Met Éireann

The Irish Meteorological Service

Storm Babet

Marine Storm Report

Marine Unit

Report Date: 25 August 2025

Report Time: 13:36 UTC

Storm Overview

Dates: 2023-10-18, 2023-10-19, 2023-10-20

Description: Severe storm bringing flooding and destructive winds across Ireland and UK.

Peak Winds: 100+ km/h

Areas Affected: East Coast, Southeast, Midlands

Marine Observations Summary

Data Sources

- **Buoy 62091** (M1 Buoy (Retired)): 53.47°N, 5.42°W - West Coast
- **Buoy 62092** (M2 Buoy): 53.48°N, 5.42°W - West Coast
- **Buoy 62093** (M3 Buoy): 51.22°N, 6.70°W - South Coast
- **Buoy 62094** (M4 Buoy): 51.69°N, 6.70°W - South Coast
- **Buoy 62095** (M5 Buoy): 53.06°N, 7.90°W - West Coast

Peak Conditions Observed

- **Maximum Wind Speed:** 18.6 m/s (67.1 km/h) at Buoy 62092

- **Maximum Significant Wave Height (Hm0):** 7.7 m at Buoy 62092
- **Maximum Wave Height (Hmax):** 13.3 m at Buoy 62092
- **Minimum Pressure:** 970.6 hPa at Buoy 62092
- **Temperature Range:** 10.0°C (Buoy 62093) to 15.5°C (Buoy 62091)
- **Total Observations:** 1,151 records from 5 stations (QC good data only)

Station-by-Station Analysis

Buoy 62091 - M1 Buoy (Retired)

- **Location:** 53.47°N, 5.42°W
- **Region:** West Coast
- **Peak Wind Speed:** 16.9 m/s (60.8 km/h)
- **Peak Significant Wave Height (Hm0):** 4.8 m
- **Peak Maximum Wave Height (Hmax):** 8.4 m
- **Minimum Pressure:** 976.3 hPa
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 223 records (QC good data only)

Buoy 62092 - M2 Buoy

- **Location:** 53.48°N, 5.42°W
- **Region:** West Coast
- **Peak Wind Speed:** 18.6 m/s (67.1 km/h)
- **Peak Significant Wave Height (Hm0):** 7.7 m
- **Peak Maximum Wave Height (Hmax):** 13.3 m
- **Minimum Pressure:** 970.6 hPa
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 236 records (QC good data only)

Buoy 62093 - M3 Buoy

- **Location:** 51.22°N, 6.70°W
- **Region:** South Coast
- **Peak Wind Speed:** 13.1 m/s (47.0 km/h)
- **Peak Significant Wave Height (Hm0):** 5.3 m
- **Peak Maximum Wave Height (Hmax):** 9.1 m
- **Minimum Pressure:** 975.3 hPa
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 219 records (QC good data only)

Buoy 62094 - M4 Buoy

- **Location:** 51.69°N, 6.70°W
- **Region:** South Coast
- **Peak Wind Speed:** 16.3 m/s (58.9 km/h)
- **Peak Significant Wave Height (Hm0):** 4.1 m
- **Peak Maximum Wave Height (Hmax):** 7.3 m
- **Minimum Pressure:** 974.9 hPa

- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 236 records (QC good data only)

Buoy 62095 - M5 Buoy

- **Location:** 53.06°N, 7.90°W
- **Region:** West Coast
- **Peak Wind Speed:** 15.8 m/s (56.7 km/h)
- **Peak Significant Wave Height (Hm0):** 6.9 m
- **Peak Maximum Wave Height (Hmax):** 11.6 m
- **Minimum Pressure:** 976.0 hPa
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 237 records (QC good data only)

Meteorological Analysis

Wind Analysis

The storm produced maximum sustained winds of **18.6 m/s** (67.1 km/h), representing significant marine weather conditions. Wind speeds of this magnitude pose considerable risks to marine operations and coastal areas.

Wind Categories:

- Force 7 (Strong Gale): 13.9-17.1 m/s (50-61 km/h)
- Force 8 (Gale): 17.2-20.7 m/s (62-74 km/h)
- Force 9 (Strong Gale): 20.8-24.4 m/s (75-88 km/h)
- Force 10+ (Storm): >24.5 m/s (>88 km/h)

Wave Analysis

Significant Wave Heights (Hm0): Peak values reached **7.7 m**, representing **high** sea states according to the World Meteorological Organization classification.

Maximum Wave Heights (Hmax): Individual wave heights peaked at **13.3 m**. Note: Hmax values represent individual wave heights and are not used for sea state classification.

Wave Height Relationship: The Hmax/Hm0 ratio was **1.72**, within normal range (1.3-1.8).

Sea State Classification (Hm0):

- Rough: 2.5-4.0 m
- Very Rough: 4.0-6.0 m
- High: 6.0-9.0 m
- Very High: 9.0-14.0 m
- Phenomenal: >14.0 m

Wave Height Definitions:

- **Hm0 (Significant Wave Height):** Average height of the highest one-third of waves
- **Hmax (Maximum Wave Height):** Highest individual wave recorded during the period

Quality Control Summary

Total Records: 1,151

QC Status Distribution:

- Good Data (QC=1): 1,151 records (100.0%)
- Adjusted Data (QC=5): 0 records (0.0%)
- Failed QC (QC=4): 0 records (0.0%)
- Missing Data (QC=9): 0 records (0.0%)
- No QC (QC=0): 0 records (0.0%)

Data Visualization

!Storm Overview

Figure 1: Marine meteorological analysis showing wind speed, wave height, atmospheric pressure, air temperature, wind direction, and wave period during Storm Babet.

Technical Notes

QC Methods Applied

- **Manual QC:** Visual inspection and expert validation
- **Automatic QC:** Range checks, spike detection, and flat-line identification

Data Quality Indicators

- 0: No QC performed
- 1: QC performed, data OK
- 4: QC performed, raw data not OK and not adjusted
- 5: QC performed, raw data not OK but value adjusted/interpolated
- 6: QC performed, data OK (Datawell Hmax sensor specific)
- 9: Data missing

Report generated by Marine Storm Analysis System Data source: Irish Marine Data Buoy Network Quality controlled data from Met Éireann marine observations

Marine Meteorological Analysis

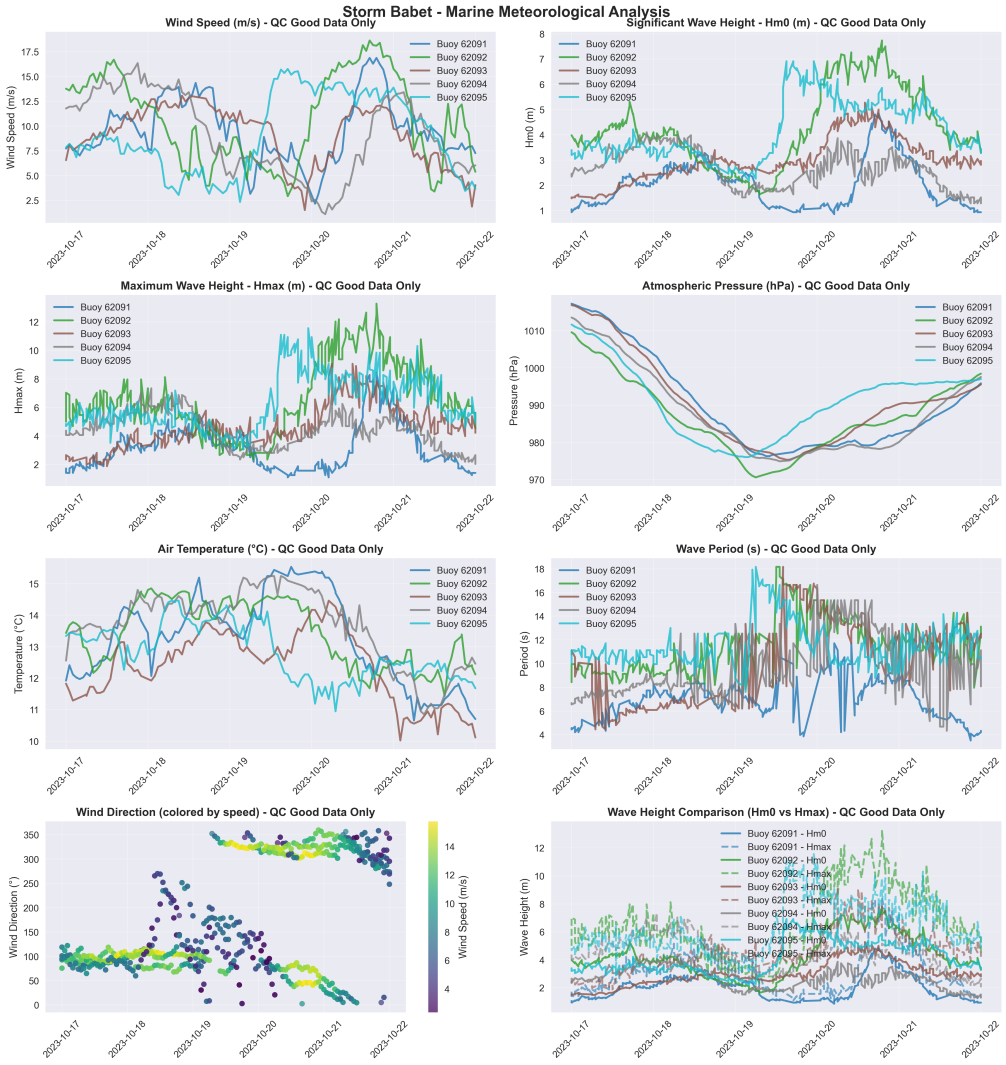

Figure 1: Marine meteorological observations during Storm Babet. Eight-panel analysis showing wind speed, significant wave height (Hm0), maximum wave height (Hmax), atmospheric pressure, air temperature, wave period, wind direction patterns, and comparative wave heights across the Irish Marine Data Buoy Network. Quality-controlled data only.

Met Éireann Marine Unit

Irish Marine Data Buoy Network

Valentia Observatory, Co. Kerry

www.met.ie/climate/storm-centre