Buoy 62095 - 2025 Quality Control Report

Generated: 2025-08-27 15:58:37

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Data Overview

• Station ID: 62095
• Year: 2025
• Total Records: 10,848
• Time Range: 2025-01-01 00:00:00 to 2025-08-14 23:00:00
• Duration: 225 days
• Sensors/Loggers: 4 active
- 13443_CR6: 3,156 records (29.1%)
- 12146_CR6: 3,156 records (29.1%)
- 12142_CR6: 2,268 records (20.9%)
- 12143_CR6: 2,268 records (20.9%)

Quality Control Results

Record-Level QC Status

- **QC complete:** 9,902 records (91.3%)
- **No QC performed:** 946 records (8.7%)

Parameter-Level QC Results

Parameter	Total	Missing	Range Fail	Spike Fail	Flat Line Fail	Passed	Pass Rate
airpressure	10,848	0	6	1	0	10,841	99.9%
airtemp	10,848	0	0	1	490	10,357	95.5%
humidity	10,848	0	0	9	80	10,759	99.2%
windsp	10,848	0	4	3	36	10,806	99.6%
winddir	10,848	0	0	114	6	10,728	98.9%
hm0	10,848	0	0	7	437	10,404	95.9%
hmax	10,848	0	0	6	188	10,654	98.2%
tp	10,848	0	0	1	25	10,822	99.8%
mdir	10,848	0	0	244	0	10,604	97.8%
seatemp_aa	10,848	0	0	0	164	10,684	98.5%

Issues Identified

- airpressure: 6 values outside range [950.0-1050.0]
- airpressure: 1 spike values (>10.0 change)
- airtemp: 1 spike values (>4.0 change)
- airtemp: 490 flat line values (5+ consecutive identical)
- humidity: 9 spike values (>20.0 change)
- humidity: 80 flat line values (5+ consecutive identical)
- windsp: 4 values outside range [0.0-50.0]

- windsp: 3 spike values (>15.0 change)
- windsp: 36 flat line values (5+ consecutive identical)
- winddir: 114 spike values (>180.0 change)
- winddir: 6 flat line values (5+ consecutive identical)
- hm0: 7 spike values (>3.0 change)
- hm0: 437 flat line values (5+ consecutive identical)
- hmax: 6 spike values (>4.5 change)
- hmax: 188 flat line values (5+ consecutive identical)
- tp: 1 spike values (>10.0 change)
- tp: 25 flat line values (5+ consecutive identical)
- mdir: 244 spike values (>180.0 change)
- seatemp_aa: 164 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

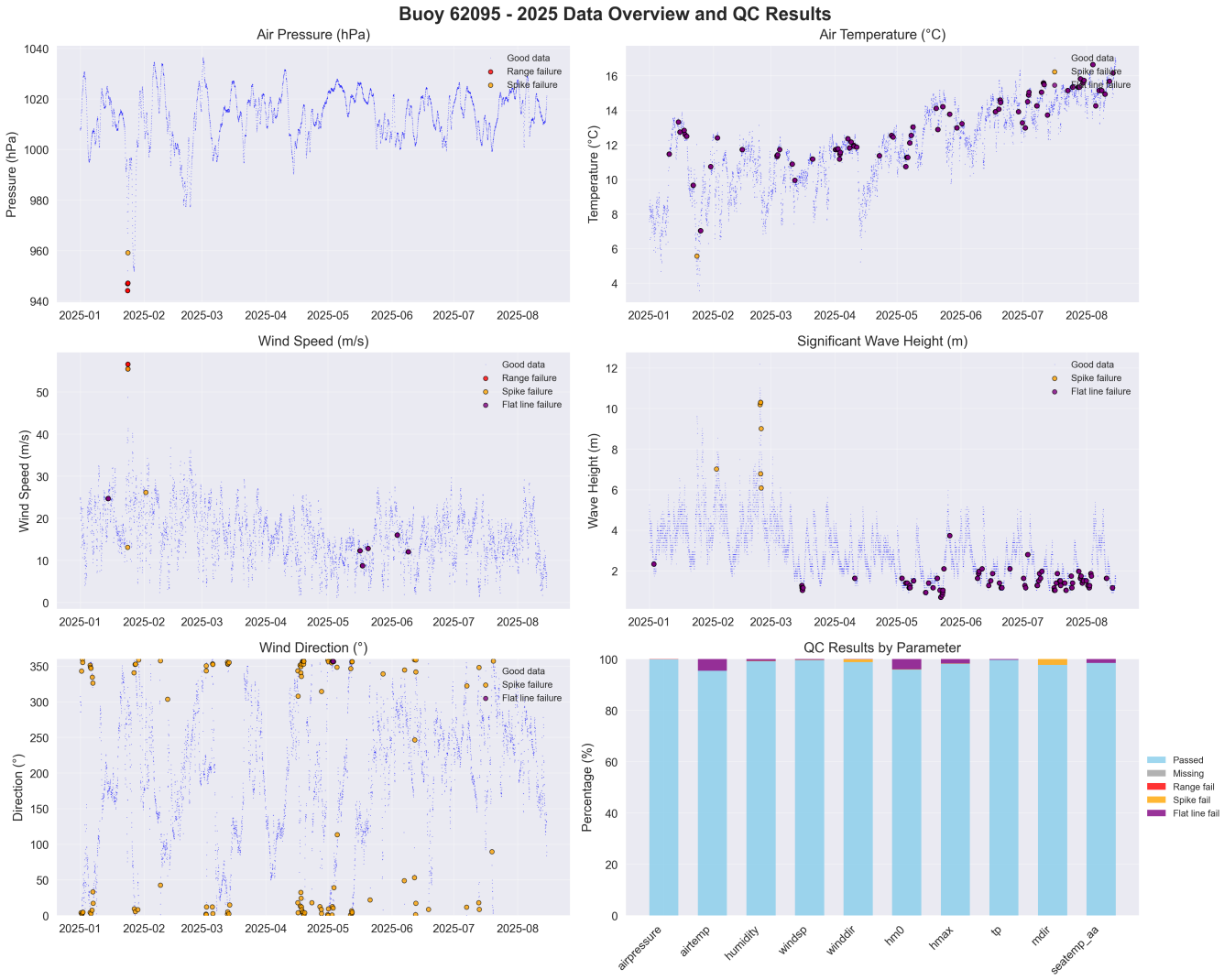
1. **Review flagged extreme values** - validate against weather events
2. **Investigate sensor failures** - replace/repair faulty sensors
3. **Cross-validate between loggers** - compare duplicate measurements
4. **Apply sensor hierarchy** - prioritize Wavesense for hm0, Datawell for hmax
5. **Transfer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



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