Monthly water situation report: North East

1 Summary – August 2024

Overall August 2024 was a dry month with very little rainfall recorded in the first 3 weeks. The only notable rainfall fell on 22 August. Monthly rainfall totals were below average for the month. Flows generally decreased throughout the month and monthly mean flows fell within the above normal, normal or below normal ranges. Groundwater levels remained the same as last month, generally falling into the normal or high ranges. Soil moisture deficit (SMD) data recorded an increase in dry soils across the east of the area and also in the north in the Till catchment. Reservoir stocks have varied but remain healthy for the time of year.

1.1 Rainfall

Monthly rainfall totals were classed as below the long term average (LTA) across all catchments in the North East area. August rainfall totals were classed as normal for the Tweed and Tyne catchments, below normal for Northumbria North Sea Tribs, notably low for Tees and Wear and exceptionally low for the Seaham catchment. Monthly rainfall totals ranged from 27% of the LTA in the Seaham catchment to 81% of the LTA in the Tyne catchment.

In the first 21 days of August very little rainfall was recorded across the area. More rainfall was recorded in the final 10 days with the highest rainfall totals of the month recorded on 22 August.

Cumulative 12 month rainfall totals show that all catchments in the North East area recorded exceptionally high totals.

1.2 Soil moisture deficit and recharge

Soils are classified as wet in the west of the area and dry around the coast in the east of the area. The Till catchment in the north is also classed as dry for August.

1.3 River flows

Monthly mean river flows have decreased this month at all indicator sites, with the exception of Rothbury which recorded a very small increase. Monthly mean flows ranged from 33% of the

LTA at Rutherford Bridge on the River Greta to 82% of the LTA at Rothbury on the River Coquet.

Analysis of the daily mean flows shows that flows were in the normal, above normal or notably high ranges at the start of the month. Daily mean flows gradually decreased at all indicator sites over the first 21 days of August. River flows increased at all indicator sites at the start of the third week of August following prolonged rainfall across the area. Haydon Bridge on the River South Tyne and Rothbury on the River Coquet recorded exceptionally high flows on 23 August following heavy rainfall. Flows generally decreased across the area in the final few days of August and sites fell within the above normal, normal or below normal ranges by the end of the month.

1.4 Groundwater levels

Groundwater levels across all reporting boreholes have remained the same since June. West Hall Farm on the Wear Magnesian Limestone, Aycliffe NRA2 on the Skerne Magnesian Limestone and Royal Observation on the Till Fell Sandstone remain in the exceptionally high range. Townlaw on the Fell sandstone remains at below normal levels. Red Lion on the Magnesian Limestone remains normal.

1.5 Reservoir stocks

Cow Green and Kielder reservoir have seen an increase in stocks this month, with Cow Green recording 100 percent stock. The remaining reservoirs have recorded a decrease in stocks this month. Overall, reservoir stocks remain healthy for the time of year.

Reservoir or reservoir group	Percentage of current stocks	Percentage of previous month stocks
Kielder	87.3	85.8
North Tynedale group	74.2	77.5
Derwent	81.4	89.9
Durham group	74.6	83.1

Lune and Balder group	82.4	89.8
Cow Green	100	98.2

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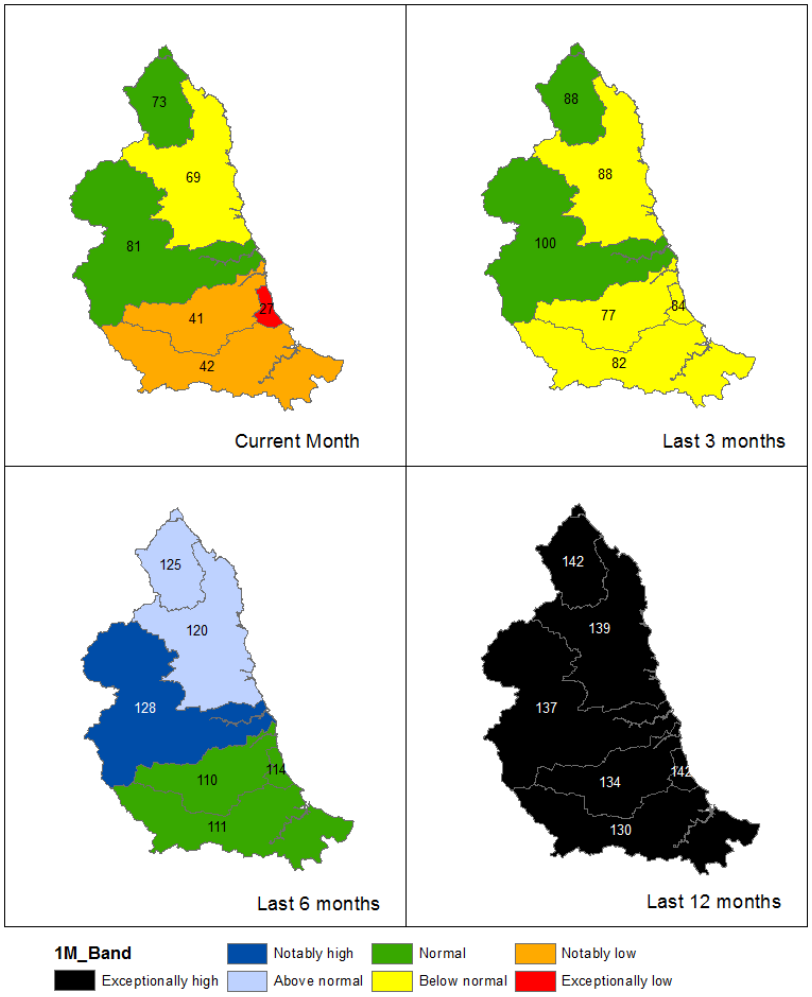
2 Rainfall

2.1 Rainfall map

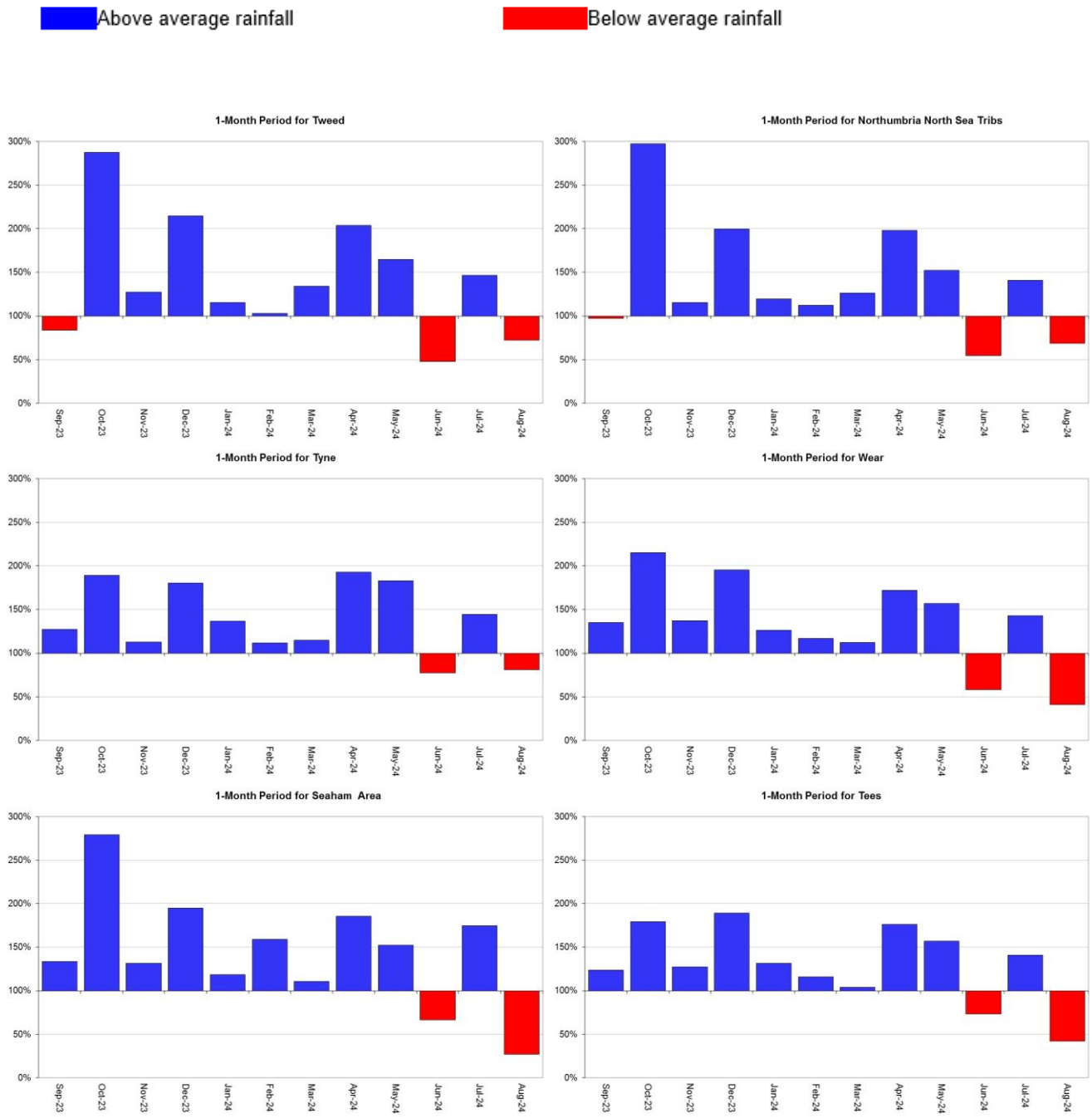
Figure 2.1: Total rainfall for hydrological areas for the current month (up to 31 August 2024), the last 3 months, the last 6 months, and the last 12 months, classed relative to an analysis of respective historic totals. August rainfall totals were classed as normal for the Tweed and Tyne catchments, below normal for Northumbria North Sea Tribs, notably low for Tees and Wear and exceptionally low for the Seaham catchment. Table available in the appendices with detailed information.



Rainfall data for 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 each hydrometric area in the North East. All catchments have recorded below average rainfall for August 2024.

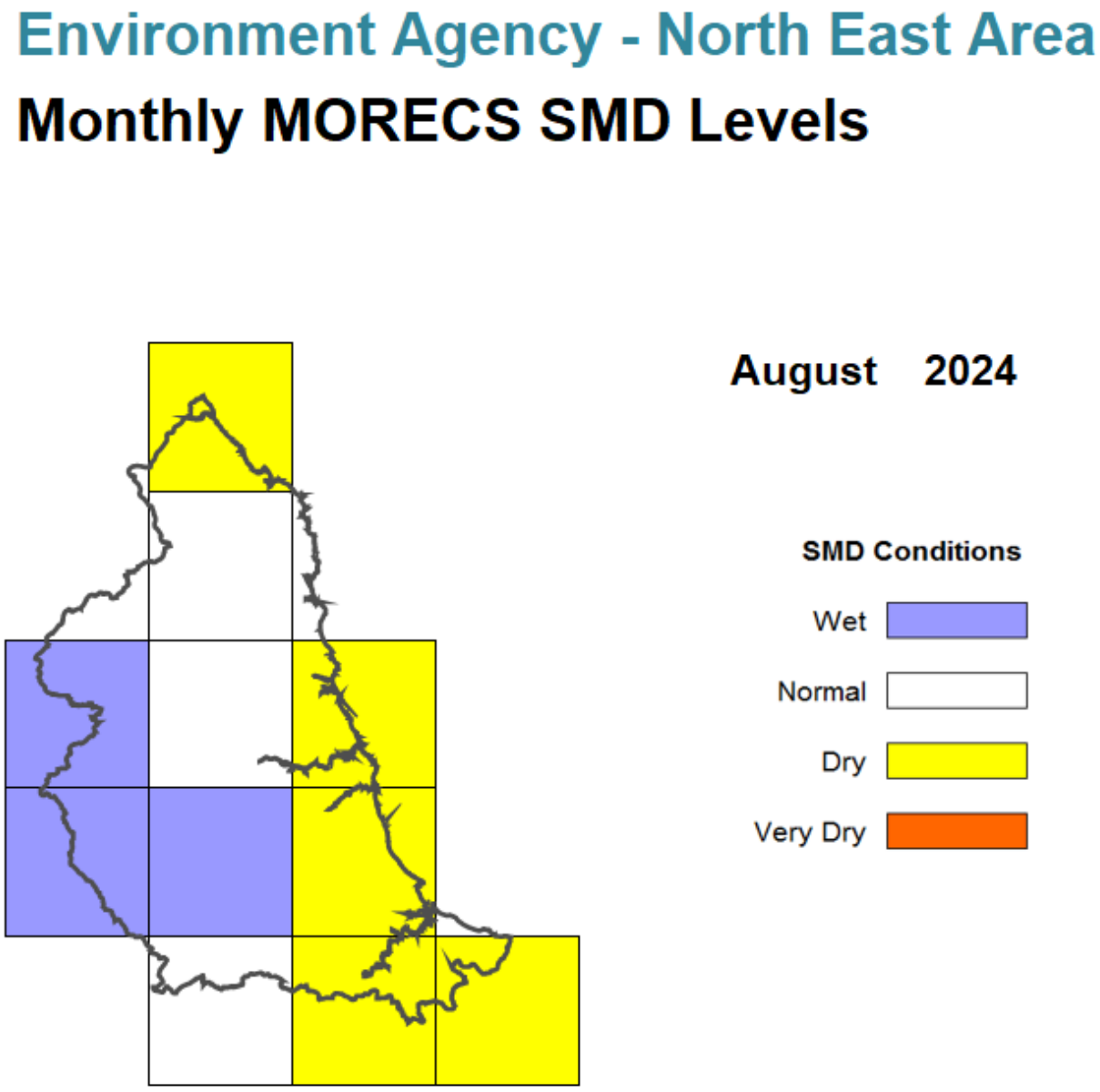


Rainfall data for 2024, extracted from Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. (Source: Environment Agency. Crown

3 Soil moisture deficit

3.1 Soil moisture deficit map

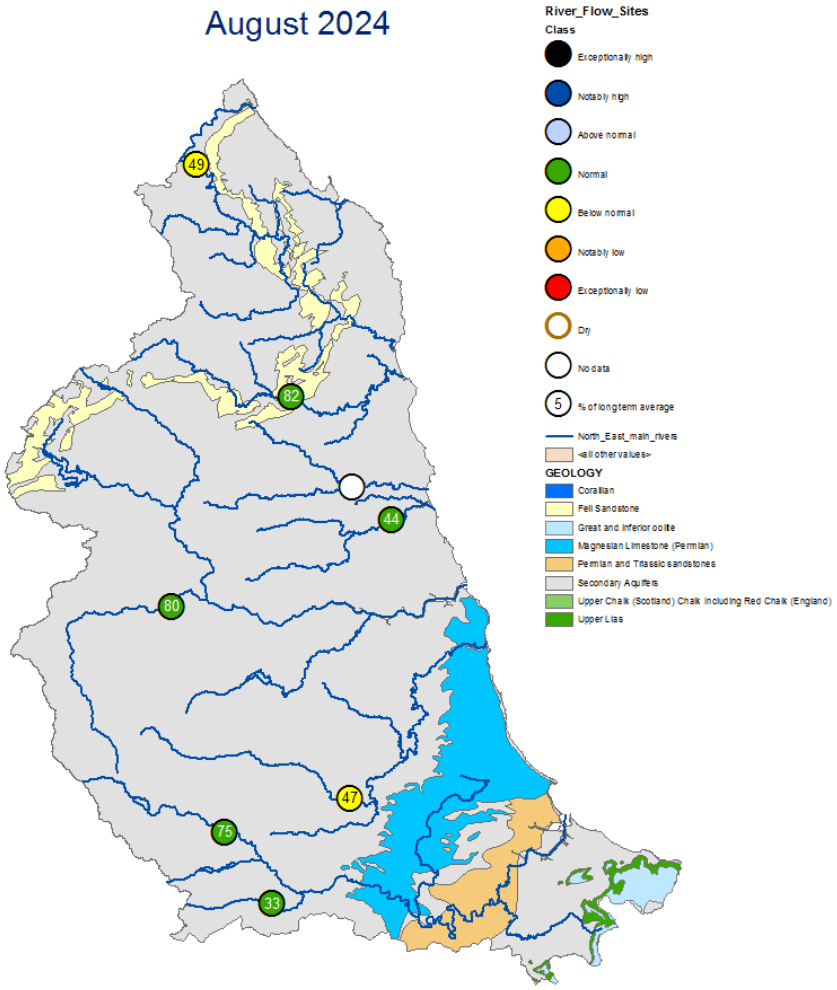
Figure 3.1: Soil moisture deficits for weeks ending 31 August 2024. MORECS data for real land use. Soils are classed as wet across the west of the area. Soils are classed as dry across the east of the area. The Till catchment in the north of the area is also classed as dry.



4 River flows

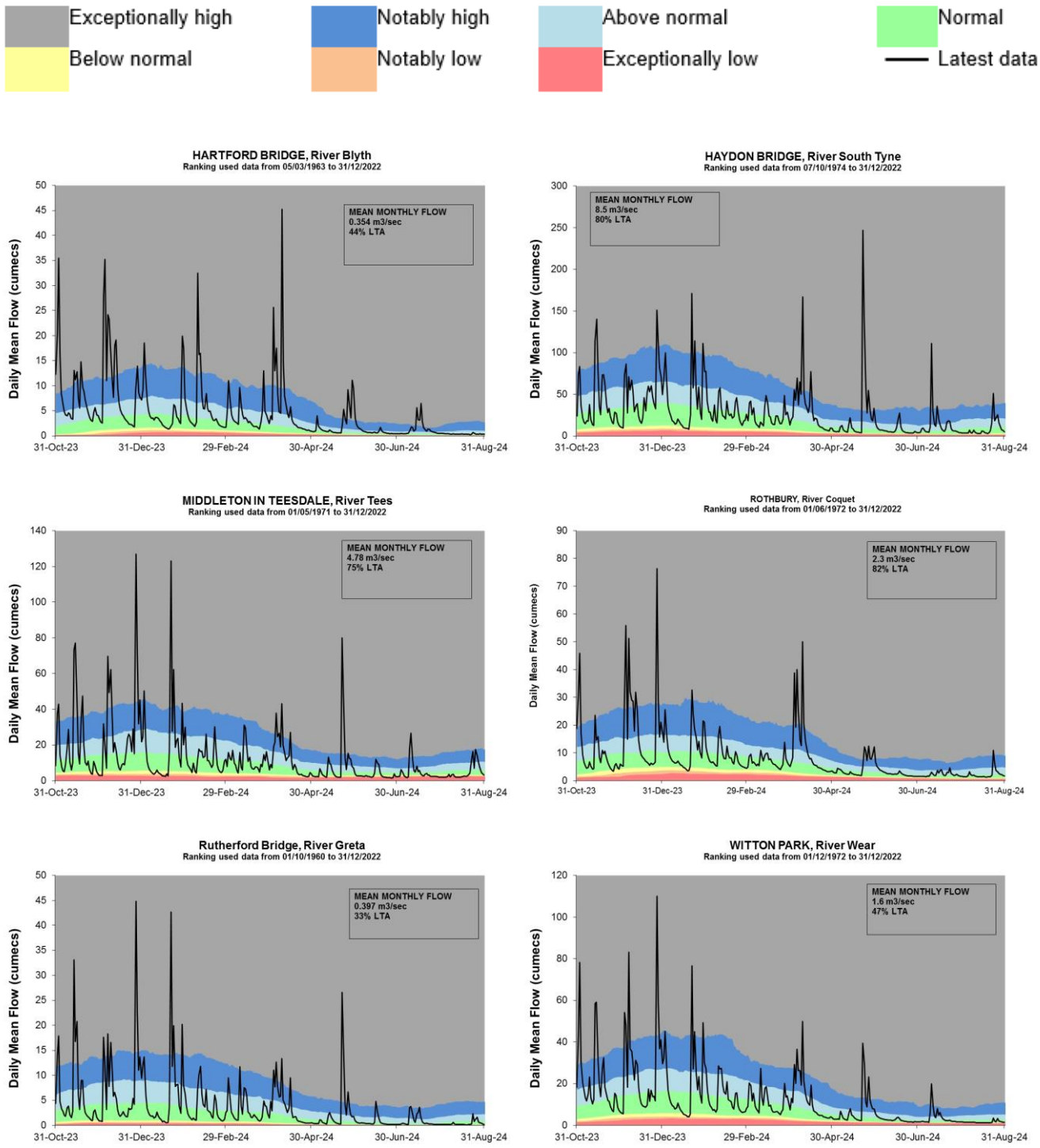
4.1 River flows map

Figure 4.1: Monthly mean river flow for indicator sites for August 2024, expressed as a percentage of the respective long term average and classed relative to an analysis of historic August monthly means. Monthly means are classed as normal at Hartford Bridge, Haydon Bridge, Middleton in Teesdale, Rothbury and Rutherford Bridge. They are classed as below normal at Heaton Mill and Witton Park. There are current ongoing data quality issues at Mitford on the River Coquet and therefore the site is marked as no data for the month. 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.

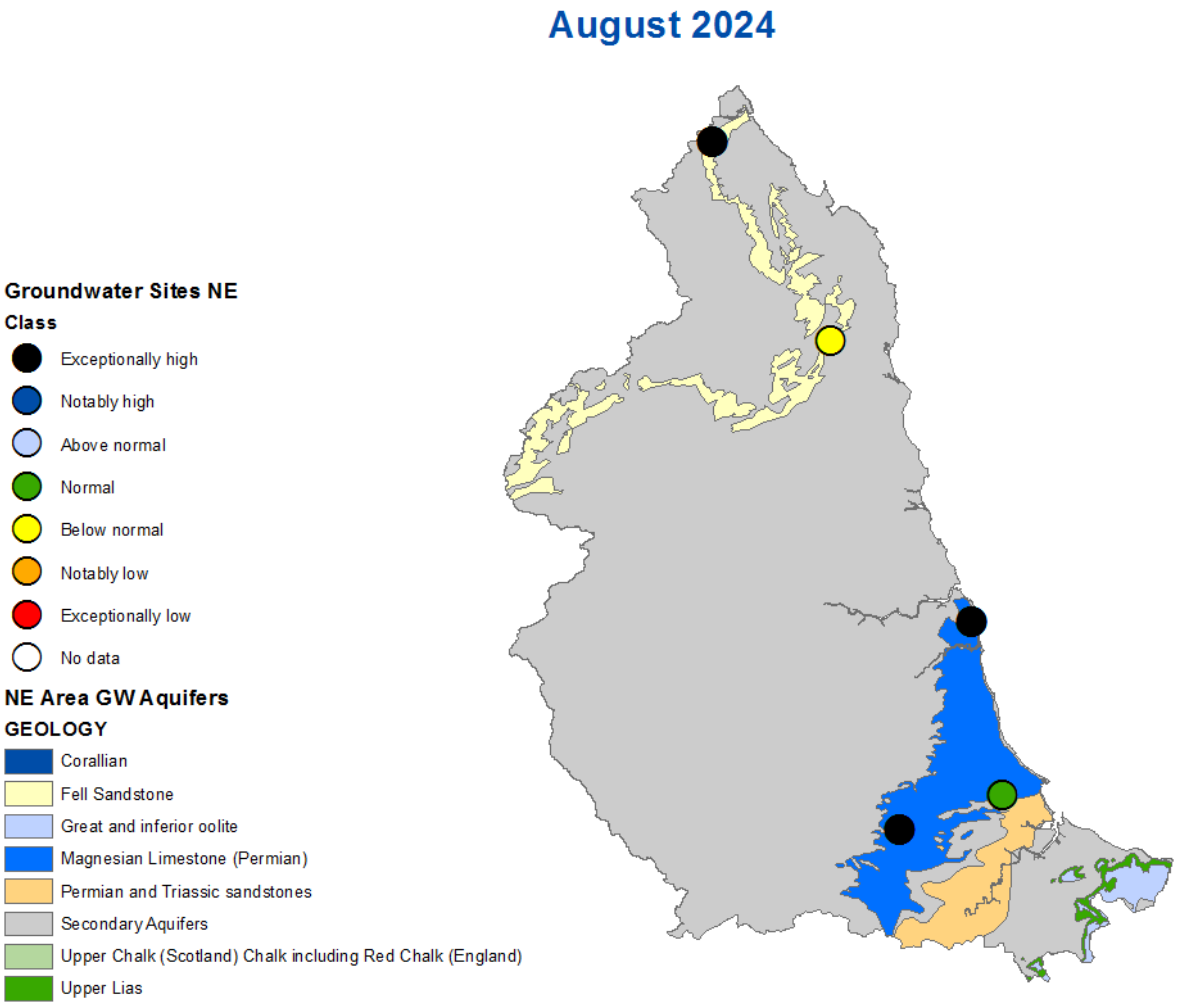


Source: Environment Agency, 2024.

5 Groundwater levels

5.1 Groundwater levels map

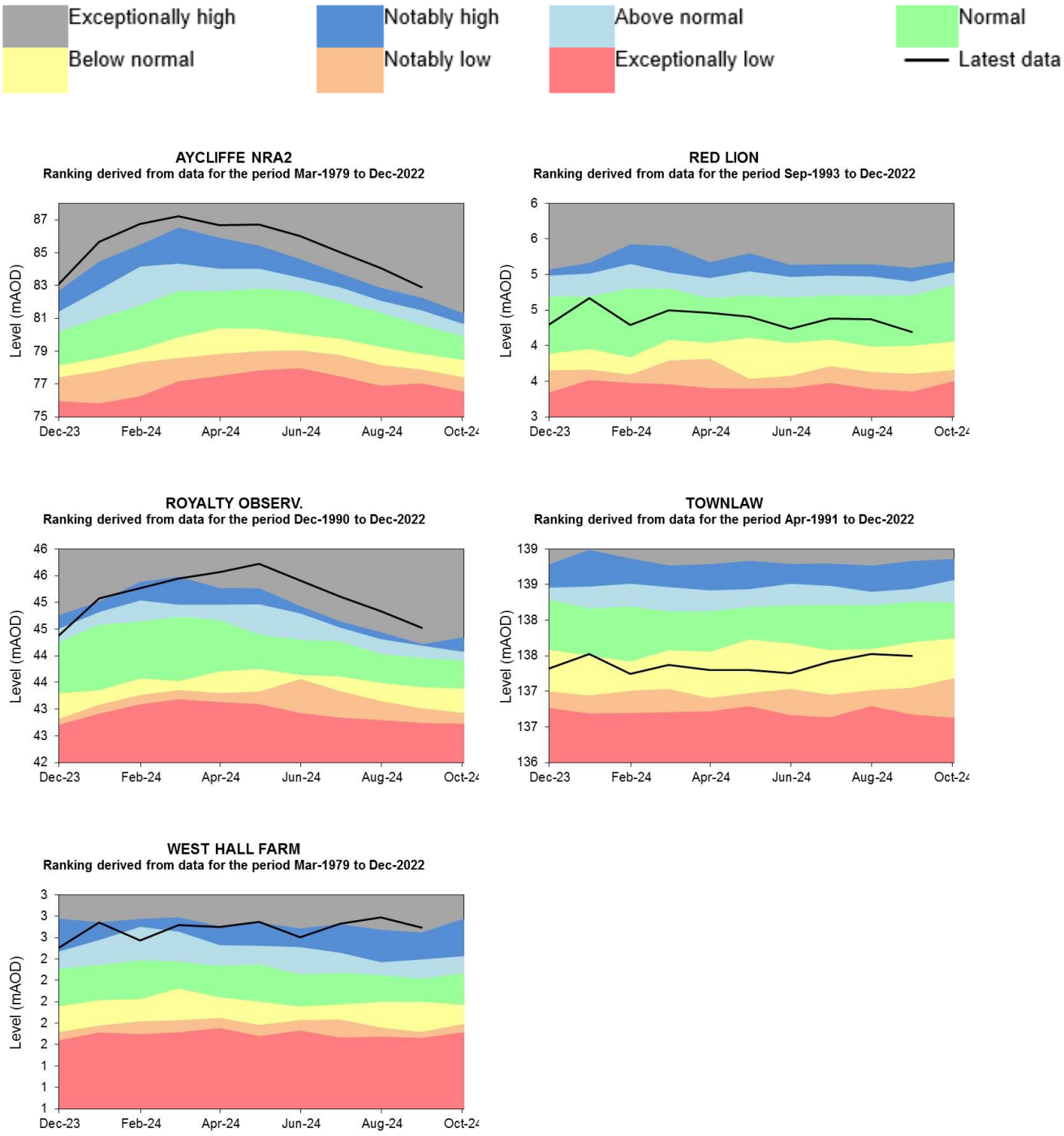
Figure 5.1: Groundwater levels for indicator sites at the end of August 2024, classed relative to an analysis of respective historic August levels. Indicator sites fall within the exceptionally high, normal, and below normal ranges. Table available in the appendices with detailed information.



(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

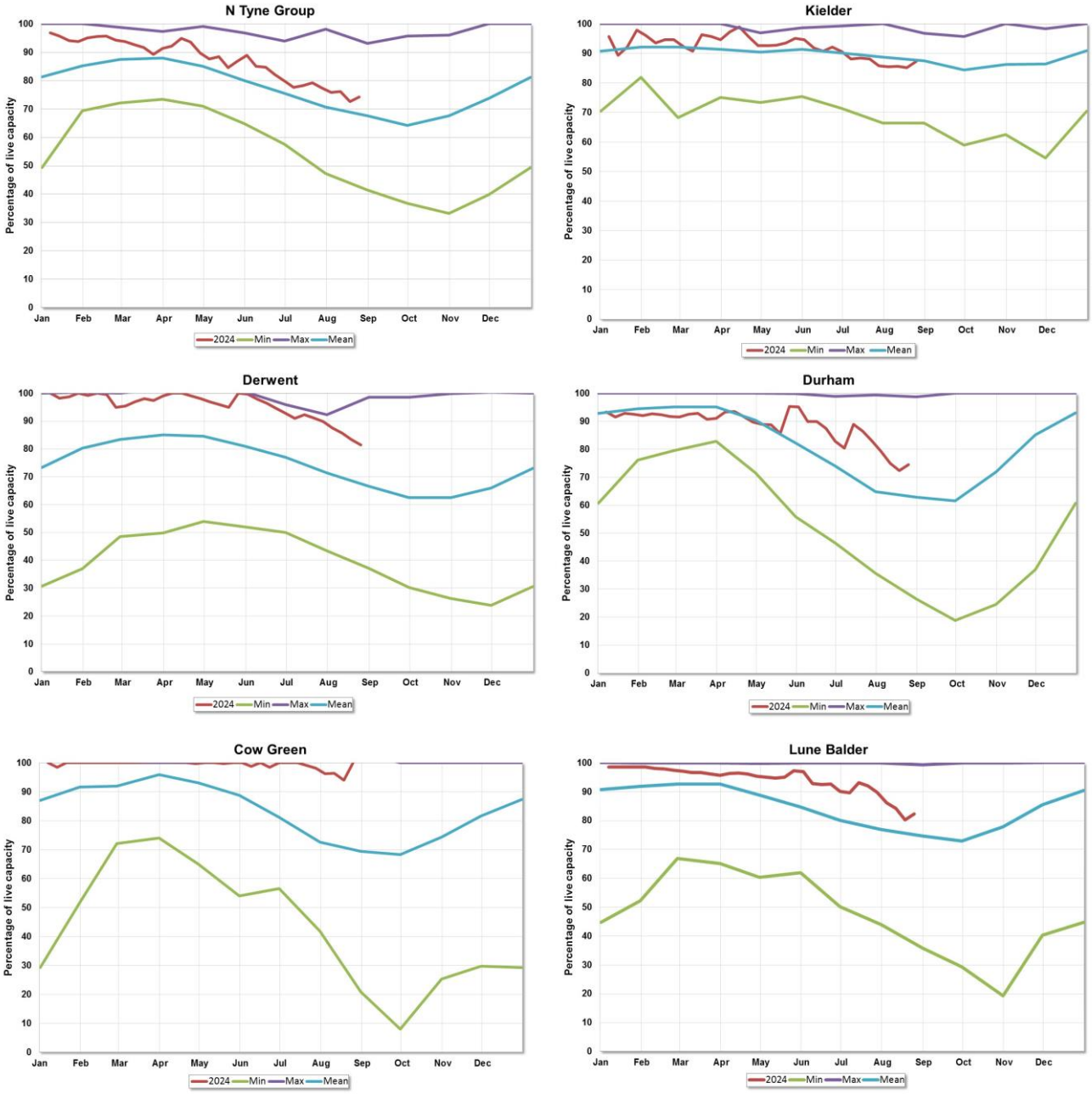
Figure 5.2: End of month groundwater levels at index groundwater level sites for major aquifers in the North East. 12 months compared to an analysis of historic end of month levels and long term maximum and minimum levels.



Source: Environment Agency, 2024.

6 Reservoir stocks

Figure 6.1: End of month reservoir stocks compared to long term maximum, minimum and average stocks. Note: Historic records of individual reservoirs and reservoir groups vary in length.



(Source: Water Company).

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.

8 Appendices

8.1 Rainfall table

Hydrological area	August 2024 rainfall % of long term average 1961 to 1990	August 2024 band	June 2024 to August 2024 cumulative band	March 2024 to August 2024 cumulative band	September 2023 to August 2024 cumulative band
Northumbria North Sea Tribs	69	Below Normal	Below normal	Above normal	Exceptionally high
Seaham Area	27	Exceptionally Low	Below normal	Normal	Exceptionally high
Tees	42	Notably Low	Below normal	Normal	Exceptionally high
Tweed	73	Normal	Normal	Above normal	Exceptionally high
Tyne	81	Normal	Normal	Notably high	Exceptionally high
Wear	41	Notably Low	Below normal	Normal	Exceptionally high

8.2 River flows table

Site name	River	Catchment	August 2024 band	July 2024 band
Hartford Bridge	Blyth	Blyth	Normal	Notably high
Haydon Bridge	South Tyne	South Tyne	Normal	Above normal
Heaton Mill	Till	Till	Below normal	Above normal
Middleton In Teesdale	Tees	Tees	Normal	Normal
Mitford	Wansbeck	Wansbeck	No data	No data
Rothbury	Coquet	Coquet	Normal	Normal
Rutherford Bridge	Greta	Greta	Normal	Normal
Witton Park	Wear	Wear	Below normal	Above normal

8.3 Groundwater table

Site name	Aquifer	End of August 2024 band	End of July 2024 band
Aycliffe Nra2	Skerne Magnesian Limestone	Exceptionally high	Exceptionally high
Red Lion	Skerne Magnesian Limestone	Normal	Normal
Royalty Observ.	Till Fell Sandstone	Exceptionally high	Exceptionally high
Townlaw	Till Fell Sandstone	Below normal	Below normal
West Hall Farm	Wear Magnesian Limestone	Exceptionally high	Exceptionally high