

# Buoy 62094 - 2025 Quality Control Report

**Generated:** 2025-08-27 15:58:09

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## Data Overview

- Station ID: 62094
- Year: 2025
- Total Records: 10,442
- Time Range: 2025-01-01 00:00:00 to 2025-08-14 23:00:00
- Duration: 225 days
- Sensors/Loggers: 2 active
  - 347\_Wavesense: 5,423 records (51.9%)
  - 8704\_CR6: 5,019 records (48.1%)

## Quality Control Results

### Record-Level QC Status

- **\*\*QC complete:\*\*** 9,539 records (91.4%)
- **\*\*No QC performed:\*\*** 903 records (8.6%)

### Parameter-Level QC Results

Parameter	Total	Missing	Range Fail	Spike Fail	Flat Line Fail	Passed	Pass Rate
airpressure	10,442	0	0	0	12	10,430	99.9%
airtemp	10,442	0	0	0	590	9,852	94.3%
humidity	10,442	0	0	1	60	10,381	99.4%
windsp	10,442	0	0	0	24	10,418	99.8%
winddir	10,442	0	0	90	12	10,340	99.0%
hm0	10,442	0	0	0	288	10,154	97.2%
hmax	10,442	0	0	137	105	10,200	97.7%
tp	10,442	0	0	324	24	10,094	96.7%
mdir	10,442	0	0	466	0	9,976	95.5%
seatemp_aa	10,442	0	136	24	92	10,203	97.7%

### Issues Identified

- airpressure: 12 flat line values (5+ consecutive identical)
- airtemp: 590 flat line values (5+ consecutive identical)
- humidity: 1 spike values (>20.0 change)
- humidity: 60 flat line values (5+ consecutive identical)
- windsp: 24 flat line values (5+ consecutive identical)
- winddir: 90 spike values (>180.0 change)
- winddir: 12 flat line values (5+ consecutive identical)
- hm0: 288 flat line values (5+ consecutive identical)
- hmax: 137 spike values (>5.5 change)

- hmax: 105 flat line values (5+ consecutive identical)
- tp: 324 spike values (>10.0 change)
- tp: 24 flat line values (5+ consecutive identical)
- mdir: 466 spike values (>180.0 change)
- seatemp\_aa: 136 values outside range [4.5-18.5]
- seatemp\_aa: 24 spike values (>2.5 change)
- seatemp\_aa: 92 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	55.0	18.0	Station-specific
winddir	0.0	360.0	180.0	Default
hm0	0.0	16.0	3.5	Station-specific
hmax	0.0	26.0	5.5	Station-specific
tp	1.0	25.0	10.0	Default
mdir	0.0	360.0	180.0	Default
seatemp_aa	4.5	18.5	2.5	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

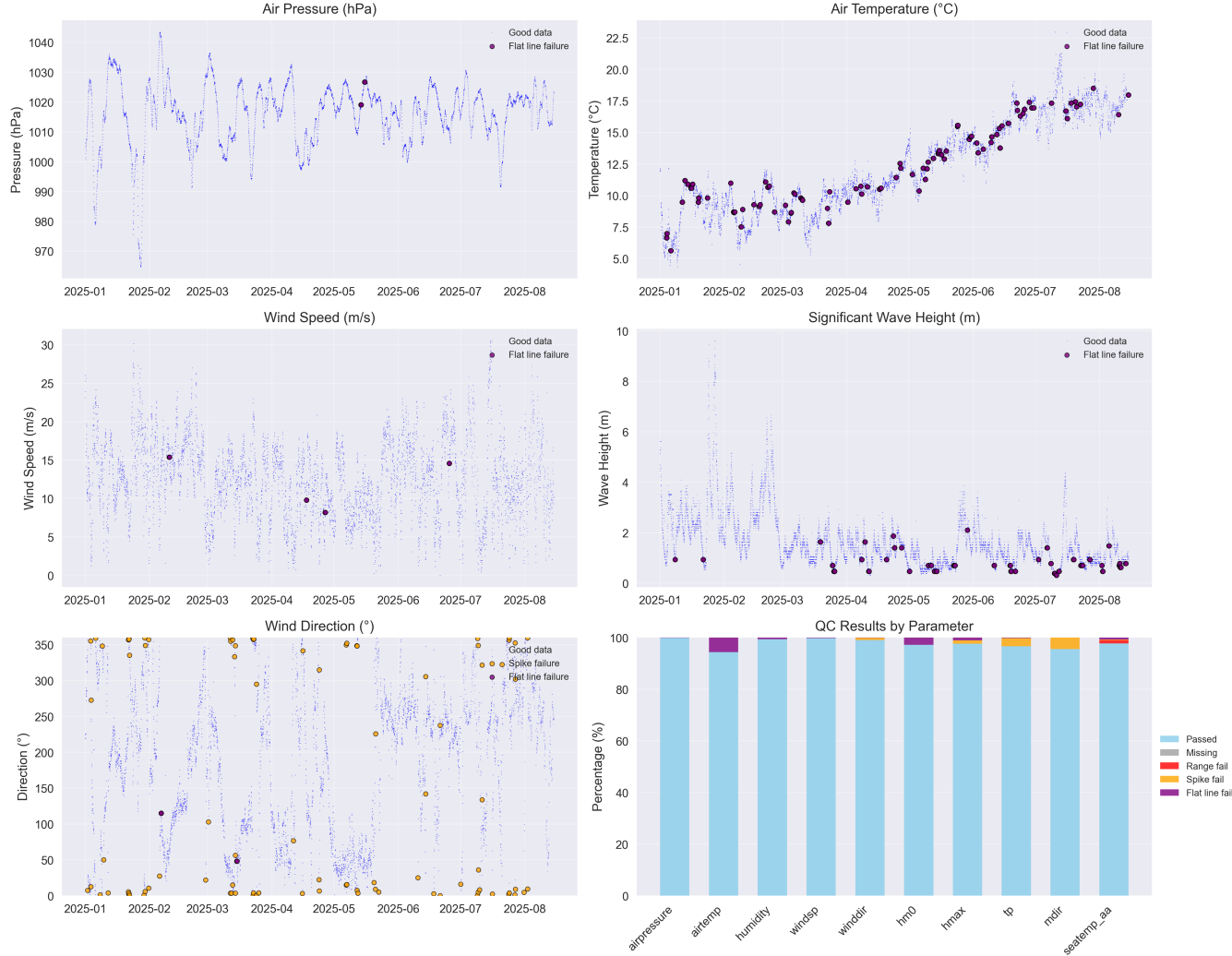
1. **Review flagged extreme values** - validate against weather events
2. **Investigate sensor failures** - replace/repair faulty sensors
3. **Cross-validate between loggers** - compare duplicate measurements
4. **Apply sensor hierarchy** - prioritize Wavesense for hm0, Datawell for hmax
5. **Transfer 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 62094 - 2025 Data Overview and QC Results



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