

Overview

Rainfall for June was generally below the long-term average in most places across the country. The monthly average river flows for June fell at almost all river monitoring since May and were below the long-term average for this month. Almost two-thirds (65%) of river stations were below the normal range for June. Similarly, 58% of lake and turlough stations observed flows below the normal range for this month.

Average monthly groundwater levels for May also fell at 97% of monitoring wells with more than half (57%) of monitoring wells observing levels below the long-term average for June. Similarly, most monitored spring outflows were in the normal range or below average for this time of year.

Rainfall

The majority of monthly rainfall totals across the country were below their 1981-2010 Long-Term Average (LTA). Percentage of monthly rainfall values ranged from 62% (monthly rainfall total of 50.3 mm) at Cork Airport to 139% (monthly rainfall total of 94.7 mm) at Ballyhaise, Co Cavan. Monthly rainfall totals ranged from 45.0 mm (72% of its LTA) at Casement Aerodrome, Co Dublin to 124.5 mm (131% of its LTA) at Valentia Observatory, Co Kerry. The highest daily rainfall total was 30.9 mm at Ballyhaise, Co Cavan on Tuesday 20th. The number of rain days ranged from 11 days at Moore Park, Co Cork to 19 days at a few stations. The number of wet days ranged from 6 days at Johnstown Castle, Co Wexford to 18 days at Athenry, Co Galway (including 16 consecutive wet days for Athenry from Thursday 15th to the end of the month). The number of very wet days ranged from zero days at a few stations to 5 days at Valentia Observatory, Co Kerry. Most of the rainfall in June was convective in nature after Sunday 11th with eight consecutive days of intense thunderstorm activity between Tuesday 13th and Tuesday 20th and again on Sunday 25th.

24 stations had absolute droughts between Monday 15th May and Sunday 11th June lasting between 17 and 26 days, longest in the South and East. Malin Head, Co Donegal had a dry spell between May 21st and June 16th lasting 27 days. Seven stations had partial droughts between Thursday 11th May and Friday 16th June lasting between 29 and 36 days, longest in the South and East.

River Flows

The average river flows for June fell at almost all (99% of) river monitoring stations compared to average flows observed in May 2023. Analysis of the monthly average flows at 155 river monitoring sites identified 1 (1%) 'above normal' [Rathdangan, Co. Kildare], 53 (34%) 'normal', 73 (47%) 'below normal' and 28 (18%) as 'particularly low' for this time of year.

Monthly Hydrology Bulletin: Edition 038: June 2023

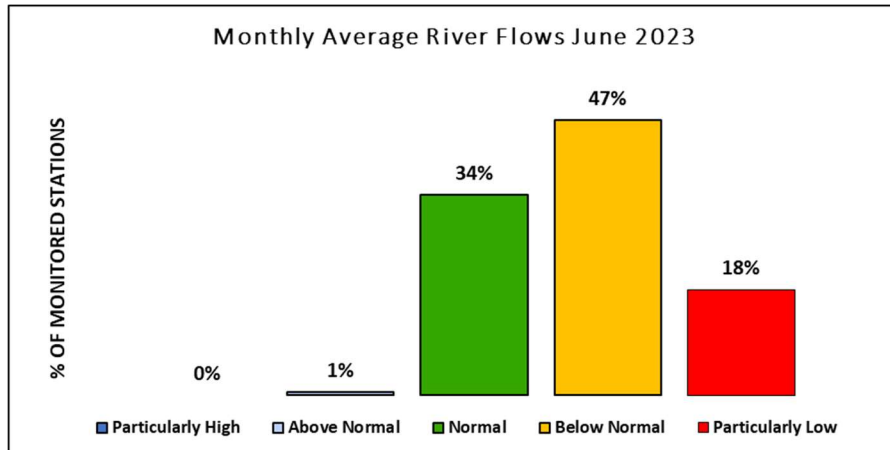


Figure 1: Percentage distribution of river flow monitoring sites within each of the percentile flow categories for June 2023.

Lake and Turlough Levels

Average water levels during June fell at almost all (92%) of monitored lakes compared to average levels for May. Analysis of monthly average levels at 39 lakes and 4 turloughs were classified as being 'above normal' at 3 (7%), 'normal' at 15 (35%), 'below normal' at 15 (35%), and 'particularly low' at 10 (23%) monitoring locations for the month of June.

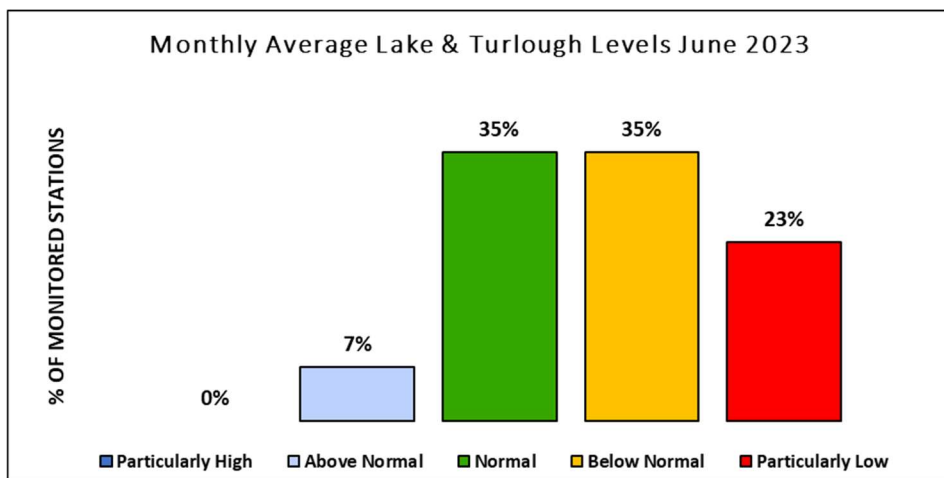


Figure 2: Percentage distribution of lake and turlough level monitoring sites within each of the percentile flow categories for June 2023.

Groundwater Levels and Spring Flows

Average groundwater levels in June fell at almost all (97%) of monitoring wells compared to average levels observed in June. Groundwater levels for June were classified as being 'particularly high' at 1 well (2%) [Muchgrange Fence, Co. Louth], 'above normal' at 3 wells (8%), 'normal' at 13 wells (33%), 'below normal' at 19 wells (49%) and 'particularly low' at 3 wells (8%) across the country.

Monthly Hydrology Bulletin: Edition 038: June 2023

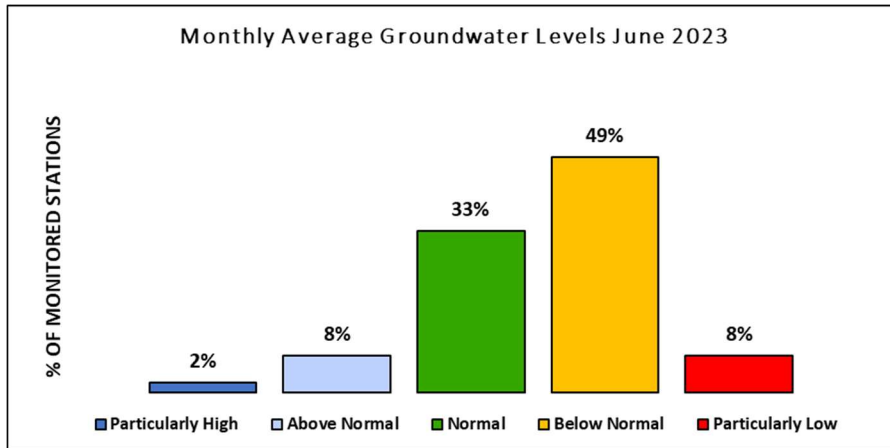


Figure 3: Percentage distribution of groundwater level sites within each of the percentile flow categories for June 2023.

Spring outflows were also monitored at 9 EPA monitoring sites for June. The outflows from these springs were compared to previously recorded flows for June and were 'above normal' at 2 locations 'normal' at 3 locations and 'below normal' at 2 locations and 'particularly low' at 2 monitoring locations for this time of year.

Monthly Hydrology Bulletin: Edition 038: June 2023

Rainfall

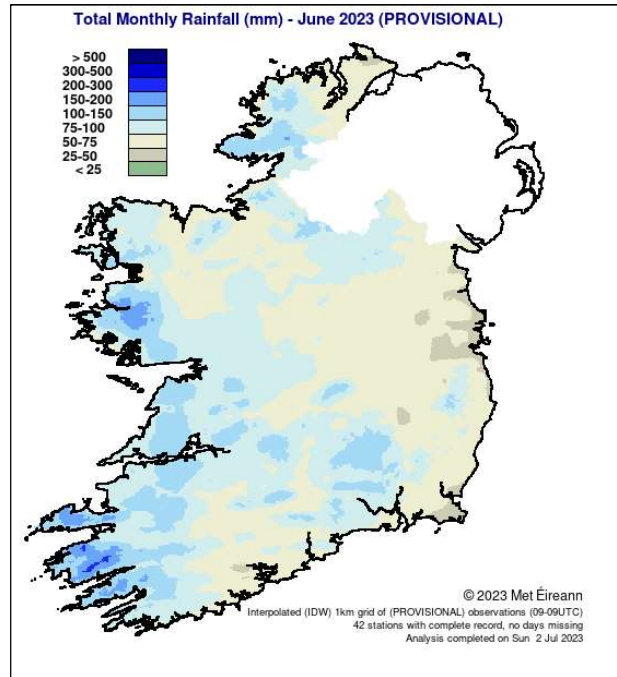


Figure 4: Rainfall map for Ireland June 2023 (Source: Met Eireann.ie).

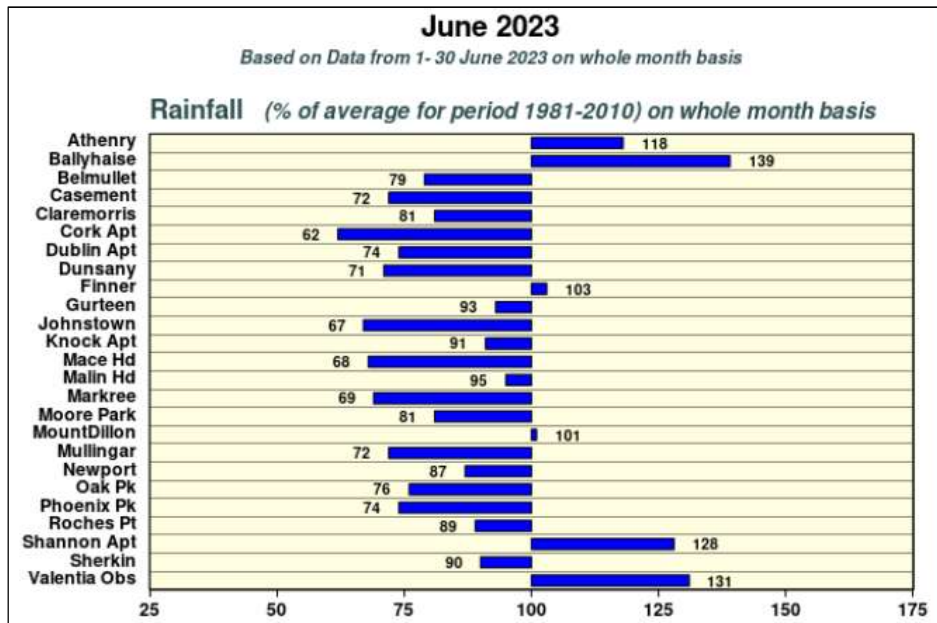


Figure 5: Summary of rainfall at synoptic stations for June 2023, figures indicate the percentage difference from the Long-Term Average rainfall for this month (Source: Met Eireann.ie).

River Flows

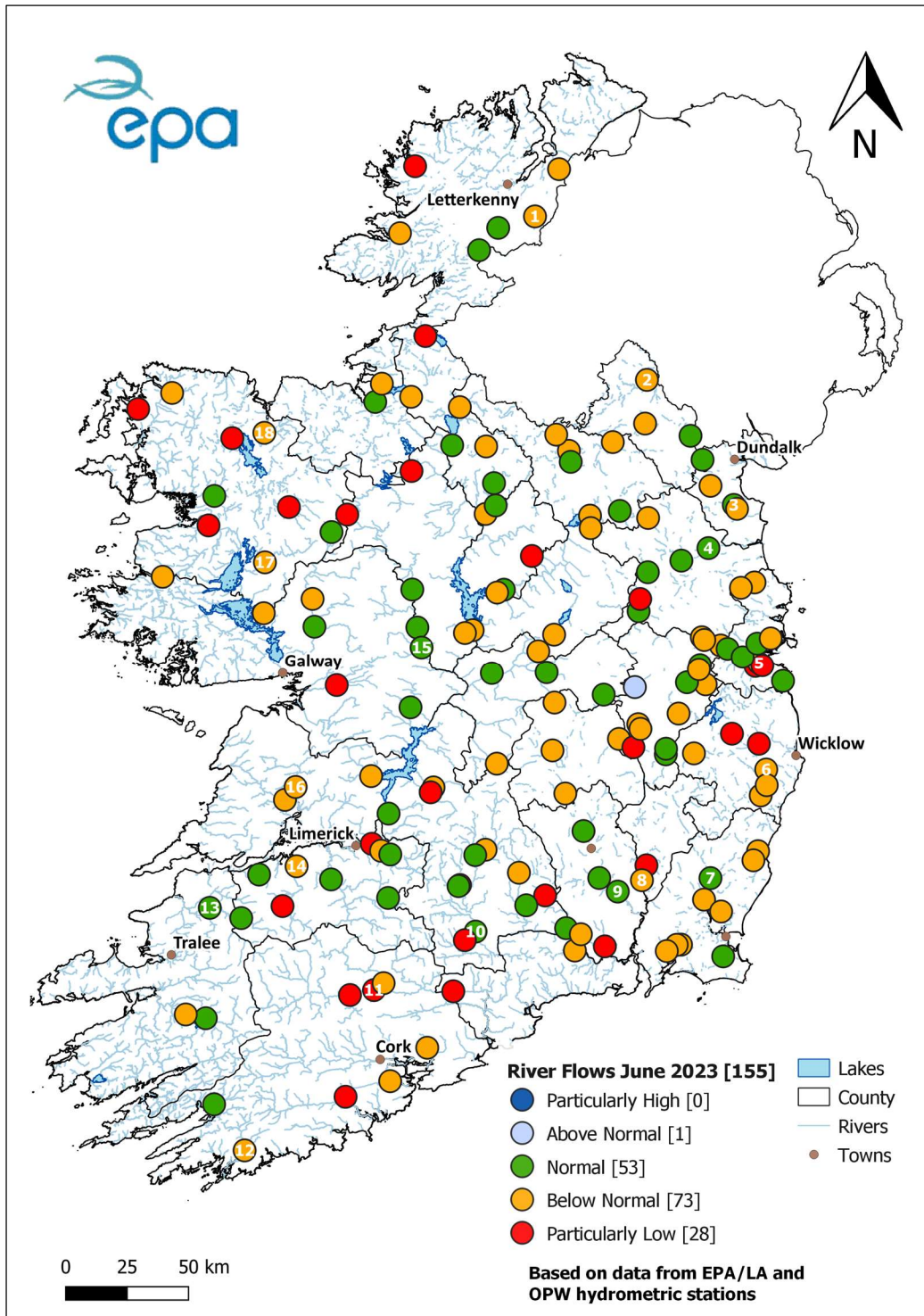


Figure 6: Monthly average river flows for June 2023 relative to historic monthly average flows expressed as percentile of the long-term values of monthly flow. Numbered sites are represented in the hydrographs below. All data are provisional and may be subject to revision (Source: EPA, OPW).

Monthly Hydrology Bulletin: Edition 038: June 2023

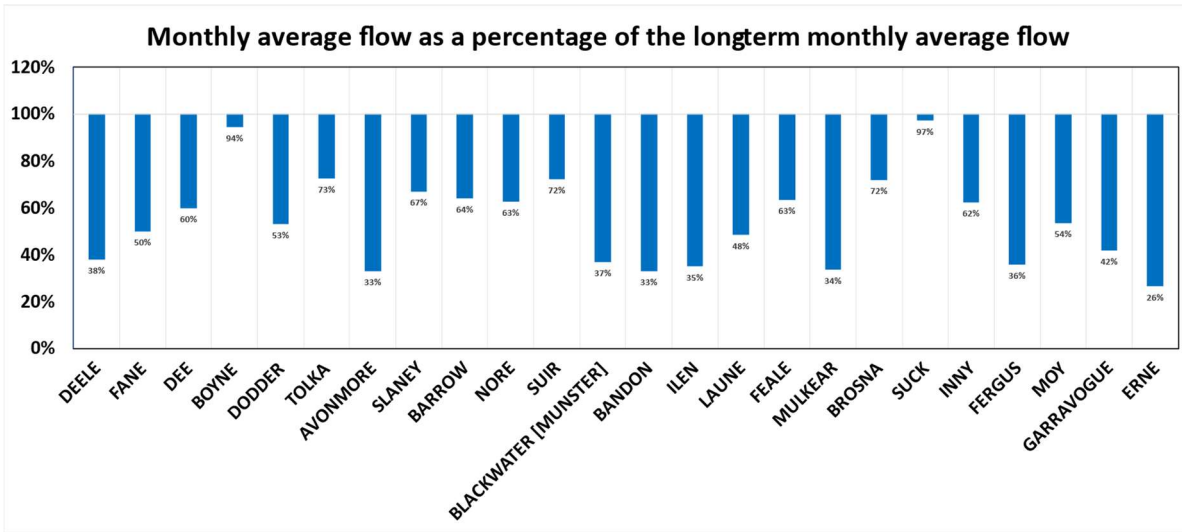
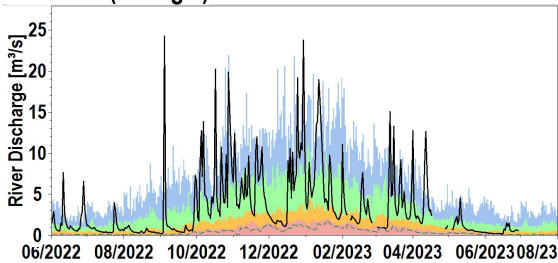


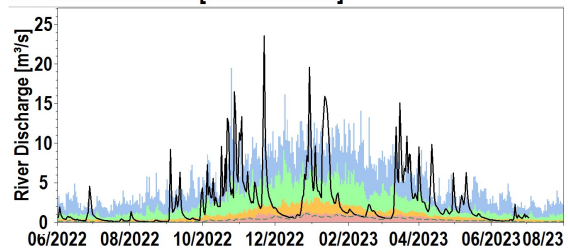
Figure 7: June 2023 average flows as a percentage of the long-term monthly average flow for this month at a selected number of stations. All data are provisional and may be subject to revision (Source: EPA, OPW).

Flow hydrographs for selected rivers

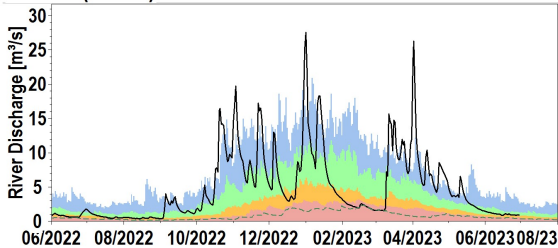
1. DEELE (Donegal)



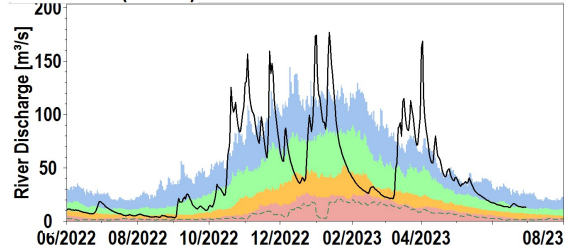
2. BLACKWATER [MONAGHAN]



3. DEE (Louth)

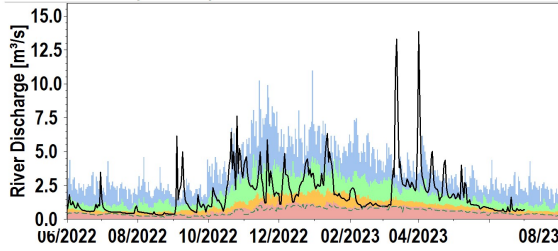


4. BOYNE (Meath)

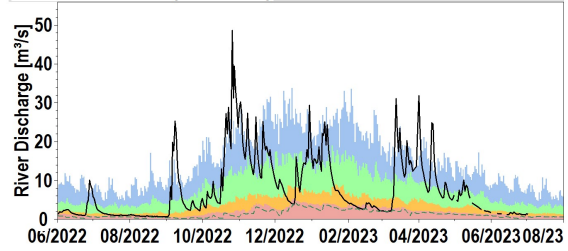


Monthly Hydrology Bulletin: Edition 038: June 2023

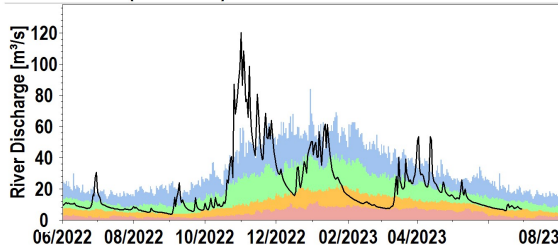
5. DODDER (Dublin)



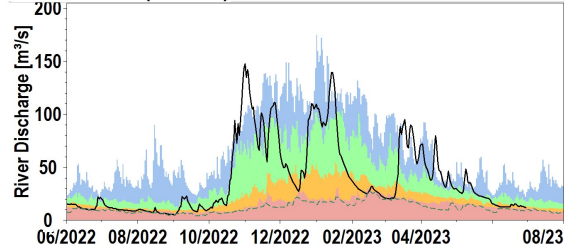
6. AVONMORE (Wicklow)



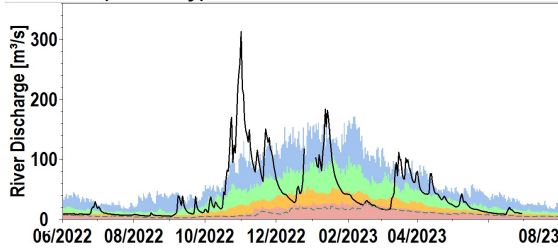
7. SLANEY (Wexford)



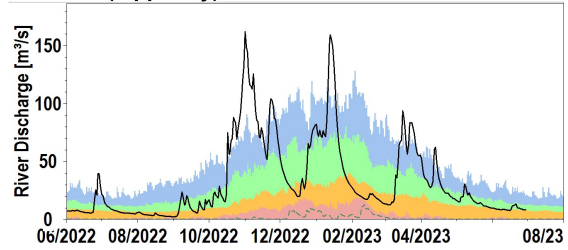
8. BARROW (Carlow)



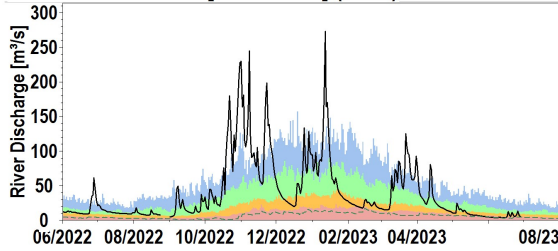
9. NORE (Kilkenny)



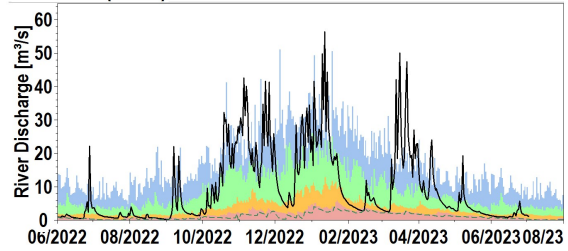
10. SUIR (Tipperary)



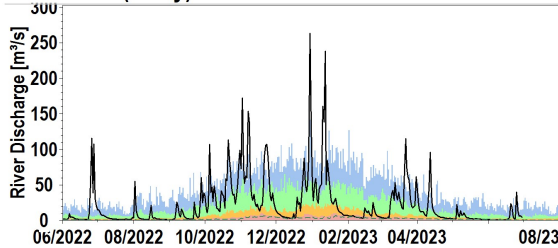
11. BLACKWATER [MUNSTER] (Cork)



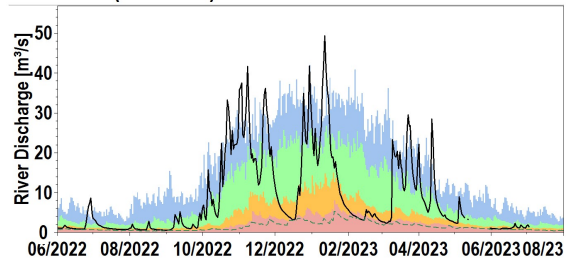
12. ILEN (Cork)



13. FEALE (Kerry)

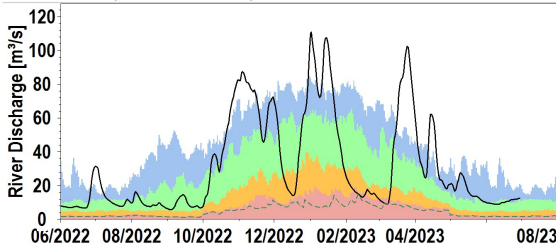


14. DEEL (Limerick)

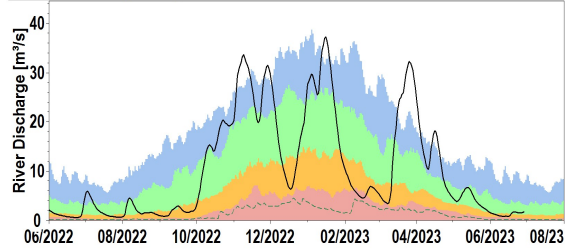


Monthly Hydrology Bulletin: Edition 038: June 2023

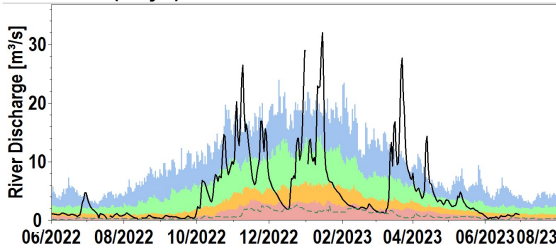
15. SUCK (Roscommon)



16. FERGUS (Clare)



17. ROBE (Mayo)



18. MOY (Mayo)

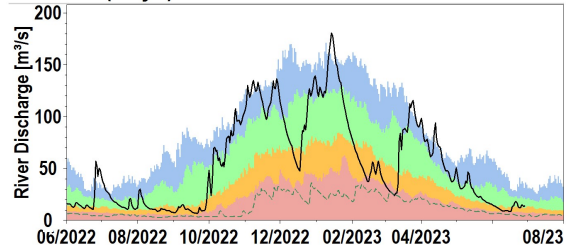




Figure 8: Daily average river flows measured in cubic metres per second relative to historic daily average flows expressed as percentile of the long-term values of each day and long-term minimum flows. All data are provisional and may be subject to revision (Source: EPA, OPW).

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

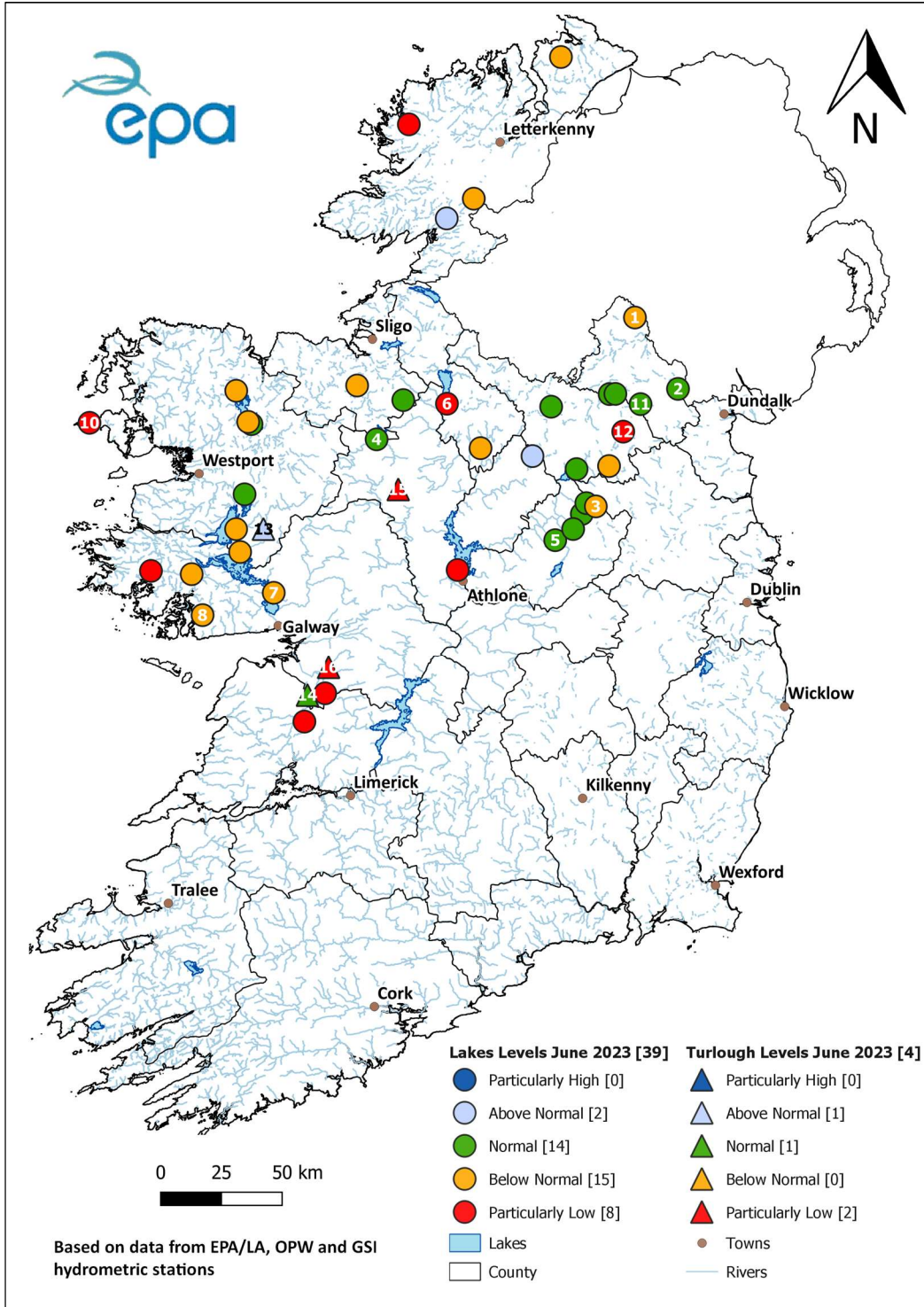
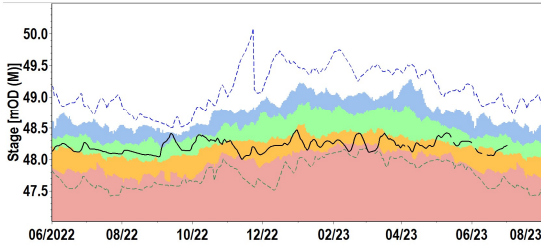


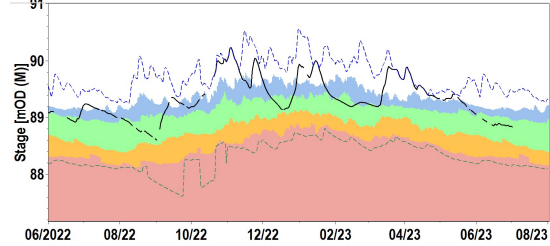
Figure 9: Monthly average lake & turlough levels for June 2023 relative to historic monthly average levels expressed as percentile of the long-term values for this month. Numbered sites are represented in the hydrographs below. All data are provisional and may be subject to revision (Source: EPA, OPW and GSI).

Water level hydrographs for selected lakes and turloughs

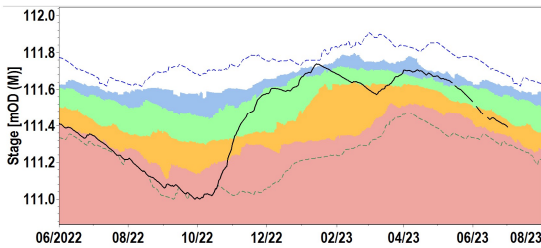
1. EMY LOUGH (Monaghan)



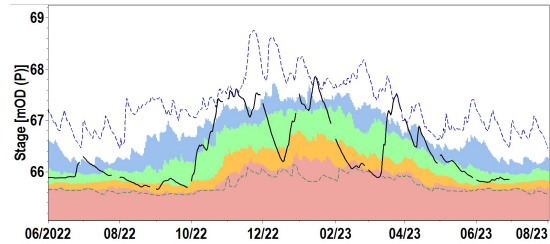
2. L. MUCKNO (Monaghan)



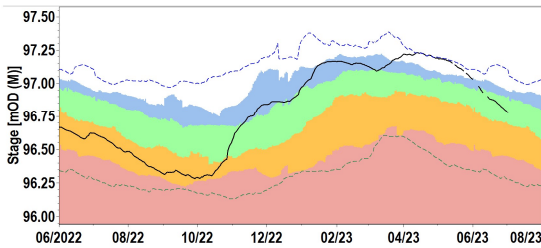
3. L. BANE (Meath)



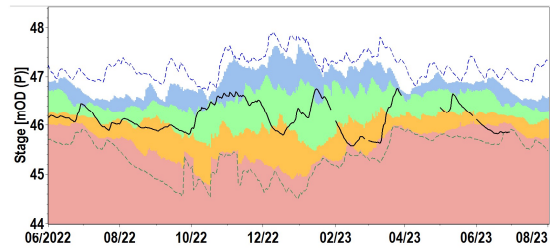
4. L. GARA (Sligo)



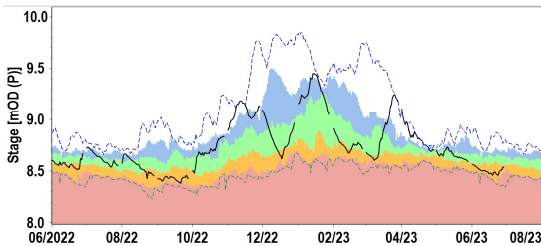
5. L. OWEL (Westmeath)



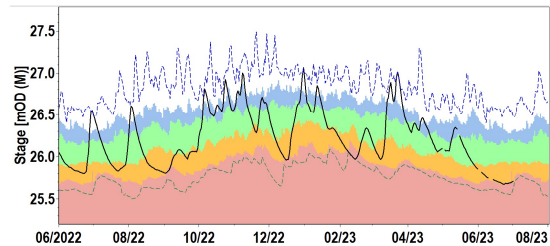
6. L. ALLEN (Leitrim)



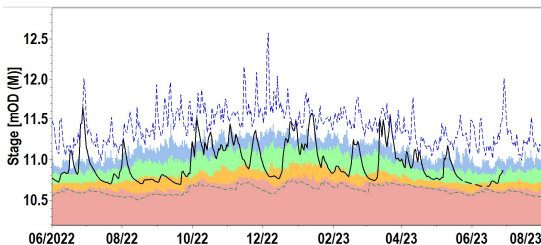
7. L. CORRIB (Galway)



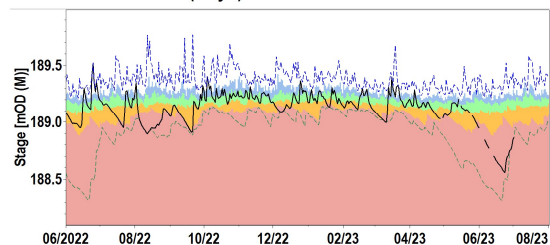
8. GLENICMURRIN LAKE (Galway)



9. L. FEEAGH (Mayo)

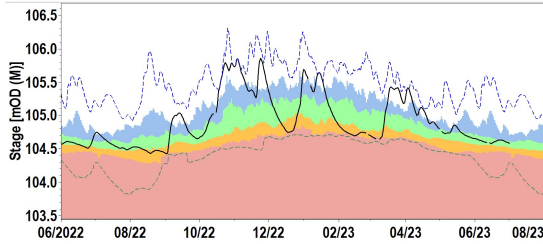


10. L. ACCORMORE (Mayo)

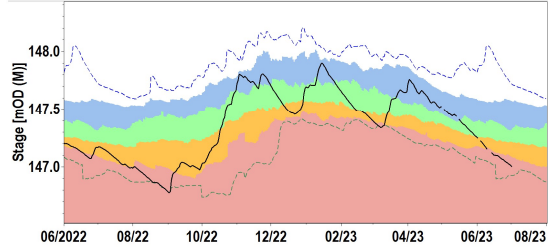


Monthly Hydrology Bulletin: Edition 038: June 2023

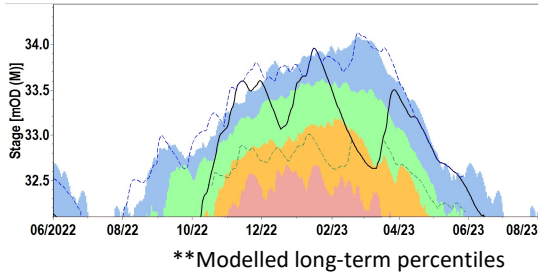
11. L.BAWN (Monaghan)



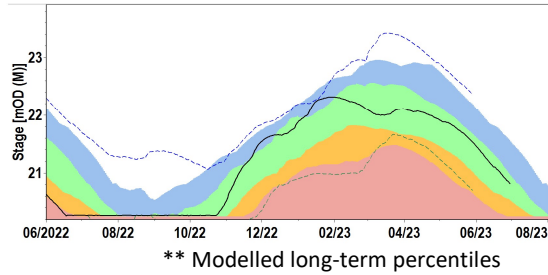
12. SKEAGH L. (Cavan)



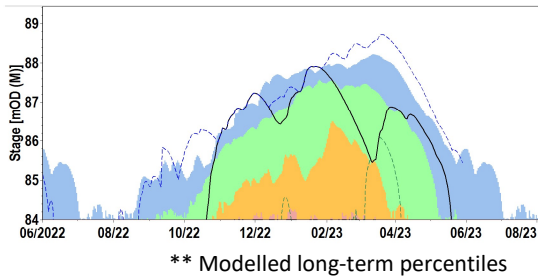
13. SKEALOGHAN TURLOUGH (Mayo)



14. TERMON SOUTH TURLOUGH (Galway)



15. CASTLEPLUNKET TURLOUGH (Roscommon)



16. BLACKROCK TURLOUGH (Galway)

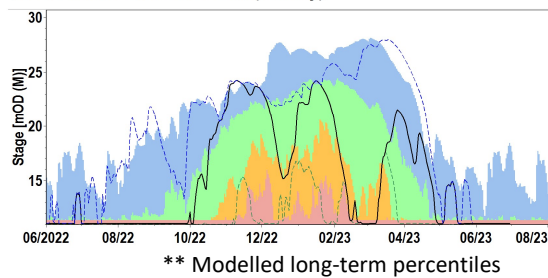





Figure 10: Observed daily mean lake and turlough levels (black trace) measured in meters above ordnance datum compared to the 10%tile, 30%tile, 70%tile and 95%tile for each month for the period of record and observed long-term maximum and minimum levels. Note historic percentiles for turloughs are based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

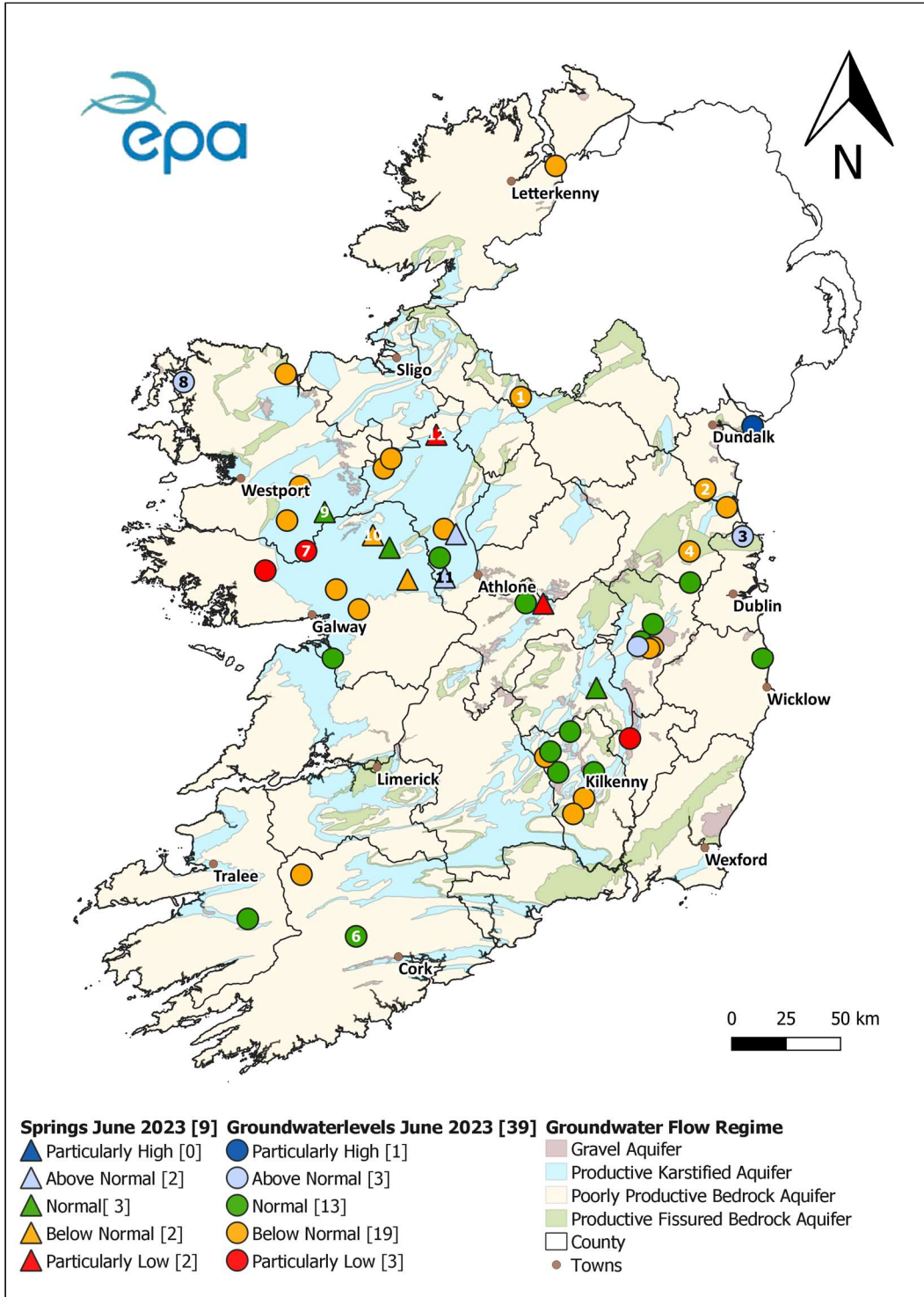
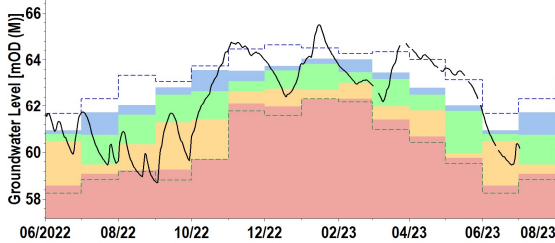


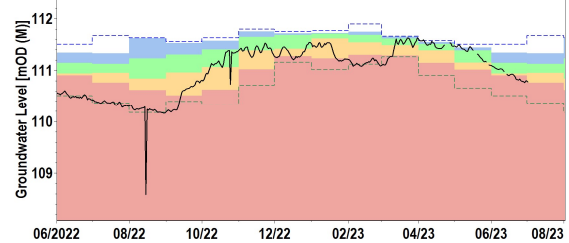
Figure 11: Groundwater level and Spring Flow status for June 2023, relative to historic monthly groundwater levels. Numbered sites are represented in the hydrographs below. All data are provisional and may be subject to revision (Source: EPA).

Groundwater and spring hydrographs

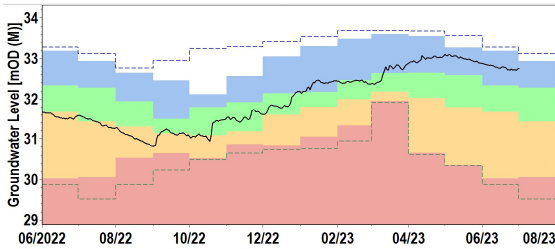
1. BAWN BOY WORKHOUSE (Cavan)



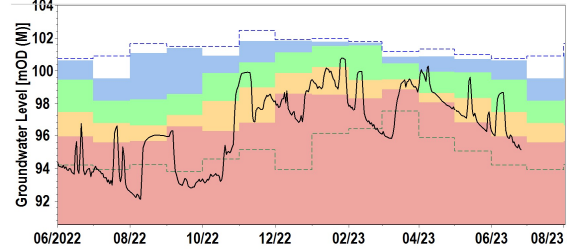
2. Mattock MK1 Deep (Meath)



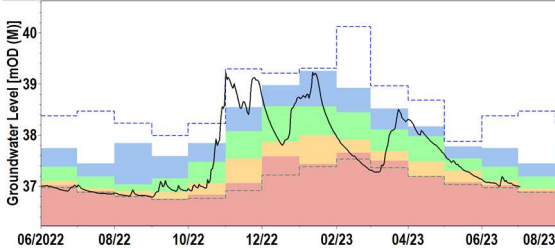
3. BOG OF THE RING OW3D (Fingal)



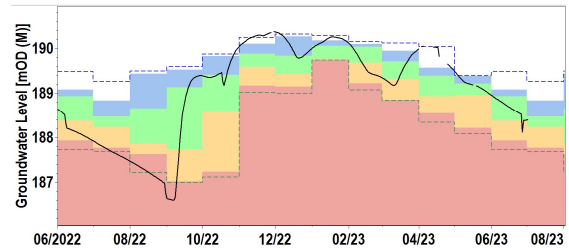
4. DUNSHAUGHLIN PW6 (Meath)



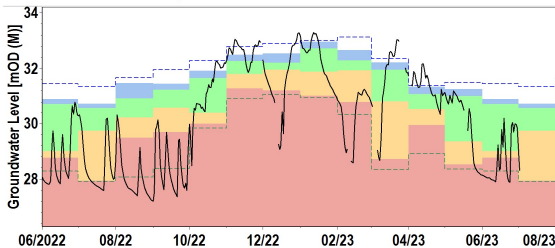
5. RATHDUFF (Kilkenny)



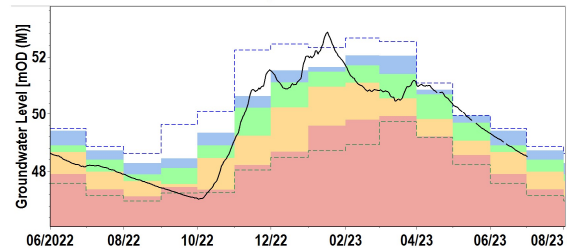
6. DRIPSEY DR1 Deep Upper Site (Cork)



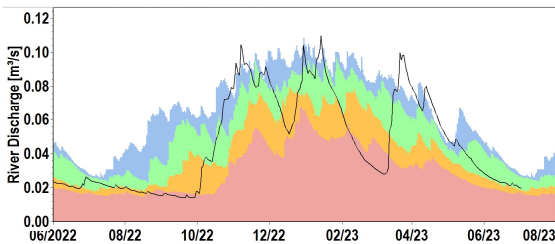
7. SHRULE GWL (Mayo)



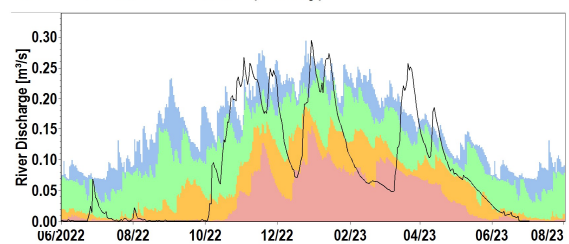
8. Glencastle - (GC1 Deep) (Mayo)



9. BALLINDINE SPRING (Mayo)

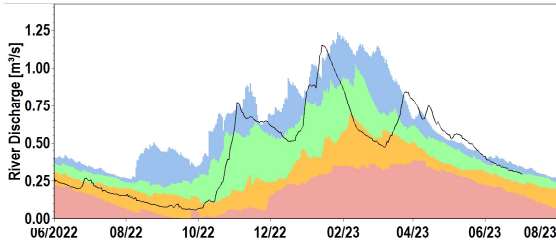


10. GORTGARROW SPRING (Galway)



Monthly Hydrology Bulletin: Edition 038: June 2023

11. KILLEGLAN SPRING (Roscommon)



12. ROCKINGHAM (Roscommon)

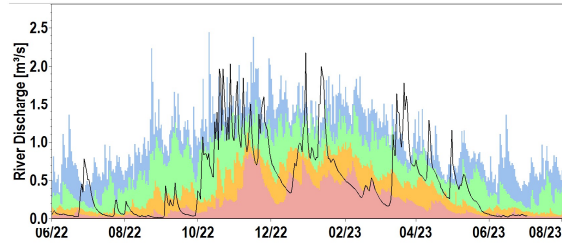





Figure 12: Daily mean groundwater levels (black trace) measured in meters above ordnance datum compared to the 10%tile, 30%tile, 70%tile and 95%tile for each month for the period of record and long-term maximum and minimum levels. All data are provisional and may be subject to revision (Source: EPA).

Explanation - Classes							
Particularly Low	Below Normal	Normal	Above Normal	Particularly High	Daily Mean Level mOD	Highest Month Mean Level mOD	Lowest Month Mean Level mOD
<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			

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	Groundwater levels or lake levels above ordnance datum. In most cases this is relative to mean sea level at Malin but in some cases is relative to Poolbeg.
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](#).