# St Mary's Sound Directional Waverider Buoy

| **Location** | |
|---|---|
| OS | 90407 E 8003 N |
| WGS84 | *Latitude:* 49° 53.518' N<br>*Longitude:* 06° 18.732' W |
| **Instrument type** | |
| Datawell<br>Directional Waverider Mk III | |
| **Water depth** | ~53m CD |

Buoy in situ in St Mary's Sound. Photo courtesy of Fugro EMU Limited


Location of buoy (Google mapping)

## Data Quality

| Recovery rate (%) | Sample interval |
|---|---|
| 62 | 30 minutes |

## Monthly averages - 2014

*All times are GMT*

| Month | $H_s$ (m) | $T_p$ (s) | $T_z$ (s) | Dir. (°) | SST (°C) | No. of days |
|---|---|---|---|---|---|---|
| January | - | - | - | - | - | - |
| February | - | - | - | - | - | - |
| March | - | - | - | - | - | - |
| April | - | - | - | - | - | - |
| May | 0.56 | 7.7 | 4.6 | 217 | 11.9 | 15 |
| June | 0.83 | 6.8 | 4.3 | 186 | 13.8 | 30 |
| July | 0.65 | 6.8 | 4.5 | 249 | 15.6 | 31 |
| August | 0.87 | 7.3 | 4.7 | 244 | 15.4 | 31 |
| September | 0.86 | 8.2 | 4.7 | 193 | 15.6 | 30 |
| October | 1.41 | 8.3 | 5.1 | 218 | 14.5 | 31 |
| November | 1.64 | 8.6 | 5.5 | 208 | 13.2 | 30 |
| December | 1.30 | 8.3 | 5.0 | 223 | 12.2 | 30 |

## Storm Analysis

| Date/Time | $H_s$ (m) | $T_p$ (s) | $T_z$ (s) | Dir. (°) | Water level elevation* (OD) | Tidal stage (hours re. HW) | Tidal range (m) | Tidal surge* (m) | Max. surge* (m) |
|---|---|---|---|---|---|---|---|---|---|
| 06-Oct-2014 02:30 | 5.30 | 9.1 | 7.4 | 193 | 2.63 | HW | 4.3 | 0.32 | 0.33 |
| 14-Nov-2014 01:00 | 4.56 | 8.3 | 6.8 | 179 | 0.34 | HW +4 | 2.4 | 0.50 | 0.58 |
| 10-Nov-2014 17:00 | 4.18 | 7.7 | 6.3 | 187 | ~1.8 | HW -2 | 4.3 | ~0.4 | ~0.4 |

## Annual Statistics

| Year | Annual $H_s$ exceedance* (m) | | | | | | Annual Maximum $H_s$ | |
|---|---|---|---|---|---|---|---|---|
| | 0.05% | 0.5% | 1% | 2% | 5% | 10% | Date | $A_{max}$ (m) |
| 2014 | - | - | - | 2.86 | 2.29 | 1.96 | 06-Oct-2014 02:30 | 5.30 |

** i.e. 5 % of the $H_s$ values measured in 2014 exceeded 2.29 m*

## Distribution plots

The distribution of wave parameters are shown in the accompanying graphs/tables of:

- Annual time series of $H_s$ (red line is 4m storm threshold)
- Wave rose (percentage of occurrence of Direction vs. $H_s$) for all measured data
- Percentage of occurrence of $H_s$, $T_p$, $T_z$ and Direction for 2014
- Incidence of storm waves for 2014. Storm events are defined using the Peaks-over-Threshold method. The highest $H_s$ of each storm event is shown
- Joint distribution of all parameters for all measured data, given as percentage of occurrence

## General

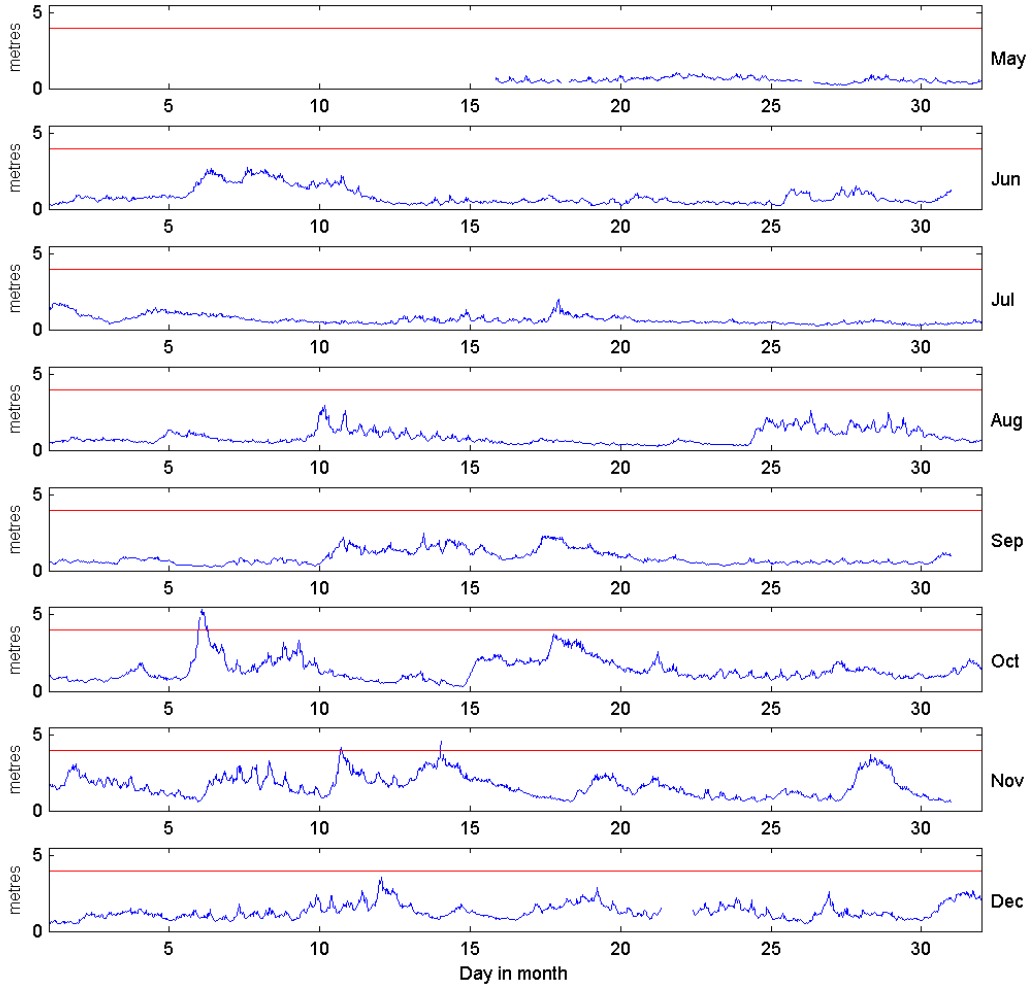
The buoy was first deployed on 15 May 2014, at which time the magnetic declination at the site was 3.03° west, changing by 0.17° east per year.

## Acknowledgements

Tidal data were supplied by the British Oceanographic Data Centre as part of the function of the National Tidal and Sea Level Facility, hosted by the Proudman Oceanographic Laboratory and funded by DEFRA and the Natural Environment Research Council. The shore station is kindly hosted by the leaseholder of the Coastguard Tower.

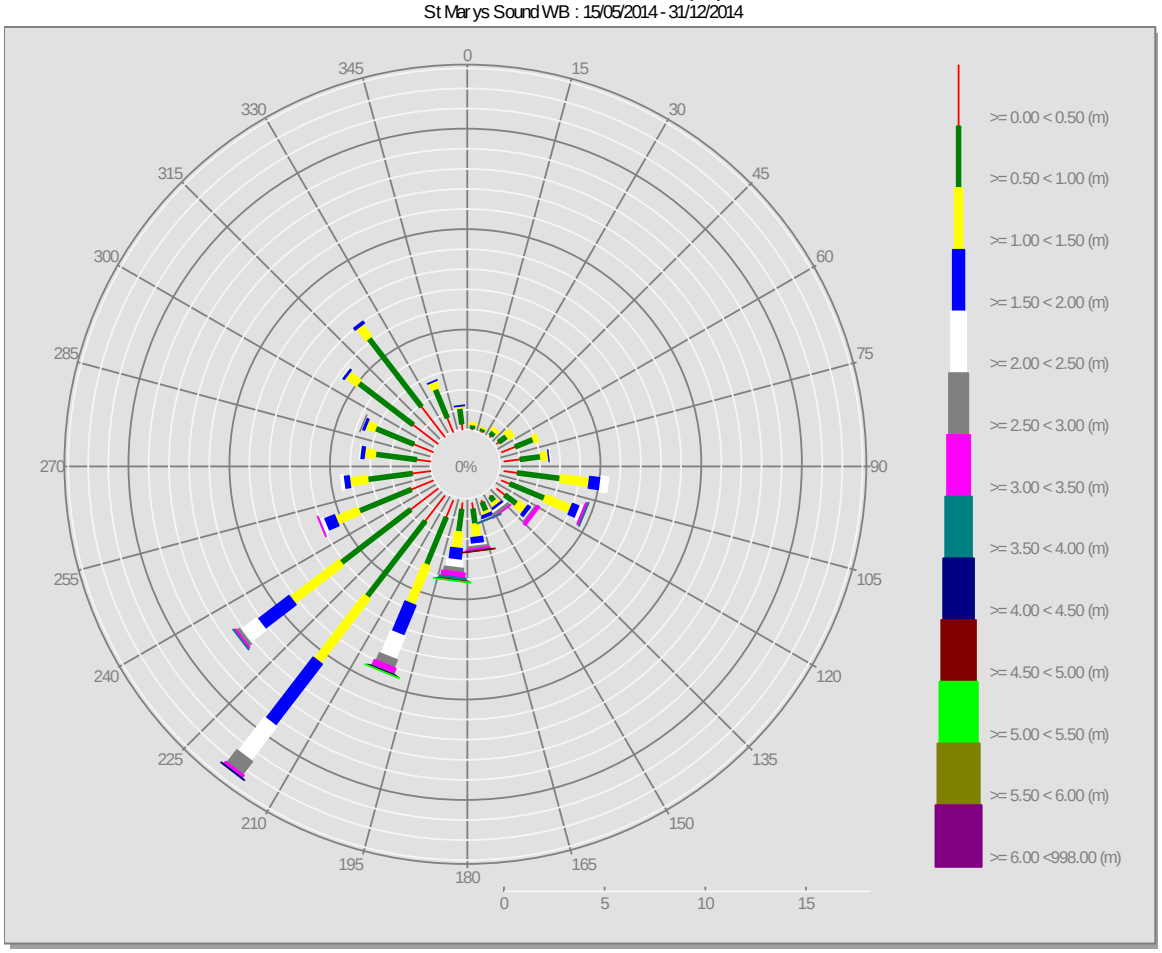
** Tidal information is obtained from the nearest recording tide gauge (the National Network gauge at St Mary's). The surge shown is the residual at the time of the highest Hs. The maximum tidal surge is the largest positive surge during the storm event.*

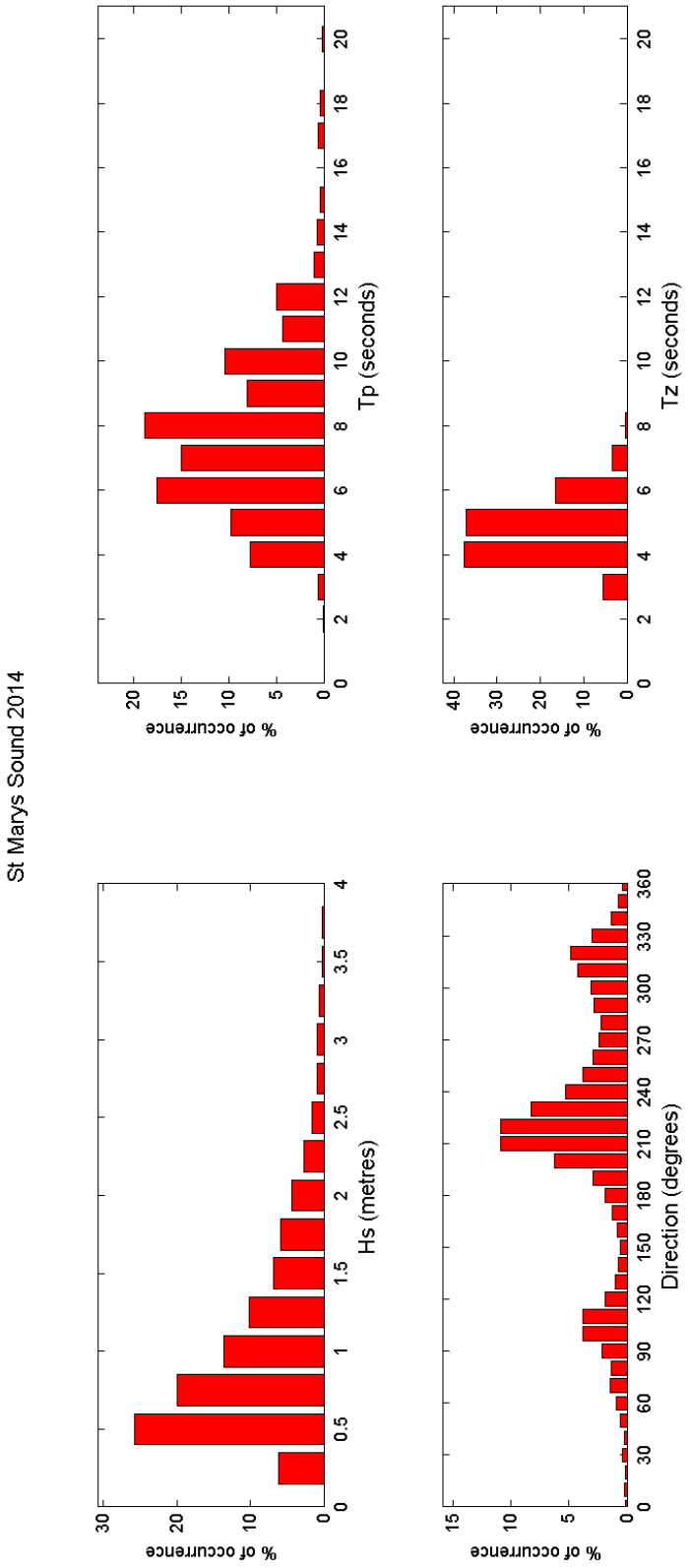
**St Mary's Sound – Significant Wave Height (Hs) during 2014**

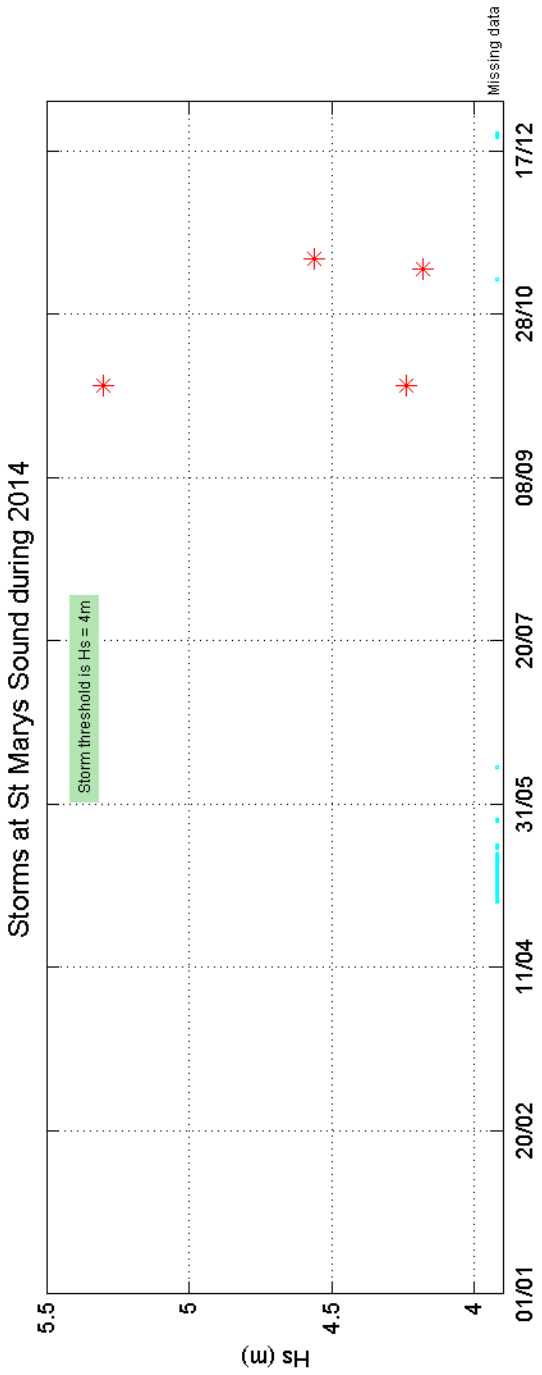


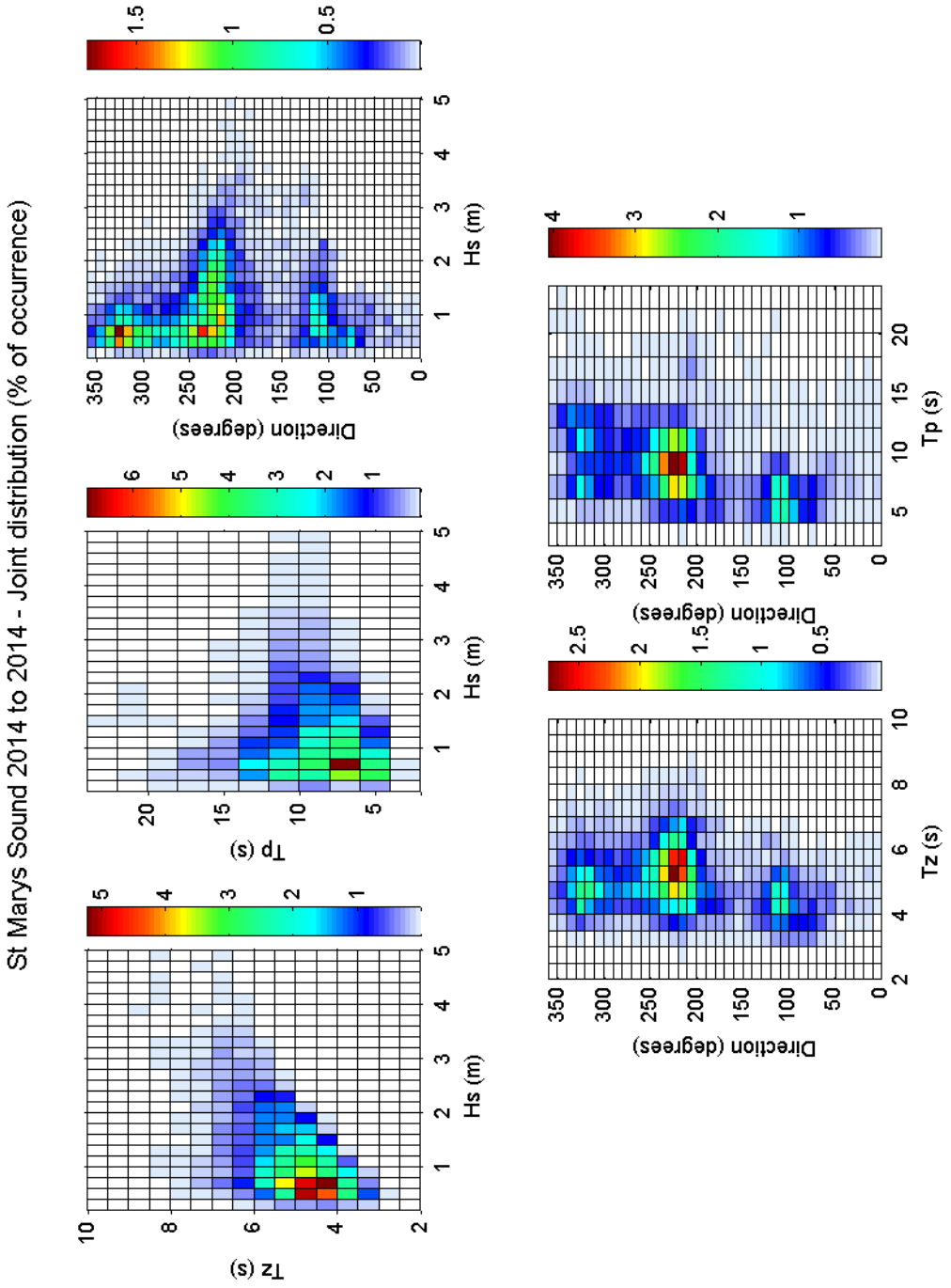
Offshore Wave Hs (m)

St Marys Sound WB : 15/05/2014 - 31/12/2014




St Marys Sound 2014
% of occurrence
Tp (seconds)
% of occurrence
Tz (seconds)
% of occurrence
Hs (metres)
% of occurrence
Direction (degrees)


Storms at St Marys Sound during 2014
Storm threshold is Hs = 4m
Missing data
Hs (m)
5.5
5
4.5
4
01/01
20/02
11/04
31/05
20/07
08/09
28/10
17/12


St Marys Sound 2014 to 2014 - Joint distribution (% of occurrence)
Direction (degrees)
Hs (m)
Tp (s)
Tz (s)