Met Éireann

The Irish Meteorological Service

Storm Agnes

Marine Storm Report

Marine Unit

Report Date: 01 September 2025

Report Time: 13:32 UTC

Marine Observations Summary

Data Sources

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

Peak Conditions Observed

- **Maximum Wind Speed:** 43.1 knots (79.7 km/h) at Buoy 62092
- **Maximum Significant Wave Height (Hm0):** 8.4 m at Buoy 62092
- **Maximum Wave Height (Hmax):** 13.1 m at Buoy 62092
- **Minimum Pressure:** 980.4 hPa at Buoy 62092
- **Temperature Range:** 11.5°C (Buoy 62095) to 17.2°C (Buoy 62091)
- **Total Observations:** 482 records from 4 stations (QC good data only)

Station-by-Station Analysis

Buoy 62091 - M1 Buoy (Retired)

- **Location:** 53.47°N, 5.42°W
- **Peak Wind Speed:** 38.6 knots (71.5 km/h)

- **Peak Significant Wave Height (Hm0):** 4.6 m
- **Peak Maximum Wave Height (Hmax):** 6.1 m
- **Minimum Pressure:** 988.3 hPa
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 97 records (QC good data only)

Buoy 62092 - M2 Buoy

- **Location:** 53.48°N, 5.42°W
- **Peak Wind Speed:** 43.1 knots (79.7 km/h)
- **Peak Significant Wave Height (Hm0):** 8.4 m
- **Peak Maximum Wave Height (Hmax):** 13.1 m
- **Minimum Pressure:** 980.4 hPa
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 97 records (QC good data only)

Buoy 62094 - M4 Buoy

- **Location:** 51.69°N, 6.70°W
- **Peak Wind Speed:** 28.9 knots (53.6 km/h)
- **Peak Significant Wave Height (Hm0):** 8.2 m
- **Peak Maximum Wave Height (Hmax):** 0.0 m
- **Minimum Pressure:** 992.8 hPa
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 97 records (QC good data only)

Buoy 62095 - M5 Buoy

- **Location:** 53.06°N, 7.90°W
- **Peak Wind Speed:** 27.4 knots (50.8 km/h)
- **Peak Significant Wave Height (Hm0):** 5.6 m
- **Peak Maximum Wave Height (Hmax):** 8.7 m
- **Minimum Pressure:** 990.4 hPa
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 191 records (QC good data only)

Meteorological Analysis

Wind Analysis

The storm produced maximum sustained winds of **43.1 knots** (79.7 km/h).

Wind Categories:

- Force 7 — Near gale: 28–33 kn (50–61 km/h)
- Force 8 — Gale: 34–40 kn (62–74 km/h)
- Force 9 — Severe gale (aka Strong gale): 41–47 kn (75–88 km/h)
- Force 10 — Storm: 48–55 kn (89–102 km/h)
- Force 11 — Violent storm: 56–63 kn (103–117 km/h)

- Force 12 — Hurricane force: ≥64 kn (≥118 km/h)

Wave Analysis

Significant Wave Heights (Hm0): Peak values reached **8.4 m**, representing **high**.

Maximum Wave Heights (Hmax): Individual wave heights peaked at **13.1 m**. Note: Hmax values represent individual wave heights and are not used for sea state classification.

Wave Height Relationship: The Hmax/Hm0 ratio was **1.57**, 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

Pressure Analysis

Atmospheric pressure dropped to a minimum of **980.4 hPa**.

Quality Control Summary

Total Records: 482

QC Status Distribution:

- Good Data (QC=1): 482 records (100.0%)
- Adjusted Data (QC=5): 0 records (0.0%)
- Missing Data (QC=9): 0 records (0.0%)
- No QC (QC=0): 0 records (0.0%)

Data Sources and Logger Information

Active Logger Information During Storm Period

Buoy 62091 (M1 Buoy (Retired)):

- Logger(s) used: 347_Wavesense , 8704_CR6

Buoy 62092 (M2 Buoy):

- Logger(s) used: 314_Wavesense , 12146_CR6

Buoy 62094 (M4 Buoy):

- Logger(s) used: 12142_CR6 , 12143_CR6

Buoy 62095 (M5 Buoy):

- Logger(s) used: 12145_CR6 , 341_Wavesense

Note: This report uses only quality-controlled data (QC indicators 1 and 5) for meteorological analysis. Logger information shows which data acquisition systems were active during the storm period.

Data Visualization

!Storm Overview

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

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

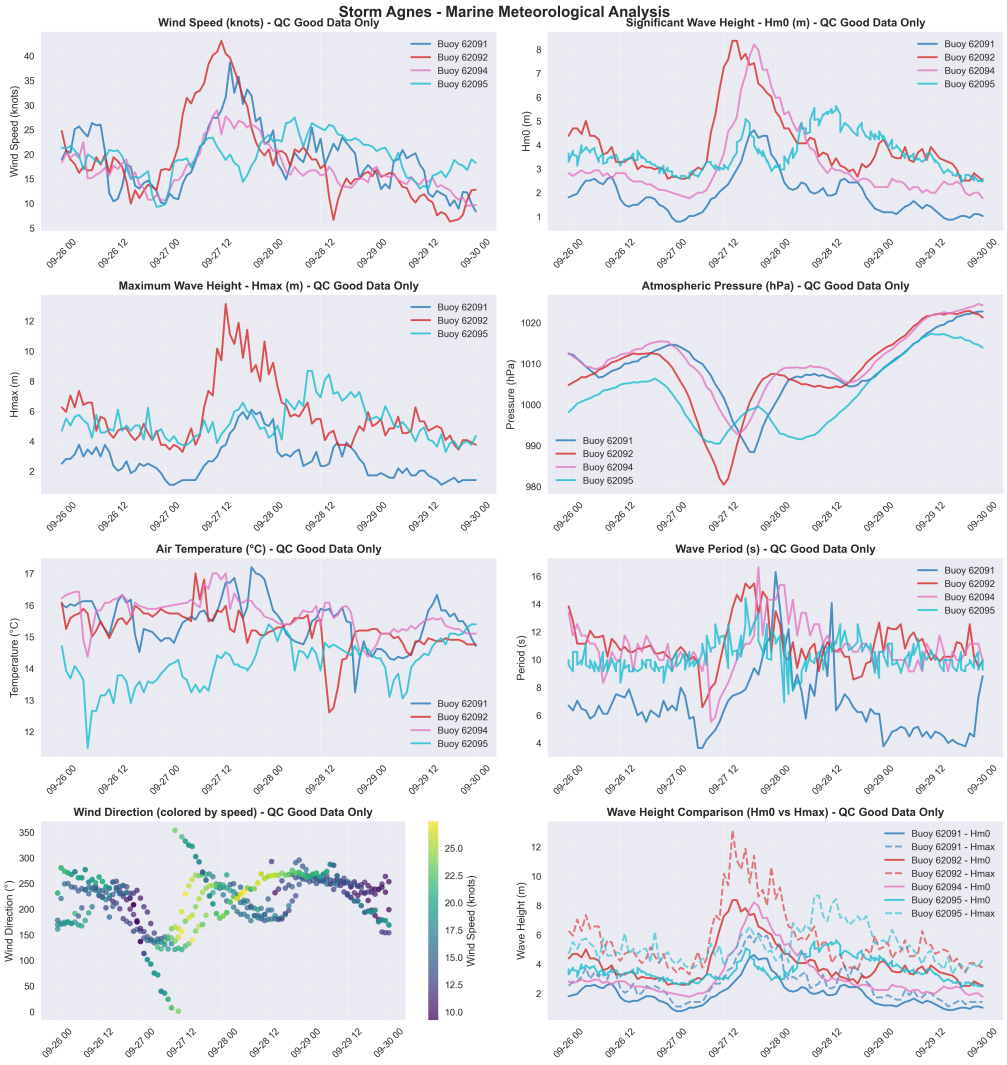

Figure 1: Marine meteorological observations during Storm Agnes. Eight-panel analysis showing wind speed, significant wave height (Hm0), maximum wave height (Hmax), atmospheric pressure, air temperature, wave period, wind direction patterns, and comparative wave heights across the Irish Marine Data Buoy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

Met Éireann Marine Unit

Irish Marine Data Buoy Network

Valentia Observatory, Co. Kerry

www.met.ie/climate/storm-centre