

# Buoy 62095 - 2024 Quality Control Report

**Generated:** 2025-08-19 23:49:32

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## Data Overview

- Station ID: 62095
- Year: 2024
- Total Records: 14,551
- Time Range: 2024-01-01 00:00:00 to 2024-10-30 23:00:00
- Duration: 303 days
- Sensors/Loggers: 4 active
  - 12146\_CR6: 4,551 records (31.3%)
  - 13443\_CR6: 4,550 records (31.3%)
  - 341\_Wavesense: 2,726 records (18.7%)
  - 12145\_CR6: 2,724 records (18.7%)

## Quality Control Results

### Record-Level QC Status

- **\*\*QC complete:\*\*** 13,416 records (92.2%)
- **\*\*No QC performed:\*\*** 1,135 records (7.8%)

### Parameter-Level QC Results

Parameter	Total	Missing	Range Fail	Spike Fail	Flat Line Fail	Passed	Pass Rate
airpressure	14,551	0	0	0	12	14,539	99.9%
airtemp	14,551	0	0	0	559	13,992	96.2%
humidity	14,551	0	0	7	47	14,497	99.6%
windsp	14,551	0	0	2	48	14,501	99.7%
winddir	14,551	0	0	187	6	14,358	98.7%
hm0	14,551	0	0	2	540	14,009	96.3%
hmax	14,551	0	0	19	194	14,338	98.5%
tp	14,551	0	0	6	58	14,487	99.6%
mdir	14,551	0	0	660	0	13,891	95.5%
seatemp_aa	14,551	0	0	0	194	14,357	98.7%

### Issues Identified

- airpressure: 12 flat line values (5+ consecutive identical)
- airtemp: 559 flat line values (5+ consecutive identical)
- humidity: 7 spike values (>20.0 change)
- humidity: 47 flat line values (5+ consecutive identical)
- windsp: 2 spike values (>15.0 change)
- windsp: 48 flat line values (5+ consecutive identical)
- winddir: 187 spike values (>180.0 change)

- winddir: 6 flat line values (5+ consecutive identical)
- hm0: 2 spike values (>3.0 change)
- hm0: 540 flat line values (5+ consecutive identical)
- hmax: 19 spike values (>4.5 change)
- hmax: 194 flat line values (5+ consecutive identical)
- tp: 6 spike values (>10.0 change)
- tp: 58 flat line values (5+ consecutive identical)
- mdir: 660 spike values (>180.0 change)
- seatemp\_aa: 194 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	-15.0	35.0	4.0	Station-specific
humidity	0.0	100.0	20.0	Default
windsp	0.0	50.0	15.0	Default
winddir	0.0	360.0	180.0	Default
hm0	0.0	14.0	3.0	Station-specific
hmax	0.0	22.0	4.5	Station-specific
tp	1.0	25.0	10.0	Default
mdir	0.0	360.0	180.0	Default
seatemp_aa	6.0	19.0	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

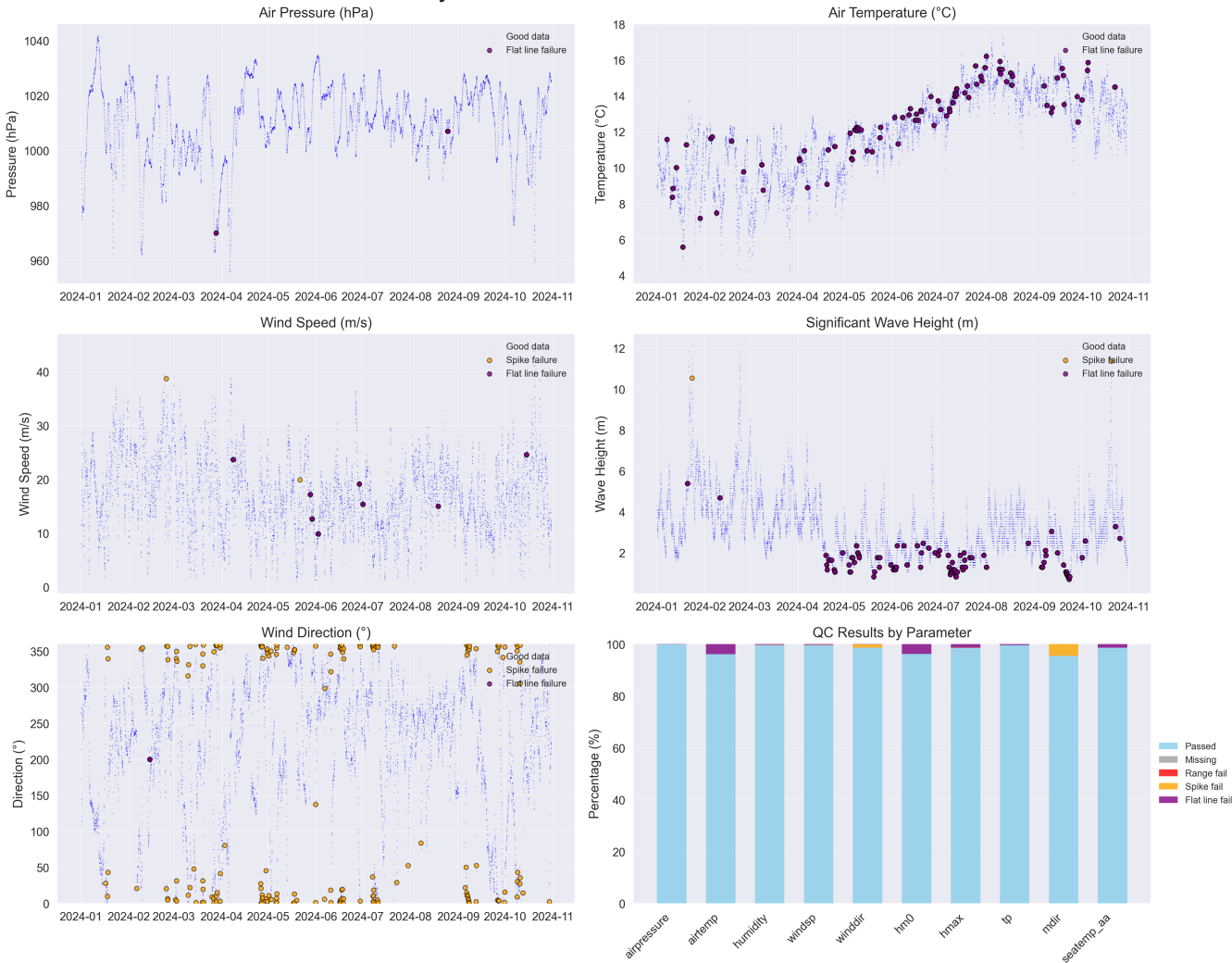
1. **Review flagged extreme values** - validate against weather events
2. **Investigate sensor failures** - replace/repair faulty sensors
3. **Cross-validate between loggers** - compare duplicate measurements
4. **Apply sensor hierarchy** - prioritize Wavesense for hm0, Datawell for hmax
5. **Transfer 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 62095 - 2024 Data Overview and QC Results



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