Buoy 62094 - 2023 Quality Control Report

Generated: 2025-08-19 23:49:09

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Data Overview

- Station ID: 62094
- Year: 2023
- Total Records: 17,383
- Time Range: 2023-01-01 00:00:00 to 2023-12-30 23:00:00
- Duration: 363 days
- Sensors/Loggers: 4 active
- 12143_CR6: 8,094 records (46.6%)
- 12142_CR6: 8,011 records (46.1%)
- 12144_CR6: 639 records (3.7%)
- 189_Wavesense: 639 records (3.7%)

Quality Control Results

Record-Level QC Status

- **QC complete:** 15,567 records (89.6%)
- **No QC performed:** 1,816 records (10.4%)

Parameter-Level QC Results

Parameter	Total	Missing	Range Fail	Spike Fail	Flat Line Fail	Passed	Pass Rate
airpressure	17,383	0	0	0	6	11,575	66.6%
airtemp	17,383	0	0	0	791	11,024	63.4%
humidity	17,383	0	0	3	108	11,501	66.2%
windsp	17,383	0	0	0	42	11,551	66.4%
winddir	17,383	0	0	153	24	11,456	65.9%
hm0	17,383	0	0	0	2,323	10,068	57.9%
hmax	17,383	0	0	0	998	8,263	47.5%
tp	17,383	0	0	231	140	17,012	97.9%
mdir	17,383	0	0	369	23	11,237	64.6%
seatemp_aa	17,383	0	168	0	270	11,323	65.1%

Issues Identified

- airpressure: 6 flat line values (5+ consecutive identical)
- airtemp: 791 flat line values (5+ consecutive identical)
- humidity: 3 spike values (>20.0 change)
- humidity: 108 flat line values (5+ consecutive identical)
- windsp: 42 flat line values (5+ consecutive identical)
- winddir: 153 spike values (>180.0 change)
- winddir: 24 flat line values (5+ consecutive identical)

- hm0: 2323 flat line values (5+ consecutive identical)
- hmax: 998 flat line values (5+ consecutive identical)
- tp: 231 spike values (>10.0 change)
- tp: 140 flat line values (5+ consecutive identical)
- mdir: 369 spike values (>180.0 change)
- mdir: 23 flat line values (5+ consecutive identical)
- seatemp_aa: 168 values outside range [4.5-18.5]
- seatemp_aa: 270 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 - 2023 Data Overview and QC Results

QC Failure Color Coding

- 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 percentage breakdown of each QC result type per parameter.