



Sandown Bay Directional Waverider Buoy

Location			
OS	461750 E 83781 N		
WGS84	Latitude: 50° 39.03' N Longitude: 01° 07.67' W		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~11m CD	Buoy in situ in Sandown Bay. Photo courtesy of Fugro GB Marine Limited	Location of buoy (Google mapping, image ©2016 TerraMetrics)

Data Quality

Recovery rate (%)	Sample interval
93	30 minutes

Monthly Averages - 2017

All times are GMT

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)	No. of days
January	0.50	6.3	3.8	159	8.6	0	31
February	0.67	7.8	4.0	164	7.6	2	28
March	0.58	7.9	4.0	167	8.7	0	31
April	0.29	6.2	3.4	160	11.0	0	30
May	0.41	5.3	3.4	152	12.9	0	31
June	0.42	5.6	3.4	174	16.2	0	30
July	0.34	4.8	3.4	164	18.4	0	31
August	0.45	5.0	3.4	178	18.6	0	31
September	0.39	5.4	3.6	170	18.6	0	30
October	0.47	6.3	3.7	173	16.9	0	31
November	0.65	6.5	3.7	174	15.7	4	15
December	0.63	7.3	4.2	178	9.0	2	23

Monthly Averages - All Years (July 2003 – December 2016)

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)
January	0.70	6.8	4.0	163	8.2	1
February	0.60	7.2	3.9	160	7.1	2
March	0.51	6.5	3.8	158	7.4	0
April	0.42	5.8	3.6	157	9.4	0
May	0.41	5.3	3.5	160	12.2	0
June	0.37	5.3	3.5	162	15.0	0
July	0.37	5.1	3.4	169	17.5	0
August	0.38	5.1	3.4	171	18.6	0
September	0.43	5.5	3.5	161	17.9	0
October	0.61	5.7	3.7	161	15.6	0
November	0.64	6.0	3.9	163	12.8	0
December	0.65	6.5	3.9	165	9.8	1

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)
25-Dec-2017 21:30	3.22	7.7	6.0	176	-0.56	HW +6	1.88	0.28	0.30
26-Dec-2017 20:00	2.53	7.1	5.3	163	0.15	HW +4	2.00	0.27	0.34
22-Mar-2017 08:30	2.46	7.1	5.3	162	0.59	HW +3	1.60	0.32	0.34
03-Feb-2017 18:00	2.38	6.7	5.1	146	1.14	HW +2	2.63	0.32	0.49
10-Dec-2017 06:30	2.15	6.7	4.8	152	1.40	HW +2	2.41	0.39	0.45

* Tidal information is obtained from the WaveRadar REX on Sandown Pier and the National Network gauge at Portsmouth. The surge shown is the residual at the time of the highest H_s. The maximum tidal surge is the largest surge during the storm event.

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
2016	3.93	2.34	1.97	1.66	1.29	1.02	28-Mar-2016 02:30	4.22
2017	2.62	1.85	1.62	1.43	1.12	0.90	25-Dec-2017 21:30	3.22

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

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 0.5 hourly records and are calculated for periods up to 10 times the record length using a peaks-over-threshold method and Weibull distribution.

Observation period	July 2003 to June 2017	
Return period (years)	Significant wave height (m)	Comments
0.25	2.66	No depth limitation
1	3.24	
2	3.51	
5	3.86	
10	4.12	
20	4.37	Depth-limited at MLWS
50	4.69	
100	4.93	

Distribution plots

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

- Annual time series of H_s (red line is 2.66 m storm alert threshold)
- Incidence of storm waves for 2017. 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 2017
- Wave rose (percentage of occurrence of direction vs H_s) for all measured data from 01 April 2004
- Joint distribution of all parameters for all measured data, given as percentage of occurrence

General

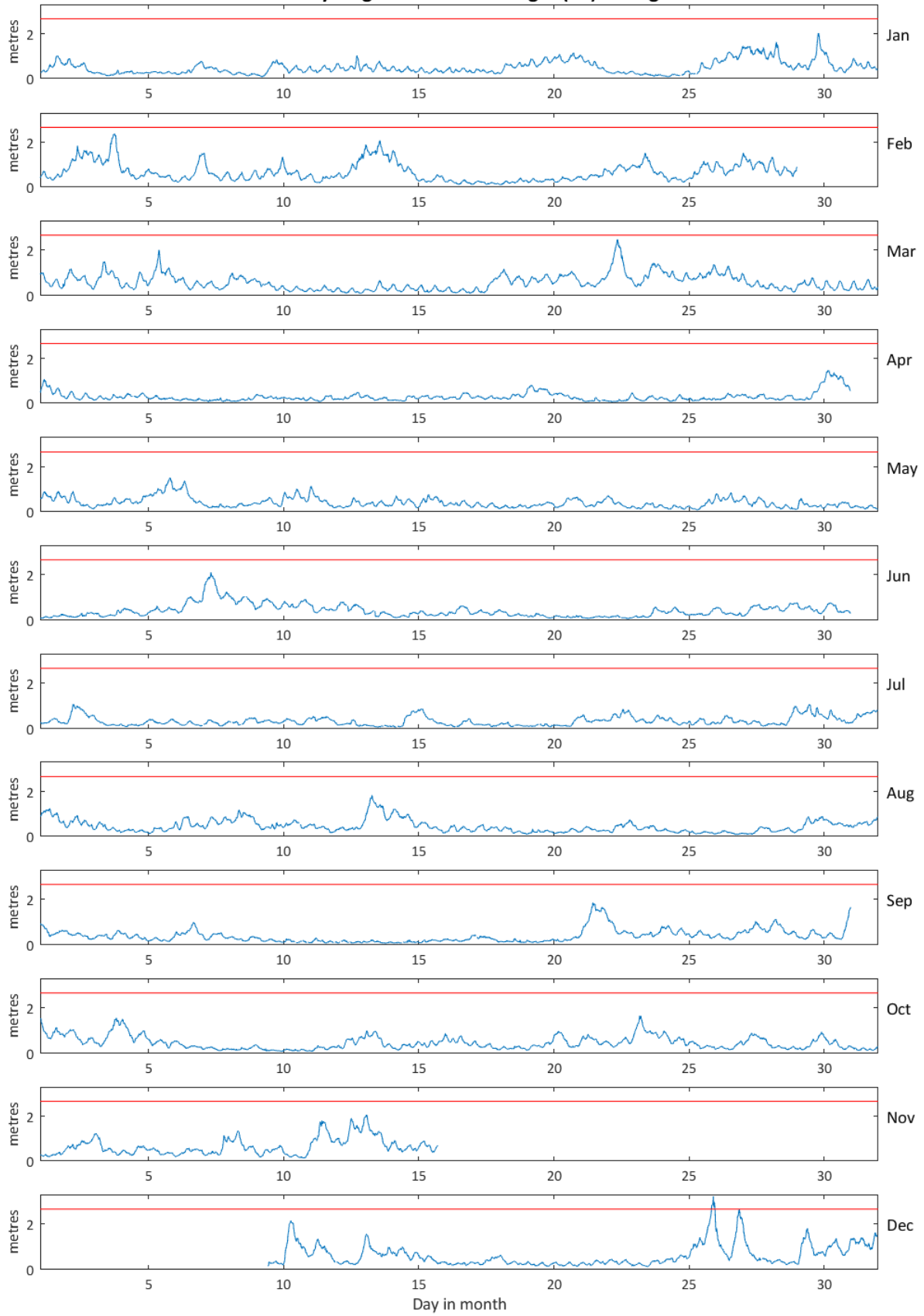
The buoy, owned by New Forest District Council, was first deployed on 16 July 2003, at which time the magnetic declination at the site was 2.9° west, changing by 0.14° east per year.

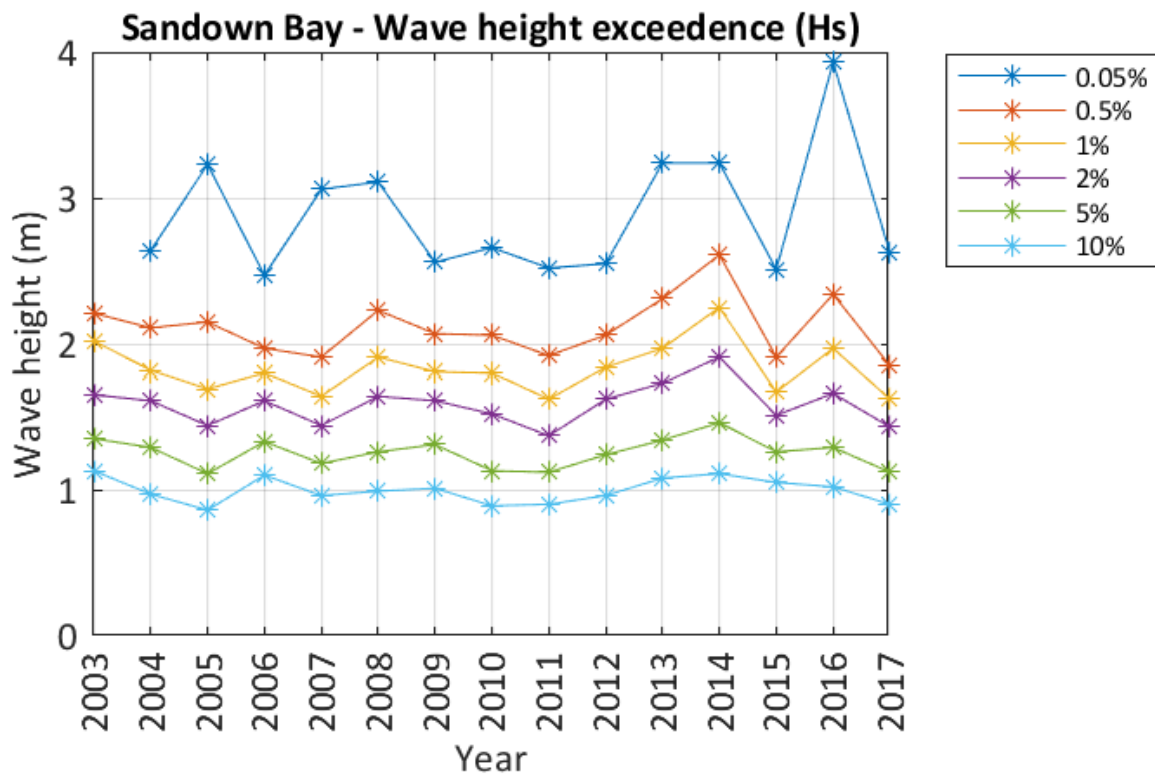
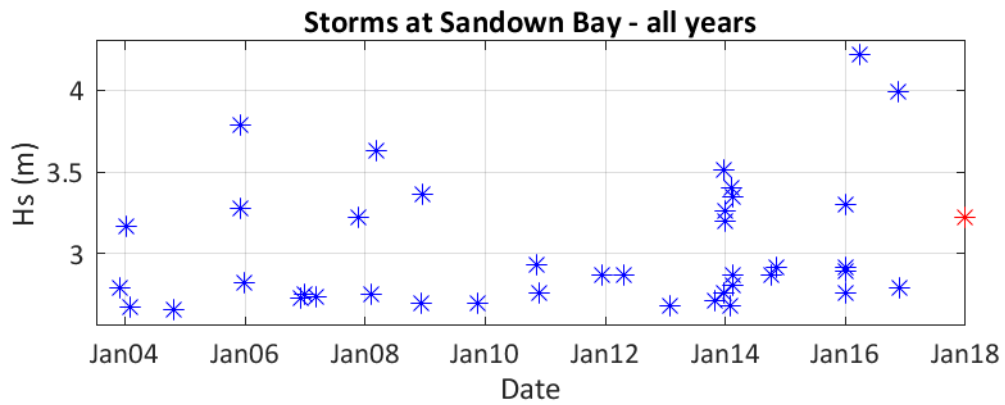
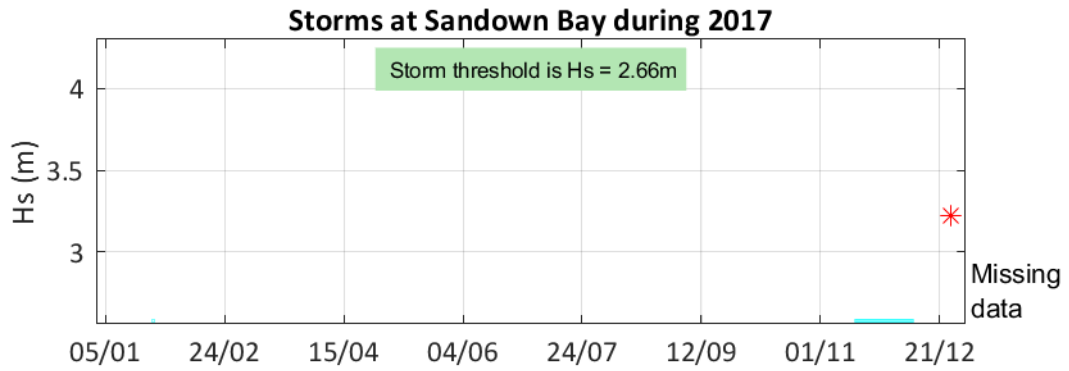
Acknowledgements

The shore station is kindly hosted by Sandown Golf Club.

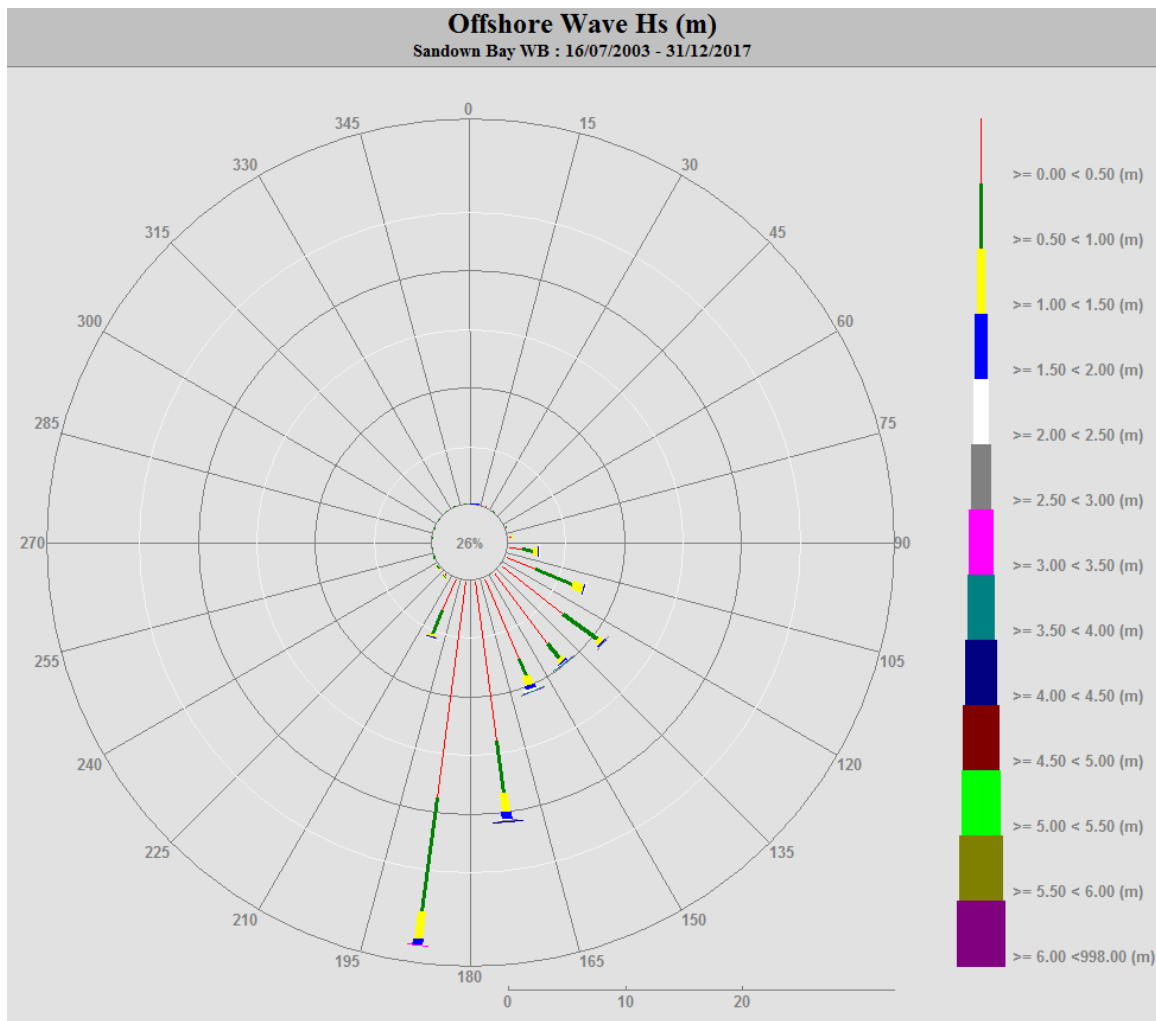
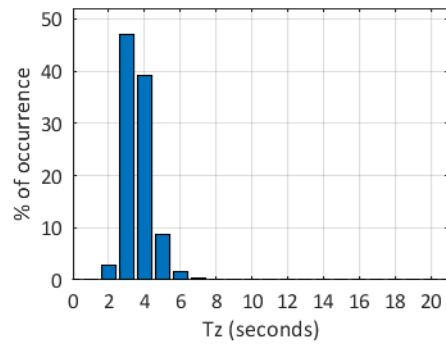
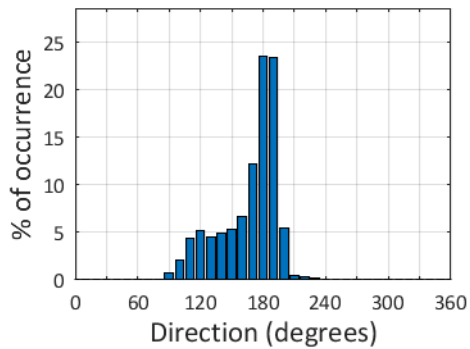
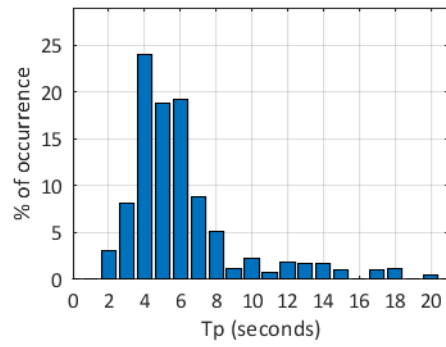
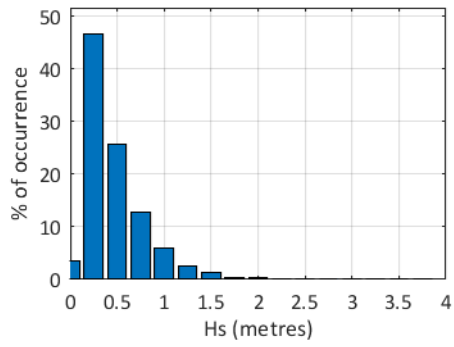
Tidal predictions at Sandown were supplied by Fugro GB Marine Limited. Tidal data at Portsmouth were provided by the British Oceanographic Data Centre from the UK national tide gauge network, owned and operated by the Environment Agency.

Sandown Bay - Significant Wave Height (Hs) during 2017





Sandown Bay 2017



Sandown Bay 2003 to 2017 - Joint distribution (% of occurrence)

