
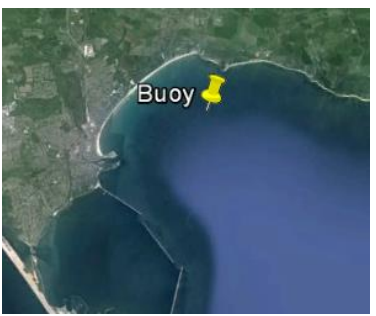


## Weymouth Directional Waverider Buoy

<b>Location</b>			
OS	370834 E 80423 N		
WGS84	Latitude: 50° 37.366' N Longitude: 02° 24.820' W		
<b>Instrument type</b>			
Datawell Directional Waverider Mk III			
<b>Water depth</b>	~10 m CD	Buoy in situ in Weymouth Bay. Photo courtesy of Fugro EMU Limited	Location of buoy (Google mapping)

### Data Quality

Recovery rate (%)	Sample interval
100	30 minutes

### Monthly Averages - 2014

*All times are GMT*

Month	H <sub>s</sub> (m)	T <sub>p</sub> (s)	T <sub>z</sub> (s)	Dir. (°)	SST (°C)	No. of days
January	0.81	8.3	4.4	160	9.6	31
February	1.00	9.0	4.4	163	8.7	28
March	0.47	8.3	4.1	154	9.3	31
April	0.39	6.9	3.9	159	10.7	30
May	0.35	5.4	3.5	157	12.9	31
June	0.29	5.4	3.4	151	15.7	30
July	0.26	4.9	3.4	161	18.0	31
August	0.38	5.1	3.5	167	18.2	31
September	0.34	5.9	3.4	143	17.9	30
October	0.54	6.4	3.7	160	16.2	31
November	0.75	6.8	4.1	149	13.8	30
December	0.46	7.1	4.1	164	11.1	31

## Storm Analysis

Date/Time	H <sub>s</sub> (m)	T <sub>p</sub> (s)	T <sub>z</sub> (s)	Dir. (°)	Water level elevation* (OD)	Tidal stage (hours re. HW)	Tidal range (m)	Tidal surge* (m)	Max. surge* (m)
05-Feb-2014 00:30	4.02	9.1	7.0	153	1.14	HW +3	1.7	0.63	0.80
01-Jan-2014 15:00	3.30	8.3	6.3	153	-0.23	HW -4	1.9	0.42	0.60
14-Feb-2014 20:30	2.85	11.1	5.8	165	1.79	HW +1	1.8	1.04	1.08
06-Nov-2014 23:30	2.61	7.7	5.9	156	-0.28	HW +5	2.3	0.26	0.41
13-Nov-2014 14:00	2.58	7.7	5.6	153	0.34	HW +4	1.0	0.35	0.51

## Annual Statistics

Year	Annual H <sub>s</sub> exceedance* (m)						Annual Maximum H <sub>s</sub>	
	0.05%	0.5%	1%	2%	5%	10%	Date	A <sub>max</sub> (m)
2007	2.29	1.72	1.43	1.24	1.03	0.85	18-Nov-2007 13:30	2.56
2008	2.57	1.95	1.75	1.46	1.10	0.89	03-Feb-2008 13:00	2.74
2009	2.17	1.75	1.63	1.48	1.18	0.90	13-Nov-2009 23:30	2.62
2010	2.54	1.84	1.54	1.29	1.00	0.81	17-Nov-2010 10:00	2.81
2011	2.16	1.77	1.54	1.26	1.03	0.85	24-Oct-2011 00:00	2.30
2012	2.82	1.81	1.60	1.38	1.08	0.86	30-Apr-2012 05:00	3.34
2013	2.47	1.89	1.66	1.47	1.20	0.97	18-Dec-2013 20:30	2.70
2014	3.17	2.30	1.97	1.65	1.28	0.99	05-Feb-2014 00:30	4.02 <sup>+</sup>

\* i.e. 5 % of the H<sub>s</sub> values measured in 2007 exceeded 1.03 m

<sup>+</sup>Note that waves were breaking at the buoy for several hours during this storm; where breaking waves were clearly present in the measured time series, the parameters have been omitted. Accordingly, there may have been short periods where measured significant wave heights exceeded this value.

## Distribution plots

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

- Annual time series of H<sub>s</sub> (red line is 2.25 m storm threshold)
- Wave roses (percentage of occurrence of direction vs H<sub>s</sub>) for all measured data
- Percentage of occurrence of H<sub>s</sub>, T<sub>p</sub>, T<sub>z</sub> and Direction for 2014
- Incidence of storm waves for 2014. Storm events are defined using the Peaks-over-Threshold method. The highest H<sub>s</sub> of each storm event is shown
- Joint distribution of all parameters for all measured data, given as percentage of occurrence

\* Tidal information is obtained from the nearest recording tide gauge (the National Network gauge at Weymouth). The surge shown is the residual at the time of the highest H<sub>s</sub>. The maximum tidal surge is the largest positive surge during the storm event.

## Significant wave height return periods

Return periods for significant wave height can be calculated since the buoy has been deployed for more than 5 years. The return periods are based on 3-hourly records and are calculated for periods up to 10 times the record length, using a Weibull distribution.

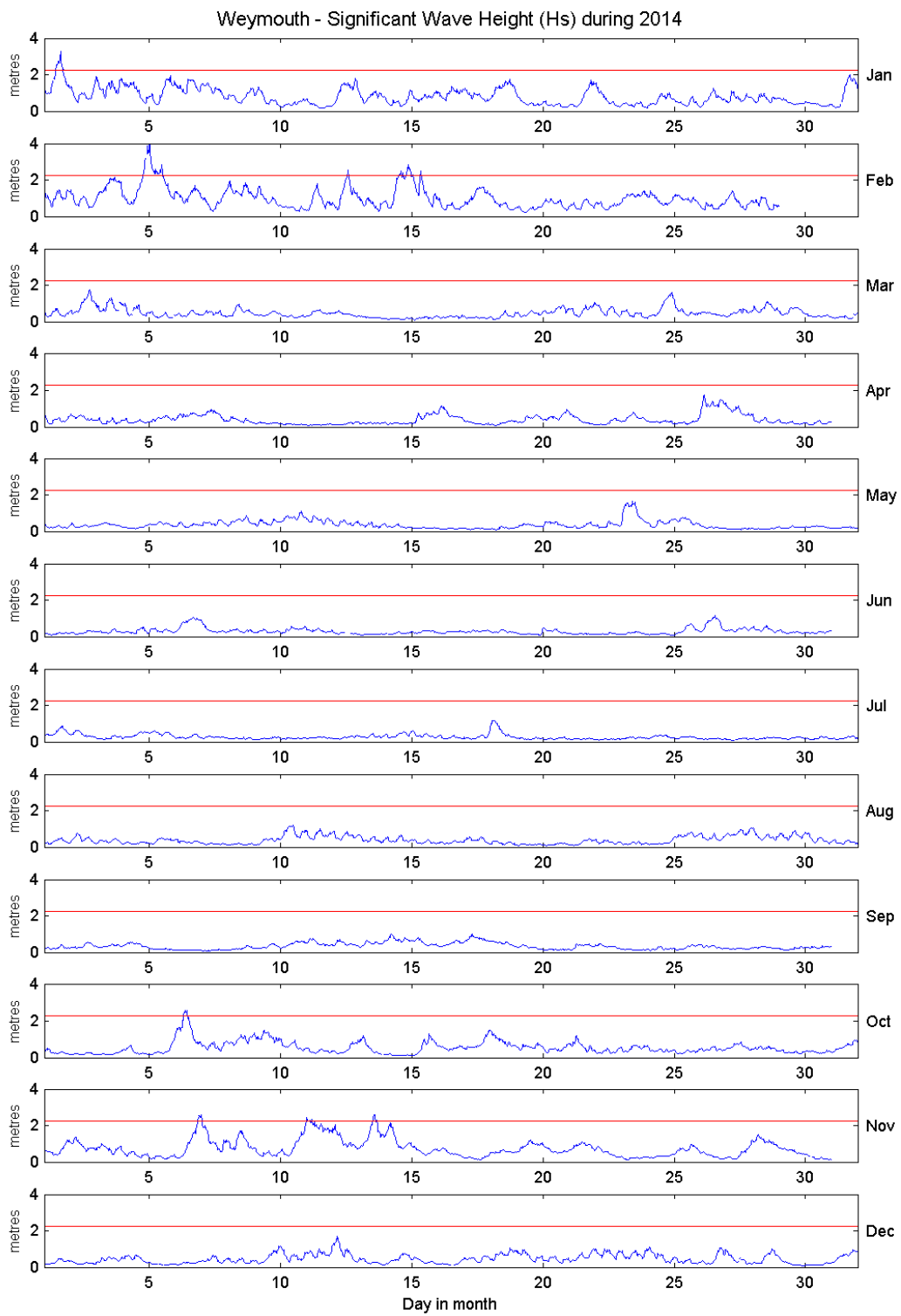
Return period (years)	Significant wave height (m)	Comments
1	3.0	No depth limitation
2	3.2	
5	3.5	
10	3.7	
20	3.9	
50	4.2	Depth-limited on MLWS

## General

The buoy was first deployed on 18 December 2006, at which time the magnetic declination at the site was 2.9° west, changing by 0.15° east per year.

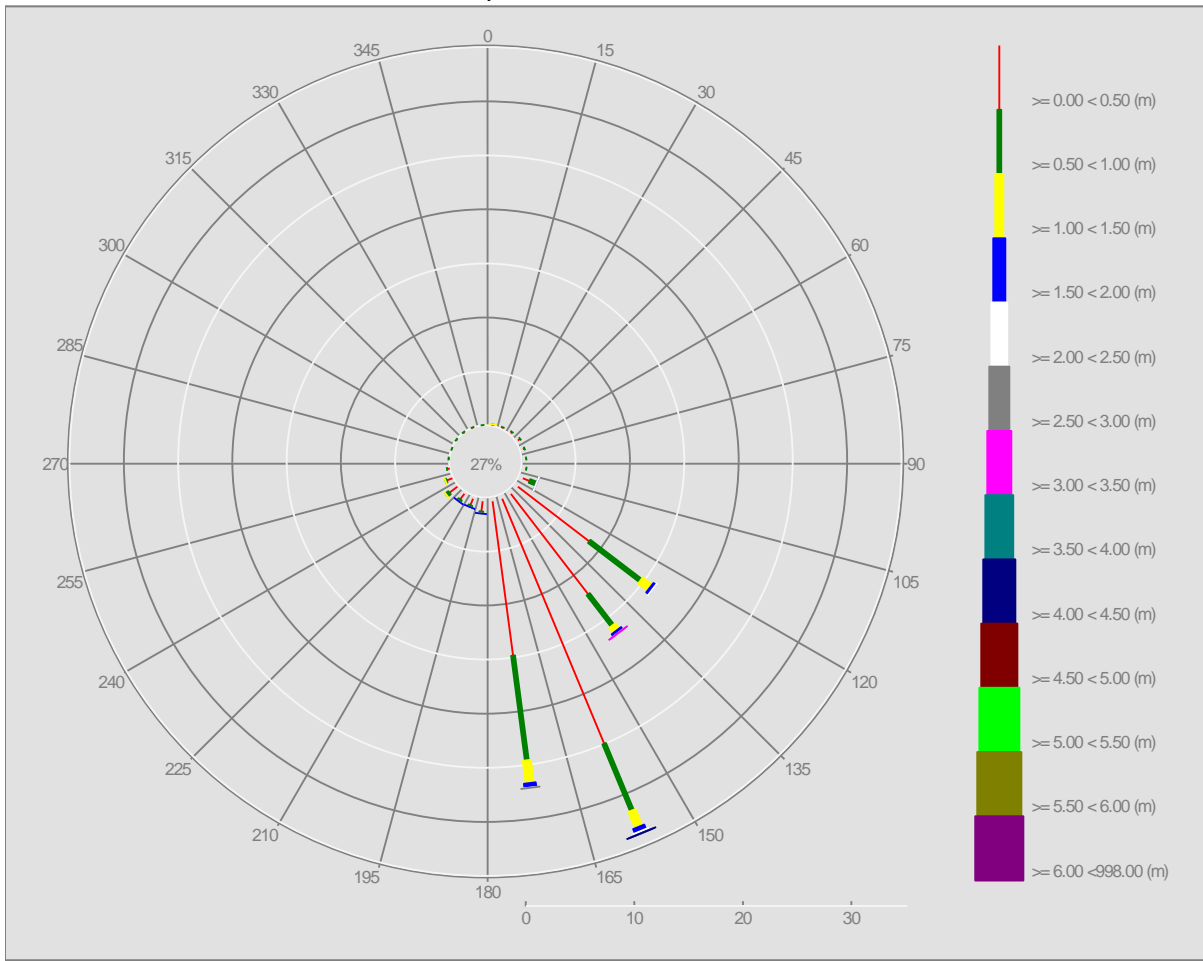
## Acknowledgements

The shore station is kindly hosted by the Weymouth and Portland National Sailing Academy. 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.

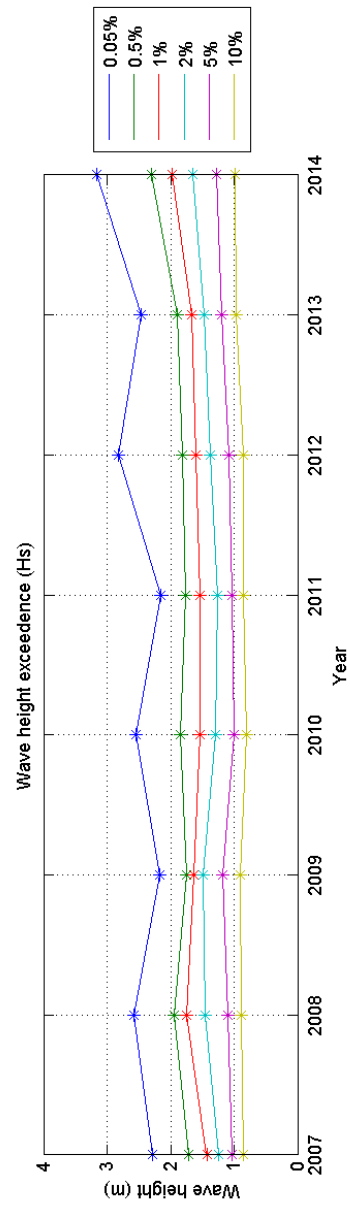
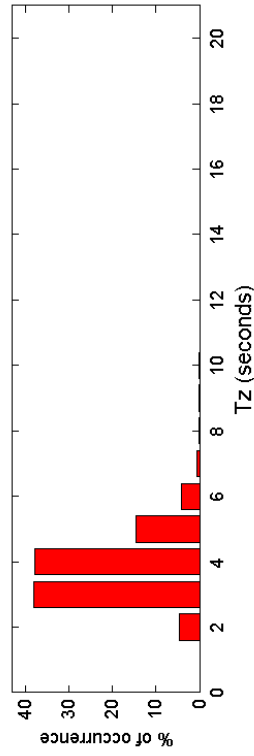
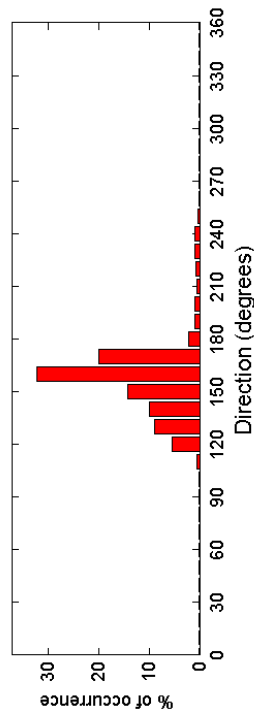
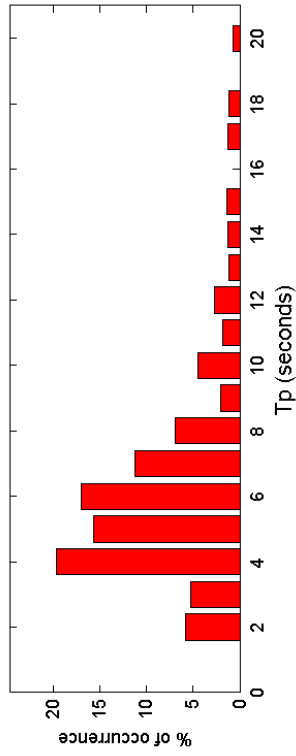
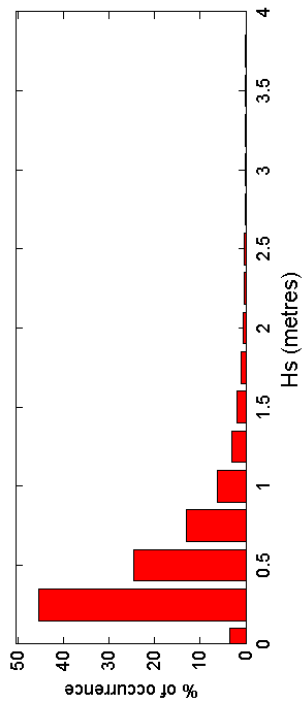


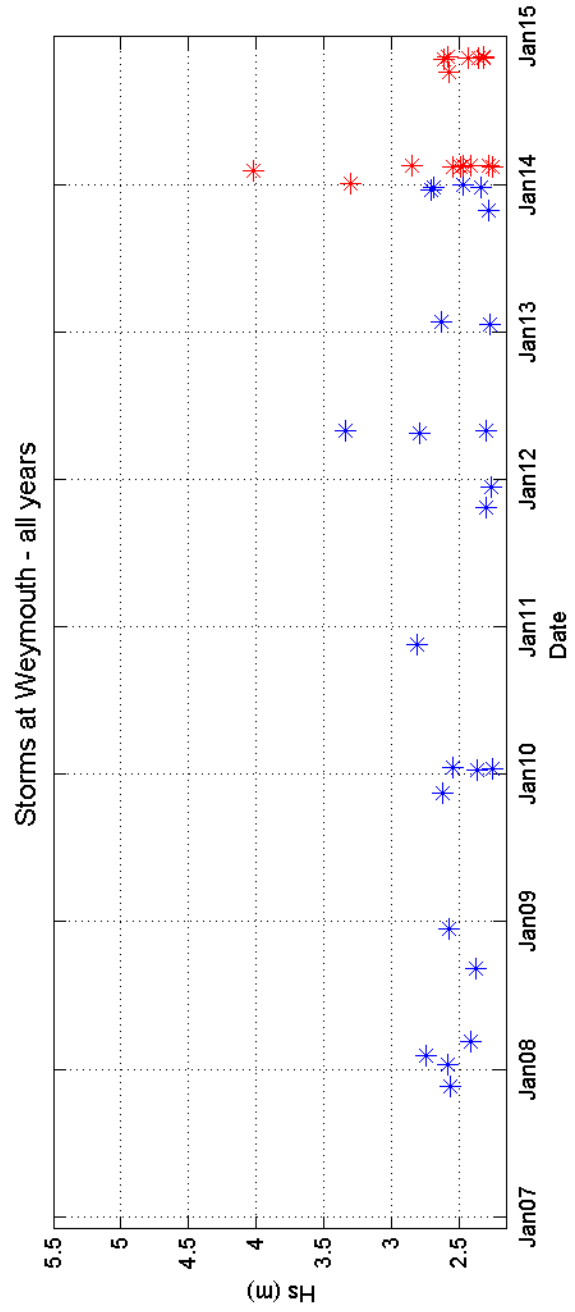
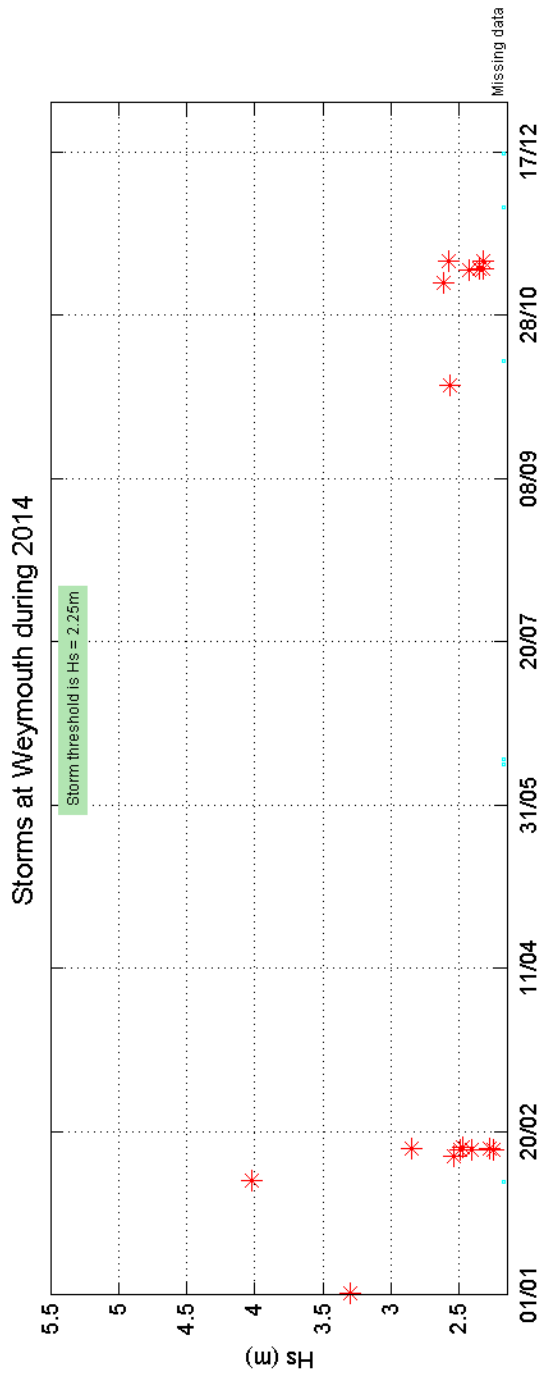
### Offshore Wave Hs (m)

Weymouth WB : 18/12/2006 - 31/12/2014



Weymouth 2014





Weymouth 2006 to 2014 - Joint distribution (% of occurrence)

