



Hayling Island Directional Waverider Buoy

Location			
OS	473534 E 92991 N		
WGS84	Latitude: 50° 43.91' N Longitude: 00° 57.56' W		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~10m CD	Buoy in situ off Hayling Island. Photo courtesy of Fugro EMU Limited	Location of buoy (Google mapping)

Data Quality

Recovery rate (%)	Sample interval
97	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	1.04	10.3	4.4	193	8.3	30
February	0.73	10.0	4.3	182	6.2	27
March	0.72	11.1	4.1	183	7.5	29
April	0.51	9.0	3.7	183	9.9	29
May	0.66	6.6	3.5	191	12.3	30
June	0.51	6.3	3.3	186	15.0	29
July	0.61	6.2	3.4	197	17.8	30
August	0.49	5.9	3.3	192	18.2	30
September	0.56	5.8	3.3	184	16.9	29
October	0.59	8.1	3.6	175	14.5	30
November	1.04	9.0	4.1	194	13.1	29
December	1.43	10.1	4.6	186	11.5	30

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

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)
January	0.93	10.3	4.2	183	7.2
February	0.80	10.5	4.3	183	6.2
March	0.66	9.5	3.9	185	6.8
April	0.52	8.1	3.7	181	9.4
May	0.54	6.5	3.4	186	12.6
June	0.49	6.0	3.3	188	15.7
July	0.52	5.5	3.2	197	17.9
August	0.53	5.3	3.2	200	18.7
September	0.55	6.7	3.4	189	17.4
October	0.75	7.3	3.7	186	14.9
November	0.85	8.2	3.9	192	12.0
December	0.89	9.2	4.1	188	8.9

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)
15-Jan-2015 03:00	3.37	7.1	5.9	191	0.89	HW -3	1.7	0.79	0.81
30-Dec-2015 15:30	3.14	16.7	6.5	180	1.28	HW +1	3.1	-0.18	0.37
31-Dec-2015 04:00	3.00	18.2	6.3	186	1.88	HW +1	2.8	0.32	0.61

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	-	2.33	2.11	1.85	1.41	1.10	29-Nov-2003 10:00	2.68
2004	3.08	2.32	2.11	1.91	1.60	1.26	08-Jan-2004 10:30	3.64
2005	3.24	2.53	2.10	1.80	1.41	1.11	02-Dec-2005 17:00	3.53
2006	3.03	2.48	2.28	2.06	1.71	1.39	03-Dec-2006 08:00	3.42
2007	3.23	2.59	2.33	2.08	1.72	1.41	18-Jan-2007 13:00	3.58
2008	3.36	2.64	2.35	2.07	1.69	1.35	10-Mar-2008 08:00	3.79
2009	3.06	2.59	2.39	2.11	1.69	1.38	14-Nov-2009 13:30	3.36
2010	2.93	2.26	2.03	1.72	1.36	1.08	11-Nov-2010 08:30	3.25
2011	3.35	2.17	2.01	1.78	1.53	1.27	13-Dec-2011 01:00	3.77
2012	3.01	2.4	2.23	1.99	1.58	1.28	03-Jan-2012 08:30	3.32
2013	3.16	2.31	2.09	1.85	1.51	1.20	28-Oct-2013 06:00	3.73
2014	3.91	2.95	2.65	2.25	1.77	1.47	05-Feb-2014 14:30	4.13
2015	3.06	2.44	2.27	2.05	1.76	1.47	15-Jan-2015 03:00	3.37

* i.e. 5 % of the H_s values measured in 2003 exceeded 1.41 m

Distribution plots

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

- Annual time series of H_s (red line is 2.9 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

* Tidal information is obtained from the nearest recording tide gauge (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 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	3.5	No depth limitation
2	3.7	
5	4.0	
10	4.1	
20	4.3	Depth-limited at MLWS
50	4.5	
100	4.7	

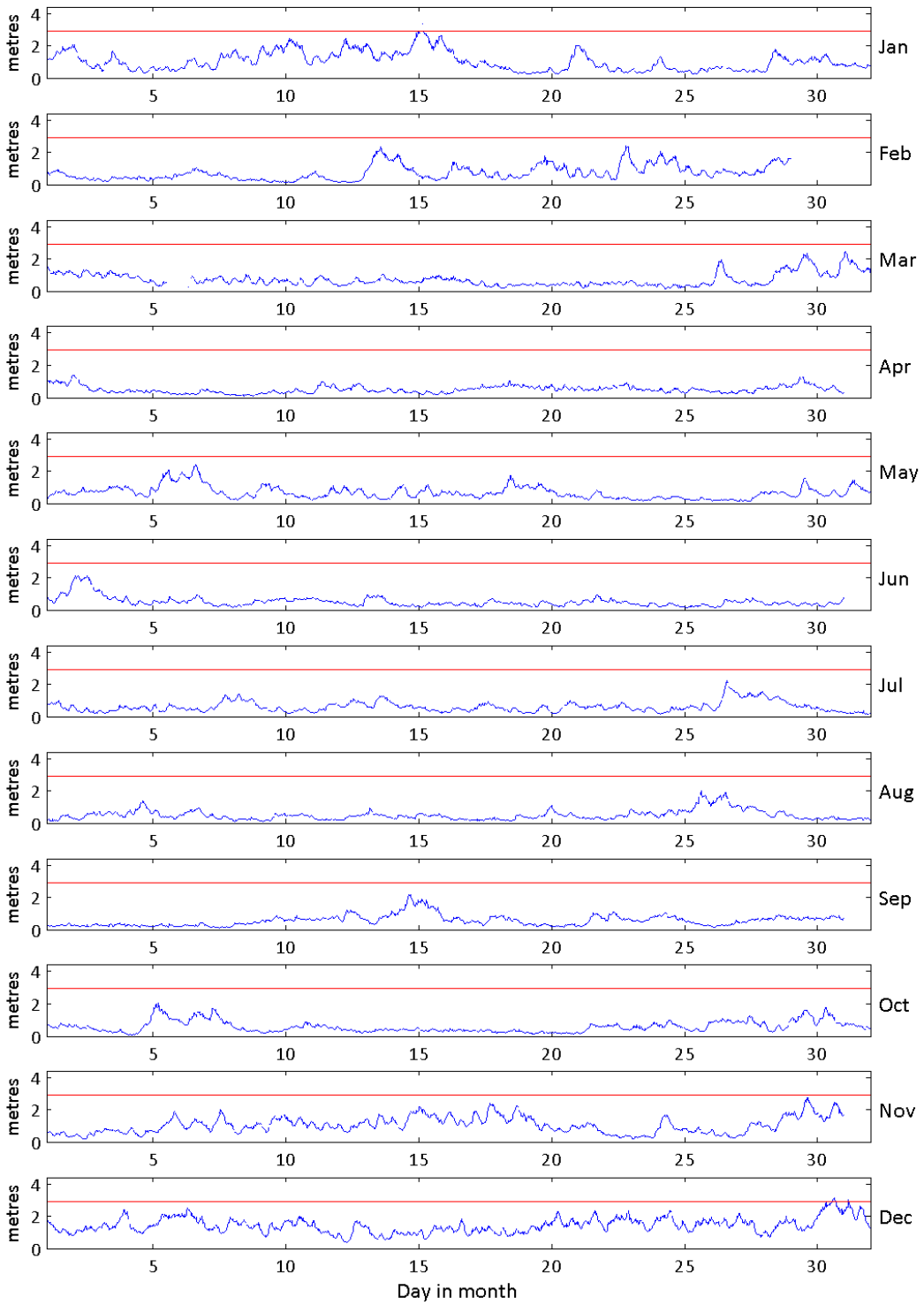
General

The buoy was first deployed on 10 July 2003, at which time the magnetic declination at the site was 2.9° west, changing by 0.14° east per year.

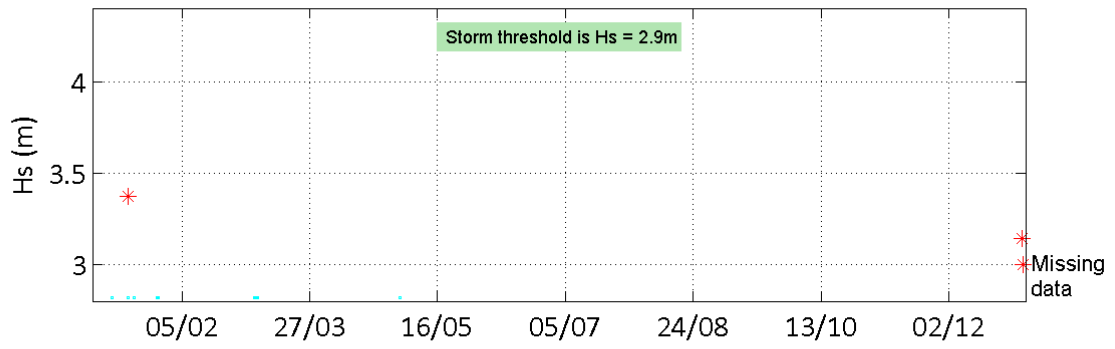
Acknowledgements

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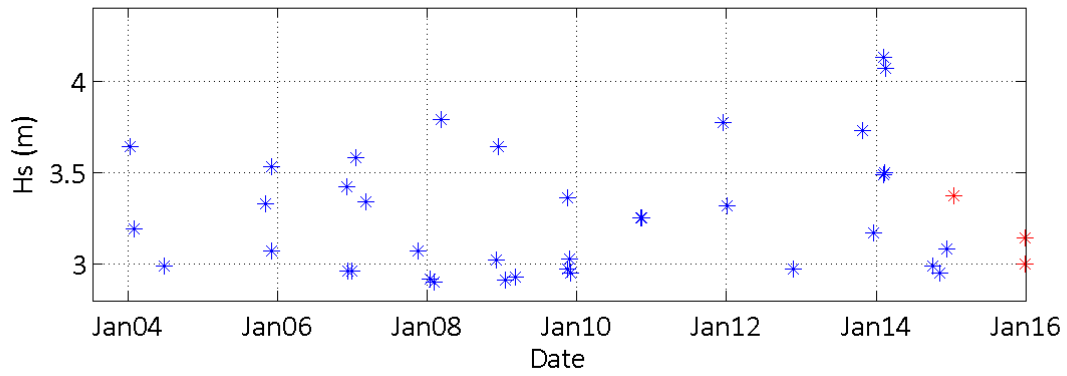
Hayling Island - Significant Wave Height (Hs) during 2015



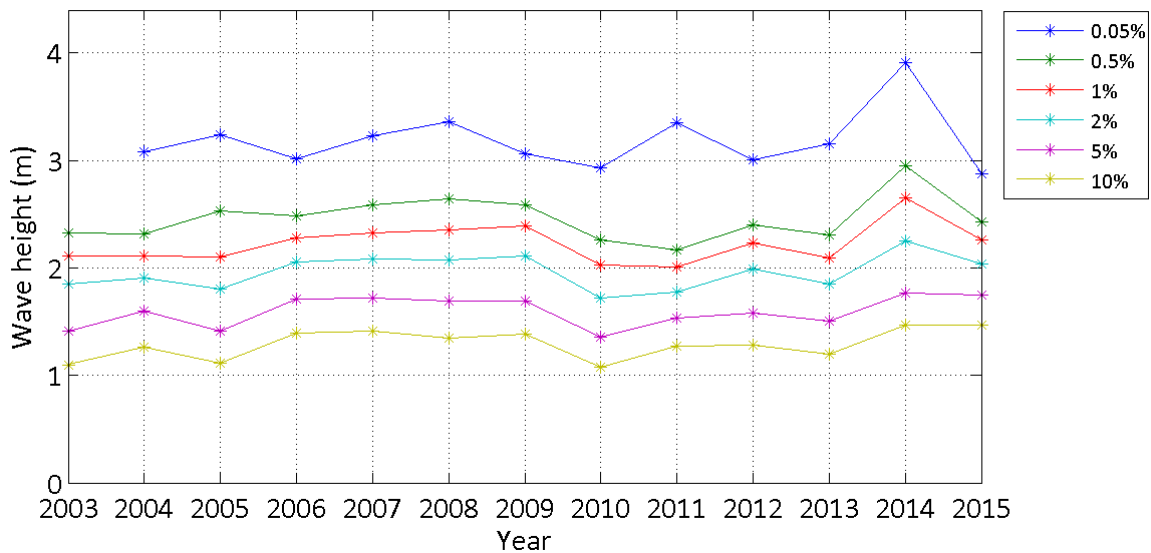
Storms at Hayling Island during 2015



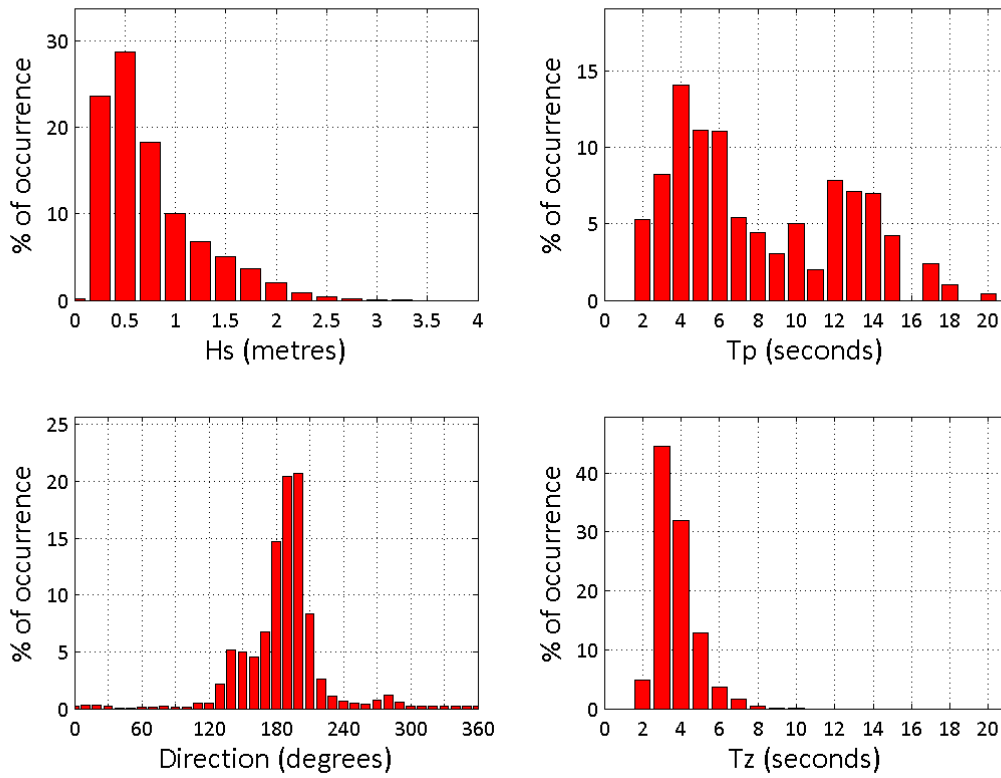
Storms at Hayling Island - all years



Hayling Island - Wave height exceedance (Hs)



Hayling Island 2015



Hayling Island 2003 to 2015 - Joint distribution (% of occurrence)

