



## Tor Bay Directional Waverider Buoy

<b>Location</b>			
OS	292267 E 60381 N		
WGS84	Latitude: 50° 26.001' N Longitude: 03° 31.097' W		
<b>Instrument type</b>			
Datawell Directional Waverider Mk III			
<b>Water depth</b>	~11m CD	Buoy in situ in Tor Bay. Photo courtesy of Fugro EMU Limited	Location of buoy (Google mapping)

### Data Quality

Recovery rate (%)	Sample interval
84	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	0.48	7.8	3.8	128	10.2	31
February	0.76	8.2	3.6	142	9.5	14
March	0.39	6.7	3.5	128	9.6	19
April	0.37	6.7	3.4	119	10.8	30
May	0.28	4.5	3.0	158	12.2	20
June	0.30	4.1	3.2	112	15.5	11
July	0.22	4.4	3.1	150	15.4	31
August	0.24	4.4	3.0	164	14.9	31
September	0.43	5.2	3.4	112	15.1	30
October	0.38	6.4	3.5	131	13.6	30
November	0.67	6.3	3.8	116	11.1	30
December	0.35	6.4	3.5	152	8.8	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)
28-Nov-2014 07:00	2.63	6.7	5.3	100	-	-	-	-	0.53
04-Feb-2014 20:30	2.56	8.3	5.3	127	-	-	-	-	1.33
03-Feb-2014 18:00	2.16	7.1	5.0	122	-	-	-	-	0.68
14-Feb-2014 12:30	2.14	7.7	5.6	131	-	-	-	-	1.60
13-Nov-2014 12:00	2.13	7.7	4.8	127	-	-	-	-	0.94

## 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)
2008	-	2.20	2.10	2.01	1.22	0.88	28-Dec-2008 04:00	2.60
2009	2.56	1.79	1.60	1.43	1.10	0.84	12-May-2009 05:00	2.88
2010	2.50	1.96	1.85	1.67	1.40	1.10	12-Jan-2010 22:30	2.70
2011	2.39	1.84	1.63	1.39	1.06	0.78	24-Oct-2011 16:30	2.63
2012	2.86	2.18	2.00	1.71	1.31	0.93	29-Apr-2012 12:30	3.06
2013	3.21	2.56	2.32	1.93	1.48	1.10	11-Mar-2013 15:00	3.73
2014	2.33	1.88	1.65	1.39	1.11	0.85	28-Nov-2014 07:00	2.63

\* i.e. 5 % of the H<sub>s</sub> values measured in 2008 exceeded 1.22 m

## 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 2.0 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 used to be obtained from the WaveRadar REX on Teignmouth Pier but this was put out of action on 03 Feb 2014 by damage to the pier. Accordingly, the maximum tidal surge during the storm event is that measured at the next closest tide gauge (the step gauge at West Bay Harbour).

### 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.

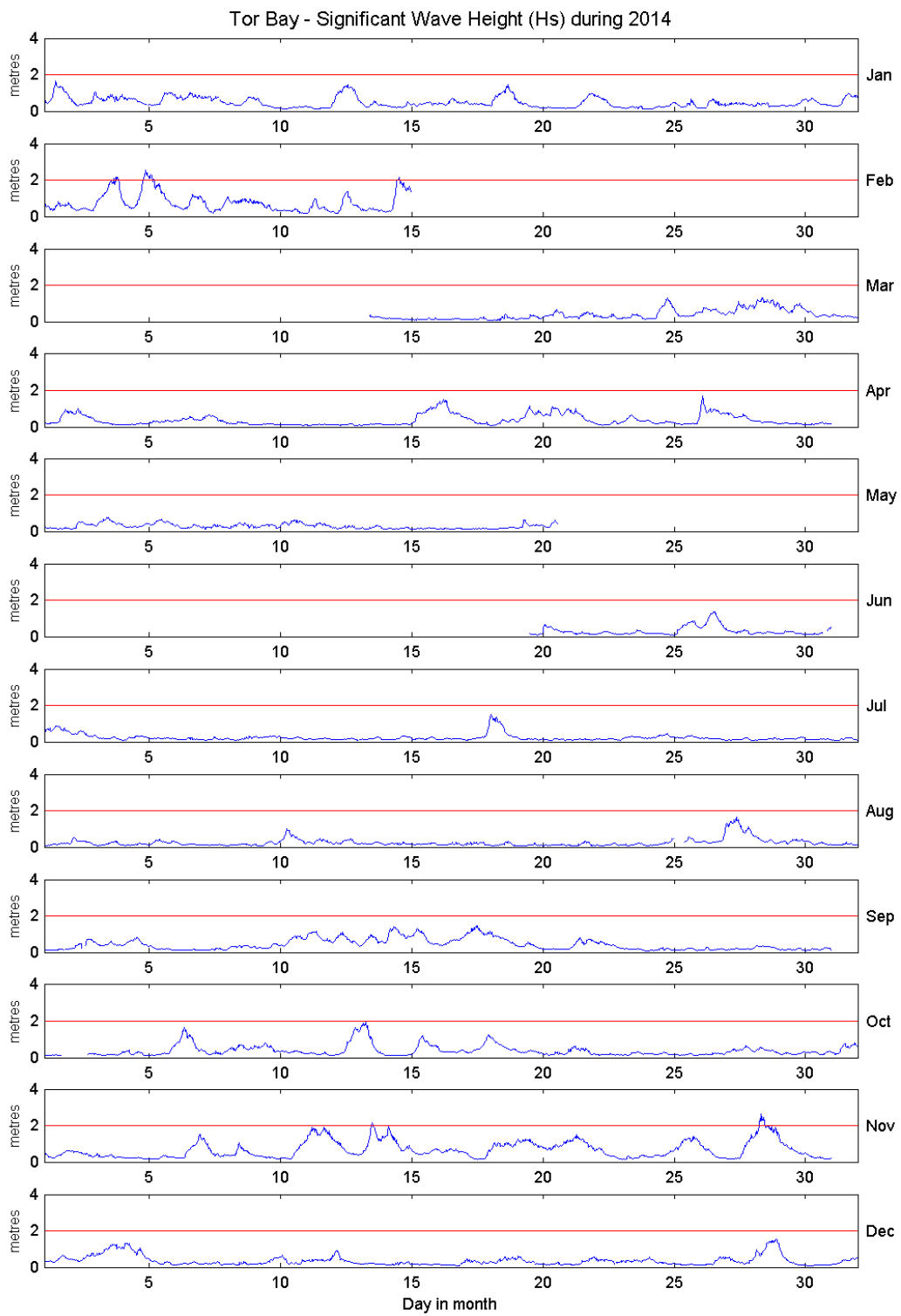
Return period (years)	Significant wave height (m)	Comments
1	3.2	No depth limitation
2	3.4	
5	3.6	
10	3.8	
20	4.0	
50	4.3	

### General

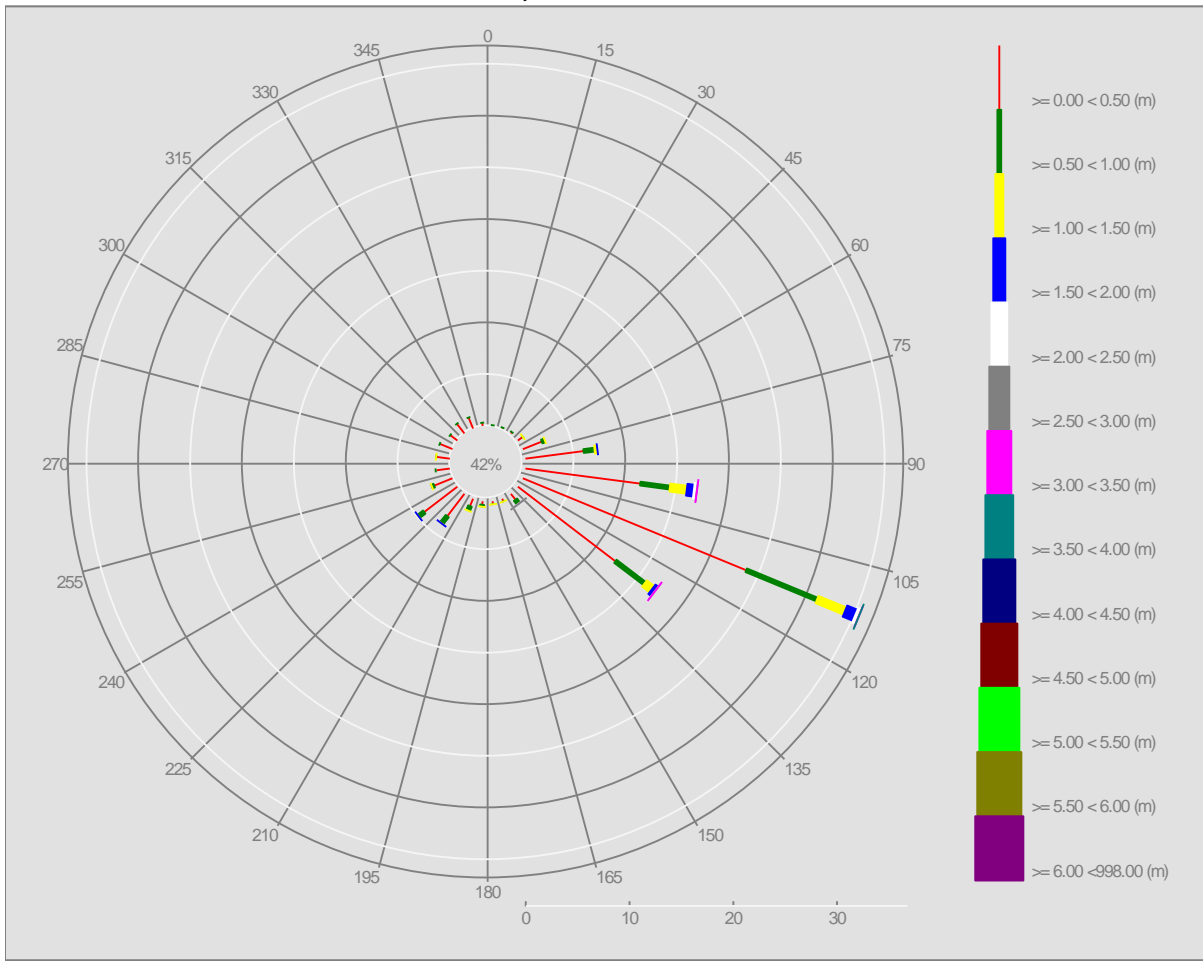
The buoy was first deployed on 4 July 2008, at which time the magnetic declination at the site was 3.0° west, changing by 0.15° east per year.

### Acknowledgements

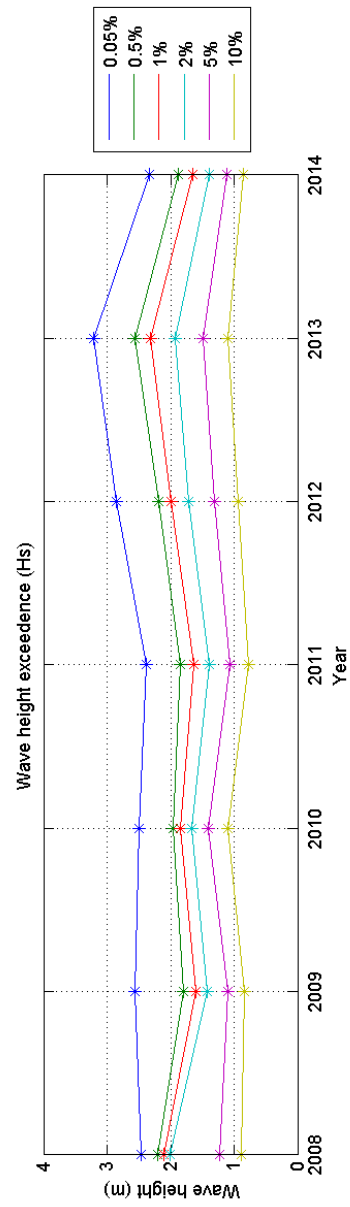
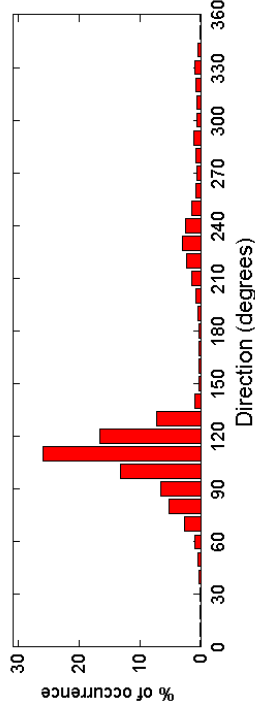
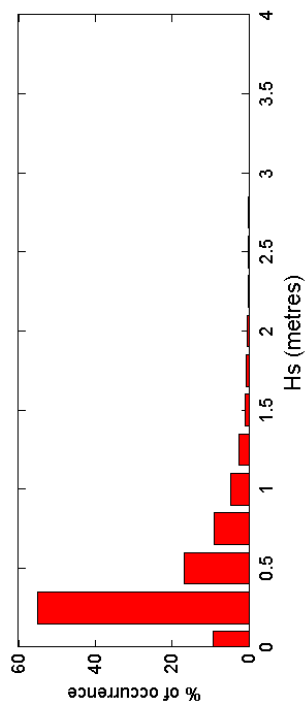
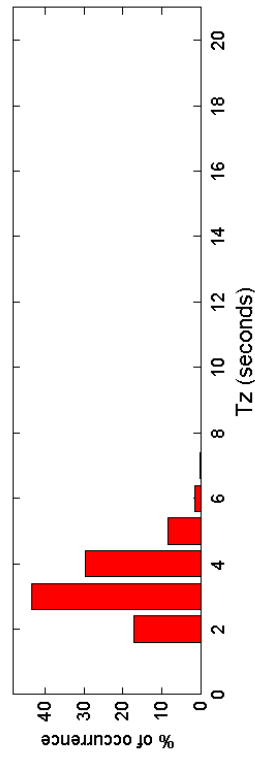
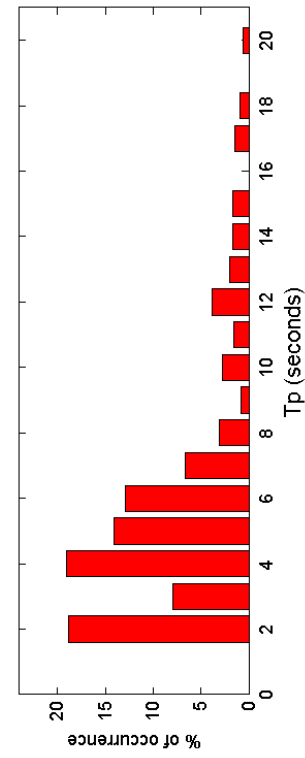
TASK2000 tidal prediction software was kindly provided by the Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory.

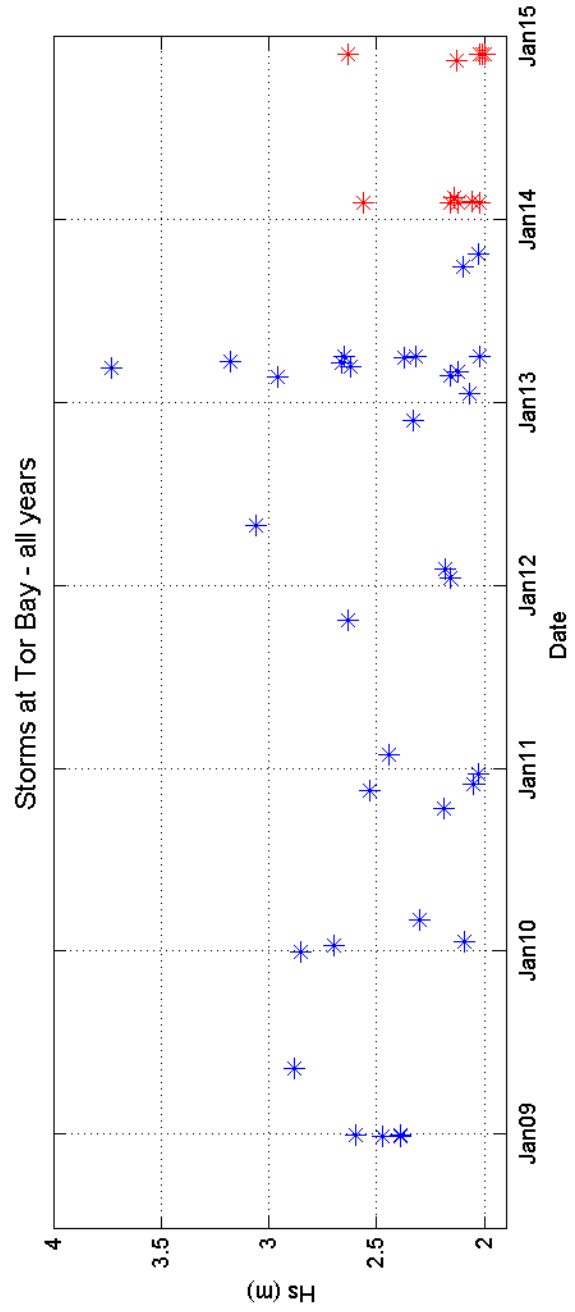
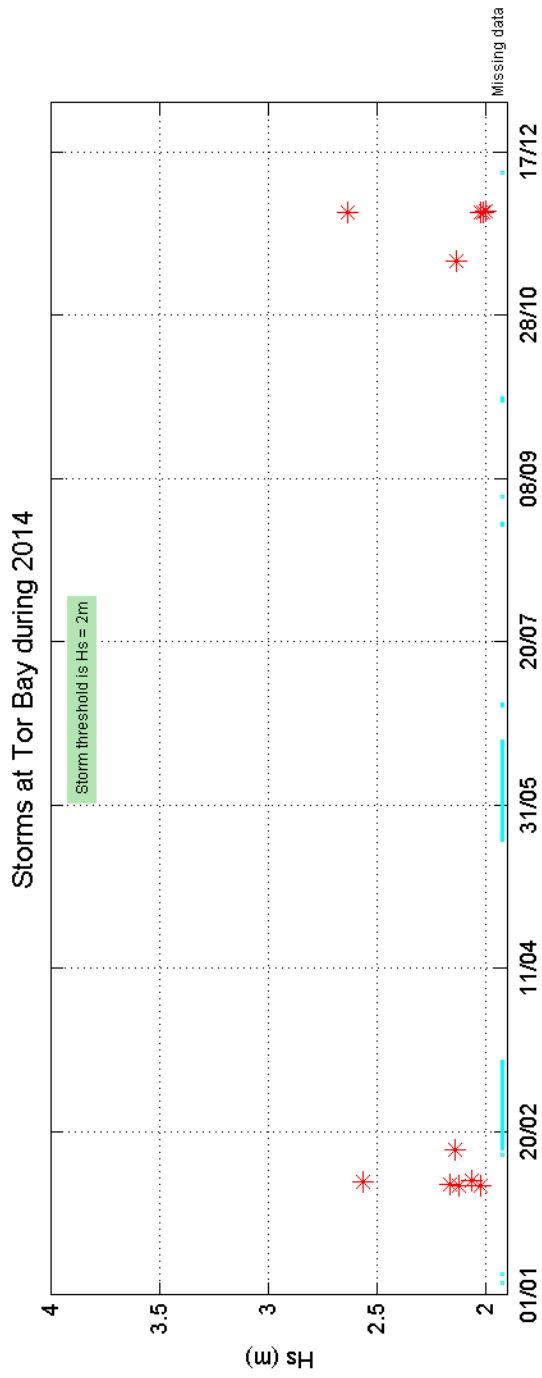


### Offshore Wave Hs (m) Tor Bay WB : 04/07/2008 - 31/12/2014



Tor Bay 2014





Tor Bay 2008 to 2014 - Joint distribution (% of occurrence)

