

The following provisional past storm analysis is completed for the named Storm Babet. The weather impacts were mainly rainfall related over a four-day period between Tuesday 17 and Thursday 19 October 2023. The storm developed quite far to the south in the mid-Atlantic over warm waters. The storm intensified as it approached Portugal on Sunday 15th and moved over sea surface temperatures, which were several degrees above average for the time of year and in their low-mid 20s. This enabled the storm to pick up a lot of moisture before it turned north towards the UK and Ireland early on Tuesday 17th. The fronts ahead of the storm brought heavy rain, especially to the South of Ireland. Before several more weather fronts and pulses of rain associated with the another depression followed over the next three days as the centre of the weakening storm slowly moved up through the UK.

- The highest sustained (10-minute mean) wind speed was an easterly (100°) gale force 72 km/h (39 knots or 45 mph) on Wednesday 18 October 2023 around 19 UTC (8 pm local time) observed at Malin Head* (coastal), Co Donegal. The highest October sustained wind speed remains a violent storm force 115 km/h (62 knots or 71 mph) during Storm Ophelia on Monday, 16 October 2017 observed at Roches Point, Co Cork.
- The highest gust (3-second mean) wind speed was a easterly 93 km/h (50 knots or 58 mph) on Wednesday 18 October 2023 around 2226 UTC (11:26 pm local time) observed at Malin Head, Co Donegal. The highest October gust wind speed remains 178 km/h (96 knots or 110 mph) on Tuesday, 24 October 1995 observed at Rosslare S.W.S., Co Wexford.
- The highest daily (00-00 UTC) rainfall total was 55.6 mm on Wednesday, 18 October 2023 at Cork Airport, Co Cork (42 % of its 1991-2020 Long Term Average (LTA)). The highest 24-hour (09-09 UTC) rainfall total was 87.2 mm on Tuesday, 17 October 2023 at Cloyne (Lisanley), Co Cork (78 % of its LTA).
- The highest individual wave was 8.1 m on the Wednesday 18th during the hour ending 05 UTC (6 am local time) at M3 Buoy (off the Cork coast).

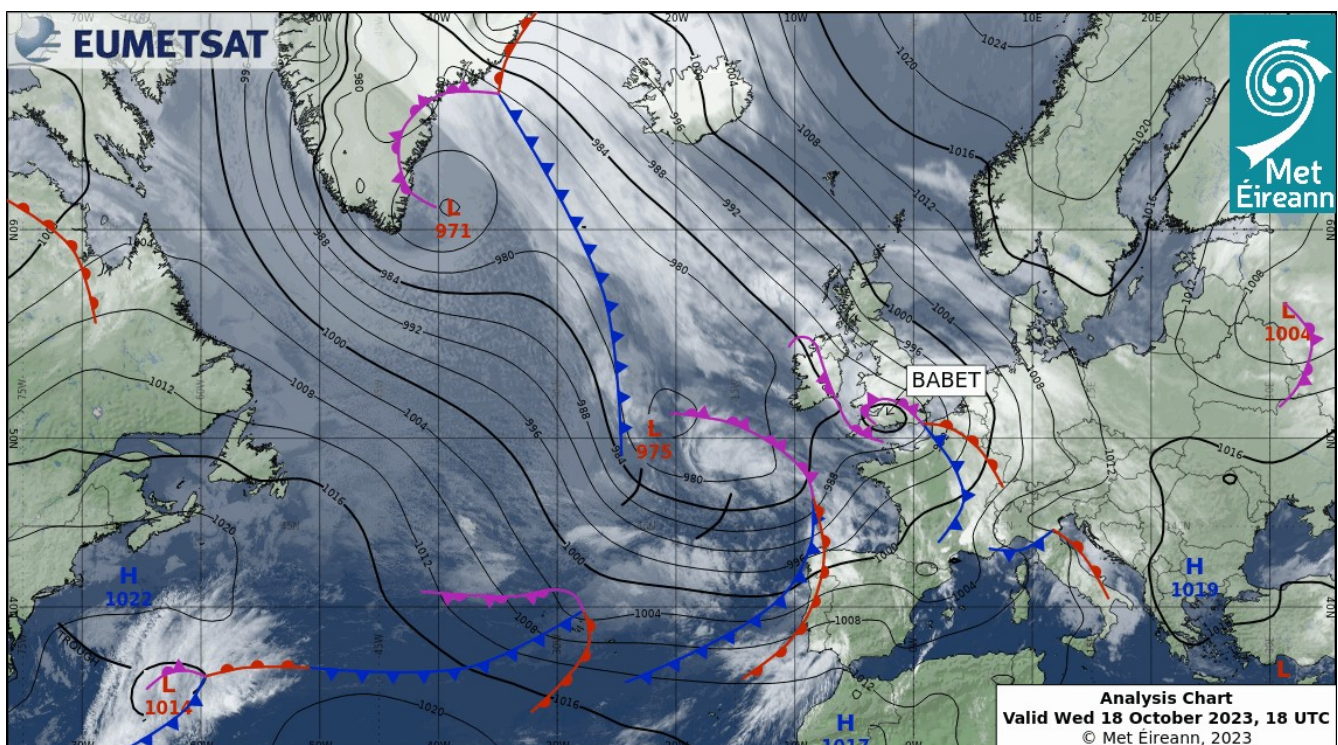
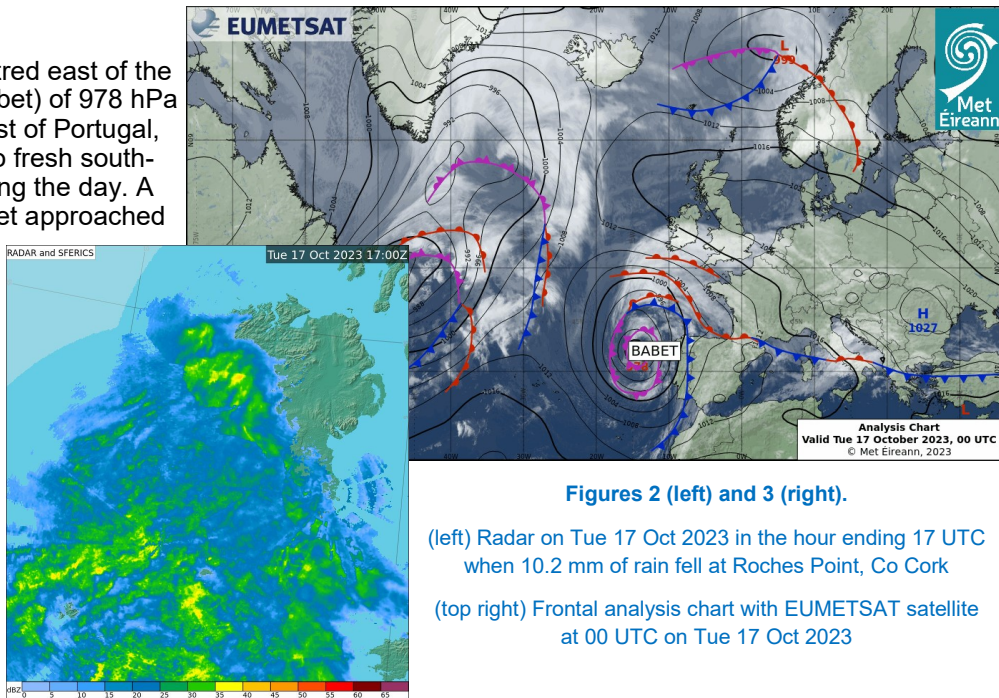


Figure 1. Analysis Chart with Satellite (EUMETSAT) at 18 UTC on Wed 18 Oct 2023

Tuesday 17 October 2023

An anticyclone of 1021 hPa centred east of the UK and a depression (Storm Babet) of 978 hPa in the South Atlantic, off the coast of Portugal, maintained a mostly moderate to fresh south-easterly airflow over Ireland during the day. A front associated with Storm Babet approached the country from the south with rain spreading across much of the south in the morning and becoming heavy and thundery at times before extending elsewhere during the afternoon and evening. Rain with heavy falls extended through the country in the evening with fresh and gusty southeasterly breezes.



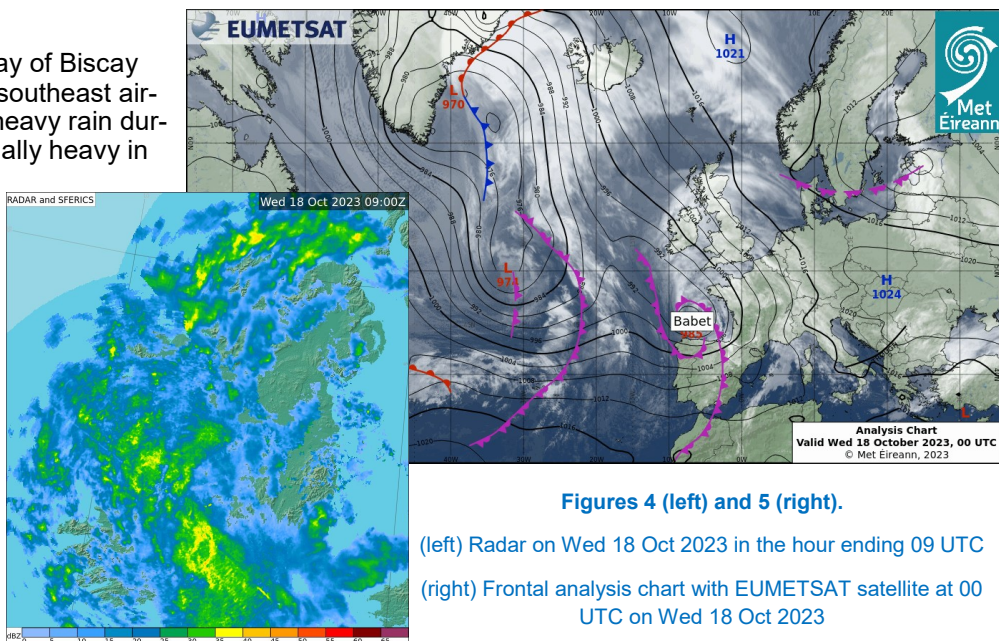
Figures 2 (left) and 3 (right).

(left) Radar on Tue 17 Oct 2023 in the hour ending 17 UTC when 10.2 mm of rain fell at Roches Point, Co Cork

(top right) Frontal analysis chart with EUMETSAT satellite at 00 UTC on Tue 17 Oct 2023

Wednesday 18 October 2023

Storm Babet positioned in the Bay of Biscay extended a strong to gale-force southeast airflow over Ireland. Outbreaks of heavy rain during the day. The rain was especially heavy in southern coastal counties during the morning. The rain gradually spread to the northeast as more showery conditions followed to the southwest. Heavy rain continued away from the southwest for the early part of the night.



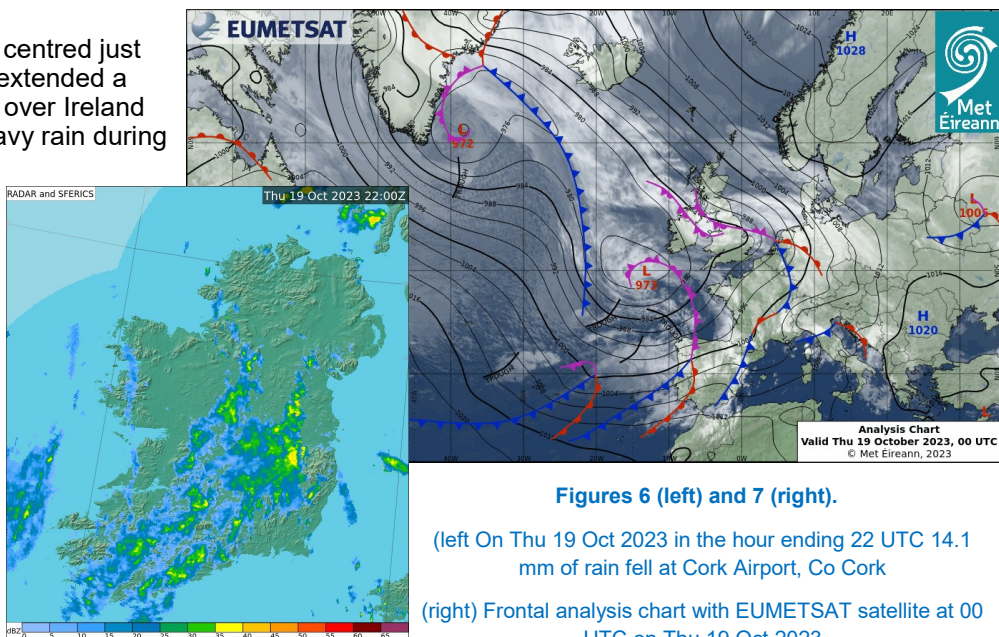
Figures 4 (left) and 5 (right).

(left) Radar on Wed 18 Oct 2023 in the hour ending 09 UTC

(right) Frontal analysis chart with EUMETSAT satellite at 00 UTC on Wed 18 Oct 2023

Thursday 19 October 2023

A complex low-pressure system centred just south of Mizen Head (969 hPa) extended a fresh to strong southeast airflow over Ireland during the day. Outbreaks of heavy rain during the morning which were heaviest in the South. Overcast in the West and North. Southeast winds during the morning, gusty in the North.



Figures 6 (left) and 7 (right).

(left) On Thu 19 Oct 2023 in the hour ending 22 UTC 14.1 mm of rain fell at Cork Airport, Co Cork

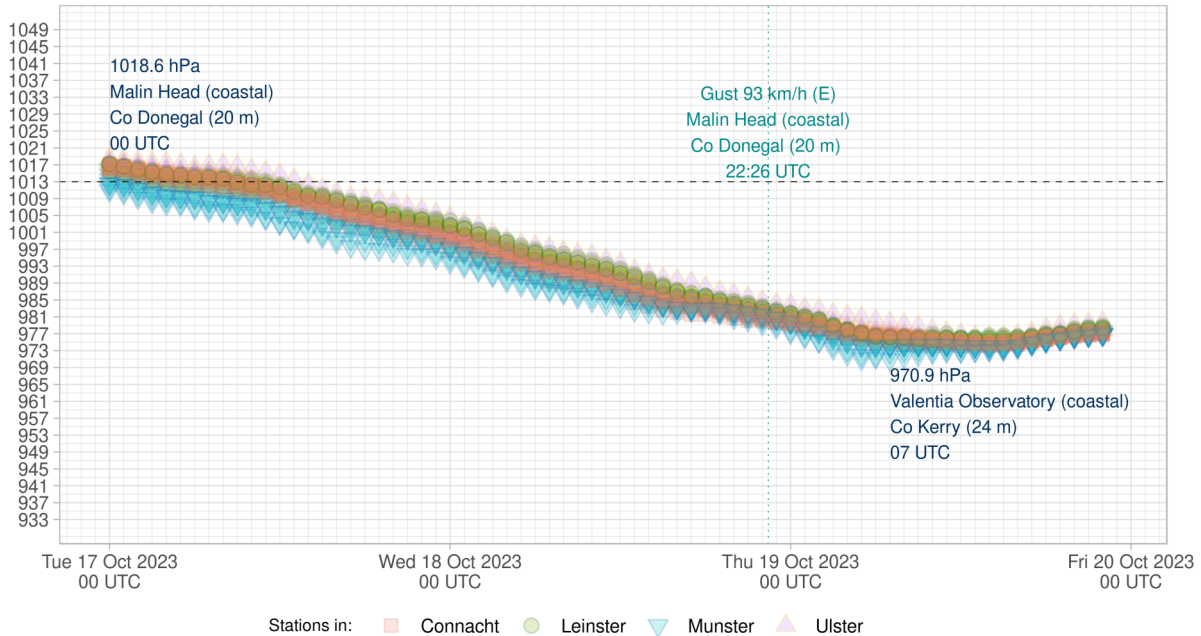
(right) Frontal analysis chart with EUMETSAT satellite at 00 UTC on Thu 19 Oct 2023

Mean Sea Level Pressure on Land

The mean sea level pressure (MSLP) dropped 42.4 hPa at Finner (coastal), Co Donegal, as the atmospheric pressure decreased from a high here of 1017.4 to 974.9 hPa between Tuesday 17 and Thursday 19 October 2023 (63 hours). While between Tuesday 17 October 2023 at 00 UTC and Thursday 19 October 2023 at 05 UTC the mean sea level pressure dropped by 39.8 hPa over the 54 hours at Sherkin Island (coastal), Co Cork. The lowest MSLP across the 3 days was 970.9 hPa at Valentia Observatory, Co Kerry on the Thursday and was associated with another depression.

Storm Babet

Hourly Mean Sea Level Pressure (hPa) and Highest Gust Wind Speed



© Met Éireann (2024)

Figure 8: Hourly Mean Sea Level pressure (MSLP) with highest gust wind speed (stations coloured by province) from Tue 17 to Thu 20 Oct 2023 (inclusive)

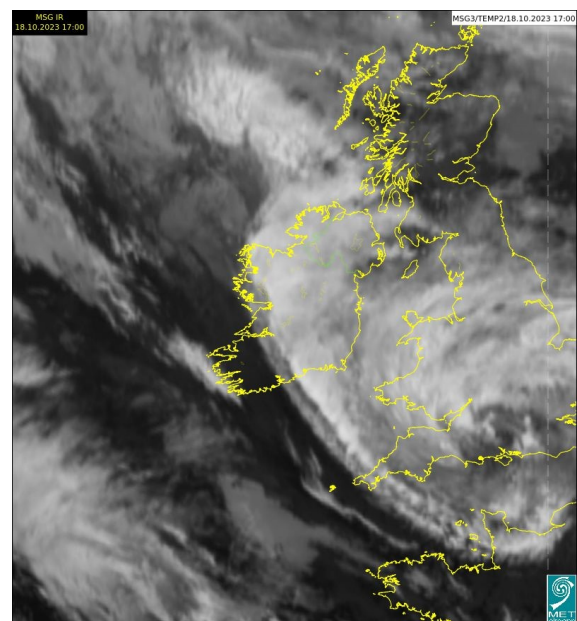
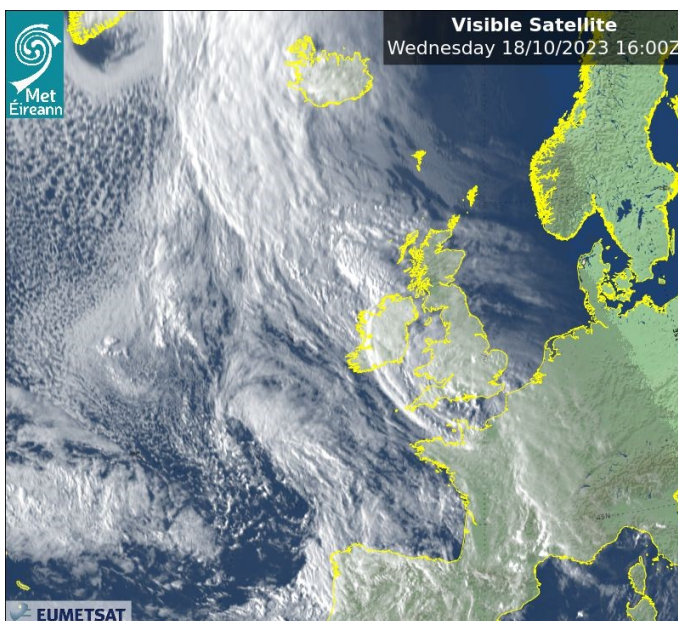


Figure 9 (left) & 10 (right). Visible and Infrared at EUMETSAT satellite images at the hours 16 and 17 UTC on Wed 18 Oct 2023

Synoptic stations—highest wind speeds and rainfall totals

The table Below contains wind speeds and rainfall observations for the SYNOPTIC stations during Storm Babet.

Table 1. Extremes of wind speeds or rainfall totals at synoptic stations.

| Station location | Sustained (10-min mean) Wind Speed | Date highest mean | Wind Direction Highest sustained | Gust (3-sec mean) Wind Speed | Date Highest Gust | Wind Direction Highest Gust | Highest Daily Rain (mm) | 3-day Total Rain (mm) |
|--|---|---------------------------|----------------------------------|--|-----------------------------|-----------------------------|-----------------------------------|-----------------------|
| Malin Head* (coastal) Co Donegal | 72 km/h Gale Force 8 (39 knots or 45 mph) | Wed 18 Oct 2023 19 UTC | 100° (E) | 93 km/h (50 knots or 58 mph) | Wed 18 Oct 2023 2226 UTC | 100° (E) | 4.7 mm Wed 18 Oct 2023 | 11.7 mm |
| Valentia Observatory (coastal) Co Kerry | 54 km/h Near Gale (29 knots or 33 mph) | Tue 17 Oct 2023 17 UTC | 100° (E) | 85 km/h (46 knots or 53 mph) | Tue 17 Oct 2023 1711 UTC | 90° (E) | 33.0 mm Tue 17 Oct 2023 | 48.5 mm |
| Sherkin Island (coastal) Co Cork | 54 km/h Near Gale (29 knots or 33 mph) | Tue 17 Oct 2023 16 UTC | 80° (E) | 76 km/h (41 knots or 47 mph) | Tue 17 Oct 2023 1439 UTC | 80° (E) | 53.6 mm Tue 17 Oct 2023 | 74.7 mm |
| Mace Head** (coastal) Co Galway | 48 km/h Strong Breeze (26 knots or 30 mph) | Wed 18 Oct 2023 02 UTC | 100° (E) | 69 km/h (37 knots or 43 mph) | Tue 17 Oct 2023 1610 UTC | 80° (E) | 20.3 mm Tue 17 Oct 2023 | 40.1 mm |
| Cork Airport (coastal) Co Cork | 48 km/h Strong Breeze (26 knots or 30 mph) | Tue 17 Oct 2023 18 UTC | 90° (E) | 69 km/h (37 knots or 43 mph) | Tue 17 Oct 2023 1643 UTC | 80° (E) | 55.6 mm Wed 18 Oct 2023 | 126.3 mm |
| Roches Point (coastal) Co Cork | 48 km/h Strong Breeze (26 knots or 30 mph) | Tue 17 Oct 2023 16 UTC | 80° (E) | 67 km/h (36 knots or 41 mph) | Tue 17 Oct 2023 1743 UTC | 90° (E) | 50.6 mm Tue 17 Oct 2023 | 95.1 mm |
| Casement Aerodrome Co Dublin | 43 km/h Strong Breeze (23 knots or 26 mph) | Tue 17 Oct 2023 24 UTC | 100° (E) | 61 km/h (33 knots or 38 mph) | Tue 17 Oct 2023 2155 UTC | 100° (E) | 18.1 mm Wed 18 Oct 2023 | 39.3 mm |
| Finner (coastal) Co Donegal | 39 km/h Fresh Breeze (21 knots or 24 mph) | Wed 18 Oct 2023 00 UTC | 110° (ESE) | 57 km/h (31 knots or 36 mph) | Wed 18 Oct 2023 0018 UTC | 110° (ESE) | 15.4 mm Thu 19 Oct 2023 | 27.9 mm |
| Dublin Airport (coastal) Co Dublin | 37 km/h Fresh Breeze (20 knots or 23 mph) | Wed 18 Oct 2023 18 UTC | 100° (E) | 52 km/h (28 knots or 32 mph) | Wed 18 Oct 2023 1840 UTC | 100° (E) | 16.6 mm Wed 18 Oct 2023 | 40.4 mm |
| Newport (coastal) Co Mayo | 35 km/h Fresh Breeze (19 knots or 22 mph) | Wed 18 Oct 2023 12 UTC | 110° (ESE) | 56 km/h (30 knots or 35 mph) | Wed 18 Oct 2023 1157 UTC | 100° (E) | 16.0 mm Wed 18 Oct 2023 | 32.6 mm |
| Dunsany Co Meath | 35 km/h Fresh Breeze (19 knots or 22 mph) | Wed 18 Oct 2023 05 UTC | 80° (E) | 50 km/h (27 knots or 31 mph) | Wed 18 Oct 2023 1407 UTC | 80° (E) | 24.6 mm Wed 18 Oct 2023 | 47.4 mm |
| Knock Airport Co Mayo | 33 km/h Fresh Breeze (18 knots or 21 mph) | Wed 18 Oct 2023 24 UTC | 120° (ESE) | 65 km/h (35 knots or 40 mph) | Tue 17 Oct 2023 2101 UTC | 110° (ESE) | 28.3 mm Wed 18 Oct 2023 | 48.8 mm |

Table 1. Cont'd

| Station location | Sustained (10-min mean) Wind Speed | Date highest mean | Wind Direction Highest sustained | Gust (3-sec mean) Wind Speed | Date Highest Gust | Wind Direction Highest Gust | Highest Daily Rain (mm) | 3-day Total Rain (mm) |
|---------------------------------------|---|---------------------------|----------------------------------|--|-----------------------------|-----------------------------|-----------------------------------|-----------------------|
| Claremorris Co Mayo | 33 km/h Fresh Breeze (18 knots or 21 mph) | Wed 18 Oct 2023 11 UTC | 100° (E) | 52 km/h (28 knots or 32 mph) | Tue 17 Oct 2023 1734 UTC | 90° (E) | 25.3 mm Wed 18 Oct 2023 | 46.7 mm |
| Moore Park Co Cork | 31 km/h Fresh Breeze (17 knots or 20 mph) | Tue 17 Oct 2023 17 UTC | 80° (E) | 52 km/h (28 knots or 32 mph) | Tue 17 Oct 2023 1925 UTC | 80° (E) | 33.7 mm Wed 18 Oct 2023 | 63.0 mm |
| Shannon Airport (coastal) Co Clare | 30 km/h moderate breeze (16 knots or 18 mph) | Wed 18 Oct 2023 21 UTC | 100° (E) | 48 km/h (26 knots or 30 mph) | Tue 17 Oct 2023 2011 UTC | 110° (ESE) | 23.1 mm Tue 17 Oct 2023 | 41.1 mm |
| Athenry Co Galway | 30 km/h moderate breeze (16 knots or 18 mph) | Tue 17 Oct 2023 17 UTC | 100° (E) | 46 km/h (25 knots or 29 mph) | Tue 17 Oct 2023 1756 UTC | 90° (E) | 25.7 mm Tue 17 Oct 2023 | 47.2 mm |
| Belmullet (coastal) Co Mayo | 30 km/h moderate breeze (16 knots or 18 mph) | Wed 18 Oct 2023 15 UTC | 120° (ESE) | 46 km/h (25 knots or 29 mph) | Wed 18 Oct 2023 1515 UTC | 110° (ESE) | 21.5 mm Wed 18 Oct 2023 | 39.5 mm |
| Gurteen Co Tipperary | 30 km/h moderate breeze (16 knots or 18 mph) | Tue 17 Oct 2023 19 UTC | 100° (E) | 46 km/h (25 knots or 29 mph) | Tue 17 Oct 2023 1957 UTC | 90° (E) | 15.3 mm Tue 17 Oct 2023 | 35.9 mm |
| Mullingar Co Westmeath | 30 km/h moderate breeze (16 knots or 18 mph) | Tue 17 Oct 2023 22 UTC | 100° (E) | 44 km/h (24 knots or 28 mph) | Tue 17 Oct 2023 2332 UTC | 110° (ESE) | 15.1 mm Thu 19 Oct 2023 | 39.7 mm |
| Mount Dillon Co Roscommon | 28 km/h moderate breeze (15 knots or 17 mph) | Tue 17 Oct 2023 23 UTC | 100° (E) | 43 km/h (23 knots or 26 mph) | Wed 18 Oct 2023 0721 UTC | 80° (E) | 22.1 mm Wed 18 Oct 2023 | 43.4 mm |
| Ballyhaise Co Cavan | 26 km/h moderate breeze (14 knots or 16 mph) | Wed 18 Oct 2023 11 UTC | 90° (E) | 54 km/h (29 knots or 33 mph) | Wed 18 Oct 2023 1103 UTC | 90° (E) | 14.4 mm Thu 19 Oct 2023 | 32.9 mm |
| Oak Park Co Carlow | 26 km/h moderate breeze (14 knots or 16 mph) | Wed 18 Oct 2023 23 UTC | 130° (SE) | 46 km/h (25 knots or 29 mph) | Tue 17 Oct 2023 2330 UTC | 130° (SE) | 19.8 mm Thu 19 Oct 2023 | 41.5 mm |
| Johnstown Castle (coastal) Co Wexford | 24 km/h moderate breeze (13 knots or 15 mph) | Tue 17 Oct 2023 08 UTC | 90° (E) | 44 km/h (24 knots or 28 mph) | Tue 17 Oct 2023 0857 UTC | 90° (E) | 35.2 mm Wed 18 Oct 2023 | 47.4 mm |

Table 2. County Cork synoptic stations' daily rainfall totals (mm) from midnight to midnight UTC, from Tue 17 to Fri 20 Oct 2023, compared to each station's monthly LTA. The rainfall during this period was associated with storm Babet and preceding fronts on Tue 17th.

| Synoptic Station | Tue 17 Oct 2023 | Wed 18 Oct-2023 | Thu 19 Oct 2023 | Fri 20 Oct 2023 | Rainfall Total (4 days) | Rainfall Total (4 days) as % October LTA |
|-------------------------|-----------------|-----------------|-----------------|-----------------|-------------------------|--|
| Cork Airport, Co Cork | 36.8 | 55.6 | 33.9 | 20.5 | 146.8 mm | 112 % |
| Roches Point, Co Cork | 50.6 | 39.1 | 5.4 | 19.9 | 115 mm | 111 % |
| Sherkin Island, Co Cork | 53.6 | 17.4 | 3.7 | 10.8 | 85.5 mm | 75 % |
| Moore Park, Co Cork | 19.1 | 33.7 | 10.2 | 32.6 | 95.6 mm | 90 % |

Impacts

- **Power Outages:** ESB Power Check showed 961 customers without power in Cork and Limerick on the morning of the Thursday 18 October 2023 ([ESB PowerCheck, 2023](#)).
- **Flooding:** Three units of the Cork Civil Defence - Cork City, Cork North and East, Cork West - were mobilised to assist with flood relief operations in the Blackpool, Glanmire and Midleton areas ([Department of Defence, 2023](#)).
- **Travel:** Irish Rail reported flooding on the line services between Cork/Cobh and Cork/Midleton ([Irish Examiner, 2023](#)).

Definitions

- Sustained (or mean) wind speeds are an average of 10-minute wind speeds.
- Gust wind speeds are an average of 3-second wind speeds.
- Unless otherwise stated daily means midnight to midnight UTC.
- Long-Term Averages (LTAs) and 'normal' refer to the observations being averaged over the period 1991-2020.
- Beaufort Scale available at www.met.ie/forecasts/marine-inland-lakes/beaufort-scale
- Marine area buoy maps and definitions available at www.met.ie/forecasts/marine-inland-lakes/sea-area-forecast-terminology

* *Malin Head, Co Donegal's wind speeds are observed (using an anemometer) at a non-standard height of 23 m while all others are at 10 m. This will cause Malin Head's wind speeds to be higher in a strong air flow.*

** *Mace Head, Co Galway's anemometer is situated above exposed rock at the coast line.*

This report is based on the observations from Met Éireann's weather and climate stations and data available up to the publication date. For more information, please contact Met Éireann's Climate Services Division: enquiries@met.ie or <https://www.met.ie/about-us/contact-us>.