Buoy 62091 - 2025 Quality Control Report

Generated: 2025-08-19 23:48:28

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Data Overview

• Station ID: 62091
• Year: 2025
• Total Records: 10,132
• Time Range: 2025-01-01 00:00:00 to 2025-08-14 23:00:00
• Duration: 225 days
• Sensors/Loggers: 4 active
- 22221_CR6: 4,118 records (40.6%)
- 12145_CR6: 4,118 records (40.6%)
- 12105_CR6: 954 records (9.4%)
- 7577_CR6: 942 records (9.3%)

Quality Control Results

Record-Level QC Status

- **QC complete:** 6,946 records (68.6%)
- **No QC performed:** 3,186 records (31.4%)

Parameter-Level QC Results

Parameter	Total	Missing	Range Fail	Spike Fail	Flat Line Fail	Passed	Pass Rate
airpressure	10,132	0	1	3	20	10,109	99.8%
airtemp	10,132	0	0	2	274	9,856	97.3%
humidity	10,132	0	0	4	84	10,044	99.1%
windsp	10,132	0	0	0	30	10,102	99.7%
winddir	10,132	0	0	137	30	9,966	98.4%
hm0	10,132	0	0	0	2,959	7,173	70.8%
hmax	10,132	0	0	0	1,170	8,962	88.5%
tp	10,132	0	1	101	81	9,950	98.2%
mdir	10,132	0	0	261	0	9,871	97.4%
seatemp_aa	10,132	0	1	6	18	10,108	99.8%

Issues Identified

- airpressure: 1 values outside range [950.0-1050.0]
- airpressure: 3 spike values (>10.0 change)
- airpressure: 20 flat line values (5+ consecutive identical)
- airtemp: 2 spike values (>5.0 change)
- airtemp: 274 flat line values (5+ consecutive identical)
- humidity: 4 spike values (>20.0 change)
- humidity: 84 flat line values (5+ consecutive identical)

- windsp: 30 flat line values (5+ consecutive identical)
- winddir: 137 spike values (>180.0 change)
- winddir: 30 flat line values (5+ consecutive identical)
- hm0: 2959 flat line values (5+ consecutive identical)
- hmax: 1170 flat line values (5+ consecutive identical)
- tp: 1 values outside range [1.0-25.0]
- tp: 101 spike values (>10.0 change)
- tp: 81 flat line values (5+ consecutive identical)
- mdir: 261 spike values (>180.0 change)
- seatemp_aa: 1 values outside range [4.0-18.0]
- seatemp_aa: 6 spike values (>2.0 change)
- seatemp_aa: 18 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

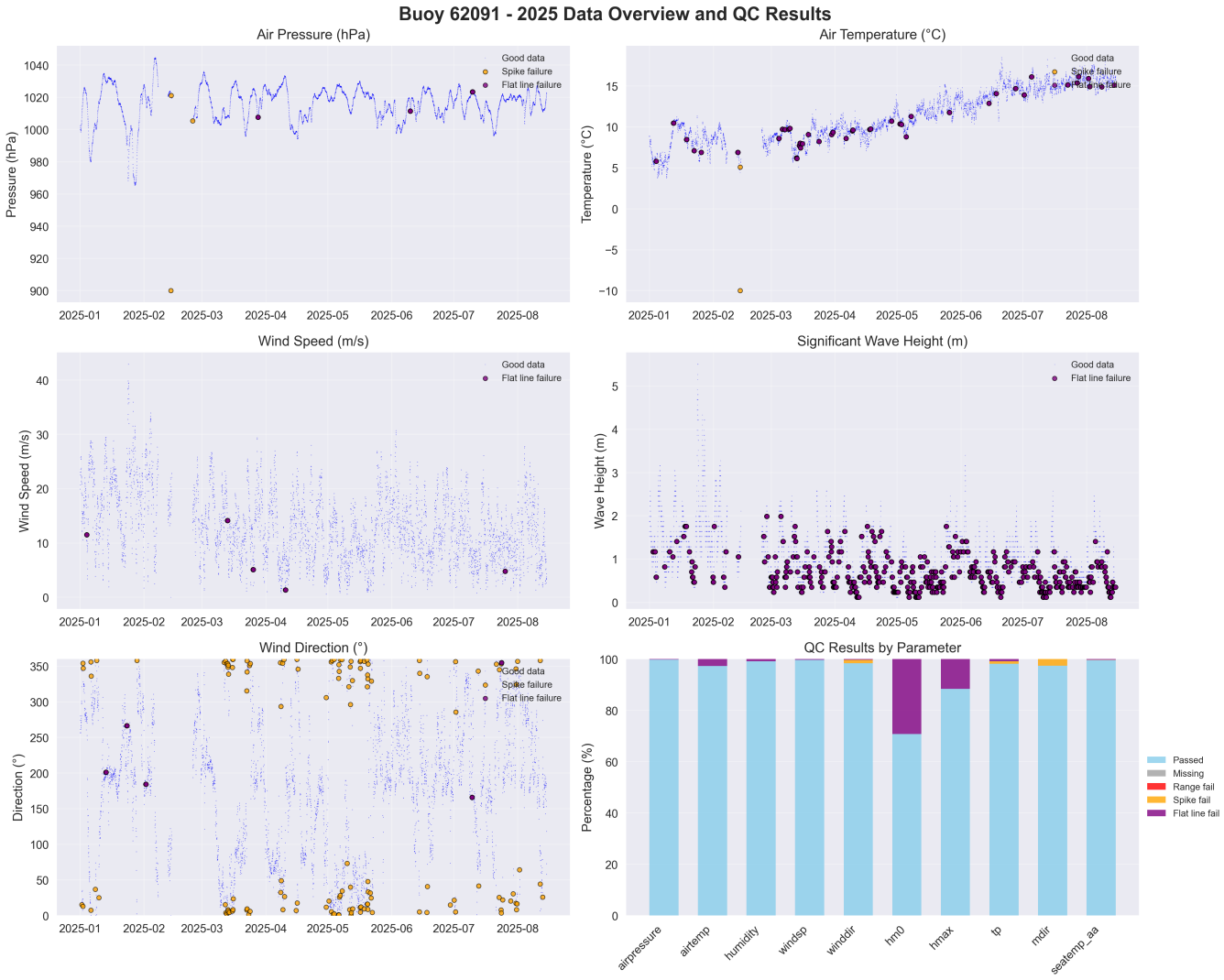
1. **Review flagged extreme values** - validate against weather events
2. **Investigate sensor failures** - replace/repair faulty sensors
3. **Cross-validate between loggers** - compare duplicate measurements
4. **Apply sensor hierarchy** - prioritize Wavesense for hm0, Datawell for hmax
5. **Transfer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



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