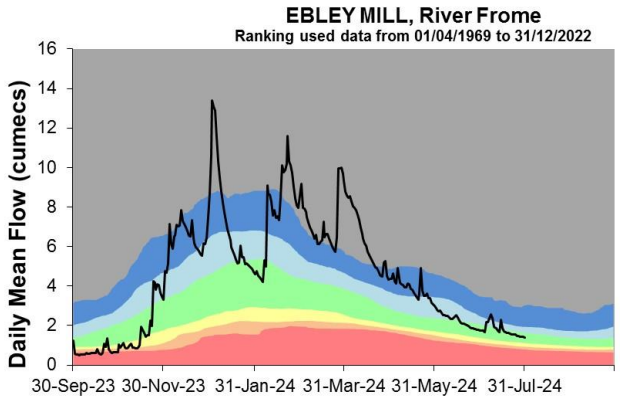
Figure 4.1: Monthly mean river flow for indicator sites for July 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic July monthly means. Table available in the appendices with detailed information.

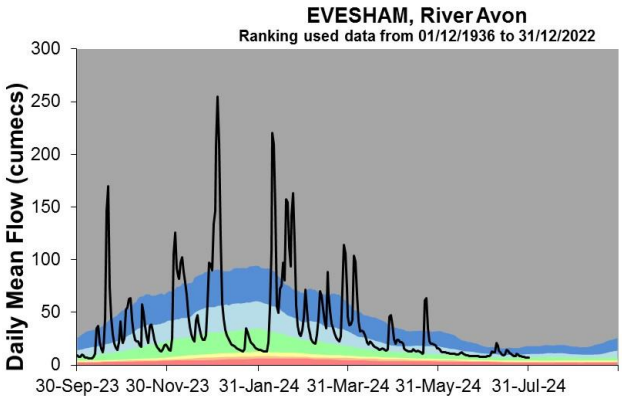


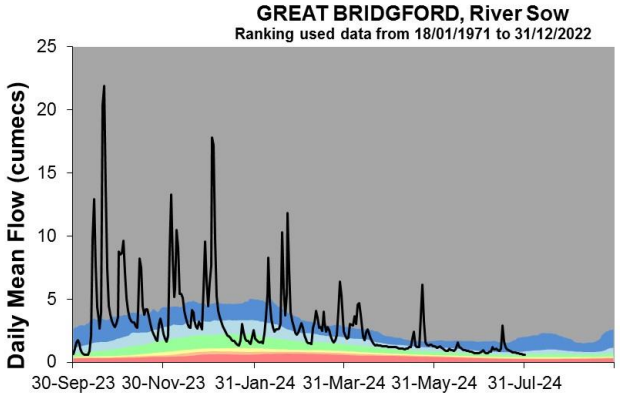
4.2 River flow charts

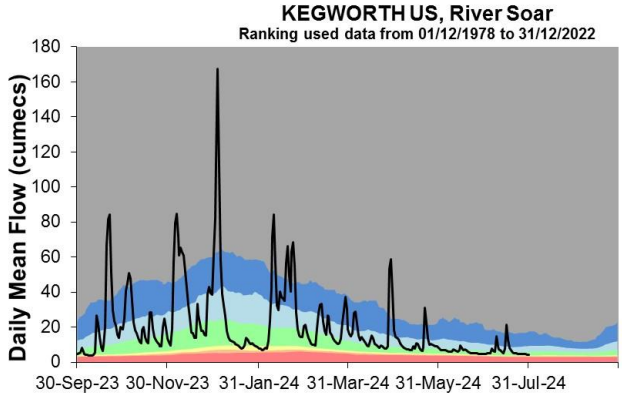
Figure 4.2: Daily mean river flow for index sites over the past year, compared to an analysis of historic daily mean flows, and long term maximum and minimum flows.

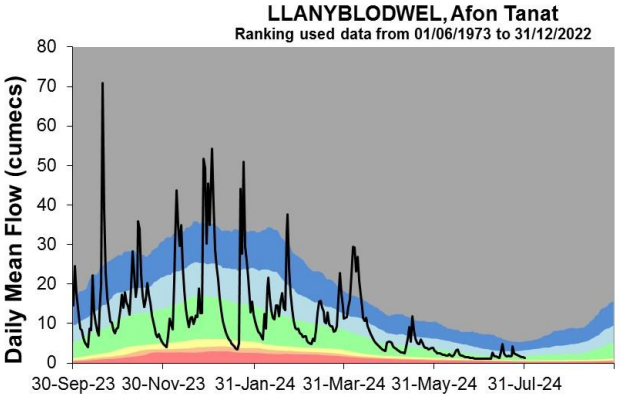


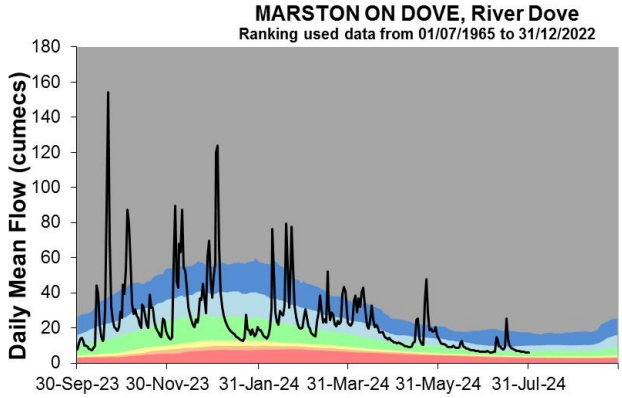

EBLEY MILL, River Frome
Ranking used data from 01/04/1969 to 31/12/2022
Daily Mean Flow (cumecs)
0
2
4
6
8
10
12
14
16
30-Sep-23 30-Nov-23 31-Jan-24 31-Mar-24 31-May-24 31-Jul-24

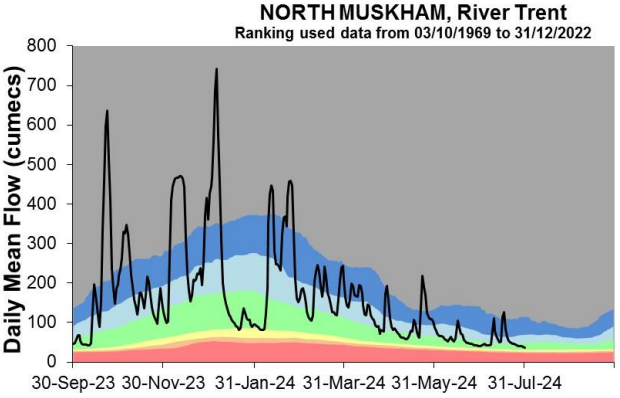

EVESHAM, River Avon
Ranking used data from 01/12/1936 to 31/12/2022
Daily Mean Flow (cumecs)
0
50
100
150
200
250
300
30-Sep-23 30-Nov-23 31-Jan-24 31-Mar-24 31-May-24 31-Jul-24

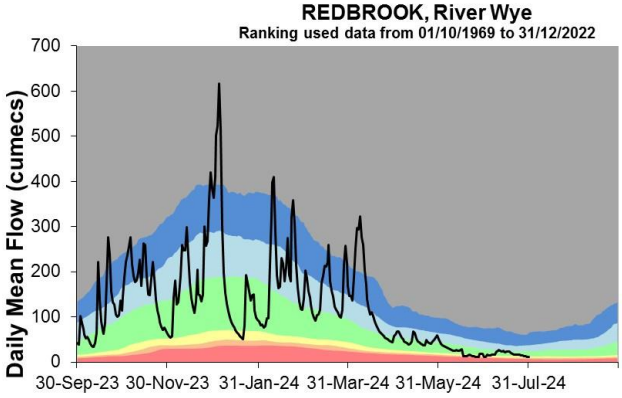

GREAT BRIDGFORD, River Sow
Ranking used data from 18/01/1971 to 31/12/2022
Daily Mean Flow (cumecs)
0
5
10
15
20
25
30-Sep-23 30-Nov-23 31-Jan-24 31-Mar-24 31-May-24 31-Jul-24

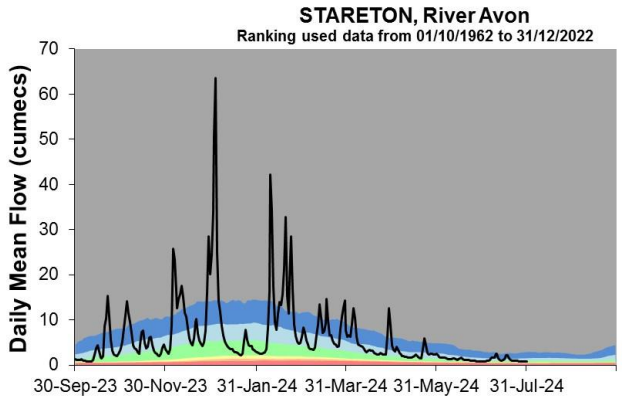

KEGWORTH US, River Soar
Ranking used data from 01/12/1978 to 31/12/2022
Daily Mean Flow (cumecs)
0
20
40
60
80
100
120
140
160
180
30-Sep-23 30-Nov-23 31-Jan-24 31-Mar-24 31-May-24 31-Jul-24

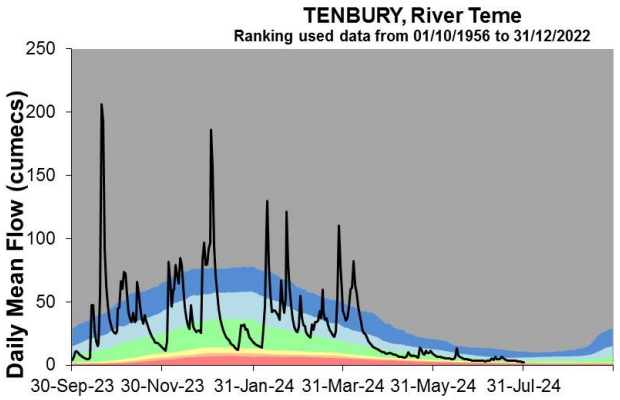

LLANYBLODWEL, Afon Tanat
Ranking used data from 01/06/1973 to 31/12/2022
Daily Mean Flow (cumecs)
0
10
20
30
40
50
60
70
80
30-Sep-23 30-Nov-23 31-Jan-24 31-Mar-24 31-May-24 31-Jul-24

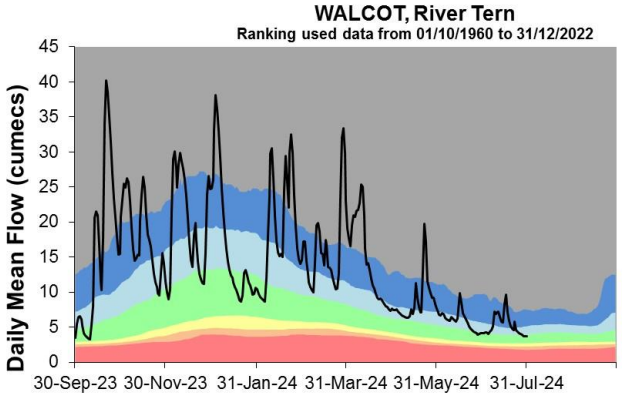

MARSTON ON DOVE, River Dove
Ranking used data from 01/07/1965 to 31/12/2022
Daily Mean Flow (cumecs)
0
20
40
60
80
100
120
140
160
180
30-Sep-23 30-Nov-23 31-Jan-24 31-Mar-24 31-May-24 31-Jul-24

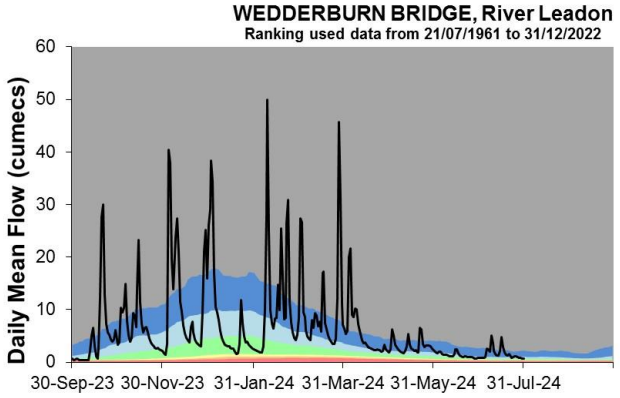

NORTH MUSKHAM, River Trent
Ranking used data from 03/10/1969 to 31/12/2022
Daily Mean Flow (cumecs)
0
100
200
300
400
500
600
700
800
30-Sep-23 30-Nov-23 31-Jan-24 31-Mar-24 31-May-24 31-Jul-24

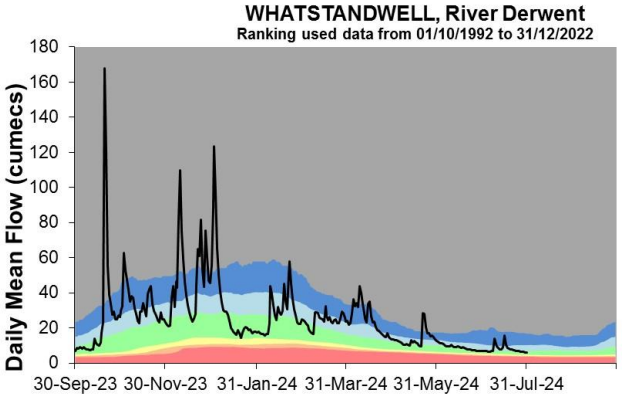

REDBROOK, River Wye
Ranking used data from 01/10/1969 to 31/12/2022
Daily Mean Flow (cumecs)
0
100
200
300
400
500
600
700
30-Sep-23 30-Nov-23 31-Jan-24 31-Mar-24 31-May-24 31-Jul-24

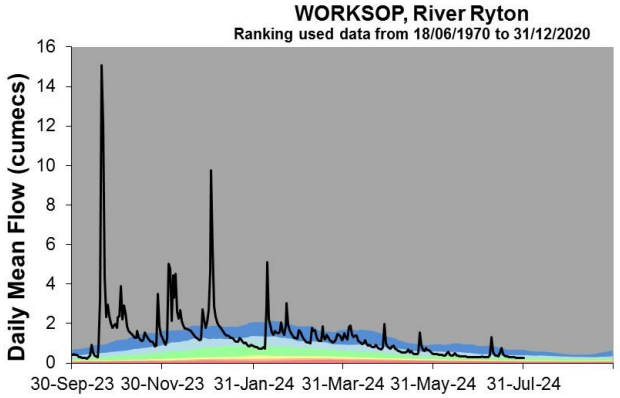

STARETON, River Avon
Ranking used data from 01/10/1962 to 31/12/2022
Daily Mean Flow (cumecs)
0
10
20
30
40
50
60
70
30-Sep-23
30-Nov-23
31-Jan-24
31-Mar-24
31-May-24
31-Jul-24

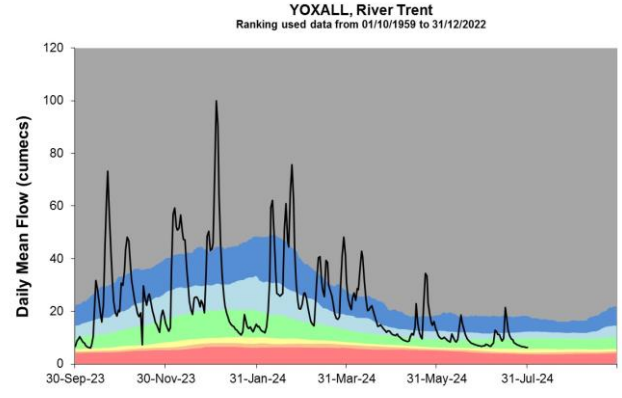

TENBURY, River Teme
Ranking used data from 01/10/1956 to 31/12/2022
Daily Mean Flow (cumecs)
0
50
100
150
200
250
30-Sep-23
30-Nov-23
31-Jan-24
31-Mar-24
31-May-24
31-Jul-24


WALCOT, River Tern
Ranking used data from 01/10/1960 to 31/12/2022
Daily Mean Flow (cumecs)
0
5
10
15
20
25
30
35
40
45
30-Sep-23
30-Nov-23
31-Jan-24
31-Mar-24
31-May-24
31-Jul-24


WEDDERBURN BRIDGE, River Leadon
Ranking used data from 21/07/1961 to 31/12/2022
Daily Mean Flow (cumecs)
0
10
20
30
40
50
60
30-Sep-23
30-Nov-23
31-Jan-24
31-Mar-24
31-May-24
31-Jul-24


WHATSTANDWELL, River Derwent
Ranking used data from 01/10/1992 to 31/12/2022
Daily Mean Flow (cumecs)
0
20
40
60
80
100
120
140
160
180
30-Sep-23
30-Nov-23
31-Jan-24
31-Mar-24
31-May-24
31-Jul-24


WORKSOP, River Ryton
Ranking used data from 18/06/1970 to 31/12/2020
Daily Mean Flow (cumecs)
0
2
4
6
8
10
12
14
16
30-Sep-23
30-Nov-23
31-Jan-24
31-Mar-24
31-May-24
31-Jul-24

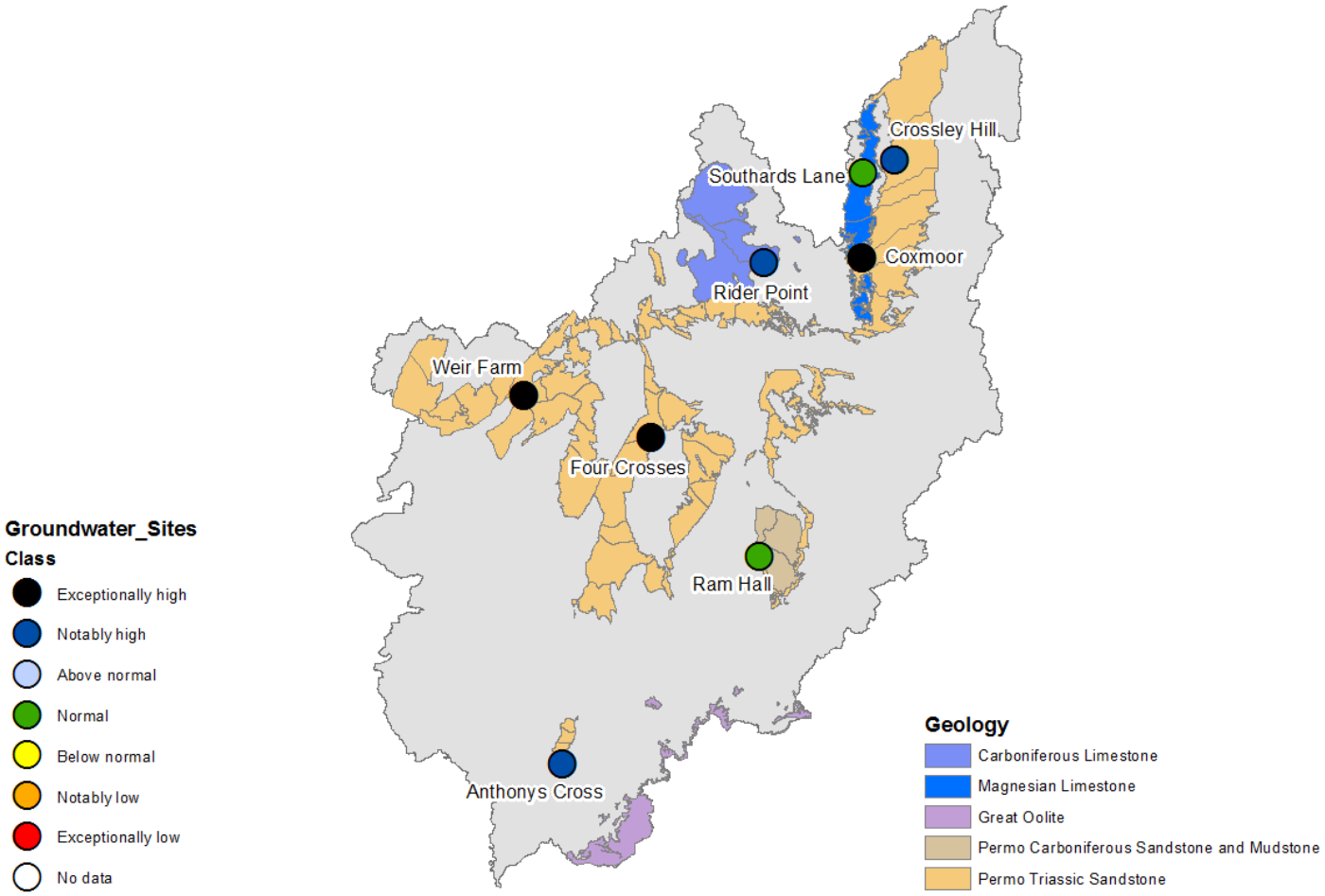

YOXALL, River Trent
Ranking used data from 01/10/1959 to 31/12/2022
Daily Mean Flow (cumecs)
0
20
40
60
80
100
120
30-Sep-23
30-Nov-23
31-Jan-24
31-Mar-24
31-May-24
31-Jul-24

Source: Environment Agency.

5 Groundwater levels

5.1 Groundwater levels map

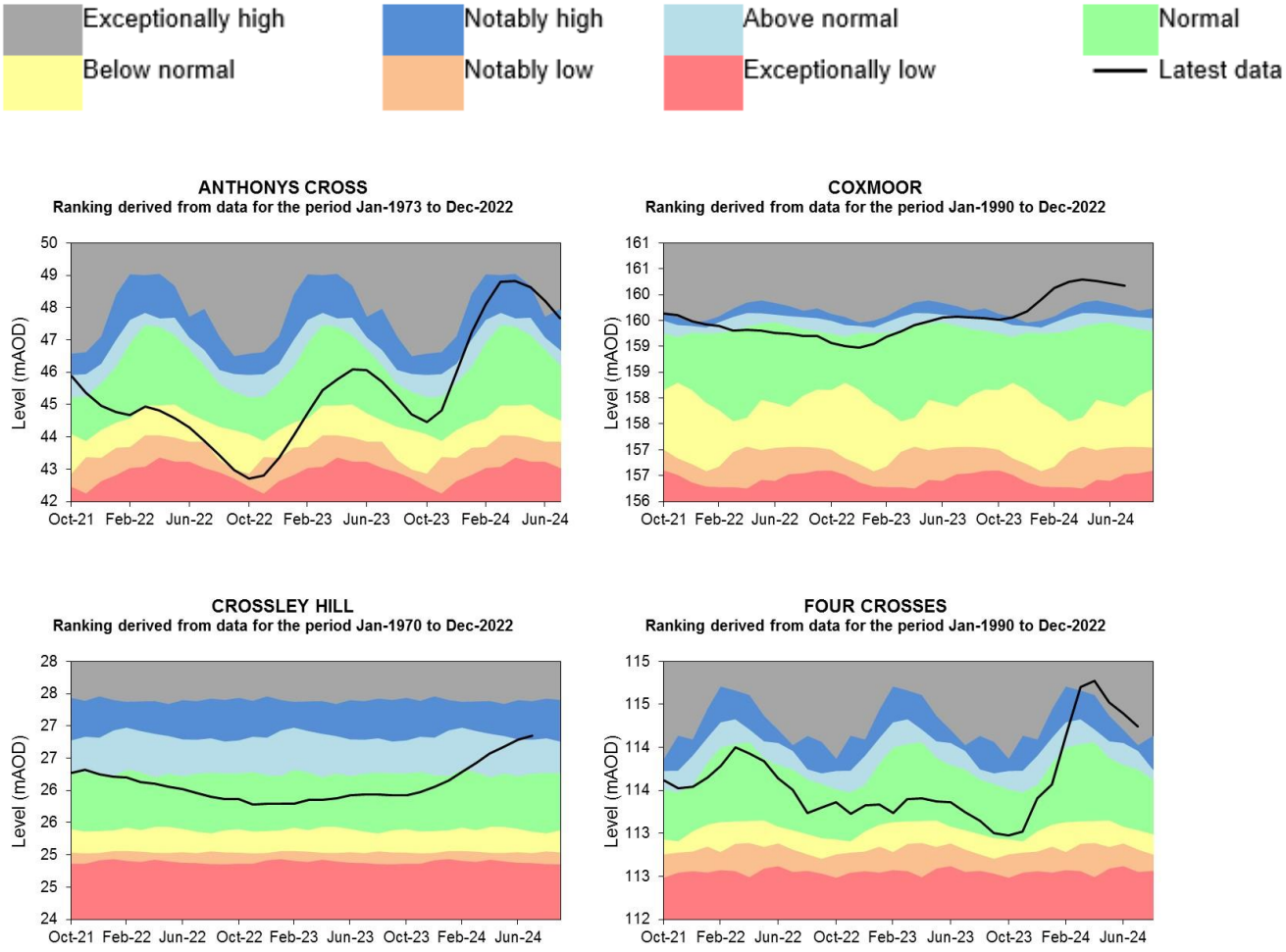
Figure 5.1: Groundwater levels for indicator sites at the end of July 2024, classed relative to an analysis of respective historic July levels. Table available in the appendices with detailed information.

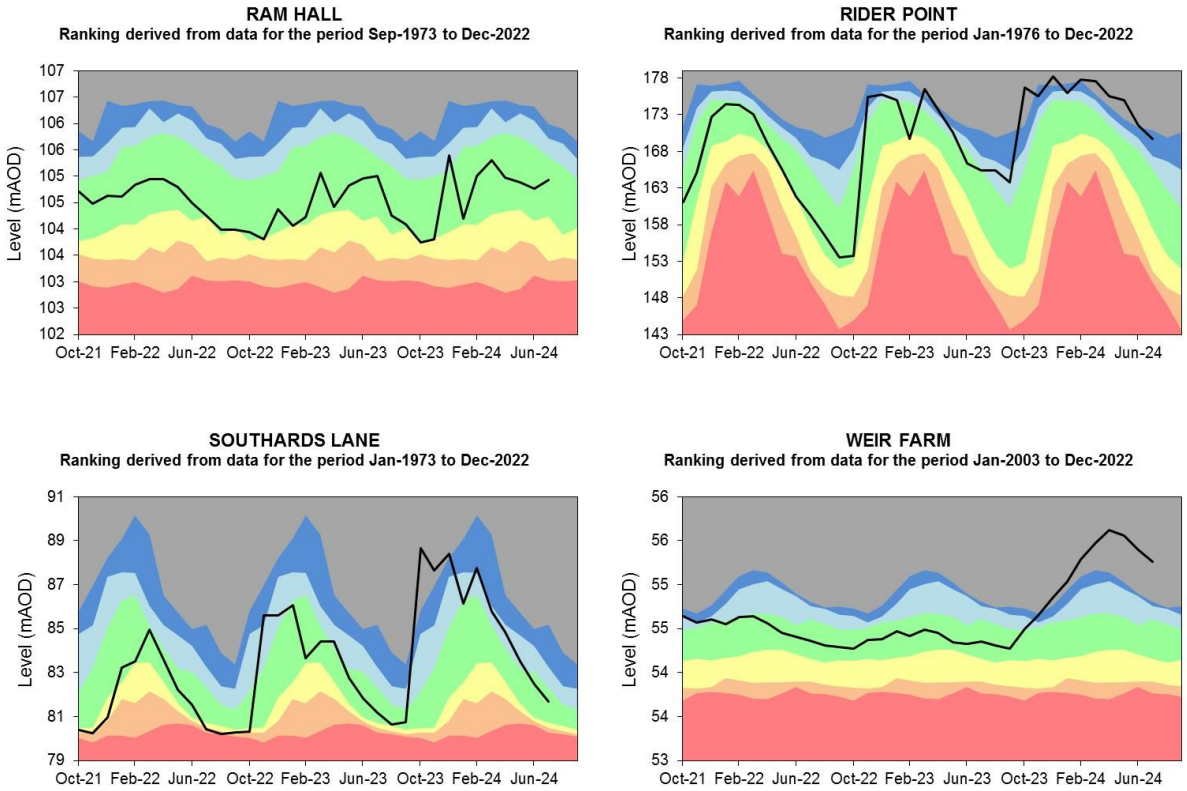


(Source: Environment Agency). Geological map reproduced with kind permission from UK Groundwater Forum, BGS copyright NERC. Crown copyright. All rights reserved. Environment Agency, 100024198, 2024.

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.

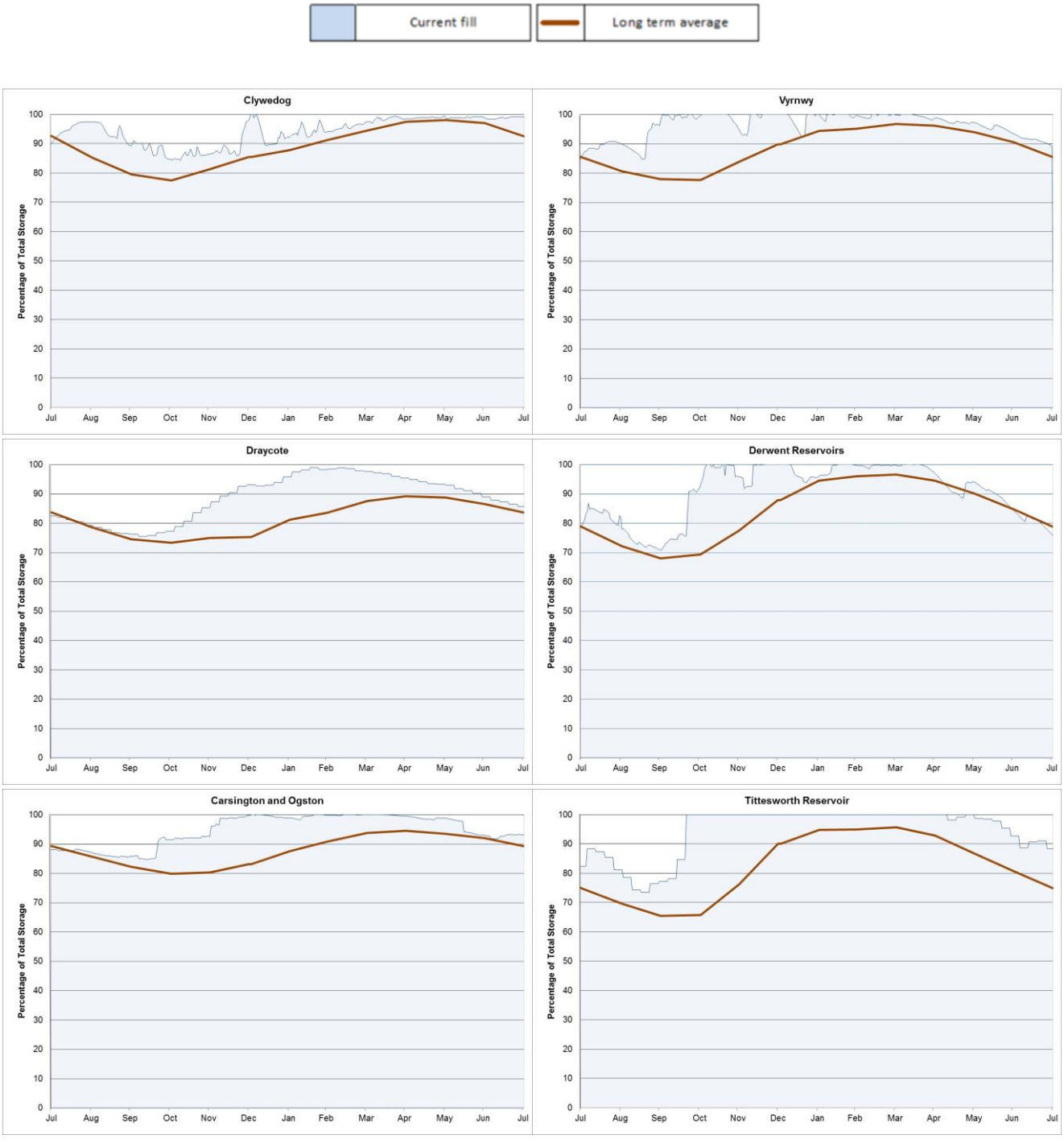


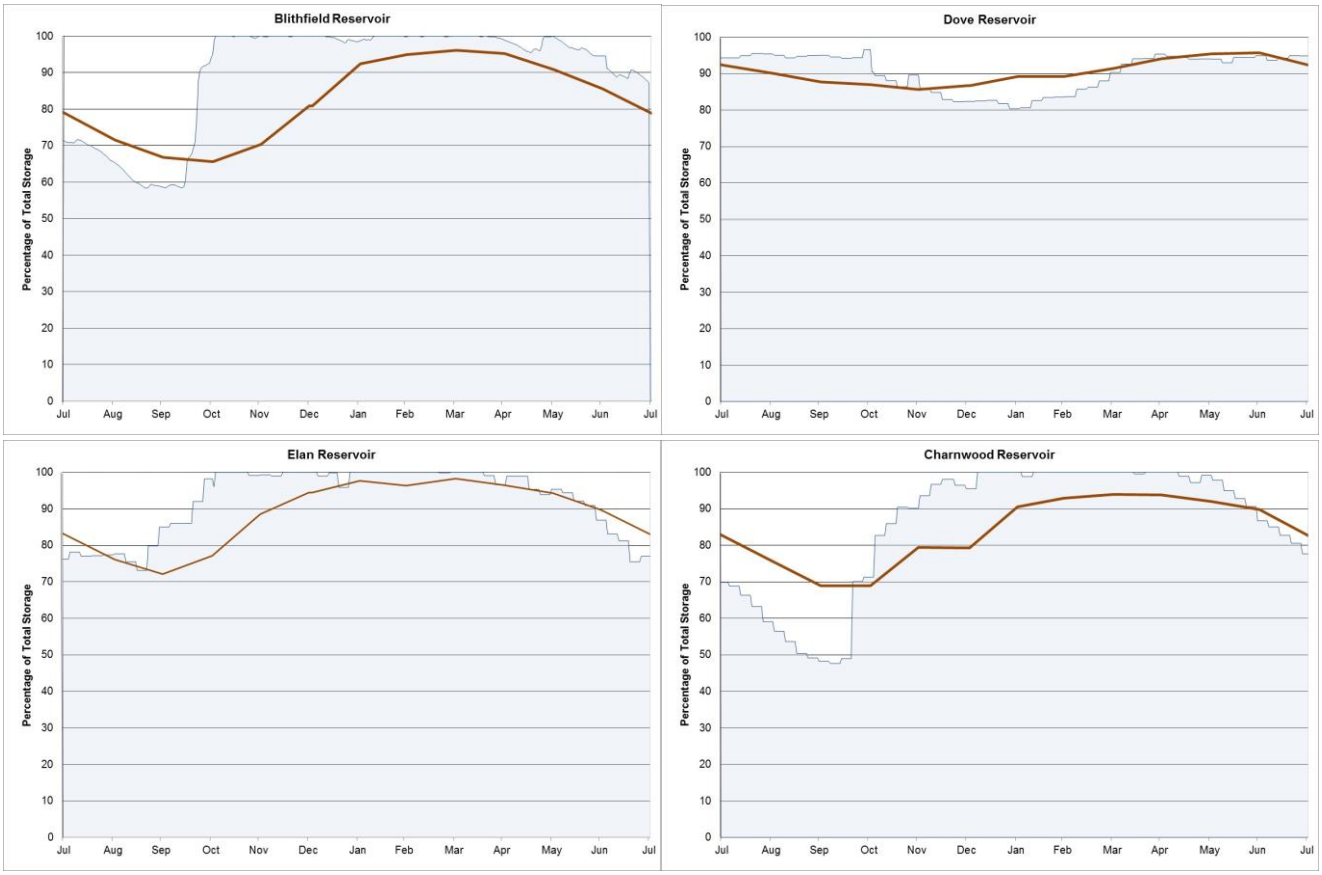


Source: Environment Agency, 2024.

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 7.5 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

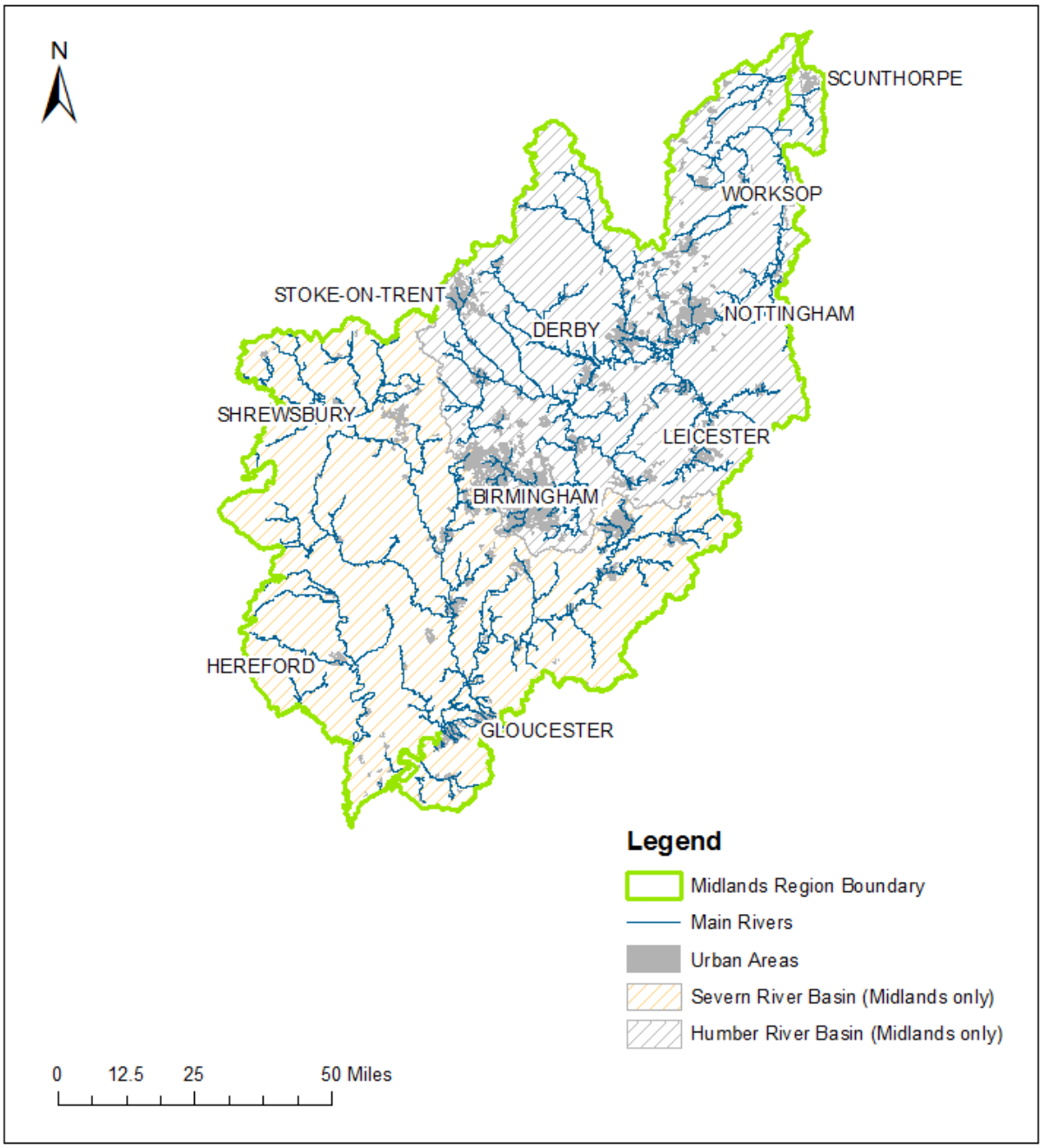
Value likely to fall within this band 8% of the time.

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.

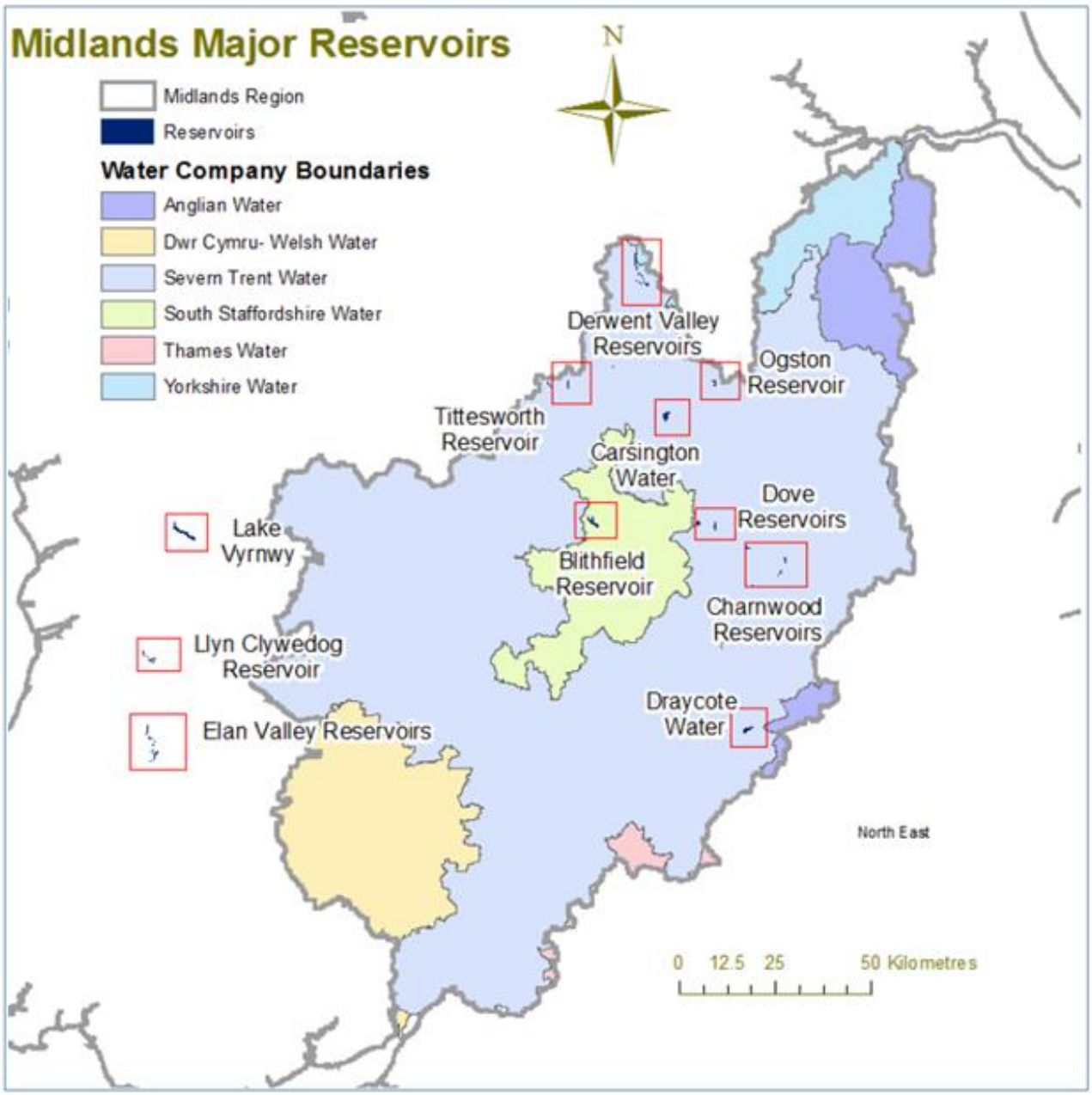


7.4 Midlands hydrological areas

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.

7.5 Midlands major reservoirs

Figure 7.3: Location of major reservoirs in the Midlands.



8 Appendices

8.1 Rainfall table

Hydrological area	Jul 2024 rainfall % of long term average 1961 to 1990	Jul 2024 band	May 2024 to July cumulative band	Feb 2024 to July cumulative band	Aug 2023 to July cumulative band
Avon To Evesham	126	Normal	Normal	Exceptionally high	Exceptionally high
Derwent (midlands)	142	Normal	Normal	Exceptionally high	Exceptionally high
Dove	134	Normal	Normal	Exceptionally high	Exceptionally high
Lower Severn Estuary	146	Normal	Normal	Exceptionally high	Exceptionally high
Lower Trent	127	Normal	Normal	Notably high	Exceptionally high
Lower Wye	122	Normal	Normal	Notably high	Notably high
Mid Severn	132	Normal	Normal	Notably high	Exceptionally high
Shropshire Plains	155	Above Normal	Above normal	Exceptionally high	Exceptionally high
Soar	128	Normal	Normal	Notably high	Exceptionally high

Tame	143	Normal	Normal	Exceptionally high	Exceptionally high
Upper Trent	135	Normal	Normal	Exceptionally high	Exceptionally high
Welsh Mountains	132	Normal	Normal	Exceptionally high	Exceptionally high

8.2 River flows table

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

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

8.3 Groundwater table

Site name	Aquifer	End of Jul 2024 band	End of Jun 2024 band
Anthony's Cross	Severn Vale Permo Triassic Sandstone	Notably high	Exceptionally high
Coxmoor	Permo Triassic Sandstone	Exceptionally high	Exceptionally high
Crossley Hill	Permo Triassic Sandstone	Notably high	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	Notably high	Exceptionally high
Southards Lane, Bolsover	Magnesian Limestone	Normal	Normal
Weir Farm	Bridgnorth Sandstone Formation	Exceptionally high	Exceptionally high