

Storm Debi  
Marine Storm Report  
Marine Unit

Report Date: 02 October 2025

Report Time: 14:38 UTC

Marine Observations Summary

Data Sources

- Buoy 62091 (M2 Buoy): 53.47°N, 5.42°W
- Buoy 62092 (M3 Buoy): 53.48°N, 5.42°W
- Buoy 62093 (M4 Buoy): 51.22°N, 6.70°W
- Buoy 62094 (M5 Buoy): 51.69°N, 6.70°W
- Buoy 62095 (M6 Buoy): 53.06°N, 7.90°W

Peak Conditions Observed

Buoy (Location)	Sustained Wind Speeds	Gust Wind Speeds	Significant Wave Height	Individual Wave	MSLP (hPa)
M2 Buoy (in the Irish Sea)	74 km/h (40 knots or 20 mph) Mon 13 Nov 2023 10 UTC	90 km/h (49 knots or 25 mph) Mon 13 Nov 2023 10 UTC	3.8 m Mon 13 Nov 2023 12 UTC	5.5 m Mon 13 Nov 2023 14 UTC	979.0 Mon 13 Nov 2023 06 UTC 13UTC

<b>M3 Buoy</b> (in the Irish Sea)	<b>62 km/h</b> (34 knots or 17 mph) Mon 13 Nov 2023 04 UTC	<b>88 km/h</b> (47 knots or 24 mph) Mon 13 Nov 2023 02 UTC	<b>5.9 m</b> Tue 14 Nov 2023 01 UTC	<b>9.8 m</b> Mon 13 Nov 2023 11 UTC	<b>983.5</b> Mon 13 Nov 2023 01 UTC 13UTC
<b>M4 Buoy</b> (off the Cork coast)	<b>53 km/h</b> (28 knots or 15 mph) Sun 12 Nov 2023 10 UTC	<b>68 km/h</b> (37 knots or 19 mph) Tue 14 Nov 2023 20 UTC	<b>5.1 m</b> Wed 15 Nov 2023 00 UTC	<b>8.3 m</b> Wed 15 Nov 2023 01 UTC	<b>980.7</b> Mon 13 Nov 2023 05 UTC 13UTC
<b>M5 Buoy</b> (off the Donegal coast)	<b>63 km/h</b> (34 knots or 17 mph) Mon 13 Nov 2023 08 UTC	<b>89 km/h</b> (48 knots or 25 mph) Mon 13 Nov 2023 05 UTC	<b>5.7 m</b> Mon 13 Nov 2023 11 UTC	<b>9.1 m</b> Mon 13 Nov 2023 11 UTC	<b>986.2</b> Mon 13 Nov 2023 05 UTC 13UTC
<b>M6 Buoy</b> (in the south Wexford coast)	<b>48 km/h</b> (26 knots or 13 mph) Tue 14 Nov 2023 00 UTC	<b>75 km/h</b> (40 knots or 21 mph) Mon 13 Nov 2023 18 UTC	<b>6.1 m</b> Tue 14 Nov 2023 01 UTC	<b>10.3 m</b> Tue 14 Nov 2023 08 UTC	<b>982.5</b> Sun 12 Nov 2023 23 UTC 13UTC

## Station-by-Station Analysis

### Buoy 62091 - M2 Buoy

- **Location:** 53.47°N, 5.42°W
- **Peak Wind Speed:** 39.8 knots (73.6 km/h) on Mon 13 Nov 2023 10:00 UTC
- **Peak Significant Wave Height (Hm0):** 3.8 m on Mon 13 Nov 2023 12:00 UTC
- **Peak Maximum Wave Height (Hmax):** 5.5 m on Mon 13 Nov 2023 14:00 UTC
- **Minimum Pressure:** 979.0 hPa on Mon 13 Nov 2023 06:00 UTC
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 97 records (QC good data only)

### Buoy 62092 - M3 Buoy

- **Location:** 53.48°N, 5.42°W
- **Peak Wind Speed:** 33.6 knots (62.2 km/h) on Mon 13 Nov 2023 04:00 UTC
- **Peak Significant Wave Height (Hm0):** 5.9 m on Tue 14 Nov 2023 01:00 UTC
- **Peak Maximum Wave Height (Hmax):** 9.8 m on Mon 13 Nov 2023 11:00 UTC
- **Minimum Pressure:** 983.5 hPa on Mon 13 Nov 2023 01:00 UTC
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 97 records (QC good data only)

### Buoy 62093 - M4 Buoy

- **Location:** 51.22°N, 6.70°W
- **Peak Wind Speed:** 28.5 knots (52.7 km/h) on Sun 12 Nov 2023 10:00 UTC
- **Peak Significant Wave Height (Hm0):** 5.1 m on Wed 15 Nov 2023 00:00 UTC
- **Peak Maximum Wave Height (Hmax):** 8.3 m on Wed 15 Nov 2023 01:00 UTC
- **Minimum Pressure:** 980.7 hPa on Mon 13 Nov 2023 05:00 UTC

- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 97 records (QC good data only)

## Buoy 62094 - M5 Buoy

- **Location:** 51.69°N, 6.70°W
- **Peak Wind Speed:** 33.9 knots (62.9 km/h) on Mon 13 Nov 2023 08:00 UTC
- **Peak Significant Wave Height (Hm0):** 5.7 m on Mon 13 Nov 2023 11:00 UTC
- **Peak Maximum Wave Height (Hmax):** 9.1 m on Mon 13 Nov 2023 11:00 UTC
- **Minimum Pressure:** 986.2 hPa on Mon 13 Nov 2023 05:00 UTC
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 87 records (QC good data only)

## Buoy 62095 - M6 Buoy

- **Location:** 53.06°N, 7.90°W
- **Peak Wind Speed:** 26.1 knots (48.3 km/h) on Tue 14 Nov 2023 00:00 UTC
- **Peak Significant Wave Height (Hm0):** 6.1 m on Tue 14 Nov 2023 01:00 UTC
- **Peak Maximum Wave Height (Hmax):** 10.3 m on Tue 14 Nov 2023 08:00 UTC
- **Minimum Pressure:** 982.5 hPa on Sun 12 Nov 2023 23:00 UTC
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 97 records (QC good data only)

# Meteorological Analysis

## Wind Analysis

The storm produced maximum sustained winds of **39.8 knots** (73.6 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 **6.1 m**, representing **high**.

**Maximum Wave Heights (Hmax):** Individual wave heights peaked at **10.3 m**. Note: Hmax values represent individual wave heights and are not used for sea state classification.

**Wave Height Relationship:** The Hmax/Hm0 ratio was **1.69**, 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:** 475

#### QC Status Distribution:

- Good Data (QC=1): 475 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 (M2 Buoy):

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

#### Buoy 62092 (M3 Buoy):

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

#### Buoy 62093 (M4 Buoy):

- Logger(s) used: 189\_Wavesense , 12144\_CR6

#### Buoy 62094 (M5 Buoy):

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

#### Buoy 62095 (M6 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: Marine meteorological analysis showing wind speed, wave height, atmospheric pressure, air temperature, wind direction, and wave period during Storm Debi.*

## Technical Notes

### QC Methods Applied

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

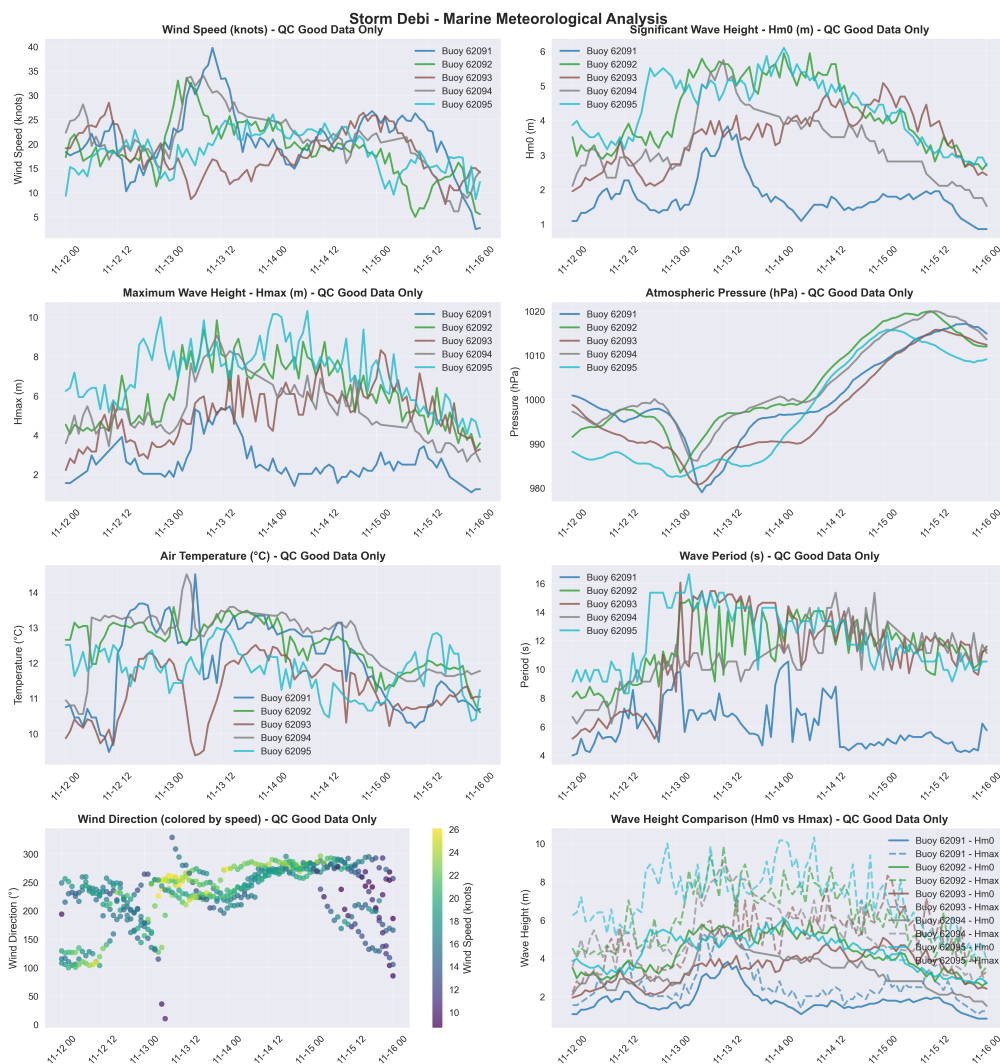
### Data Quality Indicators

- 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

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*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 Debi. 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.