Buoy 62093 - 2025 Quality Control Report

Generated: 2025-08-27 15:57:25

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Data Overview

• Station ID: 62093
• Year: 2025
• Total Records: 10,671
• Time Range: 2025-01-01 00:00:00 to 2025-08-14 23:00:00
• Duration: 225 days
• Sensors/Loggers: 4 active
- 12144_CR6: 5,104 records (47.8%)
- 189_Wavesense: 5,103 records (47.8%)
- 12146_CR6: 232 records (2.2%)
- 13443_CR6: 232 records (2.2%)

Quality Control Results

Record-Level QC Status

- **QC complete:** 9,952 records (93.3%)
- **No QC performed:** 719 records (6.7%)

Parameter-Level QC Results

Parameter	Total	Missing	Range Fail	Spike Fail	Flat Line Fail	Passed	Pass Rate
airpressure	10,671	0	10	0	6	10,655	99.9%
airtemp	10,671	0	0	0	391	10,280	96.3%
humidity	10,671	0	0	4	29	10,638	99.7%
windsp	10,671	0	2	5	18	10,646	99.8%
winddir	10,671	0	0	121	30	10,520	98.6%
hm0	10,671	0	0	1	294	10,376	97.2%
hmax	10,671	0	0	3	19	10,649	99.8%
tp	10,671	0	0	6	21	10,644	99.7%
mdir	10,671	0	0	282	0	10,389	97.4%
seatemp_aa	10,671	0	0	0	44	10,627	99.6%

Issues Identified

- airpressure: 10 values outside range [950.0-1050.0]
- airpressure: 6 flat line values (5+ consecutive identical)
- airtemp: 391 flat line values (5+ consecutive identical)
- humidity: 4 spike values (>20.0 change)
- humidity: 29 flat line values (5+ consecutive identical)
- windsp: 2 values outside range [0.0-50.0]
- windsp: 5 spike values (>15.0 change)

- windsp: 18 flat line values (5+ consecutive identical)
- winddir: 121 spike values (>180.0 change)
- winddir: 30 flat line values (5+ consecutive identical)
- hm0: 1 spike values (>3.5 change)
- hm0: 294 flat line values (5+ consecutive identical)
- hmax: 3 spike values (>5.0 change)
- hmax: 19 flat line values (5+ consecutive identical)
- tp: 6 spike values (>10.0 change)
- tp: 21 flat line values (5+ consecutive identical)
- mdir: 282 spike values (>180.0 change)
- seatemp_aa: 44 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	50.0	15.0	Default
winddir	0.0	360.0	180.0	Default
hm0	0.0	15.0	3.5	Station-specific
hmax	0.0	25.0	5.0	Station-specific
tp	1.0	25.0	10.0	Default
mdir	0.0	360.0	180.0	Default
seatemp_aa	5.0	19.0	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

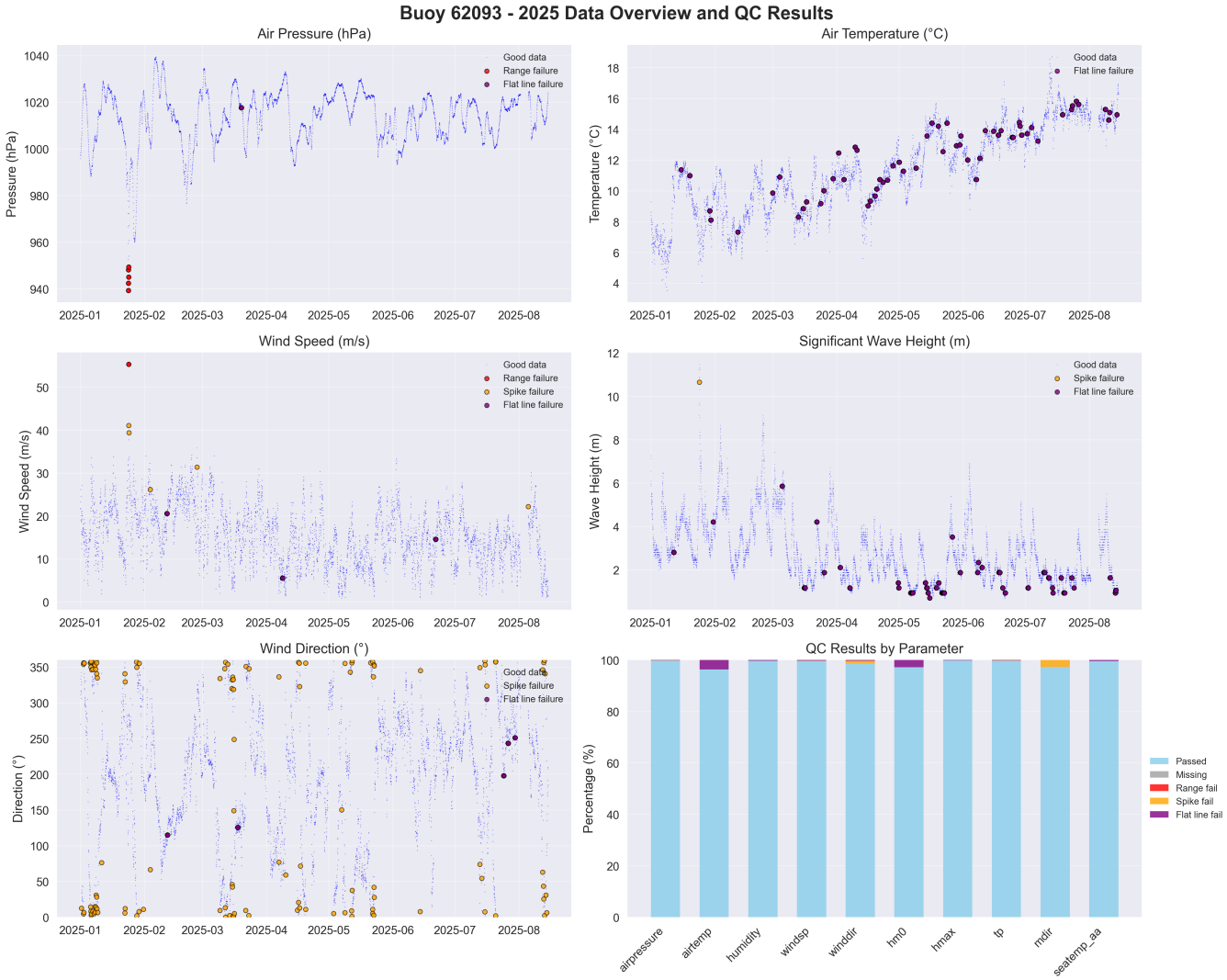
1. **Review flagged extreme values** - validate against weather events
2. **Investigate sensor failures** - replace/repair faulty sensors
3. **Cross-validate between loggers** - compare duplicate measurements
4. **Apply sensor hierarchy** - prioritize Wavesense for hm0, Datawell for hmax
5. **Transfer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



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