

Buoy 62095 - 2023 Quality Control Report

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Data Overview

- Station ID: 62095
- Year: 2023
- Total Records: 14,665
- Time Range: 2023-01-01 00:00:00 to 2023-12-30 23:00:00
- Duration: 363 days
- Sensors/Loggers: 4 active
 - 332_Wavesense: 5,632 records (38.4%)
 - 12145_CR6: 3,087 records (21.1%)
 - 341_Wavesense: 3,085 records (21.0%)
 - 7577_CR6: 2,861 records (19.5%)

Quality Control Results

Record-Level QC Status

- ****QC complete:**** 14,337 records (97.8%)
- ****No QC performed:**** 328 records (2.2%)

Parameter-Level QC Results

Parameter	Total	Missing	Range Fail	Spike Fail	Flat Line Fail	Passed	Pass Rate
airpressure	14,665	0	0	0	6	8,871	60.5%
airtemp	14,665	0	0	0	412	8,608	58.7%
humidity	14,665	1,339	0	6	1,549	8,640	58.9%
windsp	14,665	0	0	2	70	8,812	60.1%
winddir	14,665	0	0	177	40	8,725	59.5%
hm0	14,665	0	0	1	137	8,833	60.2%
hmax	14,665	0	0	28	16	5,867	40.0%
tp	14,665	0	0	8	26	14,631	99.8%
mdir	14,665	0	0	361	0	8,651	59.0%
seatemp_aa	14,665	0	0	0	267	8,692	59.3%

Issues Identified

- airpressure: 6 flat line values (5+ consecutive identical)
- airtemp: 412 flat line values (5+ consecutive identical)
- humidity: 6 spike values (>20.0 change)
- humidity: 1549 flat line values (5+ consecutive identical)
- windsp: 2 spike values (>15.0 change)
- windsp: 70 flat line values (5+ consecutive identical)
- winddir: 177 spike values (>180.0 change)

- winddir: 40 flat line values (5+ consecutive identical)
- hm0: 1 spike values (>3.0 change)
- hm0: 137 flat line values (5+ consecutive identical)
- hmax: 28 spike values (>4.5 change)
- hmax: 16 flat line values (5+ consecutive identical)
- tp: 8 spike values (>10.0 change)
- tp: 26 flat line values (5+ consecutive identical)
- mdir: 361 spike values (>180.0 change)
- seatemp_aa: 267 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 - 2023 Data Overview and QC Results



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