



Sandown Bay Directional Waverider Buoy

Location			
OS	461642 E 83782 N		
WGS84	Latitude: 50° 39.03' N Longitude: 01° 07.77' W		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~11m CD	Buoy in situ in Sandown Bay. Photo courtesy of Fugro EMU Limited	Location of buoy (Google mapping)

Data Quality

Recovery rate (%)	Sample interval
99	30 minutes

Monthly Averages - 2015

All times are GMT

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	No. of days
January	0.65	6.7	4.0	176	8.7	31
February	0.53	7.3	4.0	160	6.7	28
March	0.49	6.6	3.7	161	7.6	31
April	0.42	5.8	3.6	155	9.7	30
May	0.48	5.7	3.6	170	12.2	31
June	0.39	5.1	3.5	163	14.7	30
July	0.42	5.1	3.4	172	17.6	28
August	0.39	5.2	3.4	164	18.1	30
September	0.52	5.1	3.6	154	17.1	30
October	0.53	5.7	3.7	148	14.9	31
November	0.69	6.4	3.9	180	13.4	30
December	1.03	6.4	4.0	176	11.8	31

Monthly Averages - All Years (July 2003 – December 2015)

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)
January	0.69	6.8	3.9	162	8.0
February	0.59	7.1	3.9	159	7.0
March	0.51	6.5	3.7	158	7.3
April	0.41	5.8	3.6	156	9.4
May	0.42	5.4	3.5	160	12.1
June	0.37	5.3	3.5	162	15.0
July	0.37	5.1	3.4	169	17.5
August	0.38	5.1	3.4	171	18.6
September	0.44	5.5	3.5	160	17.8
October	0.61	5.7	3.7	162	15.6
November	0.63	6.0	3.9	163	12.8
December	0.66	6.4	3.9	165	9.8

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)
30-Dec-2015 08:30	2.76	7.1	5.6	173	-0.48	HW -5	2.3	0.30	0.37
15-Jan-2015 03:00	2.52	7.1	5.1	176	1.05	HW -2	1.6	0.61	0.66

Annual Statistics

Year	Annual H _s exceedance* (m)						Annual Maximum H _s	
	0.05%	0.5%	1%	2%	5%	10%	Date	A _{max} (m)
2003	-	2.21	2.02	1.65	1.35	1.13	29-Nov-2003 09:00	2.79
2004	2.64	2.11	1.82	1.61	1.29	0.97	08-Jan-2004 10:30	3.17
2005	3.23	2.15	1.69	1.44	1.11	0.86	02-Dec-2005 18:00	3.79
2006	2.47	1.97	1.80	1.61	1.33	1.10	30-Dec-2006 00:00	2.75
2007	3.06	1.91	1.64	1.44	1.18	0.96	18-Nov-2007 16:00	3.22
2008	3.11	2.23	1.91	1.64	1.26	0.99	10-Mar-2008 11:30	3.63
2009	2.56	2.07	1.81	1.61	1.31	1.01	18-Nov-2009 03:00	2.70
2010	2.66	2.06	1.8	1.52	1.13	0.89	09-Nov-2010 21:00	2.93
2011	2.52	1.92	1.62	1.37	1.12	0.90	12-Dec-2011 23:30	2.87
2012	2.55	2.06	1.84	1.62	1.24	0.96	25-Apr-2012 08:30	2.87
2013	3.24	2.31	1.97	1.73	1.34	1.08	24-Dec-2013 03:00	3.51
2014	3.24	2.61	2.25	1.91	1.46	1.11	05-Feb-2014 03:00	3.40
2015	2.51	1.91	1.67	1.51	1.26	1.05	30-Dec-2015 08:30	2.76

* i.e. 5 % of the H_s values measured in 2003 exceeded 1.35 m

Distribution plots

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

- Annual time series of H_s (red line is 2.5 m storm threshold)
- Incidence of storm waves for 2015. Storm events are defined using the Peaks-over-Threshold method. The highest H_s of each storm event is shown
- Wave height exceedance each year since deployment
- Percentage of occurrence of H_s, T_p, T_z and Direction for 2015
- Joint distribution of all parameters for all measured data, given as percentage of occurrence
- Wave rose (percentage of occurrence of direction vs H_s) for all measured data from 01 April 2004

* Tidal information is obtained from the nearest recording tide gauge (the WaveRadar REX on Sandown Pier). The surge shown is the residual at the time of the highest H_s. 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	3.2	No depth limitation
2	3.4	
5	3.7	
10	3.9	
20	4.1	
50	4.3	
100	4.5	

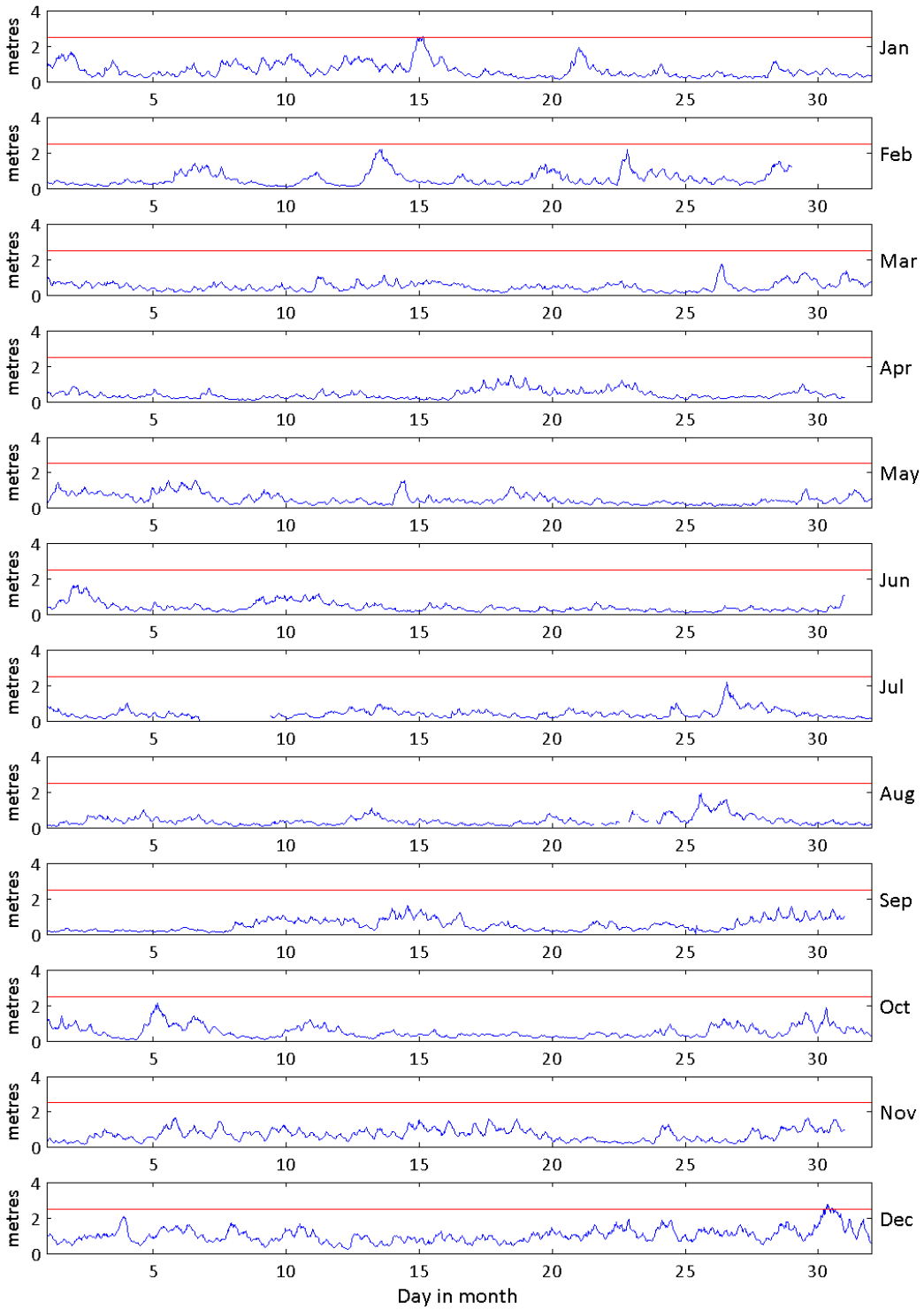
General

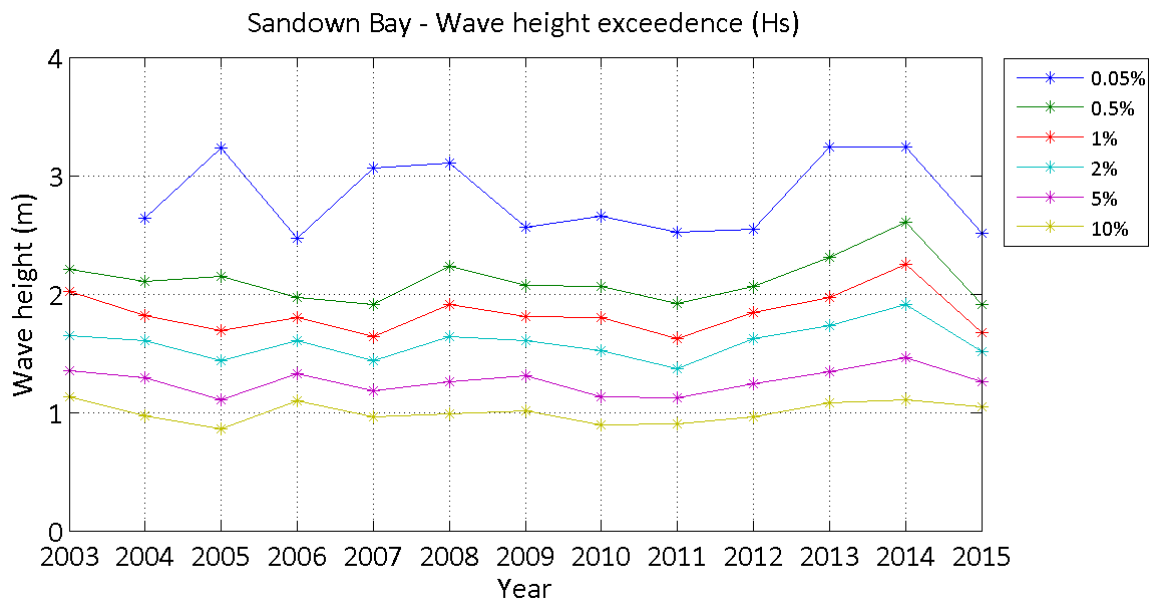
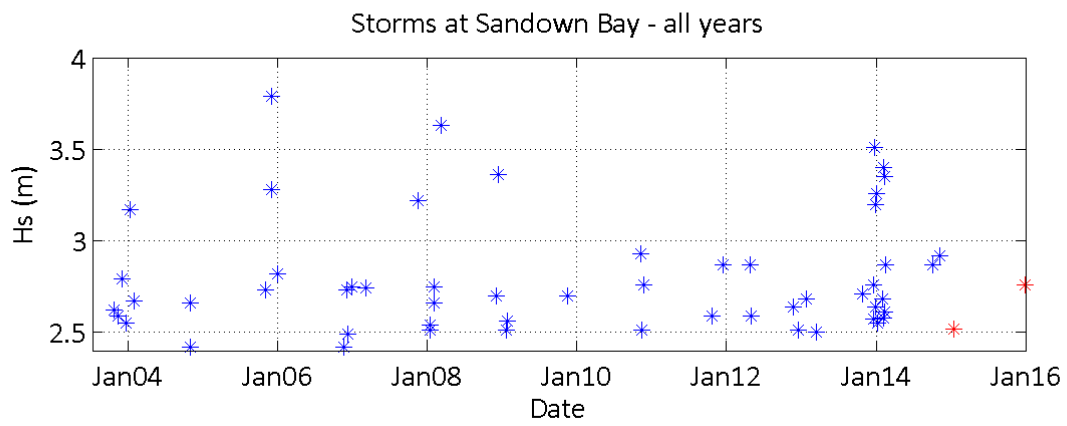
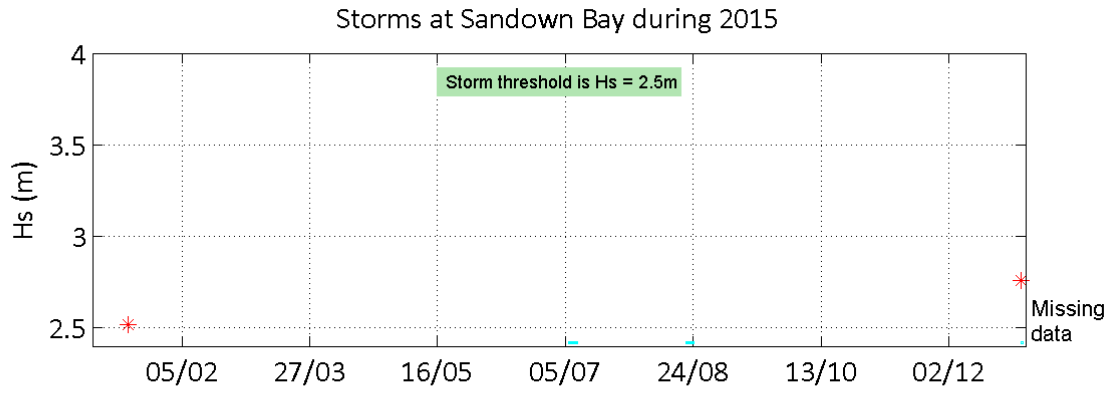
The buoy was first deployed on 16 July 2003, at which time the magnetic declination at the site was 2.9° west, changing by 0.14° east per year.

Acknowledgements

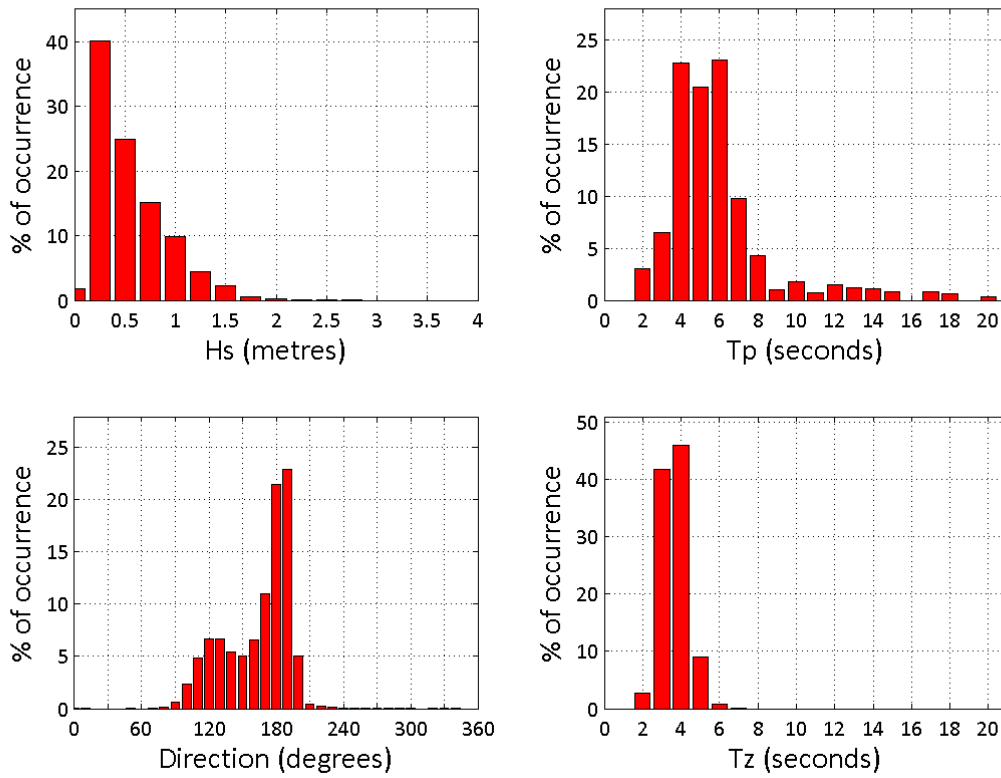
TASK2000 tidal prediction software was kindly provided by the Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory. The shore station is kindly hosted by Sandown Golf Club.

Sandown Bay - Significant Wave Height (Hs) during 2015





Sandown Bay 2015



Sandown Bay 2003 to 2015 - Joint distribution (% of occurrence)

