Overview

The majority of meteorological stations recorded monthly rainfall totals above their long-term average for November. It was wettest in the west, northwest and southwest. However, the east, especially the greater Dublin area, experienced below average rainfall for November resulting in river flows ranging from particularly high in the west and south west to normal and below normal in the east.

Lakes, groundwater levels and spring flows continued to rise across the country with all monitored lakes, groundwater wells and springs indicating normal or higher than normal levels and flows for November.

Rainfall

The majority of monthly rainfall totals were above their Long-Term Average (LTA). Percentage of monthly rainfall values ranged from 66% (the month's lowest monthly rainfall total of 48.1 mm) at Dublin Airport to 138% (monthly rainfall total of 168.8 mm) at Claremorris, Co Mayo. Monthly rainfall totals were as much as 206.6 mm (121% of its LTA) at Newport, Co Mayo. The highest daily rainfall total was 34.8 mm at Cork Airport on Wednesday 11th. The number of rain days ranged from 18 days at Casement Aerodrome, Co Dublin to 26 days at both Newport, Co Mayo and Malin Head, Co Donegal. The number of wet days ranged from 13 days at Dublin Airport to 22 days at both Newport, Co Mayo and Belmullet, Co Mayo. The number of very wet days ranged from no days at both Phoenix Park, Co Dublin and Dublin Airport to 9 days at Newport, Co Mayo.
Source: *https://www.met.ie/climate/past-weather-statements*

River Flows

River flows were higher at 95% of monitoring stations in November compared to flows observed during October. Monthly mean river flows at 170 river monitoring sites were compared to an analysis of historic November average flows; 59 (35%) were classed as particularly high, 75 (44%) as above normal, 34 (20%) were classed as normal, 2 (1%) were below normal for this time of year.

Lake Levels

Lake levels increased at all monitored lakes compared to levels observed in October. November lake levels were classified as particularly high at 26 (63%) lakes, above normal at 10 (24%), and normal at 5 (12%).

Groundwater Levels and Spring Flows

Groundwater levels increased compared to October levels at 93% of monitoring wells analysed. November groundwater levels were classified as particularly high at 23 (51%) of monitoring wells, above normal at 10 wells (22%), and normal at 12 (27%), monitored wells.

Outflow from 10 springs monitored by the EPA were also analysed. The outflows from these springs were compared to previously recorded outflows for November and 6 springs were particularly high, 2 were above normal, and 2 were normal for this time of year.

Rainfall

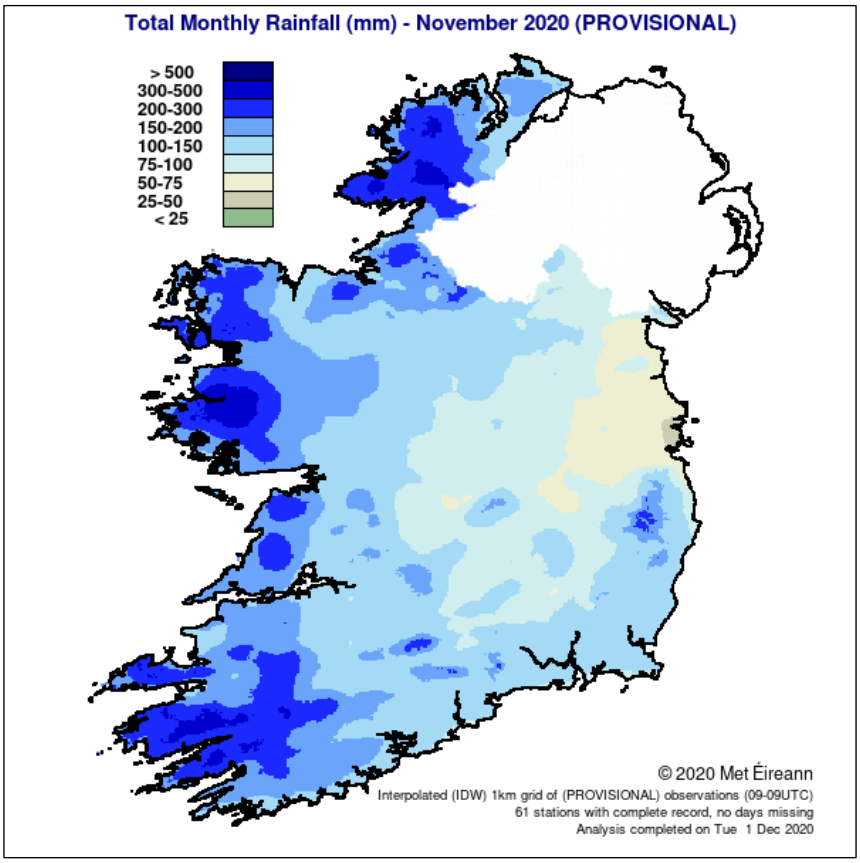


Figure 1:Rainfall map for Ireland November 2020 (Source: Met Eireann.ie)

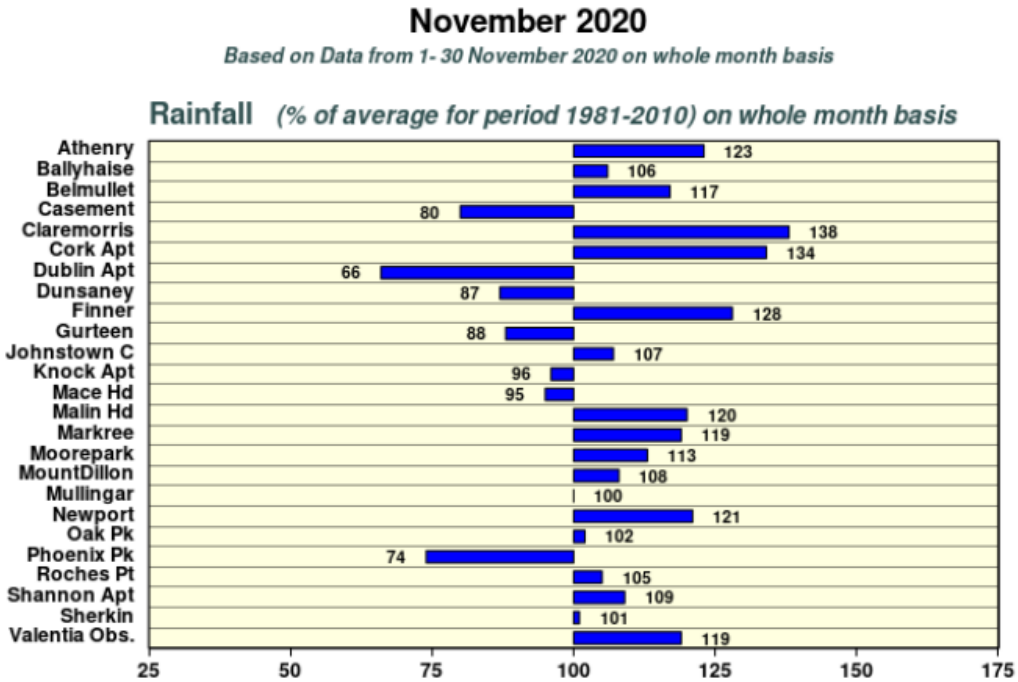


Figure 2: Summary of rainfall at synoptic stations November 2020, figures indicate the percentage difference from the Long-Term Average rainfall for November. (Source: Met Eireann.ie)

River Flows

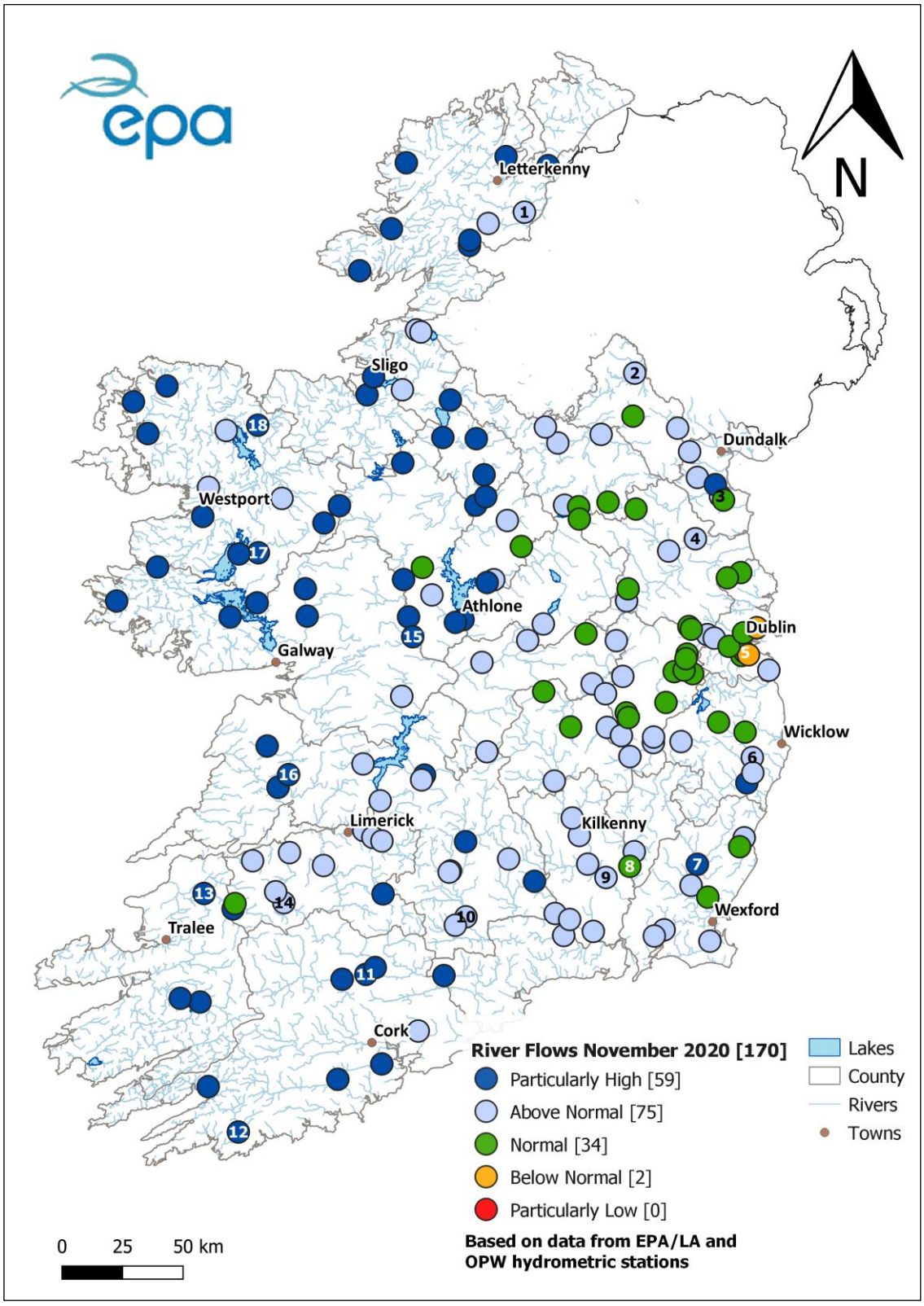


Figure 3: Monthly average river flows for November 2020 relative to historic monthly average flows expressed as percentile of the long-term values of monthly flow. Numbered sites are represented in the hydrographs below. All data are provisional and may be subject to revision. ***(Source: EPA, OPW).***

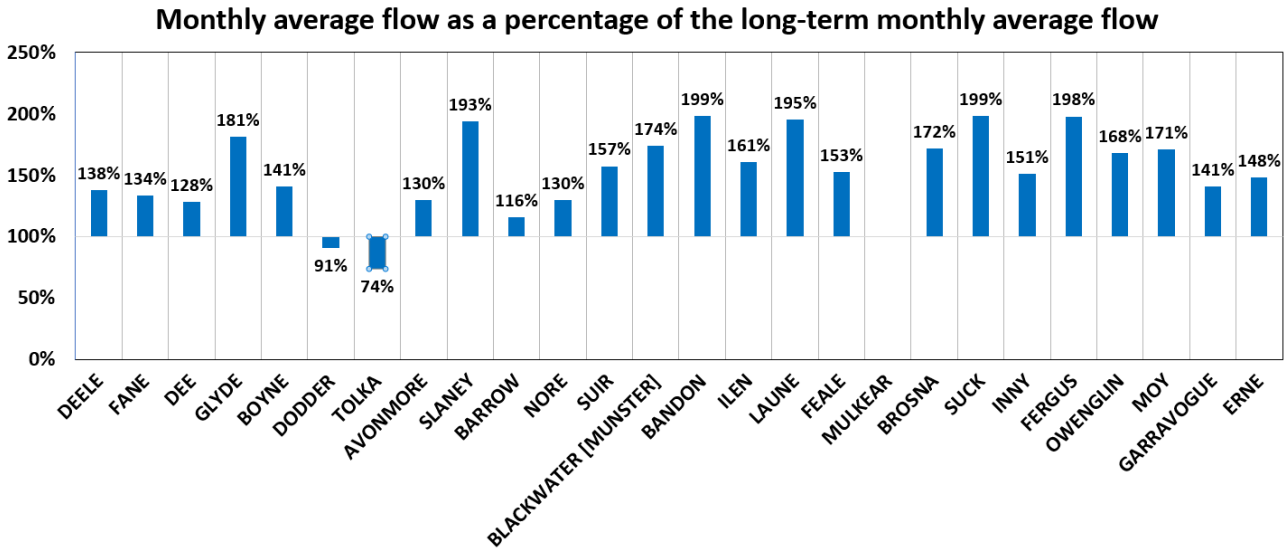
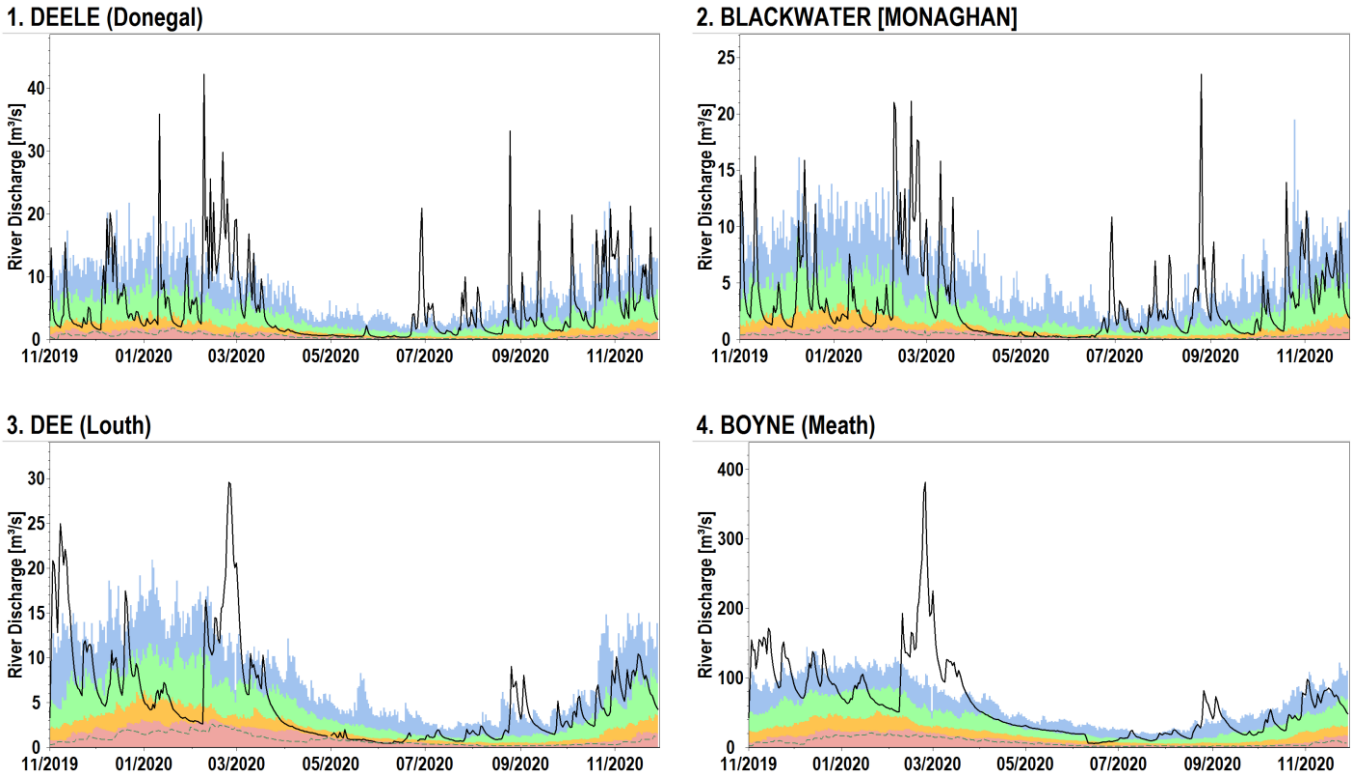
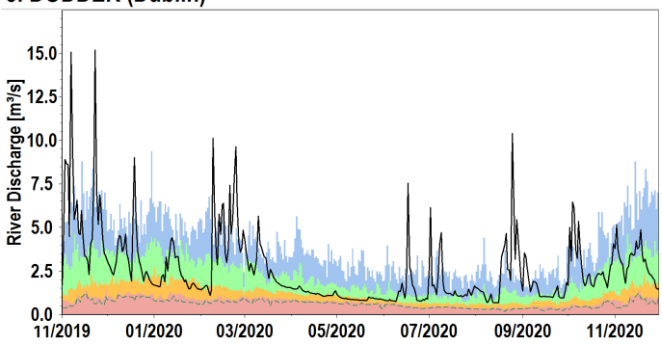


Figure 4: November 2020 average flows as a percentage of the long-term monthly average flow for November at a selected number of stations. All data are provisional and may be subject to revision. ***(Source: EPA, OPW)***

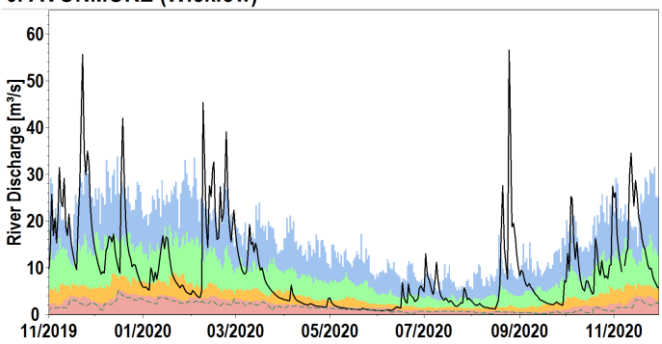
Flow Hydrographs for selected Rivers



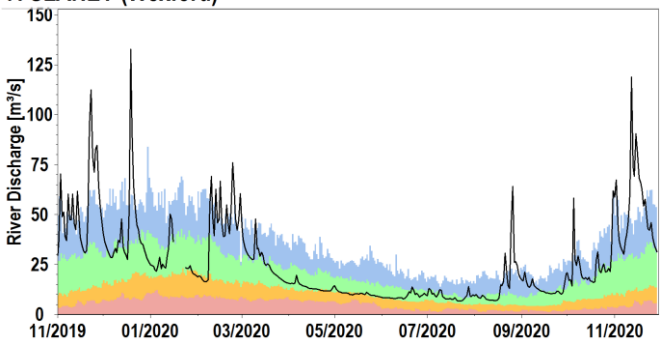
5. DODDER (Dublin)



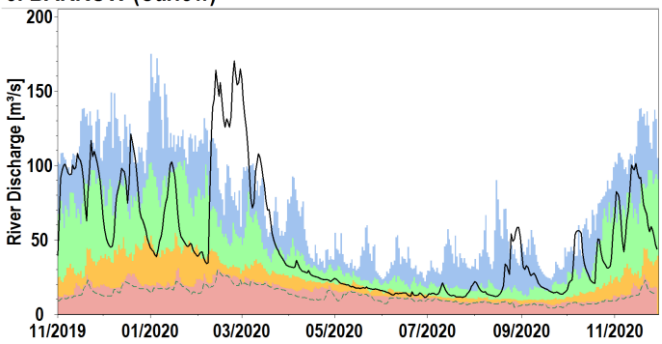
6. AVONMORE (Wicklow)



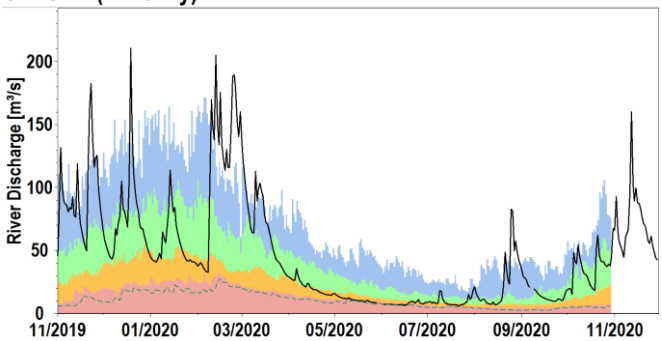
7. SLANEY (Wexford)



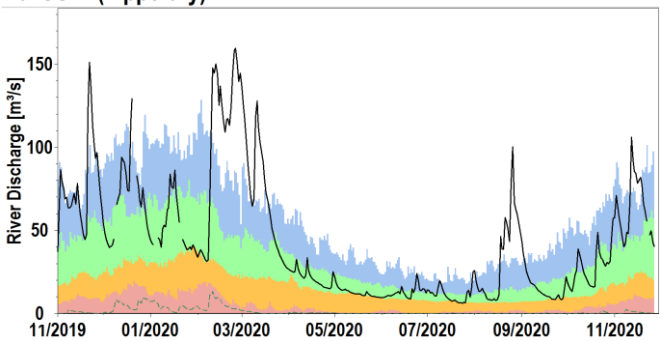
8. BARROW (Carlow)



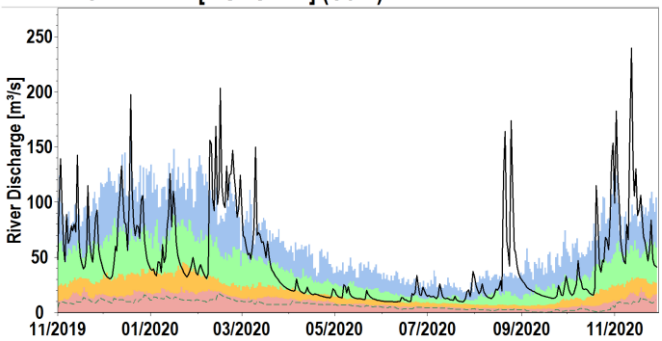
9. NORE (Kilkenny)



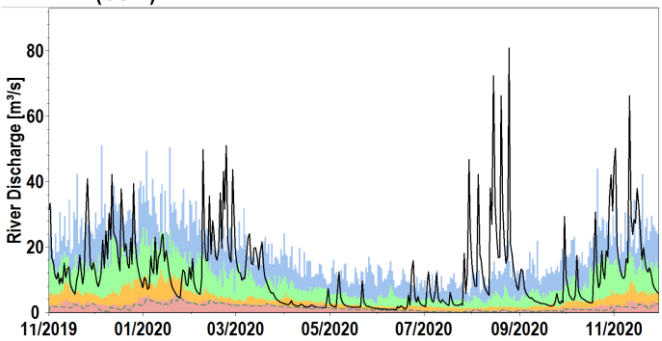
10. SUIR (Tipperary)



11. BLACKWATER [MUNSTER] (Cork)



12. ILEN (Cork)



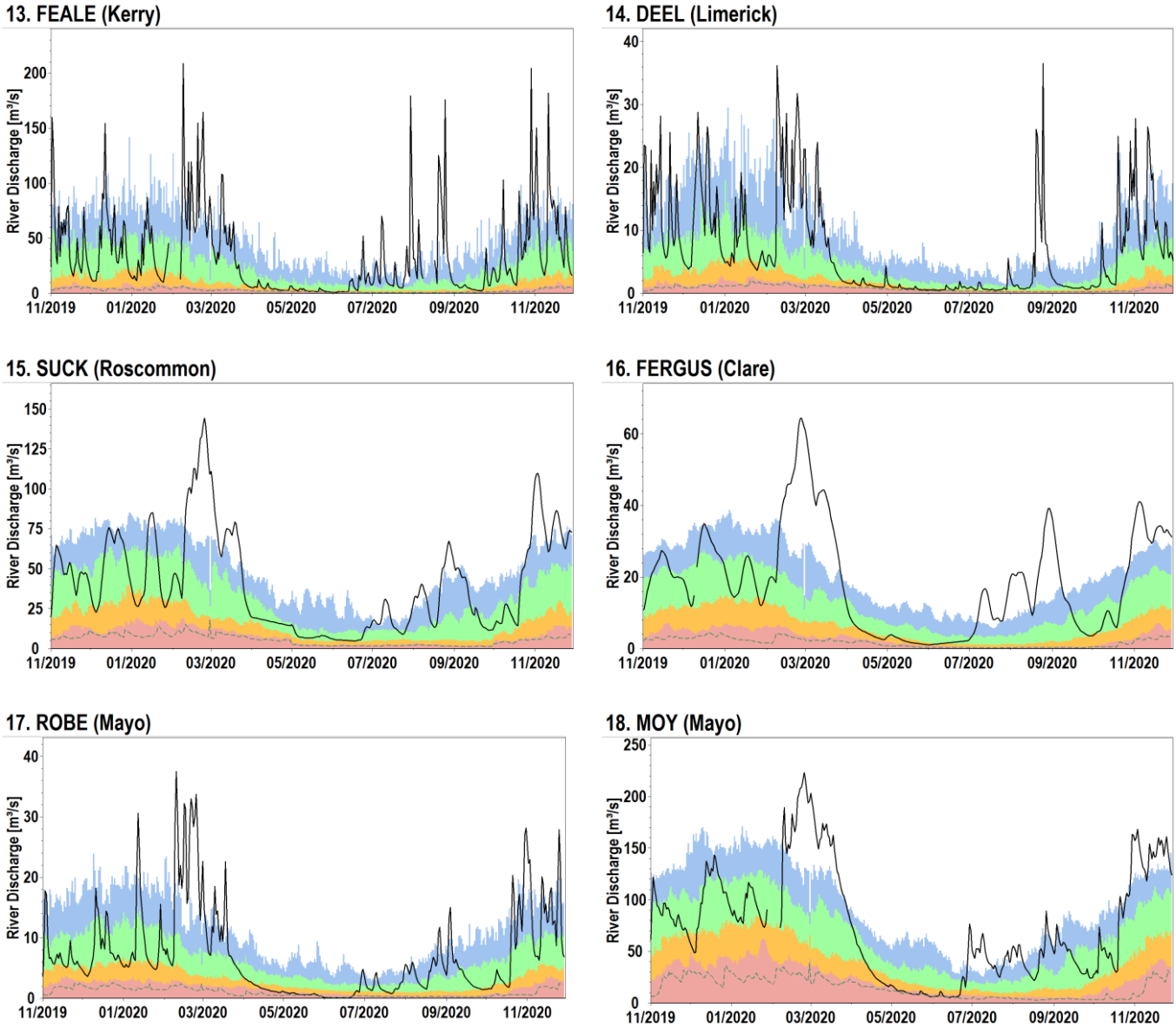


Figure 5: Daily average river flows up to November 2020 relative to historic daily average flows expressed as percentile of the long-term values of each day. All data are provisional and may be subject to revision. ***(Source: EPA, OPW)***

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

Lake Levels

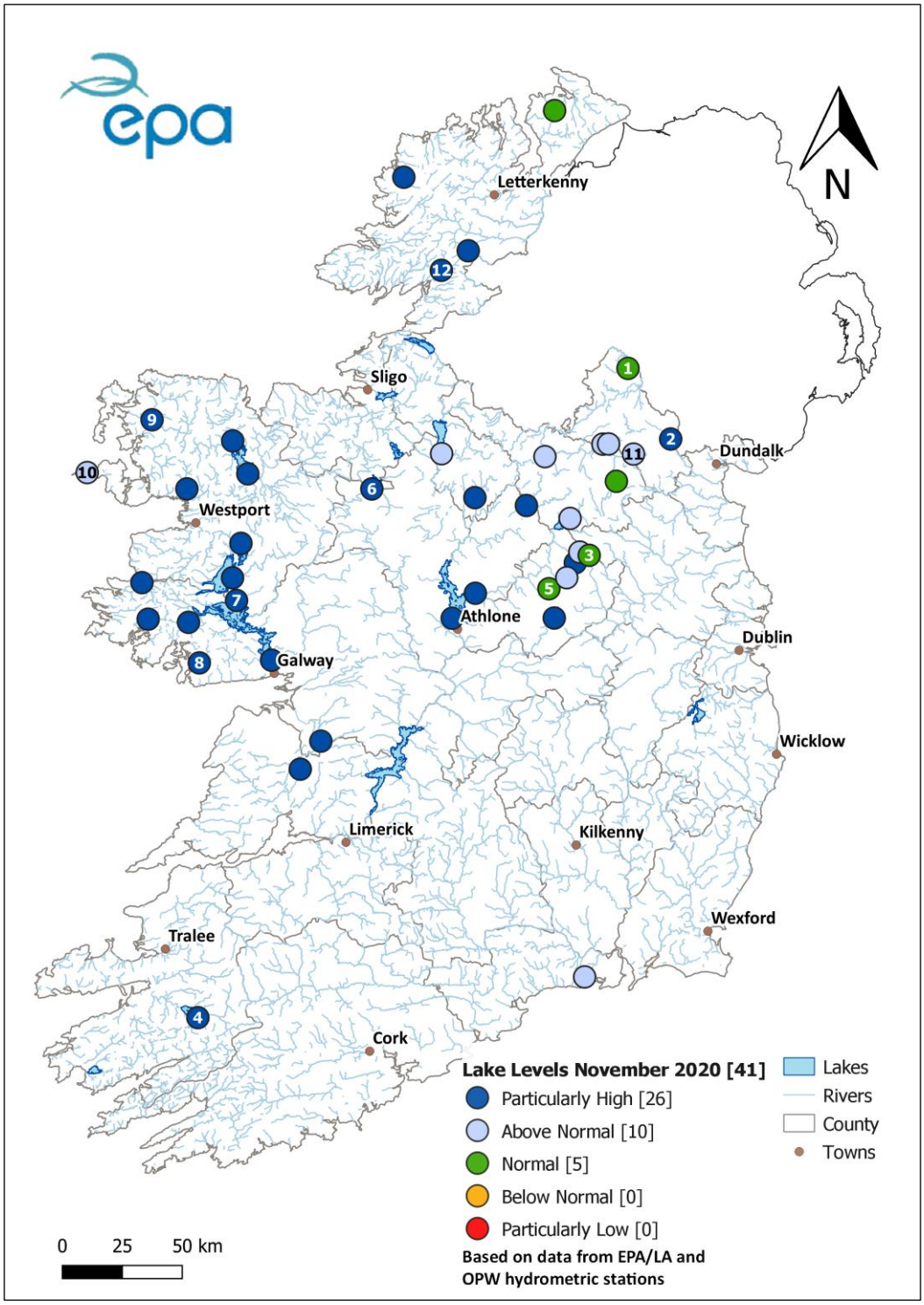
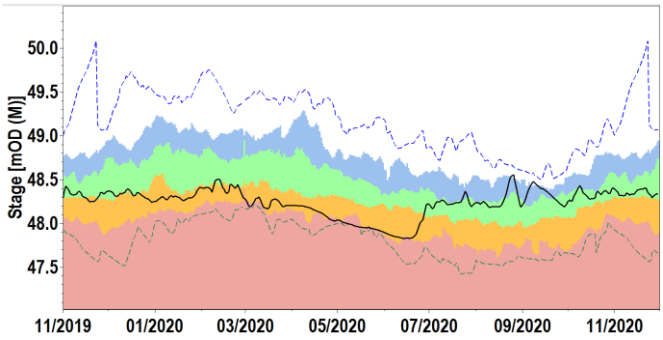


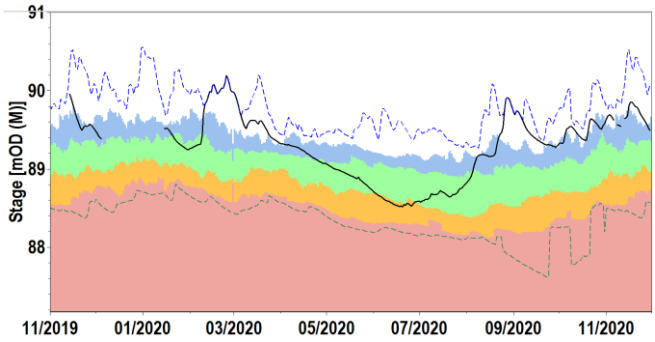
Figure 6: Monthly average lake levels for November 2020 relative to historic monthly average levels expressed as percentile of the long- term values of November. Numbered sites are represented in the hydrographs below. All data are provisional and may be subject to revision. ***(Source: EPA, OPW)***

Water Level Hydrographs for selected Lakes

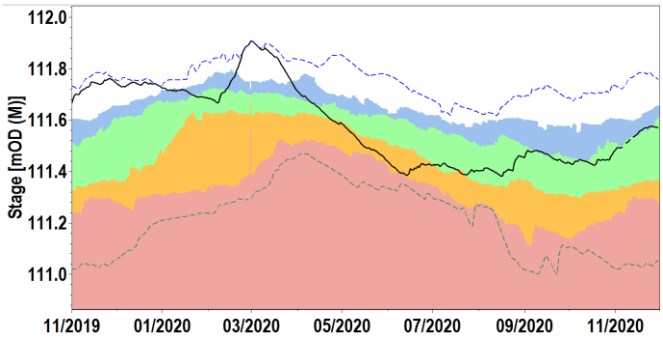
1. EMY LOUGH (Monaghan)



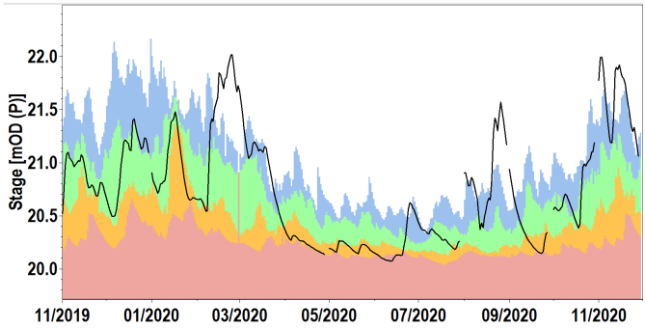
2. L. MUCKNO (Monaghan)



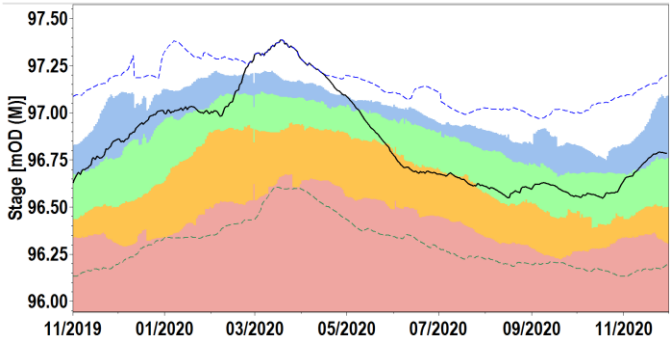
3. L. BANE (Meath)



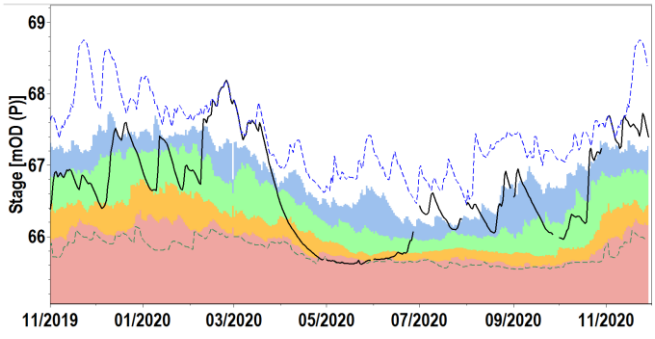
4. L. LEANE (Kerry)



5. L. OWEL (Westmeath)



6. L. GARA (Sligo)



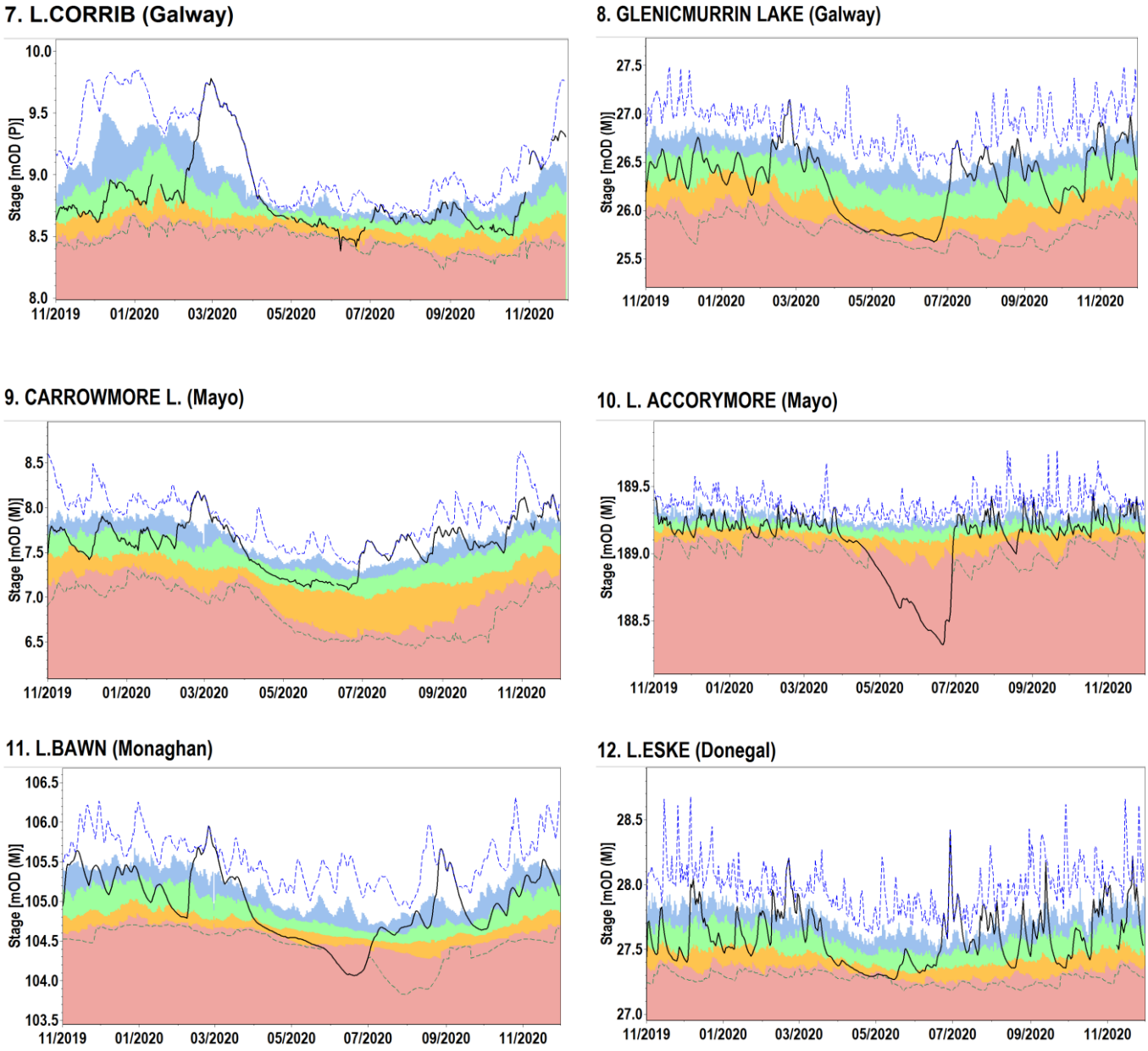


Figure 7: Daily mean lake levels classed relative to historic daily mean levels expressed as percentile of the values of each day with long-term maximum and minimum daily levels. All data are provisional and may be subject to revision. ***(Source: EPA, OPW)***

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

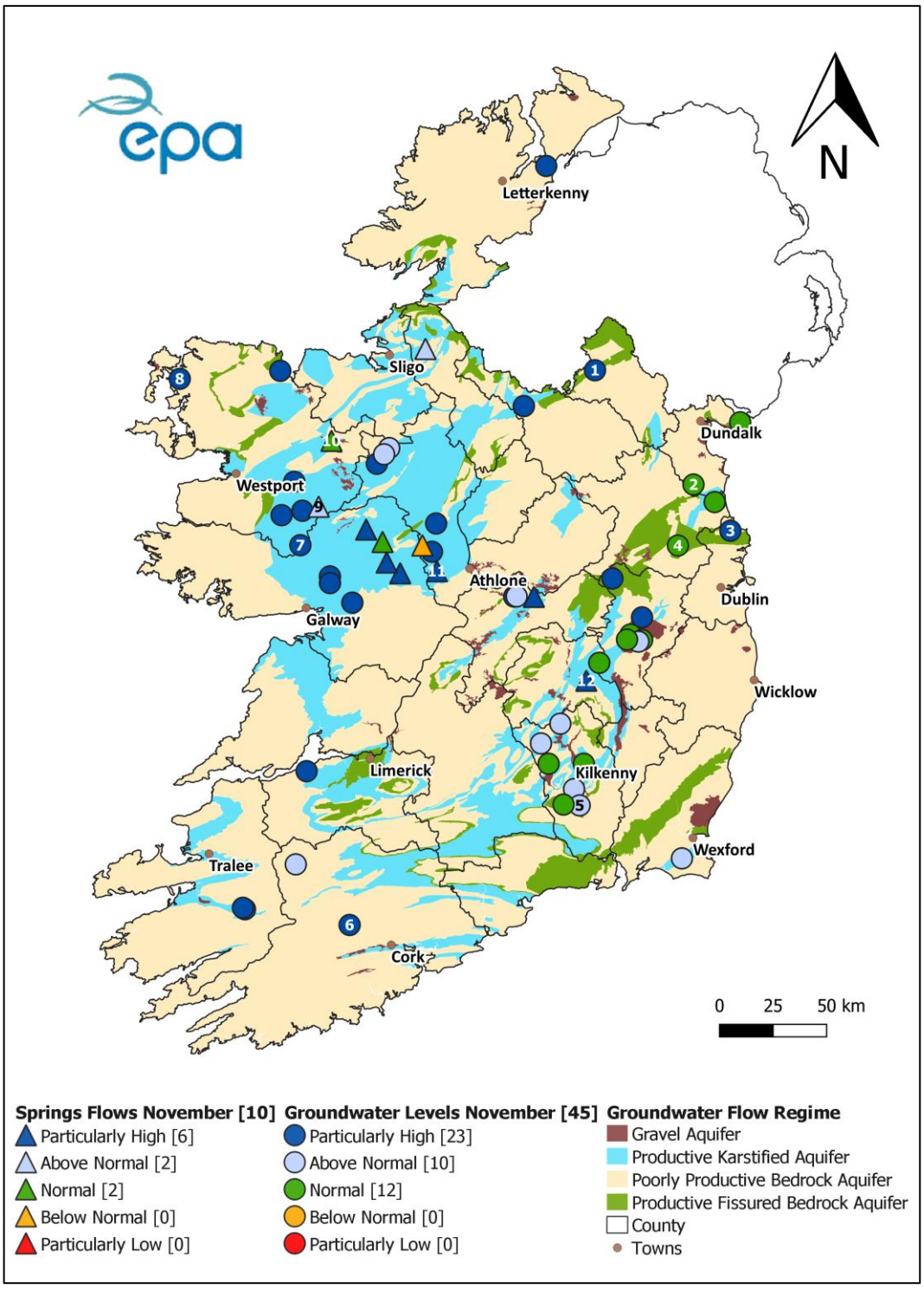
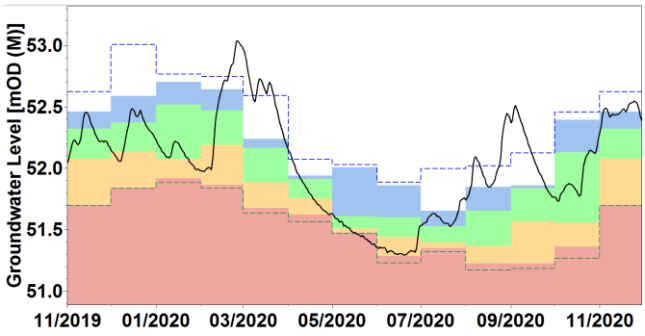
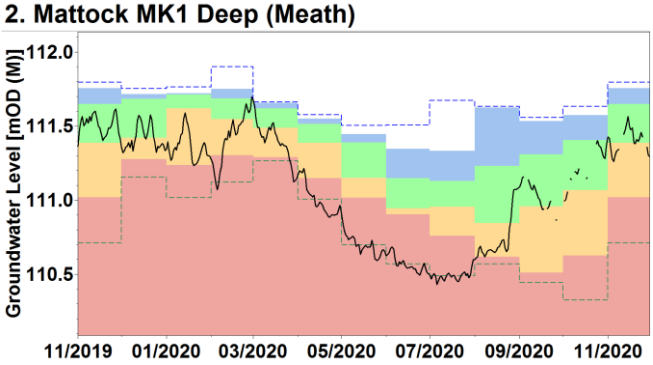


Figure 8: Groundwater level and Spring Flow status November 2020, relative to historic November groundwater levels. Numbered sites are represented in the hydrographs below. All data are provisional and may be subject to revision. ***(Source: EPA)***

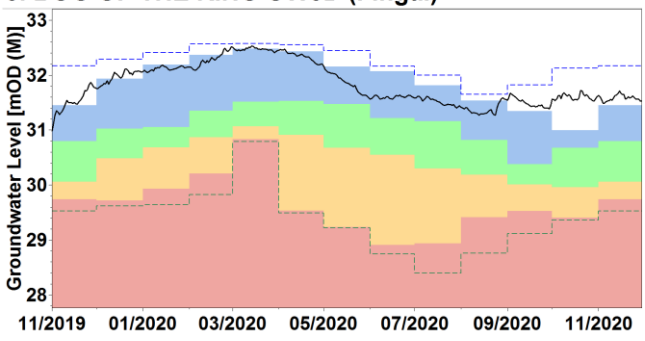
Groundwater and Spring Hydrographs



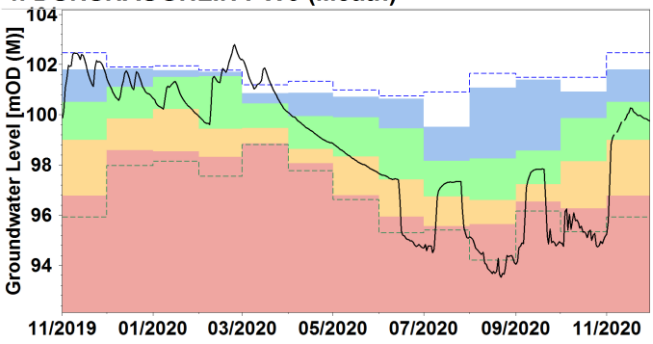
2. Mattock MK1 Deep (Meath)



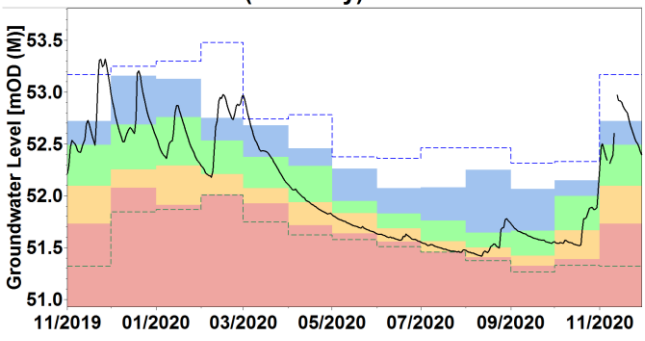
3. BOG OF THE RING OW3D (Fingal)



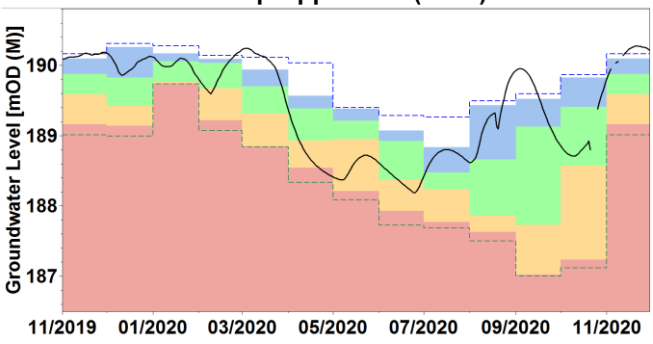
4. DUNSHAUGHLIN PW6 (Meath)



5. KNOCKTOPHER (Kilkenny)



6. DRIPSEY DR1 Deep Upper Site (Cork)



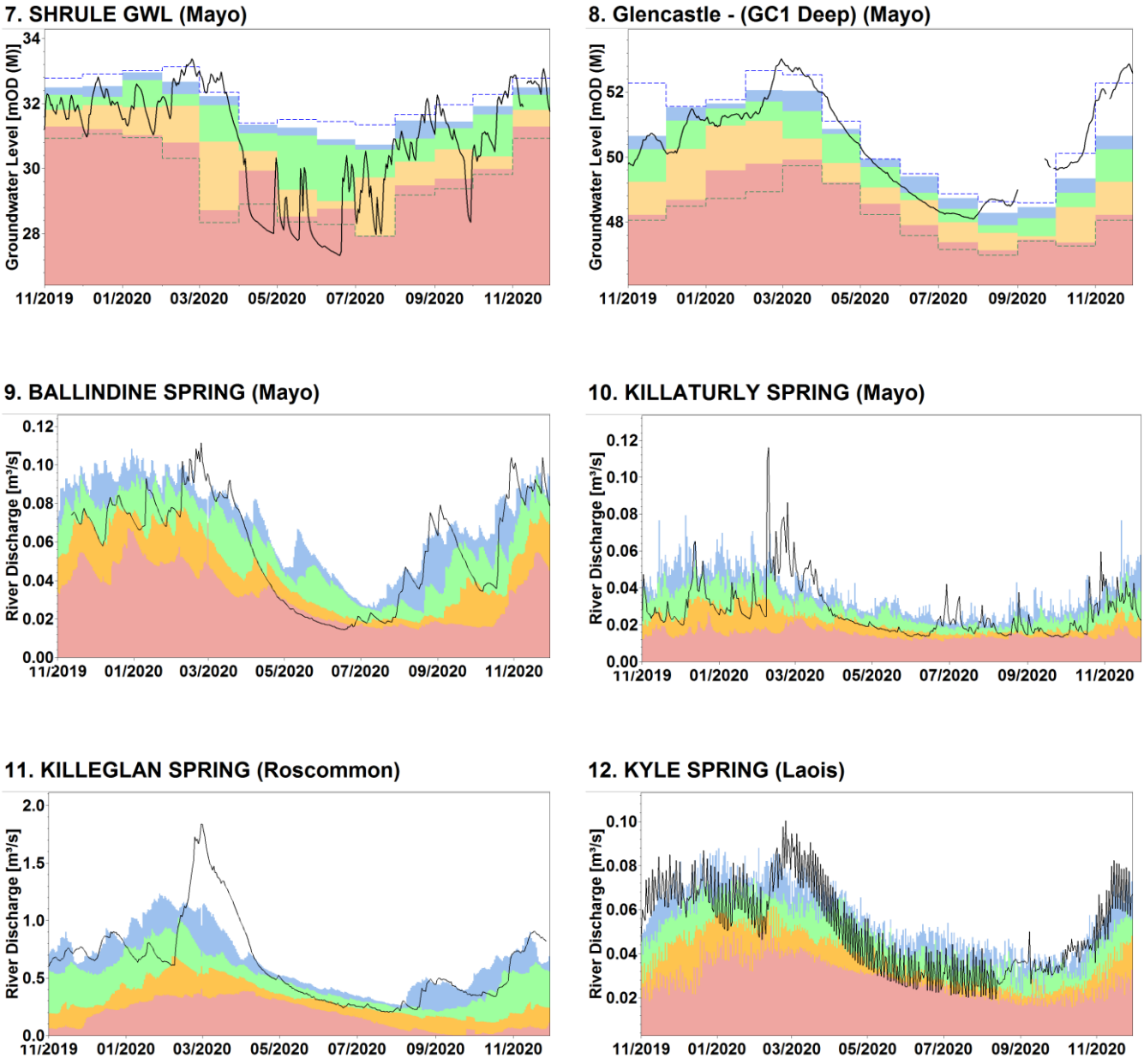


Figure 9: Daily mean groundwater levels (black trace) measured in meters above ordnance datum compared to the 10%tile, 30%tile, 70%tile and 95%tile for each month for the period of record and long-term maximum and minimum levels. All data are provisional and may be subject to revision. ***(Source: EPA)***

Explanation - Classes							
Particularly Low <95%tile monthly average level	Below Normal >95%tile <70%tile monthly average level	Normal >70 %tile <30%tile monthly average level	Above Normal >30%tile <10%tile monthly average level	Particularly High >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: ➢ Karstic (Rk and Lk) aquifers; ➢ Gravel (Rg and Lg) aquifers; ➢ Productive fractured bedrock (Rf and Lm) aquifers; ➢ Poorly productive bedrock (Ll, Pl 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.

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 this month's Met Éireann and historic weather statements.