# Met Éireann

The Irish Meteorological Service

# Storm Isha

## Marine Storm Report

Marine Unit

Report Date: 25 August 2025

Report Time: 13:36 UTC

## Storm Overview

**Dates:** 2024-01-21, 2024-01-22

**Description:** Powerful Atlantic storm with widespread severe weather warnings.

**Peak Winds:** 120+ km/h

**Areas Affected:** West Coast, Northwest, North Coast

## 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:** 24.1 m/s (86.9 km/h) at Buoy 62093

- **Maximum Significant Wave Height (Hm0):** 12.1 m at Buoy 62095
- **Maximum Wave Height (Hmax):** 19.2 m at Buoy 62095
- **Minimum Pressure:** 959.5 hPa at Buoy 62093
- **Temperature Range:** 7.3°C (Buoy 62095) to 13.7°C (Buoy 62095)
- **Total Observations:** 958 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:** 18.8 m/s (67.7 km/h)
- **Peak Significant Wave Height (Hm0):** 5.2 m
- **Peak Maximum Wave Height (Hmax):** 8.3 m
- **Minimum Pressure:** 979.7 hPa
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 194 records (QC good data only)

## Buoy 62092 - M2 Buoy

- **Location:** 53.48°N, 5.42°W
- **Region:** West Coast
- **Peak Wind Speed:** 16.6 m/s (59.9 km/h)
- **Peak Significant Wave Height (Hm0):** 10.5 m
- **Peak Maximum Wave Height (Hmax):** 17.8 m
- **Minimum Pressure:** 986.1 hPa
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 191 records (QC good data only)

## Buoy 62093 - M3 Buoy

- **Location:** 51.22°N, 6.70°W
- **Region:** South Coast
- **Peak Wind Speed:** 24.1 m/s (86.9 km/h)
- **Peak Significant Wave Height (Hm0):** 10.9 m
- **Peak Maximum Wave Height (Hmax):** 16.7 m
- **Minimum Pressure:** 959.5 hPa
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 193 records (QC good data only)

## Buoy 62094 - M4 Buoy

- **Location:** 51.69°N, 6.70°W
- **Region:** South Coast
- **Peak Wind Speed:** 20.8 m/s (74.9 km/h)
- **Peak Significant Wave Height (Hm0):** 8.2 m
- **Peak Maximum Wave Height (Hmax):** 13.3 m
- **Minimum Pressure:** 989.3 hPa

- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 194 records (QC good data only)

### Buoy 62095 - M5 Buoy

- **Location:** 53.06°N, 7.90°W
- **Region:** West Coast
- **Peak Wind Speed:** 19.0 m/s (68.3 km/h)
- **Peak Significant Wave Height (Hm0):** 12.1 m
- **Peak Maximum Wave Height (Hmax):** 19.2 m
- **Minimum Pressure:** 962.2 hPa
- **Data Quality:** Excellent (100.0% good data)
- **Observations:** 186 records (QC good data only)

## Meteorological Analysis

### Wind Analysis

The storm produced maximum sustained winds of **24.1 m/s** (86.9 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 **12.1 m**, representing **very high** sea states according to the World Meteorological Organization classification.

**Maximum Wave Heights (Hmax):** Individual wave heights peaked at **19.2 m**. Note: Hmax values represent individual wave heights and are not used for sea state classification.

**Wave Height Relationship:** The Hmax/Hm0 ratio was **1.59**, 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 **959.5 hPa**, representing a pressure anomaly of 53.8 hPa below standard atmospheric pressure (1013.25 hPa).

**Pressure Categories:**

- Normal: 1013-1023 hPa
- Low: 1000-1013 hPa
- Very Low: 980-1000 hPa
- Extremely Low: <980 hPa

## Storm Timeline

**Storm Period:** 2024-01-20 00:00 to 2024-01-24 00:00 UTC

**Duration:** 4 days, 0 hours

**Key Timeline Points:**

- Storm approach: Pressure began dropping and winds increased
- Peak intensity: Maximum winds and waves recorded
- Storm passage: Gradual improvement in conditions

## Quality Control Summary

**Total Records:** 958

**QC Status Distribution:**

- Good Data (QC=1): 958 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: Comprehensive marine meteorological analysis showing wind speed, wave height, atmospheric pressure, air temperature, wind direction, and wave period during Storm Isha.*

## 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

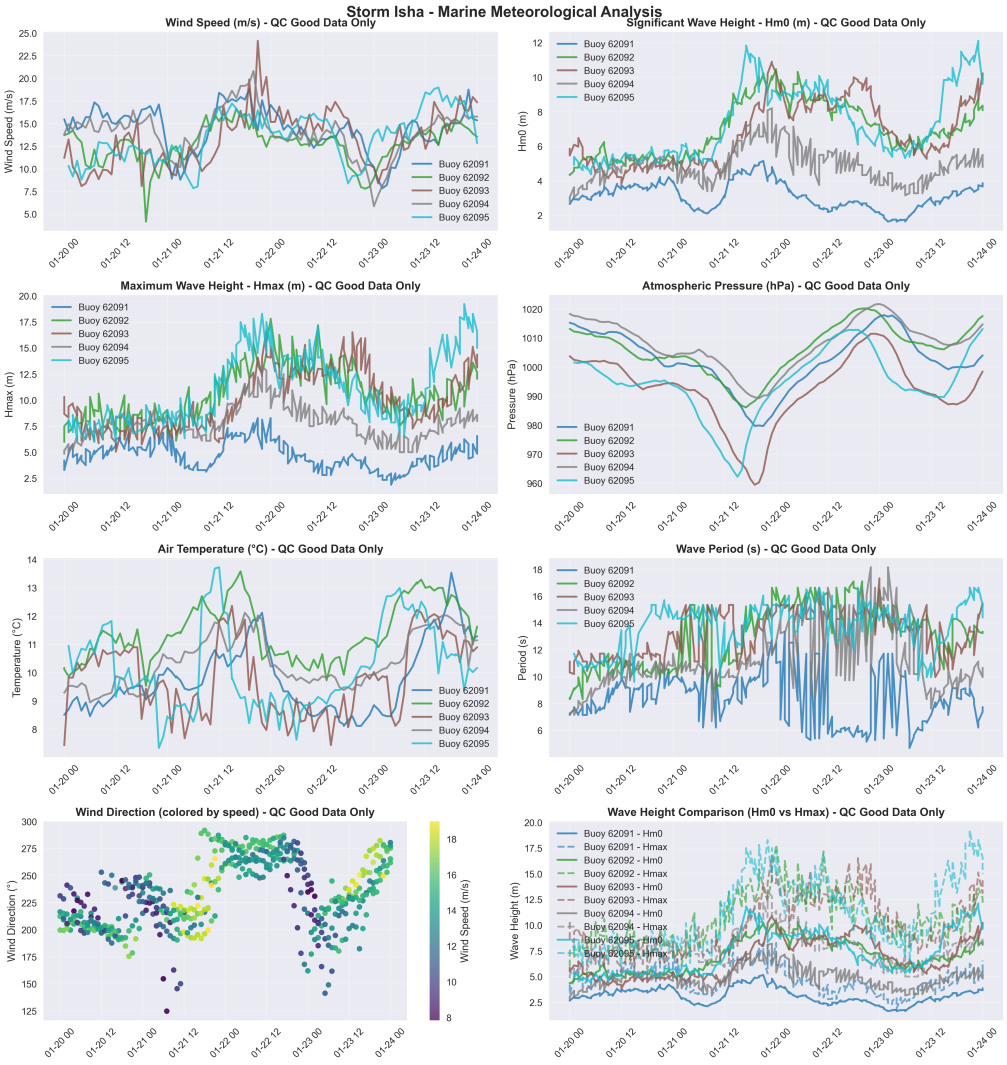


**Figure 1:** Marine meteorological observations during Storm Isha. Eight-panel analysis showing wind speed, significant wave height (Hm0), maximum wave height (Hmax), atmospheric pressure, air temperature, wave period, wind direction patterns, and comparative wave heights across the Irish Marine Data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