

Overview

March 2024 saw Atlantic low-pressure systems continue to dominate with a southerly displaced jet stream bringing the bulk of the rain to the Midlands, South and East. The monthly average river flows for March increased at 69% of all monitoring sites since February, with 93% of river flows being above the long-term normal range, while 86% of the lake and turlough monitoring stations analysed in March observed levels above the long-term normal range. Groundwater levels increased at 82% of the wells monitored this month and of the six groundwater spring flows monitored, all were classified as being above the long-term normal range¹.

Rainfall

Above average in most places, wettest in the South and East. The majority of monthly rainfall totals were above their 1981-2010 Long-Term Average (LTA). Percentage of monthly rainfall values ranged from 79% (the month's lowest monthly rainfall total of 82.4 mm) at Finner, Co Donegal to 219% (monthly rainfall total of 115.4 mm) at Dublin Airport, Co Dublin (its third highest March rainfall on record, behind 2023 and 1947 (length 82 years)). Monthly rainfall totals were as much as 239.8 mm (194% of its LTA) at Valentia Observatory, Co Kerry (its wettest March since 1963). The highest daily rainfall total was 45.3 mm at Dublin Airport on Friday 1st (its highest daily fall for March on record (length 82 years)).

The number of rain days ranged from 20 days at Belmullet, Co Mayo to 29 days at both Shannon Airport, Co Clare and Ballyhaise, Co Cavan. The number of wet days ranged from 14 days at Malin Head, Co Donegal to 26 days at Valentia Observatory, Co Kerry. The number of very wet days ranged from 1 day at Dublin Airport to 8 days at both Valentia Observatory, Co Kerry and Cork Airport, Co Cork. Along with Dublin Airport, Phoenix Park, Co Dublin also had its wettest March day on record on Friday 1st with 43.9 mm (length 83 years), while Mount Dillon, Co Roscommon had its wettest March day on record on Thursday 14th with 33.6 mm (length 19 years).

River Flows

The average river flows for March increased at 69% of river monitoring stations compared to average flows observed in February. Analysis of the monthly average flows at 134 river monitoring sites, identified 93 (69%) as 'particularly high', 32 (24%) 'above normal' and 9 (7%) as 'normal'. Overall, there was an increase in the number of monitoring sites classified as 'particularly high'. River monitoring sites above the long-term average are observed in almost all locations except the northwest.

¹ A reduced number of groundwater and lake monitoring sites were analysed in March 2024 due to unscheduled disruption in the EPA hydrometric telemetry system.

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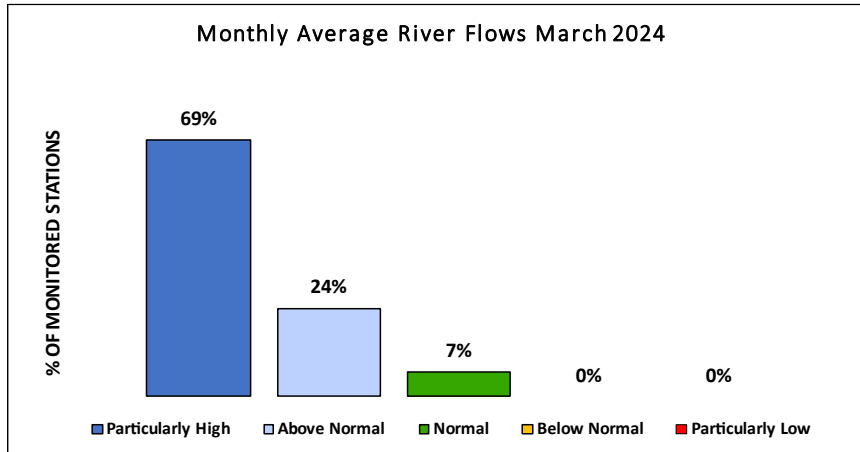


Figure 1: Percentage distribution of river flow monitoring sites within each of the percentile flow categories for March 2024.

Lake and Turlough Levels

Analysis of monthly average levels at 17 lakes and 4 turloughs for March were classified as being 'particularly high' at 5 (24%), 'above normal' at 13 (62%) and 'normal' at 3 (14%).

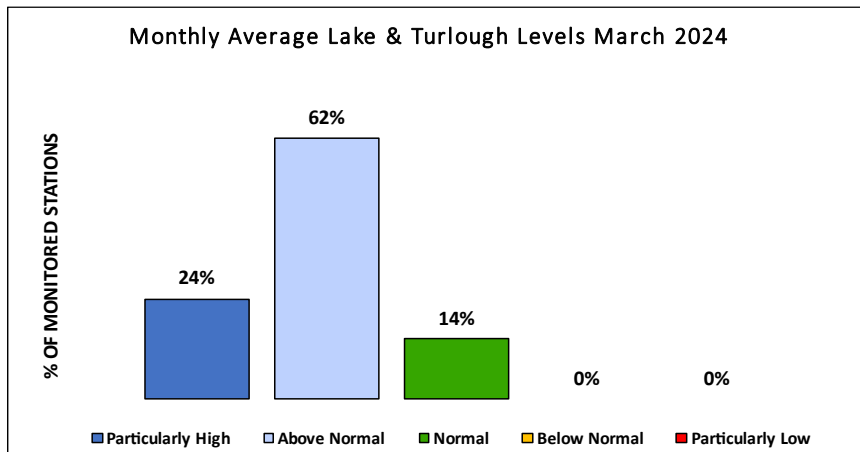


Figure 2: Percentage distribution of lake and turlough level monitoring sites within each of the percentile flow categories for March 2024.

Groundwater Levels and Spring Flows

Groundwater levels recorded at 17 wells in March were classified as being 'particularly high' at 9 wells (53%), 'above normal' at 5 wells (29%) and 'normal' at 3 wells (18%).

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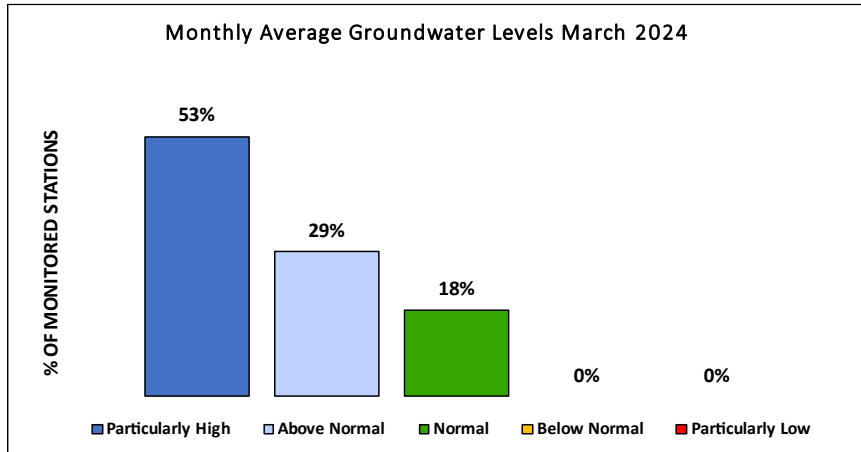


Figure 3: Percentage distribution of groundwater level sites within each of the percentile flow categories for March 2024.

Spring outflows were also monitored at 6 EPA monitoring sites in March. The outflows from these springs were compared to previously recorded March flows and were 'particularly high' at 5 locations and 1 location was 'above normal'.

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Rainfall

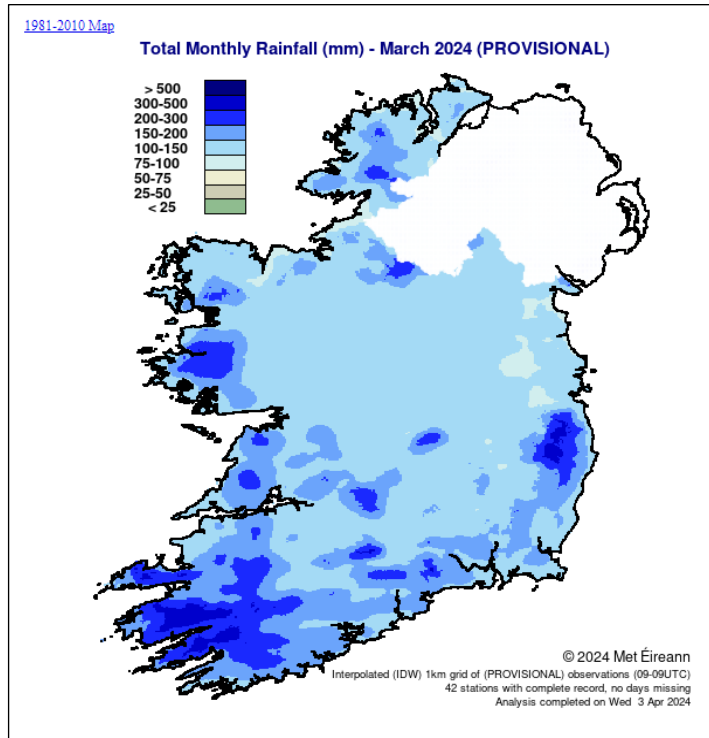


Figure 4: Rainfall map for Ireland March 2024 (Source: Met Eireann.ie).

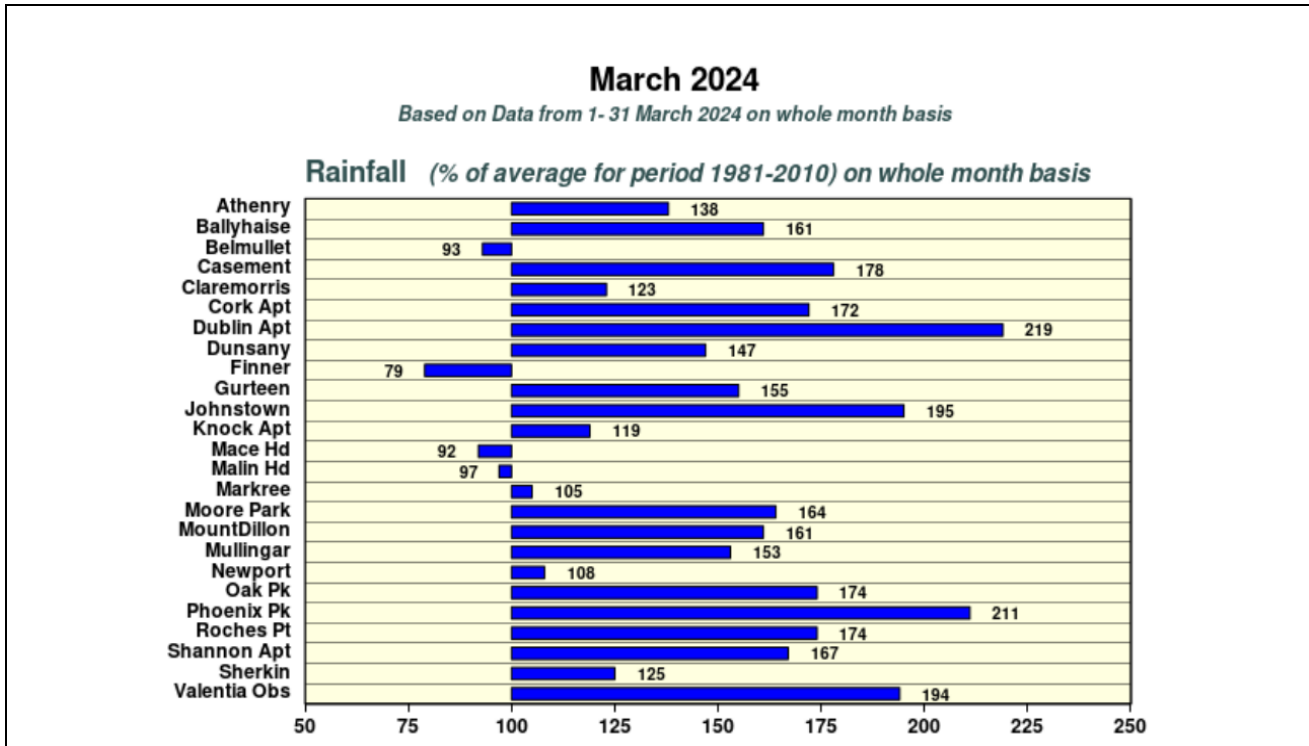


Figure 5: Summary of rainfall at synoptic stations for March 2024, figures indicate the percentage difference from the Long-Term Average rainfall for this month (Source: Met Eireann.ie).

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River Flows

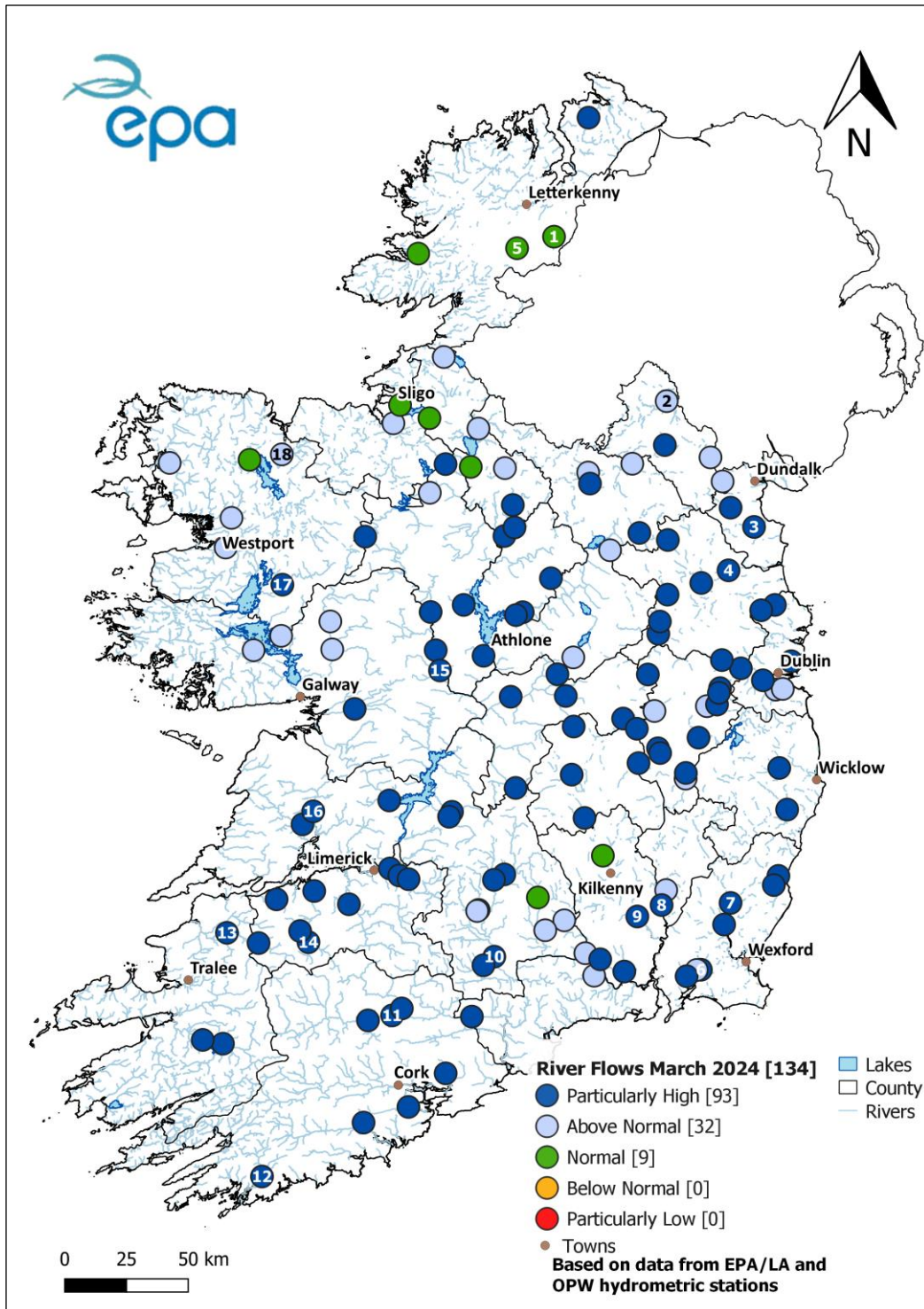


Figure 6: Monthly average river flows for March 2024 relative to historic monthly average flows expressed as percentile of the long-term values of monthly flow. Numbered sites are represented in the hydrographs below. All data are provisional and may be subject to revision (Source: EPA, OPW).

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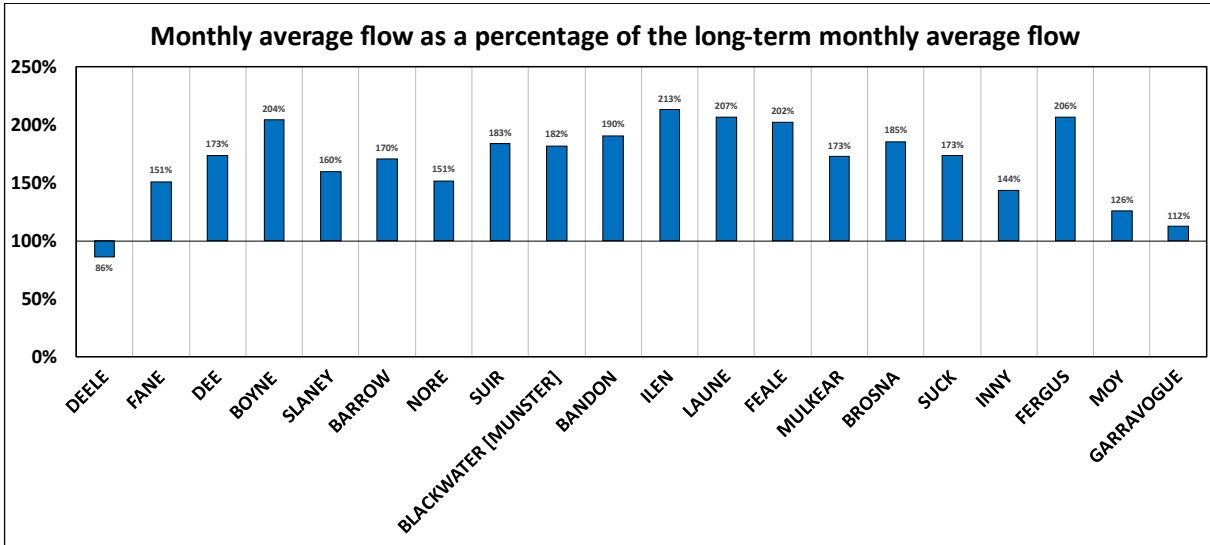
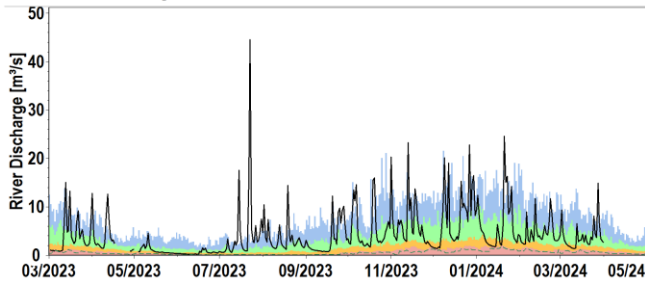


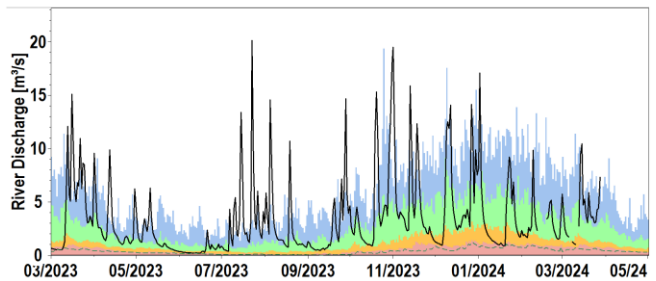
Figure 7: March 2024 average flows as a percentage of the long-term monthly average flow for this month at a selected number of stations. All data are provisional and may be subject to revision (Source: EPA, OPW).

Flow hydrographs for selected rivers

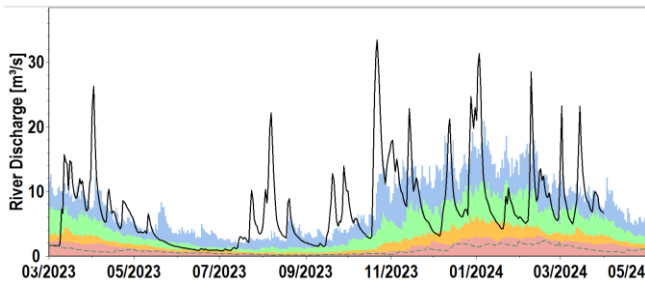
1. DEELE (Donegal)



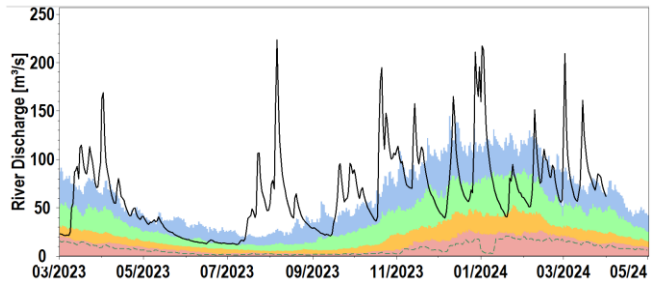
2. BLACKWATER [MONAGHAN]



3. DEE (Louth)

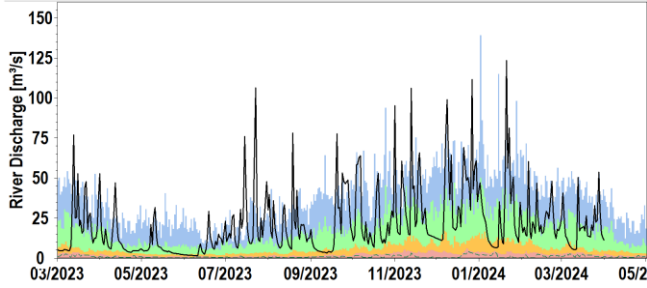


4. BOYNE (Meath)

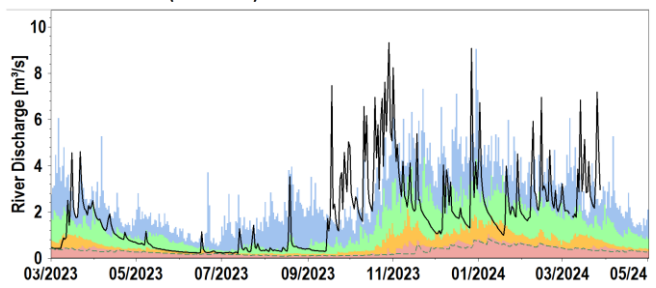


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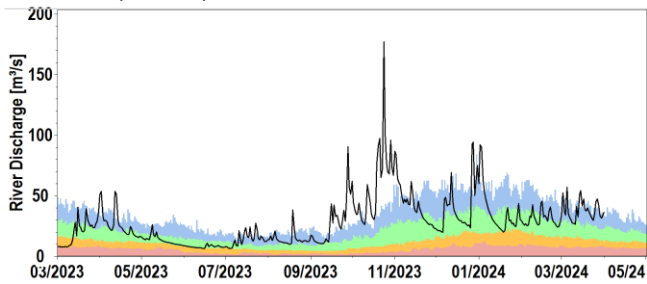
5. FINN [DONEGAL] (Donegal)



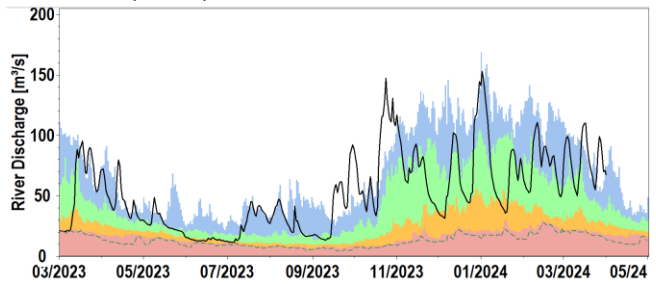
6. MULMONTRY (Wexford)



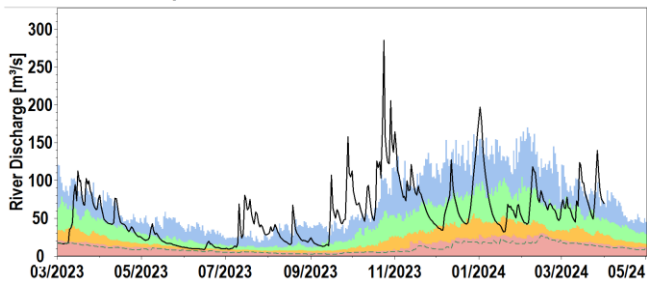
7. SLANEY (Wexford)



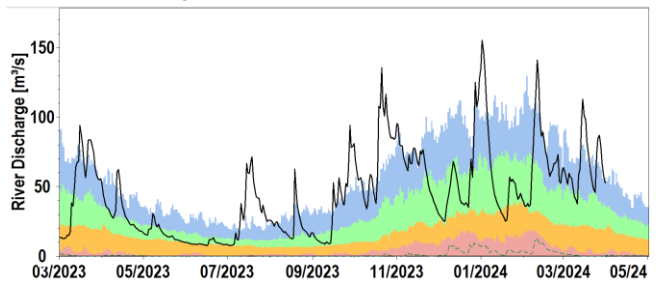
8. BARROW (Carlow)



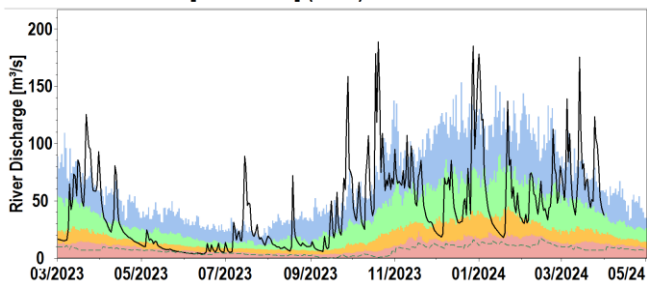
9. NORE (Kilkenny)



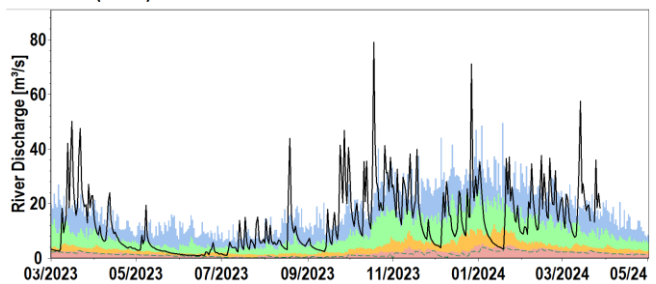
10. SUIR (Tipperary)



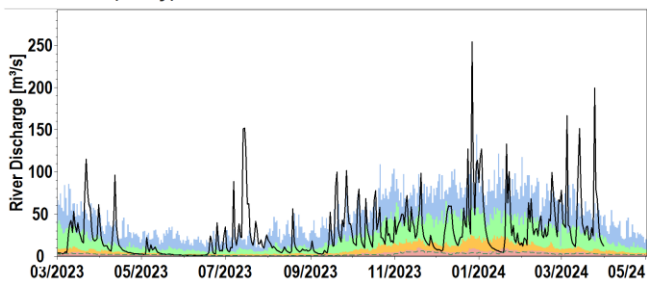
11. BLACKWATER [MUNSTER] (Cork)



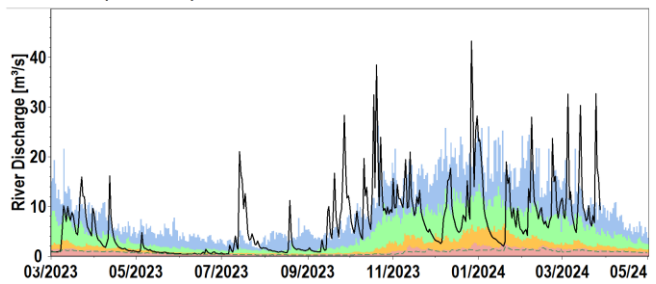
12. ILEN (Cork)



13. FEALE (Kerry)

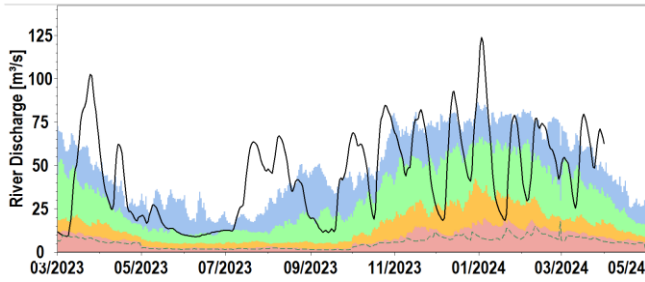


14. DEEL (Limerick)

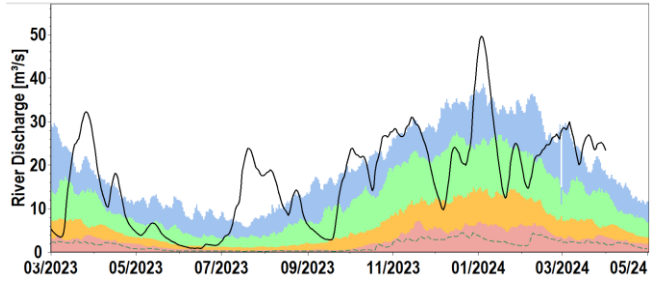


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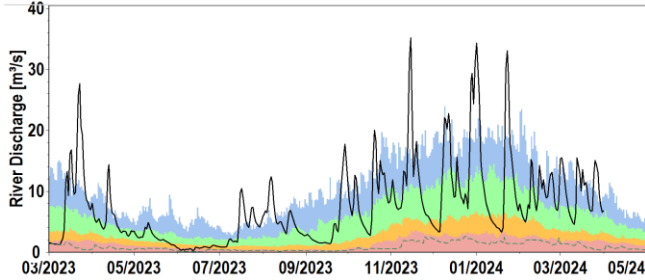
15. SUCK (Roscommon)



16. FERGUS (Clare)



17. ROBE (Mayo)



18. MOY (Mayo)

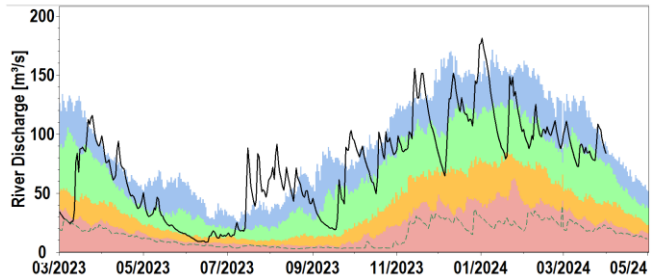
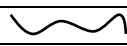



Figure 8: Daily average river flows measured in cubic metres per second relative to historic daily average flows expressed as percentile of the long-term values of each day and long-term minimum flows. All data are provisional and may be subject to revision (Source: EPA, OPW).

Explanation - Classes

Explanation - Classes						
Particularly Low	Below Normal	Normal	Above Normal	Particularly High	Daily Mean Flow	Lowest Daily Mean Flow
<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		

Lake and Turlough Levels

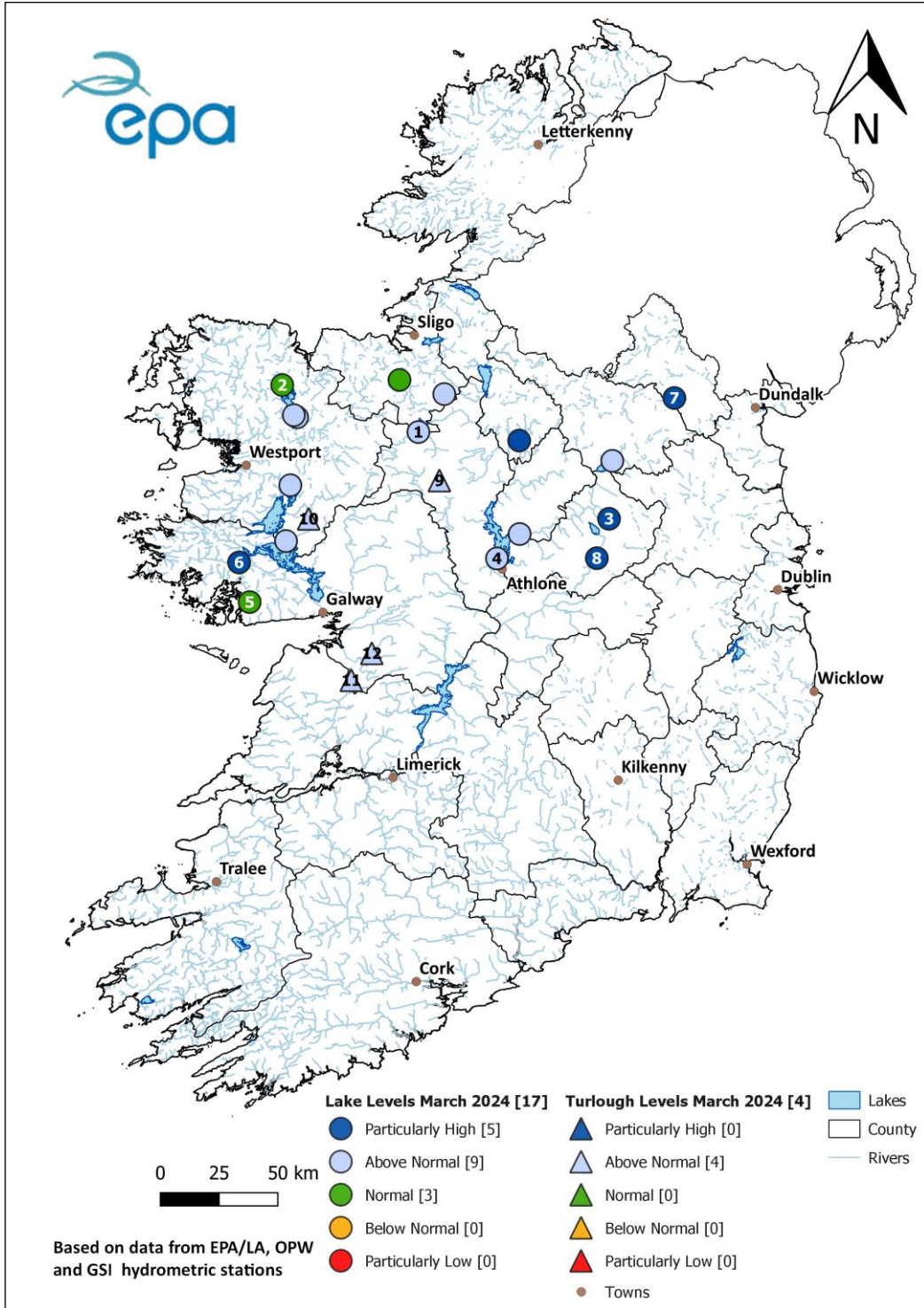
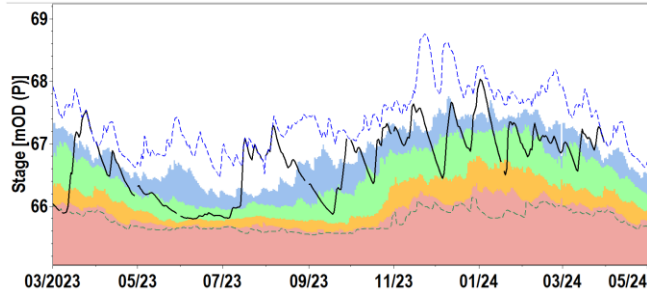


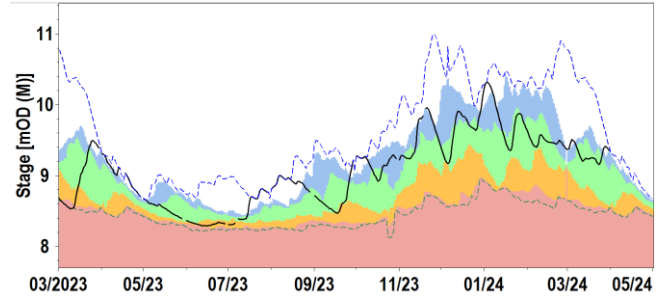
Figure 9: Monthly average lake & turlough levels for March 2024 relative to historic monthly average levels expressed as percentile of the long-term values for this month. Numbered sites are represented in the hydrographs below. All data are provisional and may be subject to revision (Source: EPA, OPW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

Water level hydrographs for selected lakes and turloughs

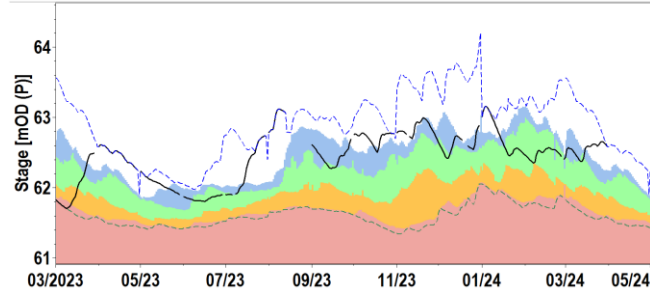
1. L. GARA (Sligo)



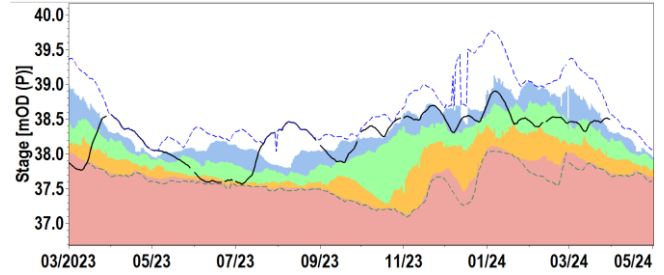
2. L.CONN (Mayo)



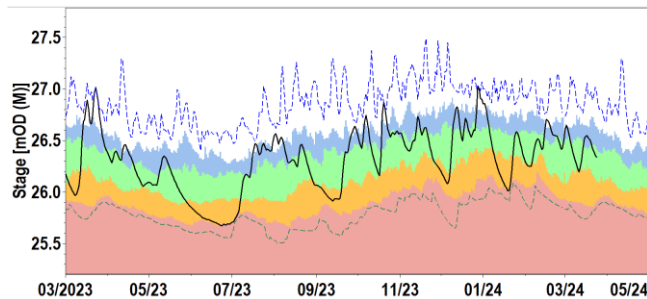
3. L.DERRAVARAGH (Westmeath)



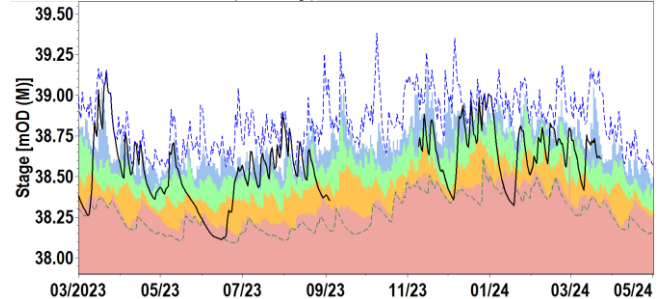
4. L.REE (Roscommon)



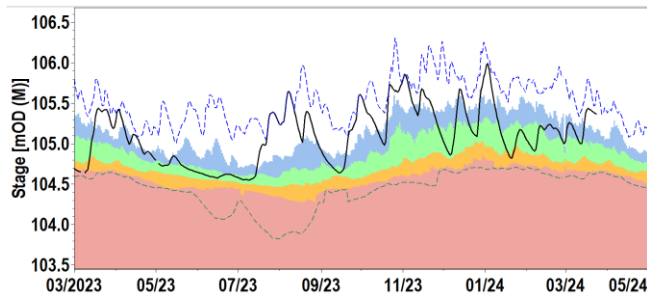
5. GLENICMURRIN LAKE (Galway)



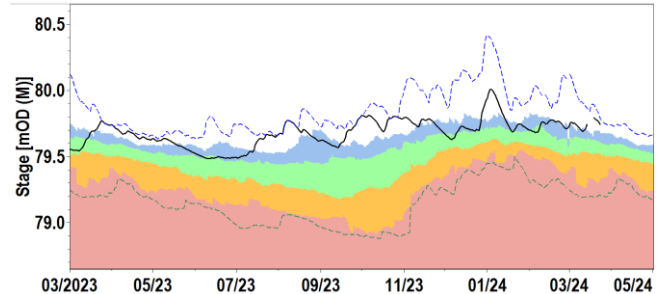
6. LOUGH SHINDILLA (Galway)



7. L.BAWN (Monaghan)

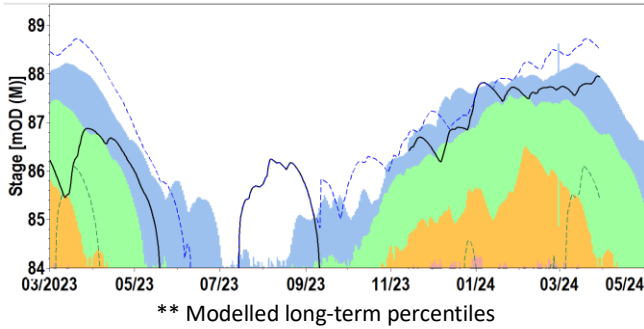


8. L.ENNELL (Leitrim)

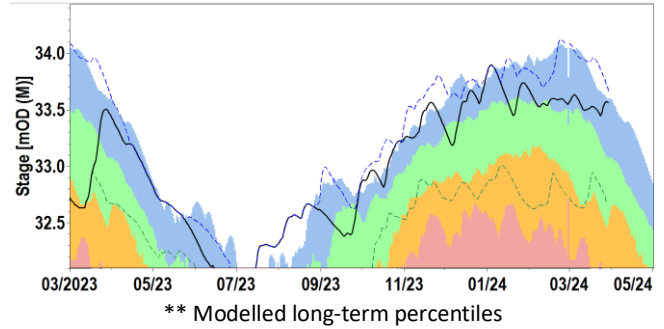


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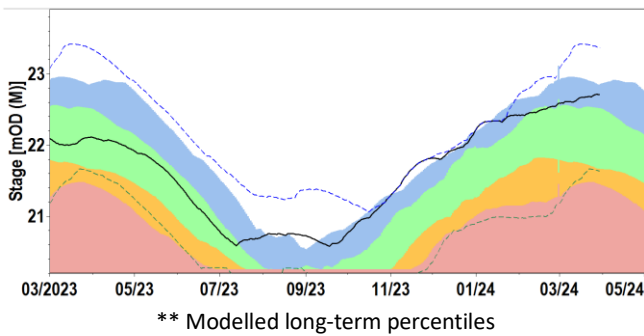
9. CASTLEPLUNKET TURLOUGH (Roscommon)



10. SKEALOGHAN TURLOUGH (Mayo)



11. TERMON SOUTH TURLOUGH (Galway)



12. BLACKROCK TURLOUGH (Galway)

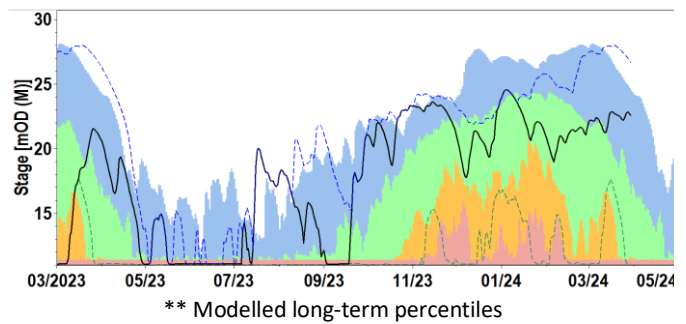





Figure 10: Observed daily mean lake and turlough levels (black trace) measured in meters above ordnance datum compared to the 10%tile, 30%tile, 70%tile and 95%tile for each month for the period of record and observed long-term maximum and minimum levels. Note historic percentiles for turloughs are based 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	Daily Mean Level mOD	Highest Daily Mean Level mOD	Lowest Daily Mean Level mOD
<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			

Groundwater Levels and Spring Flows

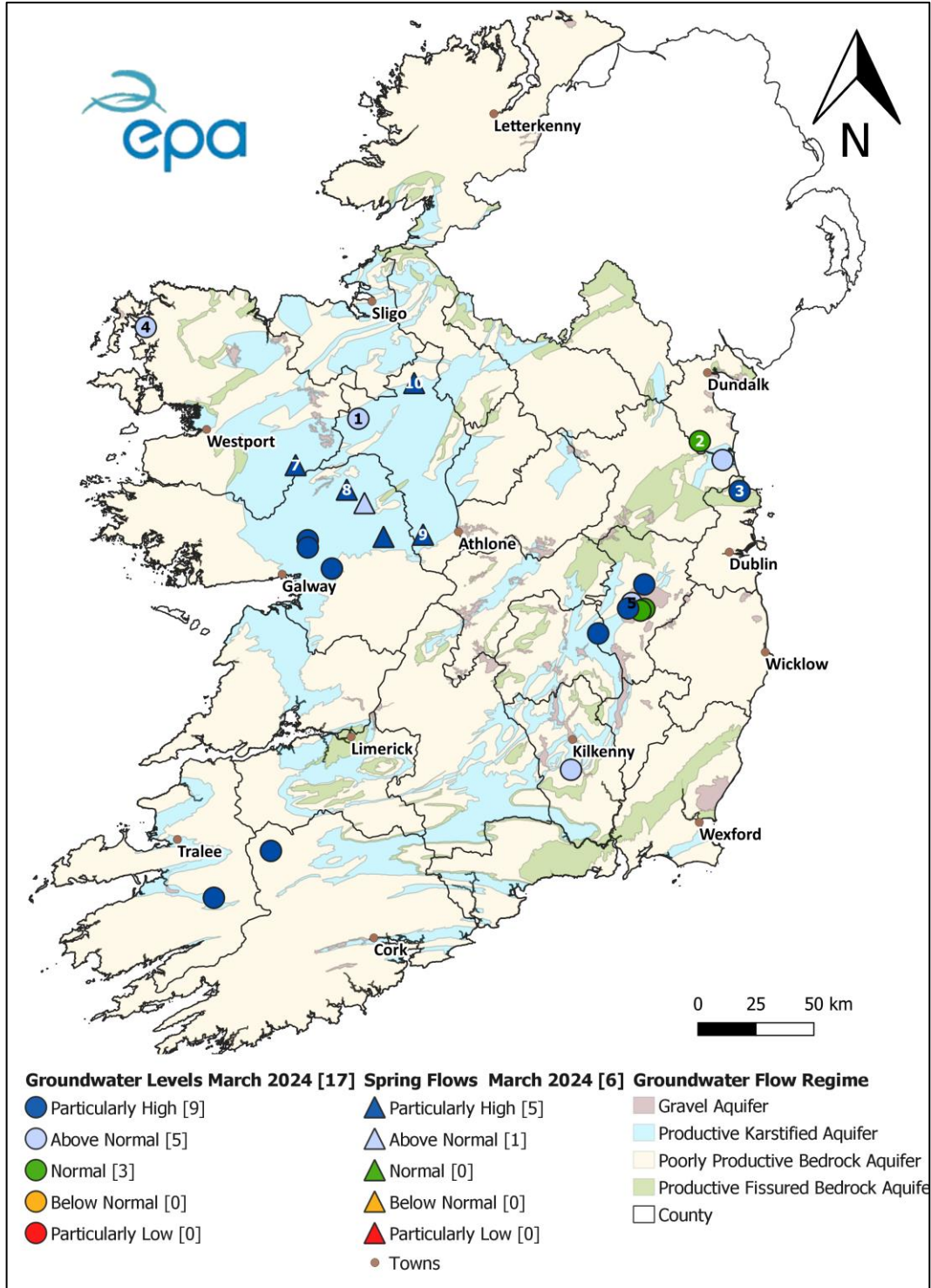
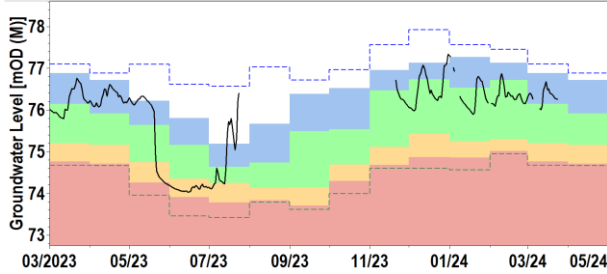


Figure 11: Groundwater level and Spring Flow status for March 2024, relative to historic monthly groundwater levels. Numbered sites are represented in the hydrographs below. All data are provisional and may be subject to revision (Source: EPA).

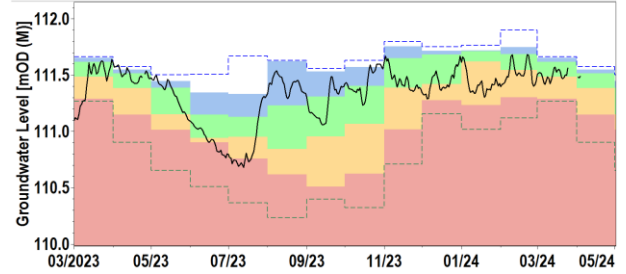
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Groundwater and spring hydrographs

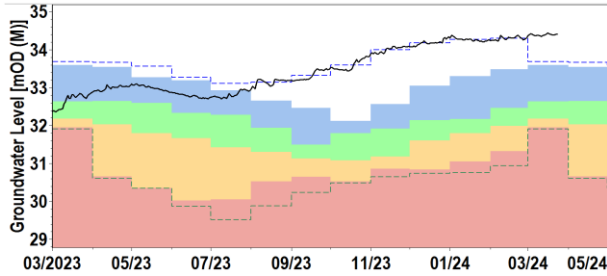
1. AGHADRESTAN (Roscommon)



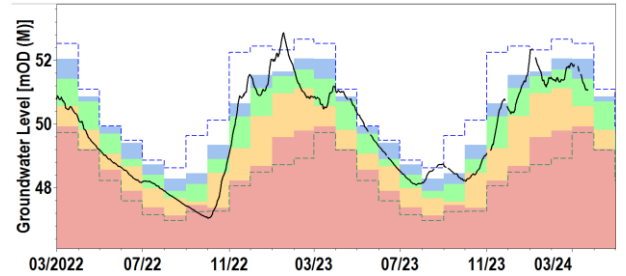
2. Mattock MK1 Deep (Meath)



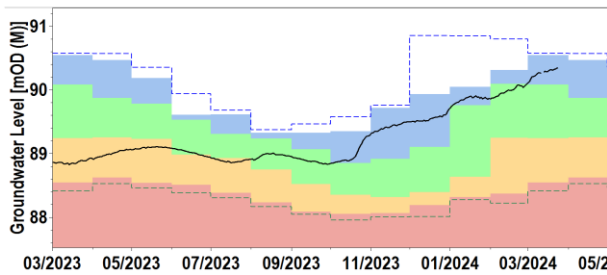
3. BOG OF THE RING OW3D (Fingal)



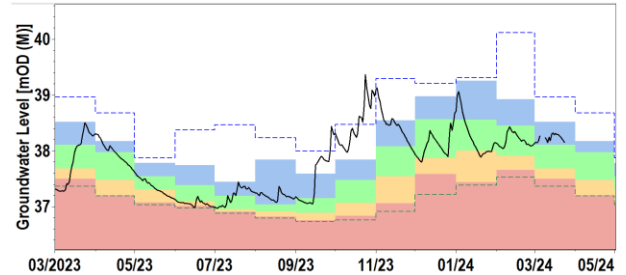
4. Glencastle - (GC1 Deep) (Mayo)



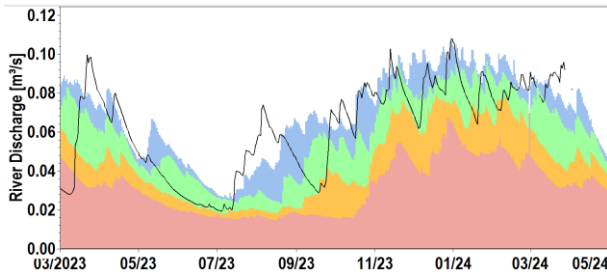
5. POLLARDSTOWN FEN - MB 30 (Kildare)



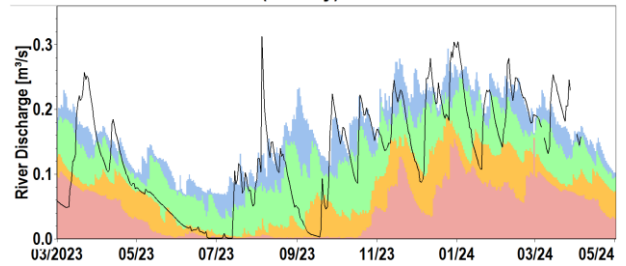
6. RATHDUFF (Kilkenny)



7. BALLINDINE SPRING (Mayo)

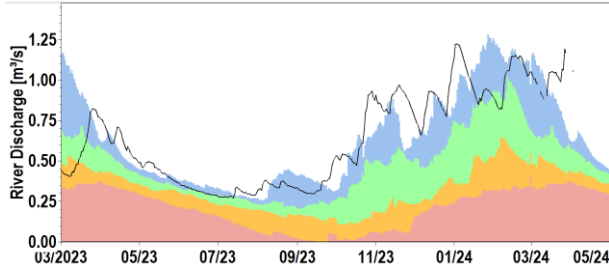


8. GORTGARROW SPRING (Galway)



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9. KILLEGLAN SPRING (Roscommon)



10. ROCKINGHAM (Roscommon)

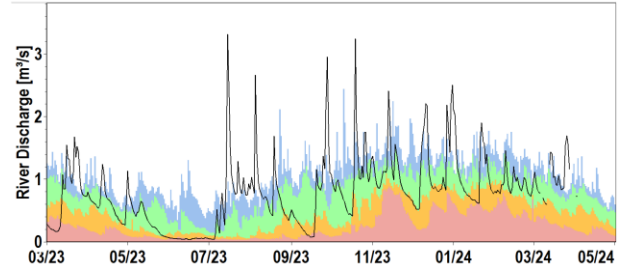
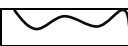




Figure 12: Daily mean groundwater levels (black trace) measured in meters above ordnance datum compared to the 10%tile, 30%tile, 70%tile and 95%tile for each month for the period of record and long-term maximum and minimum levels. All data are provisional and may be subject to revision (Source: EPA).

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"> ➤ Karstic (Rk and Lk) aquifers; ➤ Gravel (Rg and Lg) aquifers; ➤ Productive fractured bedrock (Rf and Lm) aquifers; ➤ Poorly productive bedrock (LI, PI and Pu) aquifers.
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 [HydroData](#)

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](#).