

# Buoy 62091 - 2024 Quality Control Report

**Generated:** 2025-08-19 23:48:23

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## Data Overview

- Station ID: 62091
- Year: 2024
- Total Records: 14,468
- Time Range: 2024-01-01 00:00:00 to 2024-10-30 23:00:00
- Duration: 303 days
- Sensors/Loggers: 4 active
  - 12105\_CR6: 5,944 records (41.1%)
  - 7577\_CR6: 5,943 records (41.1%)
  - 347\_Wavesense: 1,292 records (8.9%)
  - 8704\_CR6: 1,289 records (8.9%)

## Quality Control Results

### Record-Level QC Status

- **\*\*QC complete:\*\*** 11,301 records (78.1%)
- **\*\*No QC performed:\*\*** 3,167 records (21.9%)

### Parameter-Level QC Results

Parameter	Total	Missing	Range Fail	Spike Fail	Flat Line Fail	Passed	Pass Rate
airpressure	14,468	0	0	1	17	14,450	99.9%
airtemp	14,468	0	0	0	392	14,076	97.3%
humidity	14,468	0	0	3	220	14,245	98.5%
windsp	14,468	0	0	0	30	14,438	99.8%
winddir	14,468	0	0	225	12	14,231	98.4%
hm0	14,468	0	0	0	2,806	11,662	80.6%
hmax	14,468	0	0	0	1,294	13,174	91.1%
tp	14,468	0	0	74	155	14,239	98.4%
mdir	14,468	0	0	352	6	14,110	97.5%
seatemp_aa	14,468	0	0	0	82	14,386	99.4%

### Issues Identified

- airpressure: 1 spike values (>10.0 change)
- airpressure: 17 flat line values (5+ consecutive identical)
- airtemp: 392 flat line values (5+ consecutive identical)
- humidity: 3 spike values (>20.0 change)
- humidity: 220 flat line values (5+ consecutive identical)
- windsp: 30 flat line values (5+ consecutive identical)
- winddir: 225 spike values (>180.0 change)

- winddir: 12 flat line values (5+ consecutive identical)
- hm0: 2806 flat line values (5+ consecutive identical)
- hmax: 1294 flat line values (5+ consecutive identical)
- tp: 74 spike values (>10.0 change)
- tp: 155 flat line values (5+ consecutive identical)
- mdir: 352 spike values (>180.0 change)
- mdir: 6 flat line values (5+ consecutive identical)
- seatemp\_aa: 82 flat line values (5+ consecutive identical)

## QC Limits Applied

Station-specific QC limits used for this analysis:

Parameter	Min Value	Max Value	Spike Threshold	Notes
airpressure	950.0	1050.0	10.0	Default
airtemp	-20.0	40.0	5.0	Default
humidity	0.0	100.0	20.0	Default
windsp	0.0	60.0	20.0	Station-specific
winddir	0.0	360.0	180.0	Default
hm0	0.0	18.0	4.0	Station-specific
hmax	0.0	30.0	6.0	Station-specific
tp	1.0	25.0	10.0	Default
mdir	0.0	360.0	180.0	Default
seatemp_aa	4.0	18.0	2.0	Station-specific

## Data Visualization

### QC Failure Color Coding

The visualization uses different colors to distinguish QC failure types:

- **Blue dots**: Good data (passed all QC tests)
- **Red dots**: Range failures (values outside physical limits)
- **Orange dots**: Spike failures (unrealistic sudden changes)
- **Purple dots**: Flat line failures (sensor stuck/malfunctioning)

The bottom-right panel shows a stacked bar chart with the percentage breakdown of each QC result type per parameter.

## Recommendations

### Manual QC Actions Needed

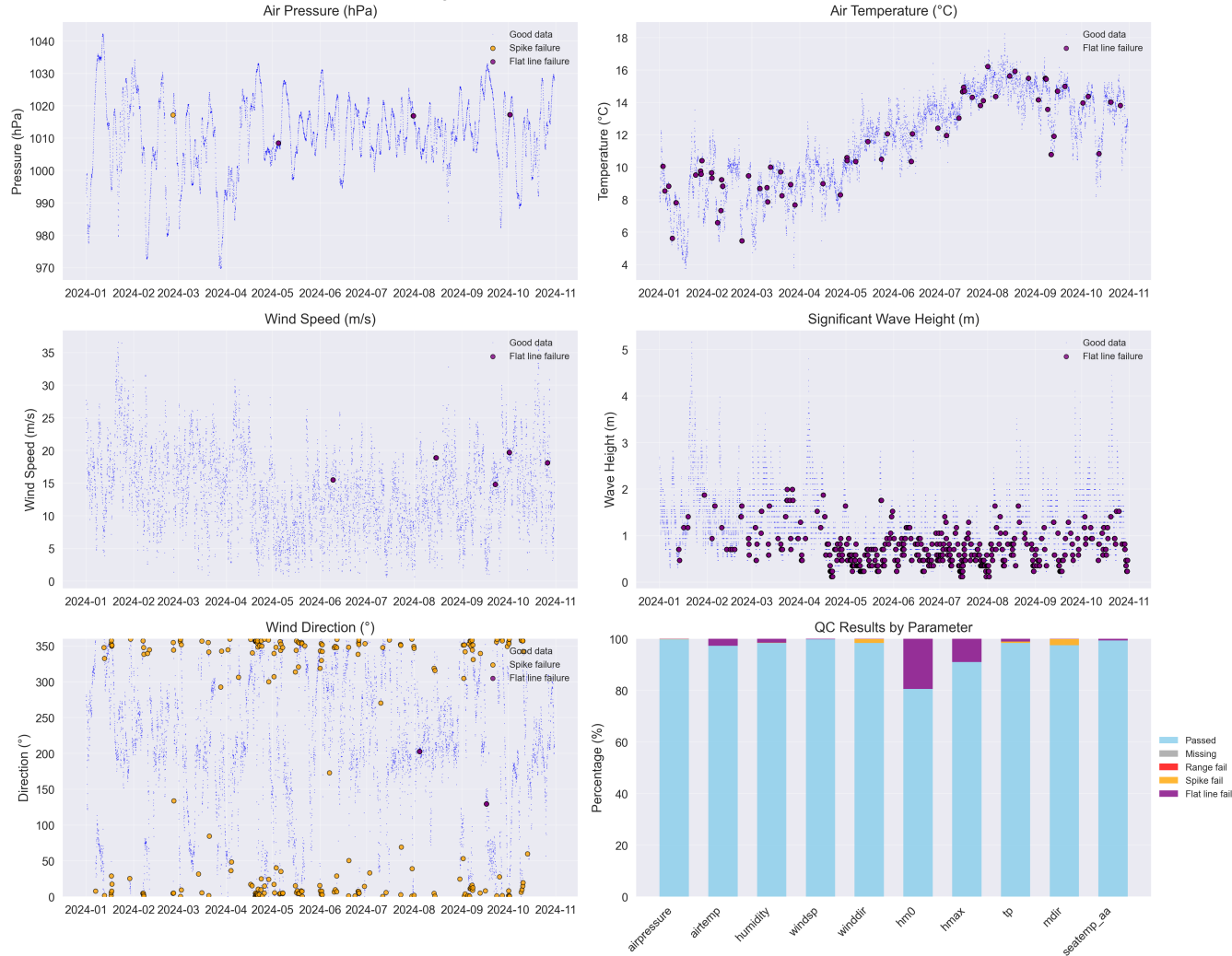
1. **Review flagged extreme values** - validate against weather events
2. **Investigate sensor failures** - replace/repair faulty sensors
3. **Cross-validate between loggers** - compare duplicate measurements
4. **Apply sensor hierarchy** - prioritize Wavesense for hm0, Datawell for hmax
5. **Transfer to production** - move QC'd data to irish\_buoys\_fugro table

### Next Steps

1. Execute parameter-level QC SQL commands from readme.md
2. Perform individual value corrections for flagged data
3. Complete record-level QC marking
4. Transfer approved data to production table

# Data Visualization

Buoy 62091 - 2024 Data Overview and QC Results



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