

### Overview

September 2024 was cool and dry overall, however, conditions varied considerably throughout the month and from region to region. The final third of the month was cool and dominated by low pressure to the south, this brought spells of wet and windy weather with the bulk of the rain falling in the South and East.

The monthly average river flows for September decreased when compared to August with 61% of river flows below the long-term normal range. Similarly, average water levels decreased at most lake sites compared to August with 51% of the lake and turlough monitoring stations observed levels below the long-term normal range. Average monthly groundwater levels also decreased compared to August with 54% of the wells recording levels below the long-term average. Out of the six spring flows monitored, three were in the 'normal' range and three were 'below normal'.

### Rainfall

September was driest in the Northwest, wettest in the East and South. Nearly all rainfall totals were below their 1981-2010 Long-Term Average (LTA) for the month. Percentage of monthly rainfall values ranged from 15% (the month's lowest monthly rainfall total of 17.2 mm) at Mace Head, Co Galway (its driest September since 2014) to 124% (the month's highest monthly rainfall total of 108.4 mm) at Johnstown Castle, Co Wexford. The highest daily rainfall total was 51.3 mm at Cork Airport, Co Cork on Sunday 29th (its highest daily fall in September since 1965). The number of rain days ranged from 10 days at Sherkin Island, Co Cork to 20 days at Knock Airport, Co Mayo. The number of wet days ranged from 5 days at Mace Head, Co Galway to 15 days at both Newport, Co Mayo and Knock Airport, Co Mayo. The number of very wet days ranged from zero days at seven stations in the West and Northwest to 3 days at four stations in the South and East. Nine stations, mostly in the West and Northwest, had their driest September since 2014. There were eight consecutive dry days (0.0 mm) from Monday 16th to Monday 23rd, at Markree Castle, Co Sligo, Malin Head, Co Donegal and Valentia Observatory, Co Kerry

### River Flows

The average river flows for September decreased at 60% of river monitoring stations compared to average flows observed in August. Analysis of the monthly average flows at 142 river monitoring sites, identified 4 (3%) as 'above normal', 51 (36%) as 'normal', 73 (51%) as 'below normal' and 14 (10%) as 'particularly low'. Generally, average river flows classified as 'below normal' and 'particularly low' were observed in the midlands, and west of the country (see Figure 6).

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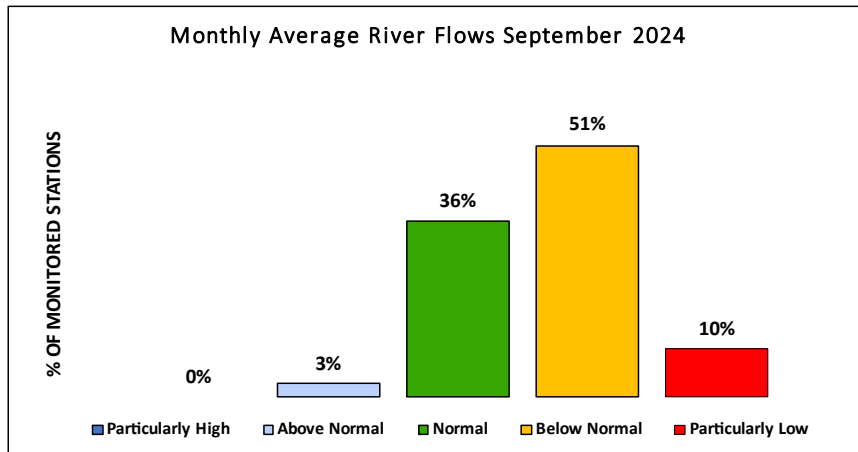


Figure 1: Percentage distribution of river flow monitoring sites within each of the percentile flow categories for September 2024.

### Lake and Turlough Levels

Average water levels for September decreased at 67% of lake sites compared to August. In September, monthly average levels at 31 lakes and 4 turloughs were classified as being 'above normal' at 6 (17%), 'normal' at 11 (32%), 'below normal' at 14 (40%) and 'particularly low' at 4 (11%).

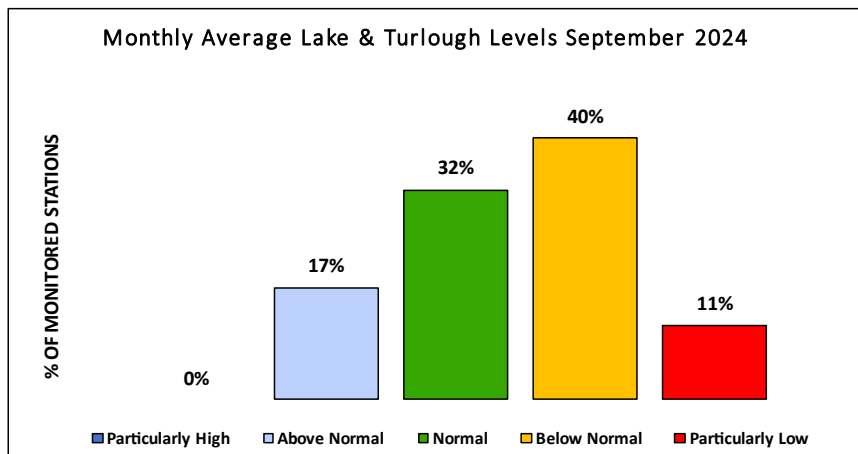


Figure 2: Percentage distribution of lake and turlough level monitoring sites within each of the percentile flow categories for September 2024

### Groundwater Levels and Spring Flows

Groundwater levels for September were lower at 94% of the monitoring wells compared to average levels observed in August. Groundwater levels at 37 monitoring wells were classified as being 'particularly high' at 4 wells (11%), 'above normal' at 2 wells (5%), 'normal' at 11 wells (30%), 'below normal' at 16 wells (43%) and 'particularly low' at 4 wells (11%) (see Figure 11).

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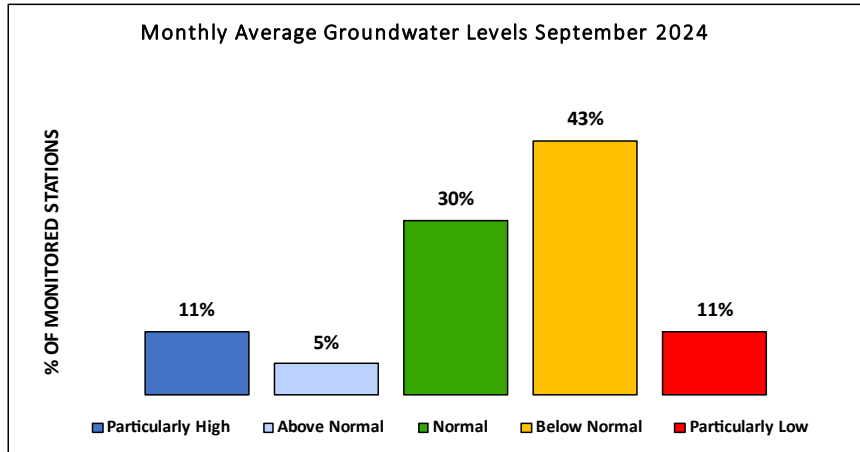


Figure 3: Percentage distribution of groundwater level sites within each of the percentile flow categories for September 2024.

Spring outflows were also monitored at 6 EPA monitoring sites for September. The outflows from these springs were compared to previously recorded September flows and were classified as 'normal' at 3 locations and 'below normal' at the other 3 monitoring locations.

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## Rainfall

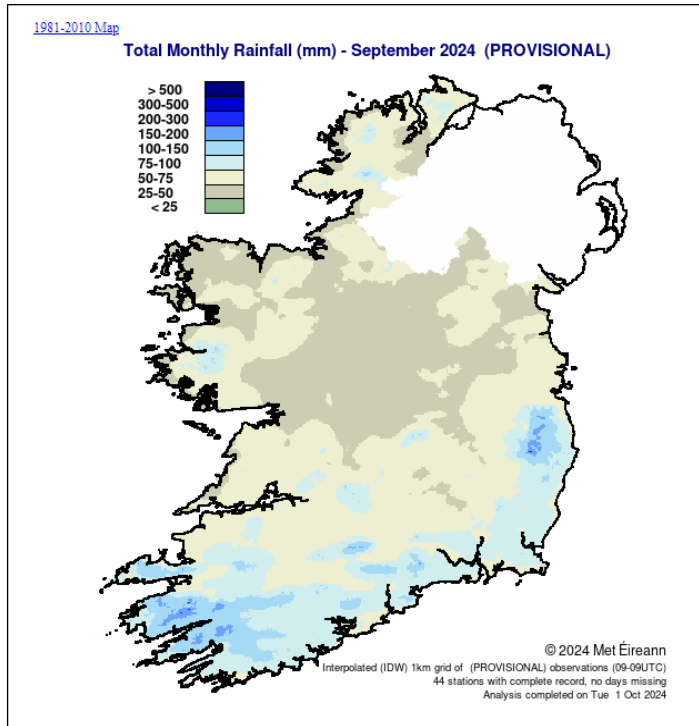


Figure 4: Rainfall map for Ireland September 2024 (Source: Met Eireann.ie).

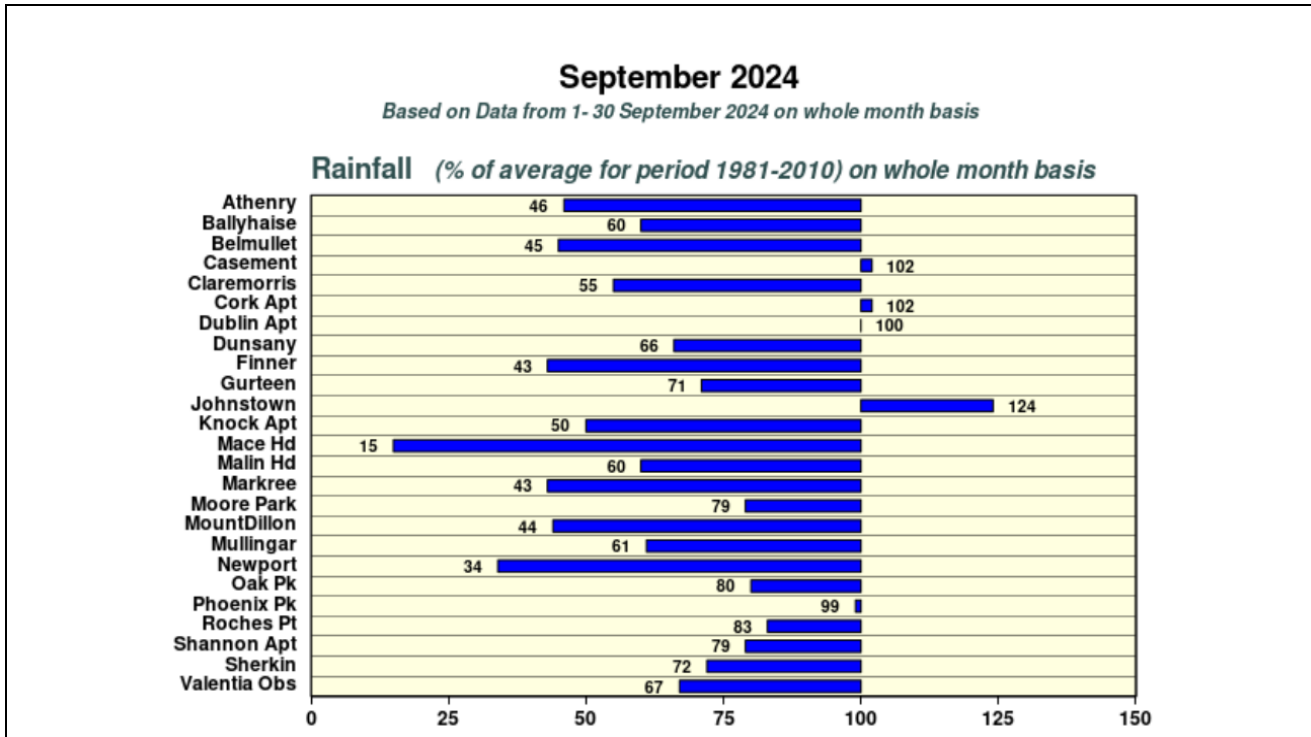


Figure 5: Summary of rainfall at synoptic stations for September 2024, figures indicate the percentage difference from the Long-Term Average rainfall for this month (Source: Met Eireann.ie).

## River Flows

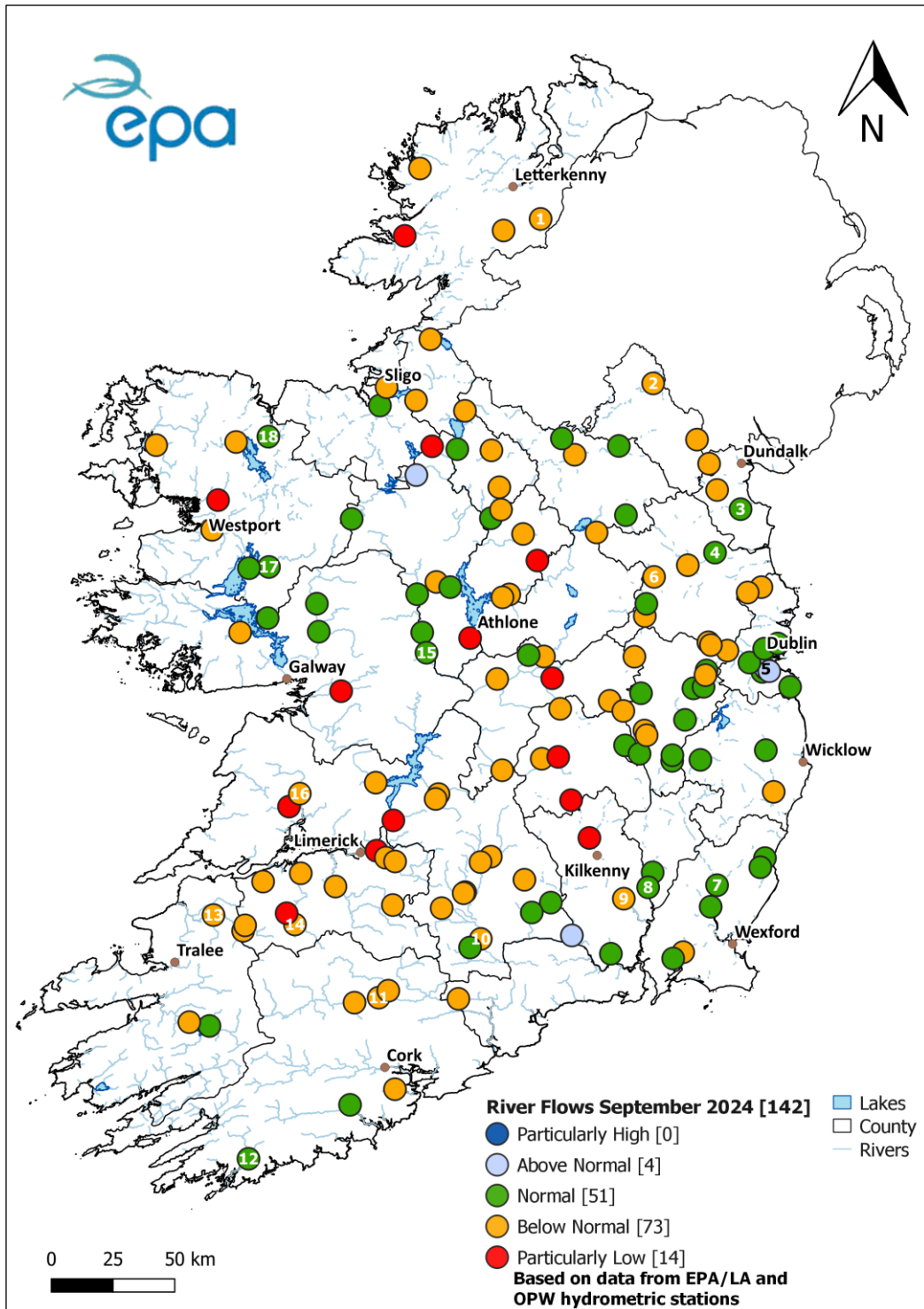


Figure 6: Monthly average river flows for September 2024 relative to historic monthly average flows expressed as percentile of the long-term values of monthly flow. Numbered sites are represented in the hydrographs below. All data are provisional and may be subject to revision (Source: EPA, OPW).

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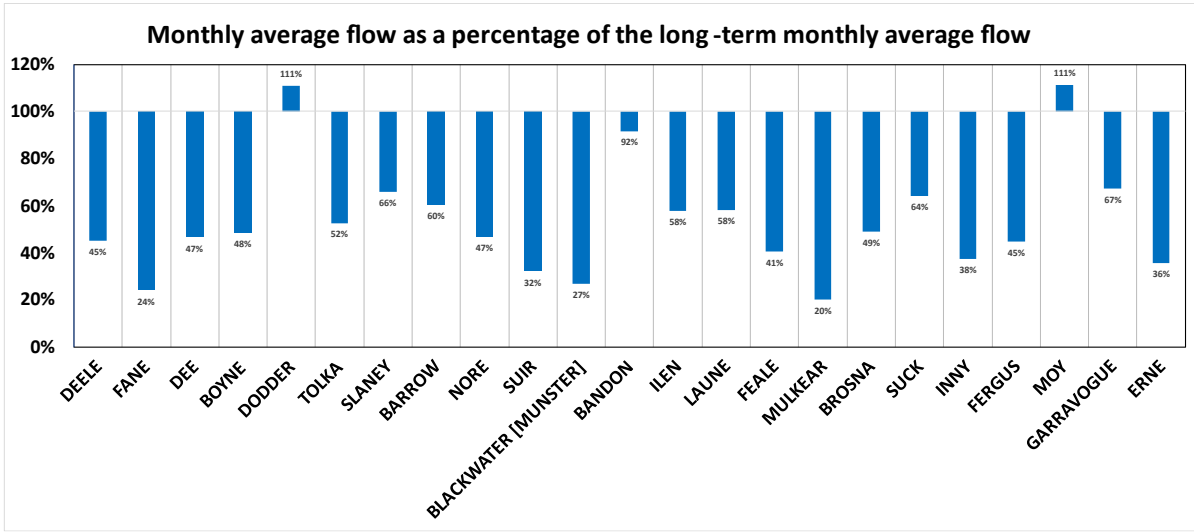
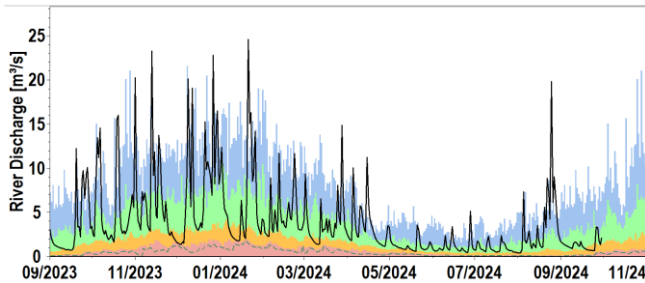


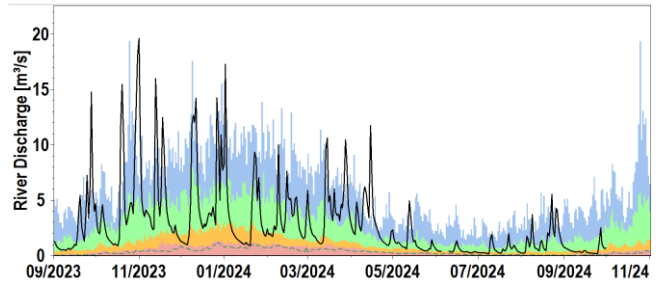
Figure 7: September 2024 average flows as a percentage of the long-term monthly average flow for this month at a selected number of stations. All data are provisional and may be subject to revision (Source: EPA, OPW).

## Flow hydrographs for selected rivers

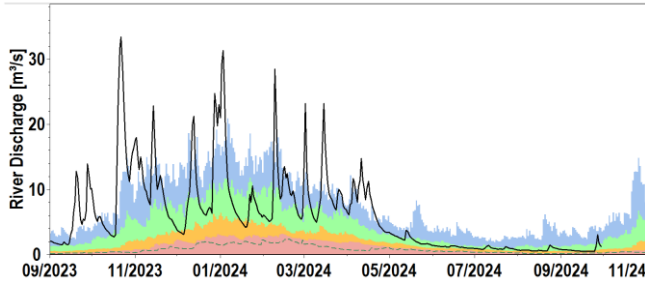
1. DEELE (Donegal)



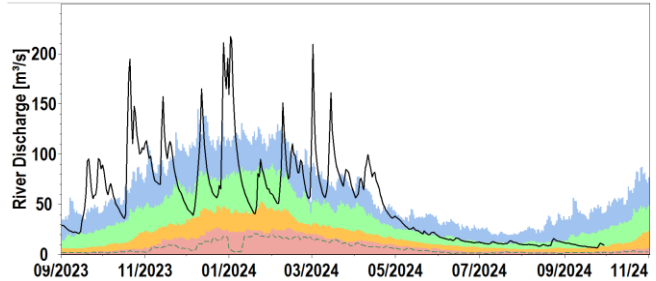
2. BLACKWATER [MONAGHAN]



3. DEE (Louth)

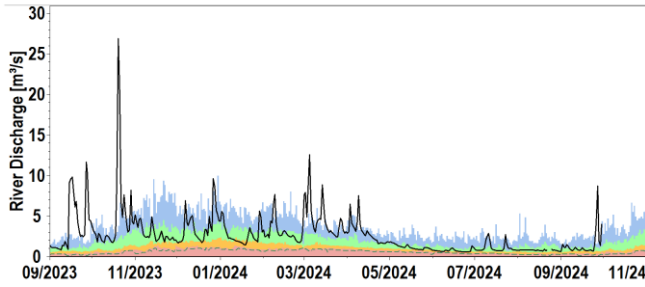


4. BOYNE (Meath)

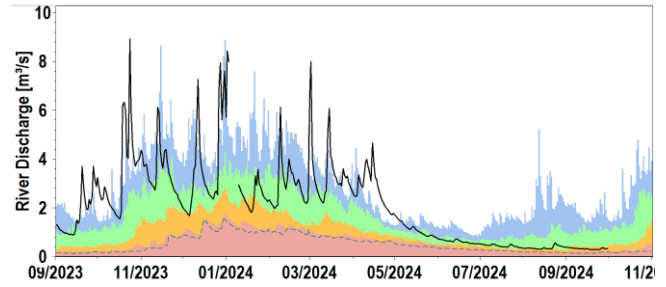


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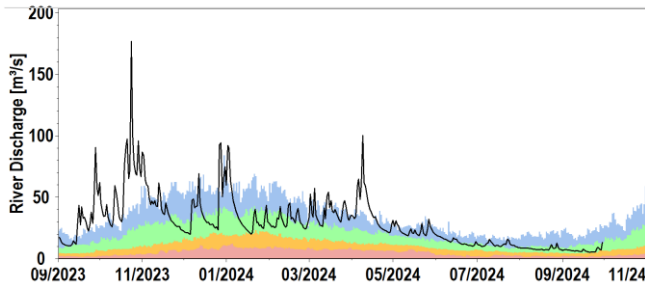
**5. DODDER (Dublin)**



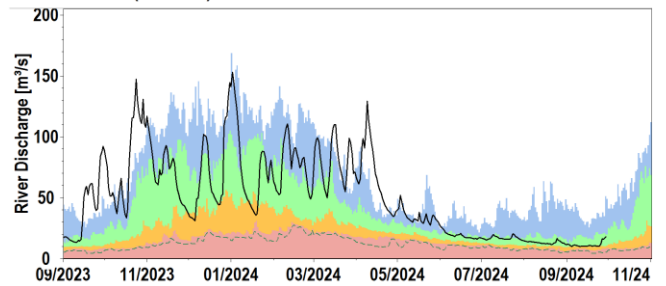
**6. ATHBOY (Meath)**



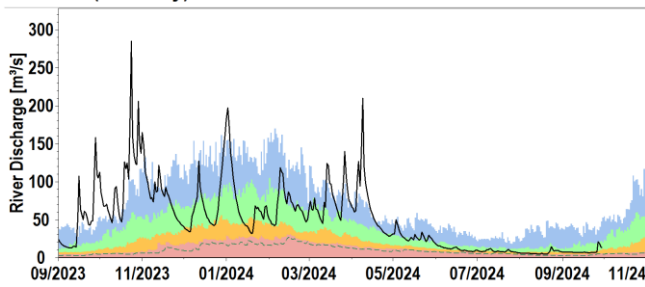
**7. SLANEY (Wexford)**



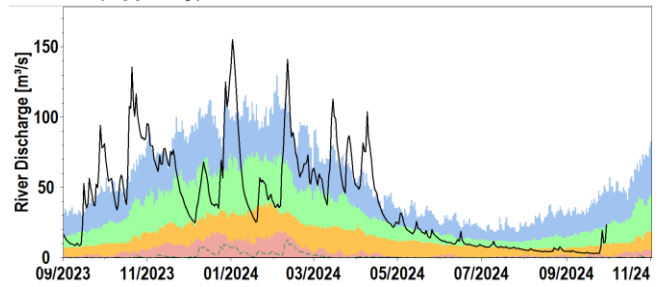
**8. BARROW (Carlow)**



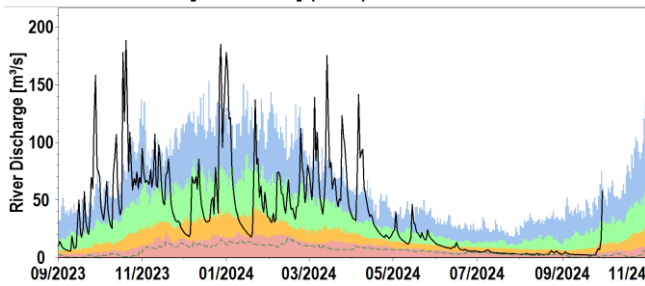
**9. NORE (Kilkenny)**



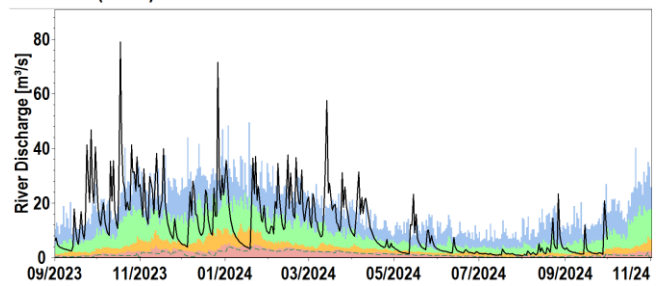
**10. SUIR (Tipperary)**



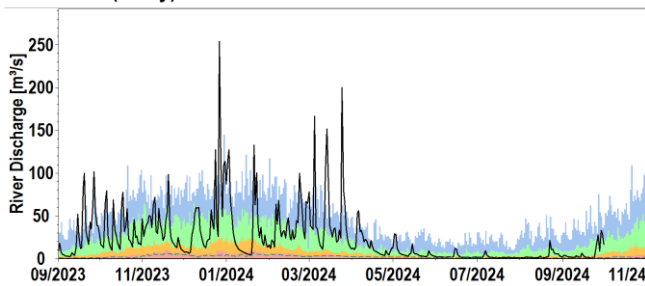
**11. BLACKWATER [MUNSTER] (Cork)**



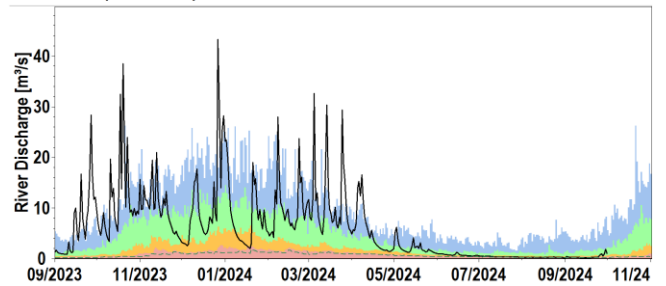
**12. ILEN (Cork)**



**13. FEALE (Kerry)**

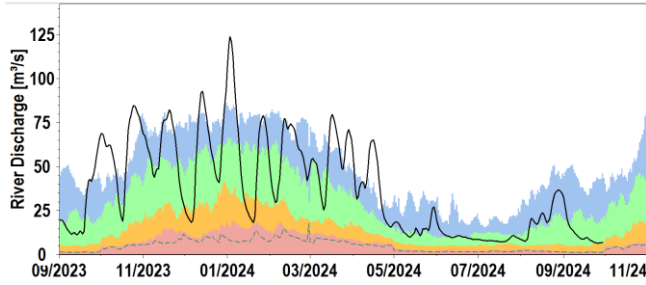


**14. DEEL (Limerick)**

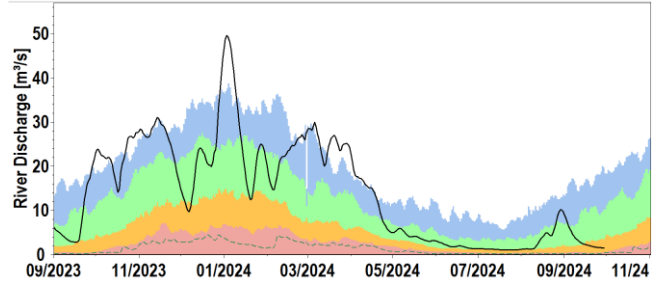


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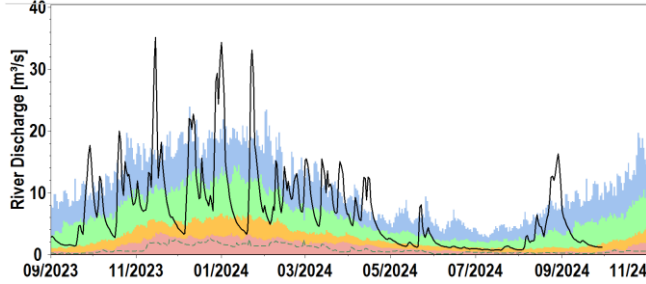
15. SUCK (Roscommon)



16. FERGUS (Clare)



17. ROBE (Mayo)



18. MOY (Mayo)

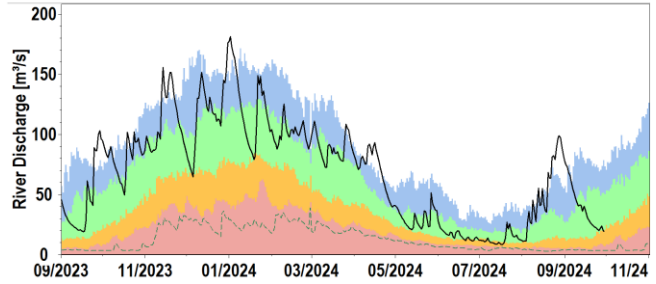
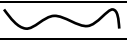



Figure 8: Daily average river flows measured in cubic metres per second relative to historic daily average flows expressed as percentile of the long-term values of each day and long-term minimum flows. All data are provisional and may be subject to revision (Source: EPA, OPW).

Explanation – Classes						
Particularly Low	Below Normal	Normal	Above Normal	Particularly High		
<95%tile daily average flow	>95%tile <70%tile daily average flow	>70 %tile <30%tile daily average flow	>30%tile 10%tile daily average flow	>10%tile daily average flow	Daily Mean Flow	Lowest Daily Mean Flow



## Lake and Turlough Levels

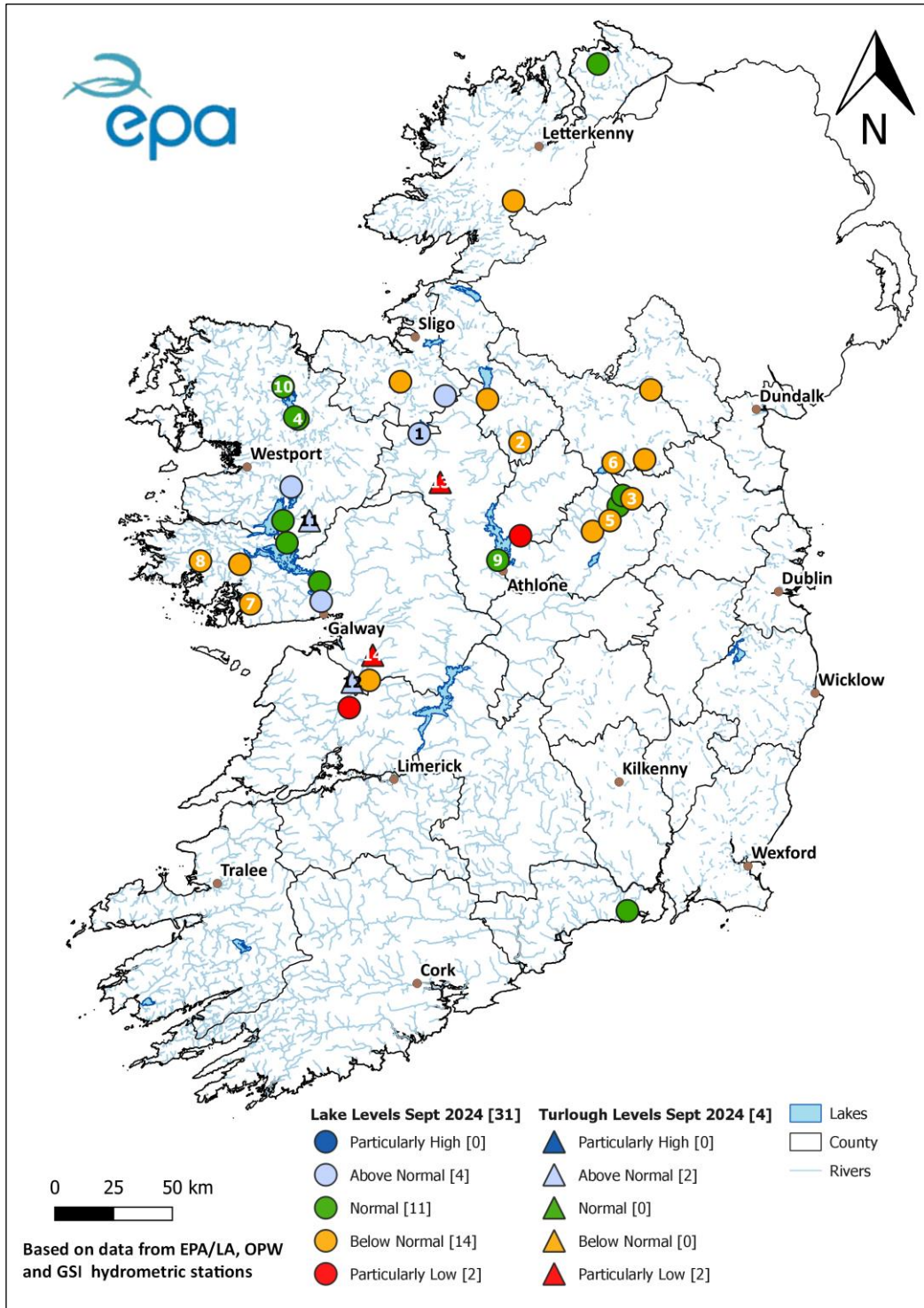
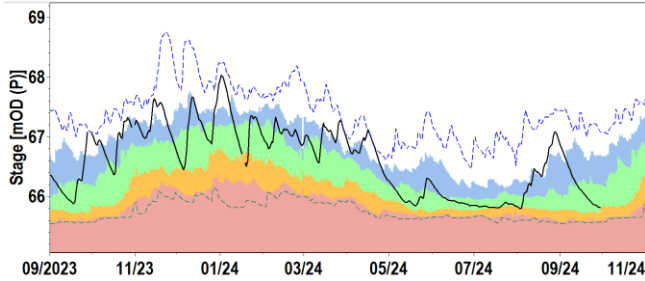


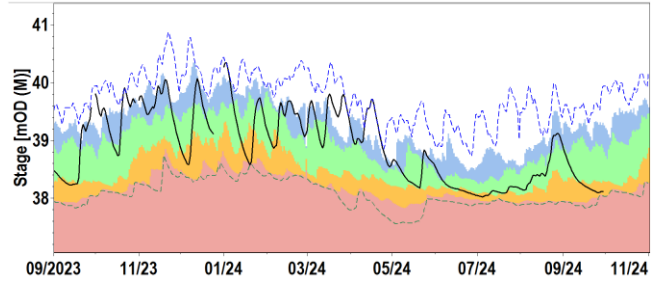
Figure 9: Monthly average lake & turlough levels for September 2024 relative to historic monthly average levels expressed as percentile of the long-term values for this month. Numbered sites are represented in the hydrographs below. All data are provisional and may be subject to revision (Source: EPA, OPW and GSI).

## Water level hydrographs for selected lakes and turloughs

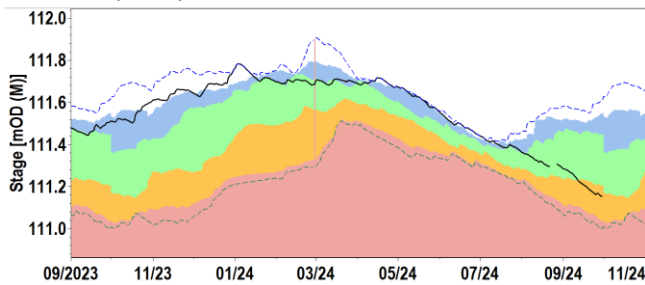
1. L. GARA (Sligo)



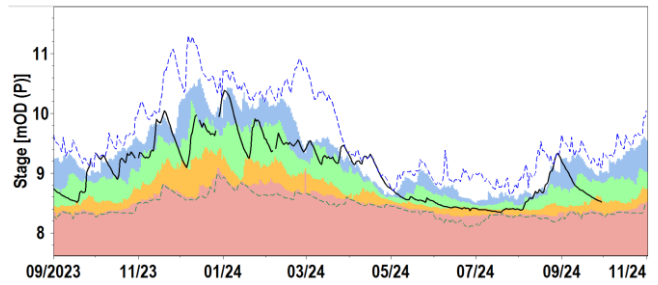
2. LOUGH RINN (Leitrim)



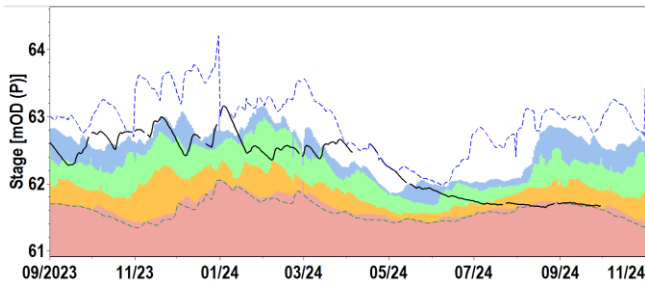
3. L. BANE (Meath)



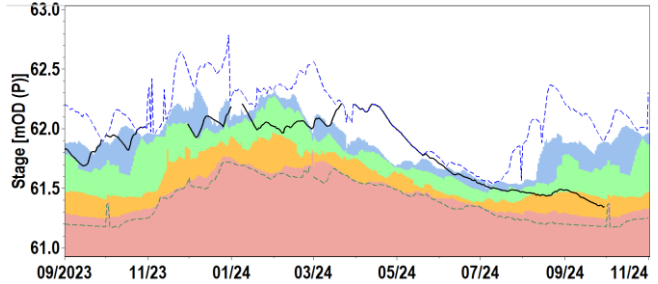
4. L.CULLIN (Mayo)



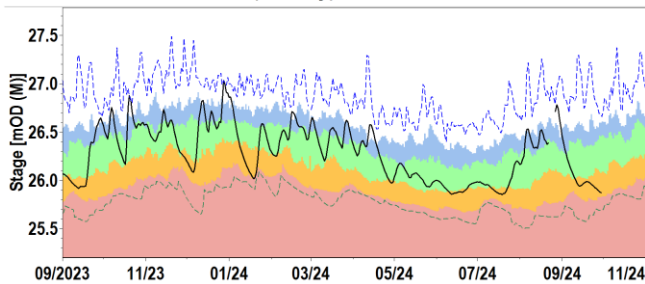
5. L.DERRAVARAGH (Westmeath)



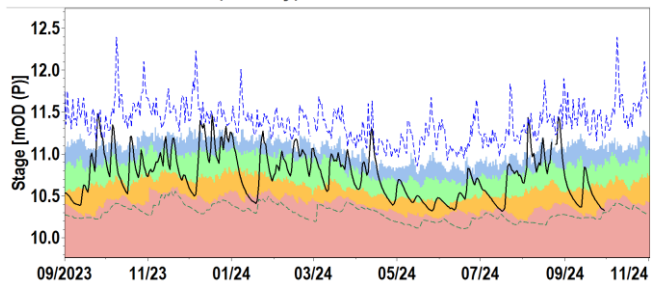
6. L.SHEELIN (Cavan)



7. GLENICMURRIN LAKE (Galway)

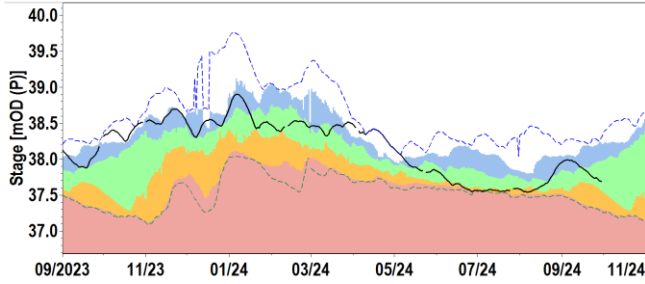


8. DERRYCLARE L. (Galway)

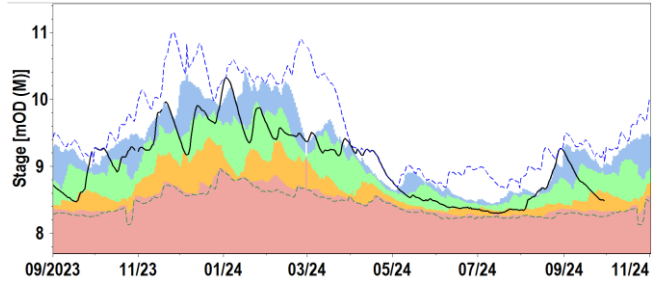


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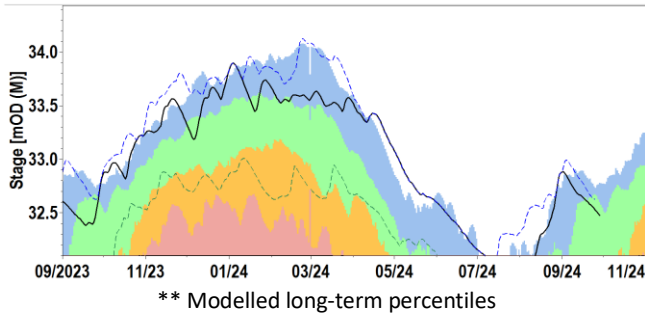
9. L.REE (Roscommon)



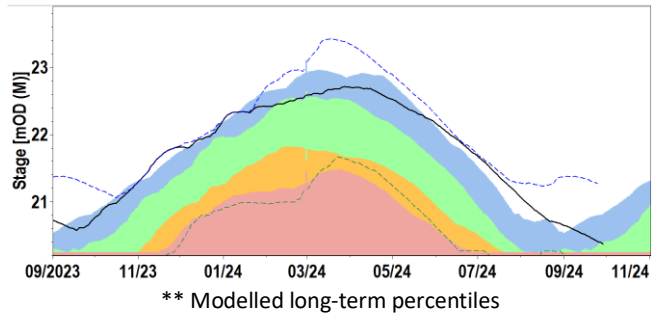
10. L.CONN (Mayo)



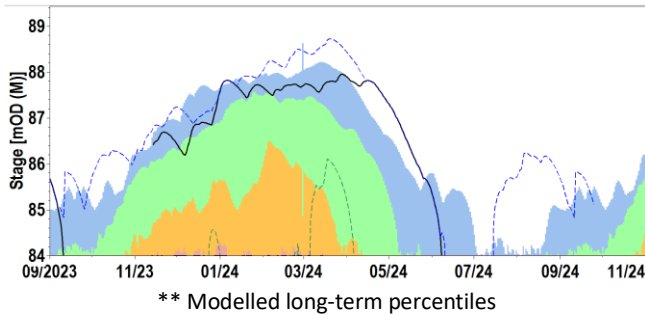
11. SKEALOGHAN TURLOUGH (Mayo)



12. TERMON SOUTH TURLOUGH (Galway)



13. CASTLEPLUNKET TURLOUGH (Roscommon)



14. BLACKROCK TURLOUGH (Galway)

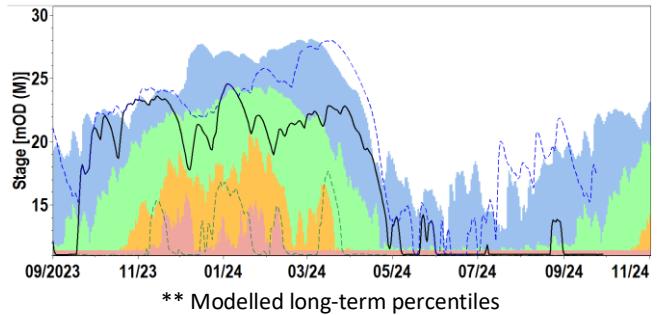





Figure 10: Observed daily mean lake and turlough levels (black trace) measured in meters above ordnance datum compared to the 10%tile, 30%tile, 70%tile and 95%tile for each month for the period of record and observed long-term maximum and minimum levels. Note historic percentiles for turloughs are based on modelled data. All data are provisional and may be subject to revision (Source: EPA, OPW, GSI, TCD, IT Carlow).

Explanation - Classes							
Particularly Low	Below Normal	Normal	Above Normal	Particularly High			
<95%tile daily average level	>95%tile <70%tile daily average level	>70 %tile <30%tile daily average level	>30%tile <10%tile daily average level	>10%tile daily average level	Daily Mean Level mOD	Highest Daily Mean Level mOD	Lowest Daily Mean Level mOD

## Groundwater Levels and Spring Flows

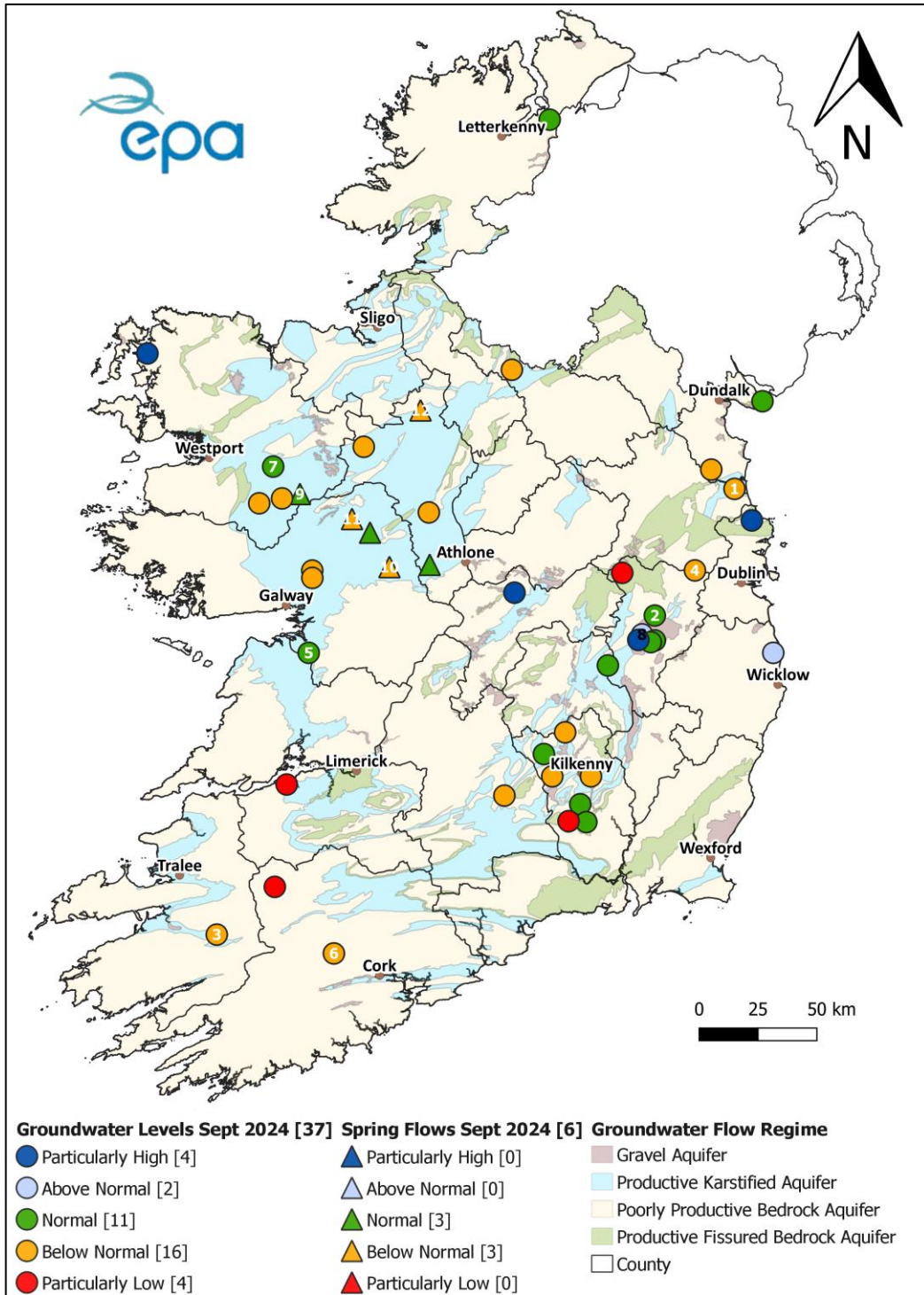
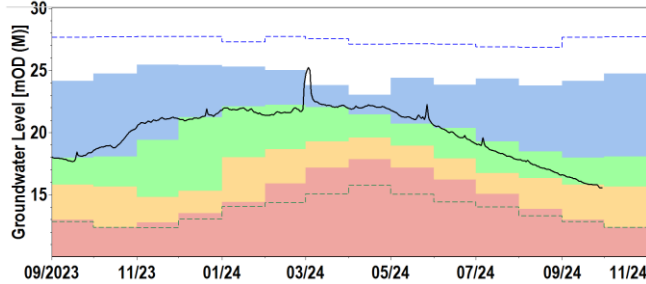


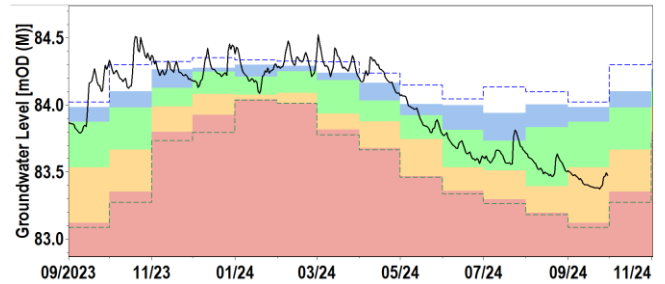
Figure 11: Groundwater level and Spring Flow status for September 2024, relative to historic monthly groundwater levels. Numbered sites are represented in the hydrographs below. All data are provisional and may be subject to revision (Source: EPA).

## Groundwater and spring hydrographs

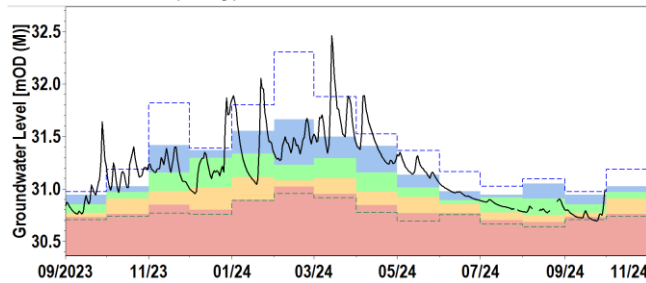
1. KILTROUGH TOWER (Meath)



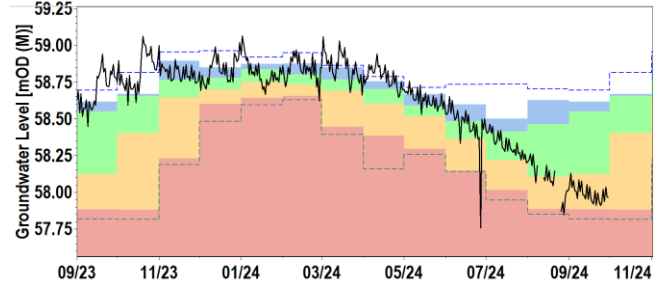
2. Allen (Kildare)



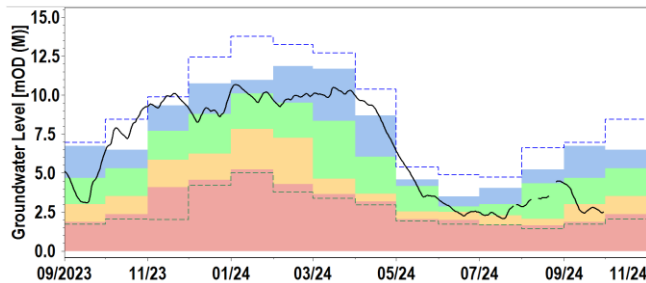
3. FBH9 - FLESK (Kerry)



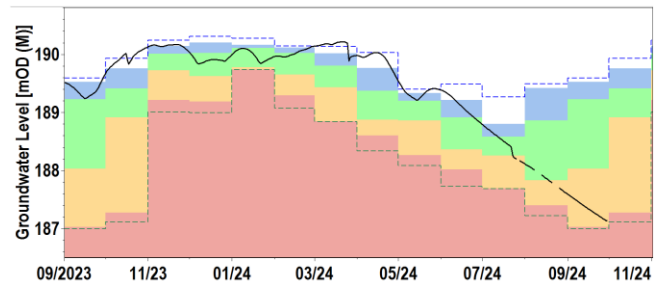
4. RW1 - DEEP (Meath)



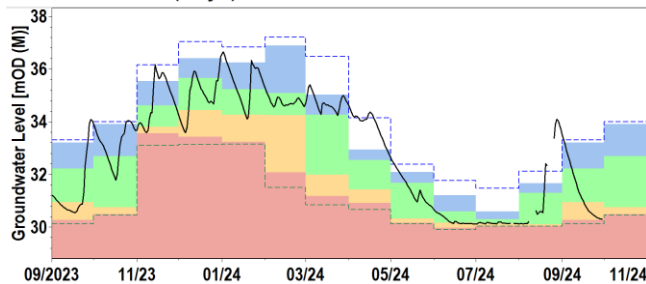
5. KILLINY (Galway)



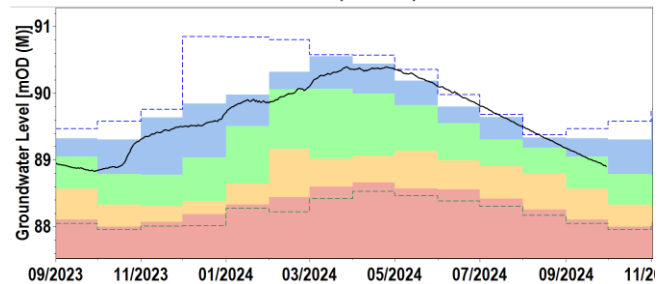
6. DR1 Deep Upper Site (Cork)



7. MAYO ABBEY (Mayo)

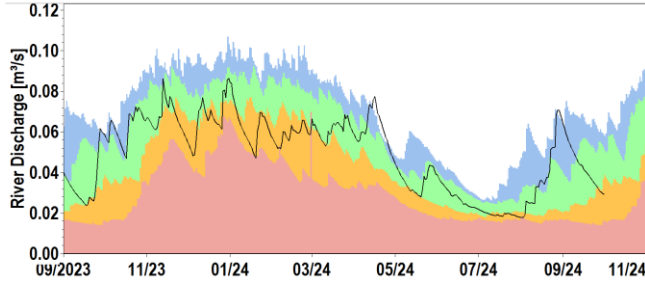


8. POLLARDSTOWN FEN - MB 30 (Kildare)

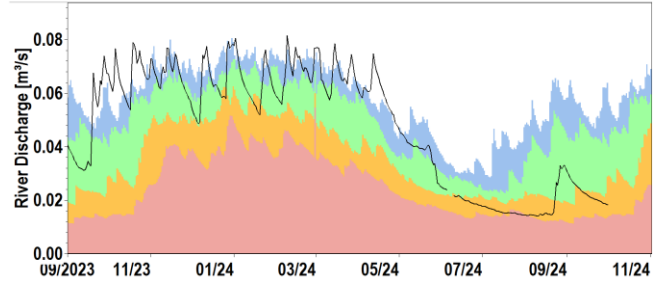


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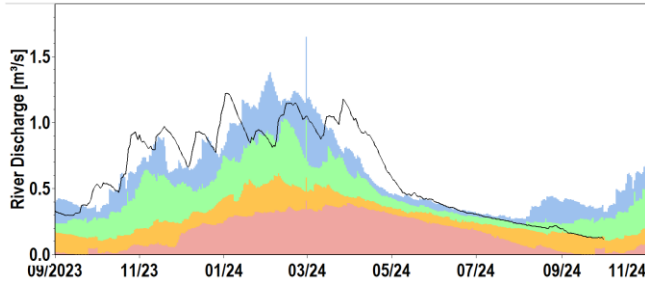
**9. BALLINDINE SPRING (Mayo)**



**10. CALTRA SPRING (Galway)**



**11. KILLEGLAN SPRING (Roscommon)**



**12. ROCKINGHAM (Roscommon)**

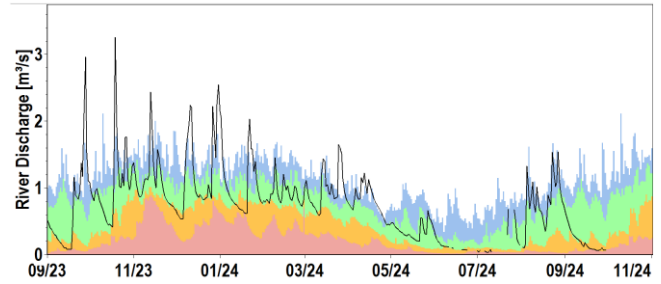





Figure 12: Daily mean groundwater levels (black trace) measured in meters above ordnance datum compared to the 10%tile, 30%tile, 70%tile and 95%tile for each month for the period of record and long-term maximum and minimum levels. All data are provisional and may be subject to revision (Source: EPA).

Explanation - Classes							
Particularly Low	Below Normal	Normal	Above Normal	Particularly High			
<95%tile monthly average level	>95%tile <70%tile monthly average level	>70 %tile <30%tile monthly average level	>30%tile <10%tile monthly average level	>10%tile monthly average level	Daily Mean Level mOD	Highest Month Mean Level mOD	Lowest Month Mean Level mOD

## Glossary of terms

Aquifer Type	An aquifer is an underground body of water bearing rock or unconsolidated materials (gravel or sand) from which groundwater can be extracted in useful amounts. For the purposes of this report they have been grouped into four aquifer categories as follows: <ul style="list-style-type: none"> <li>➤ Karstic (Rk and Lk) aquifers;</li> <li>➤ Gravel (Rg and Lg) aquifers;</li> <li>➤ Productive fractured bedrock (Rf and Lm) aquifers;</li> <li>➤ Poorly productive bedrock (LI, PI and Pu) aquifers.</li> </ul>
Dry spell	A dry spell is a period of 15 or more consecutive days to none of which is credited 1.0 mm or more of precipitation (i.e. daily tot < 1.0 mm).
Long term average (LTA)	The arithmetic mean calculated from historic record. For rainfall, the period 1981 to 2010 is used. For other parameters, such as groundwater levels, lake levels and river flow the period may vary according to data availability.
mOD (M or P)	Groundwater levels or lake levels above ordnance datum. In most cases this is relative to mean sea level at Malin (M) but in some cases is relative to Poolbeg (P).
Long-term monthly average	The arithmetic mean calculated from historic record of all monthly averages.
Percentile Level/Flow	Level or flow that is equalled or exceeded the stated percent of the time, e.g. 30%tile is the level or flow that is equalled or exceeded 30 percent of the time.
Very Wet Days	A very wet day is a day with 10.0 mm or more of rainfall.
Wet Days	A wet day is a day with 1.0 mm or more of rainfall.
Dry Spell	A dry spell is a period of 15 or more consecutive days to none of which is credited 1.0mm or more of precipitation (i.e. daily tot < 1.0 mm).
Absolute Drought	An absolute drought is a period of 15 or more consecutive days to none of which is credited 0.2 mm or more of precipitation.
Partial Drought	A partial drought is a period of at least 29 consecutive days, the mean daily rainfall of which does not exceed 0.2 mm

## Description of flow and level percentile classifications

Particularly High	>10%tile exceedance	Monthly level or flow that can occur 10% of the time
Above Normal	>30%tile <10%tile exceedance	Monthly level or flow that can occur 20% of the time
Normal	>70%tile <30%tile exceedance	Monthly level or flow that can occur 40% of the time
Below Normal	>95%tile <70%tile exceedance	Monthly level or flow that can occur 20% of the time
Particularly Low	<95%tile exceedance	Monthly level or flow that can occur 5% of the time

## Useful links

Access to EPA/LA Hydrometric data on [HydroNet](#)

Access to provisional water level only data from OPW hydrometric stations on [waterlevel.ie/](#)

Access to archived water level and flow data from OPW hydrometric stations on [waterlevel.ie/hydro-data](#)

Access to turlough and borehole level data from GSI hydrometric stations on [gwlevel.ie](#)

Access to this month's Met Éireann and historic [weather statements](#).