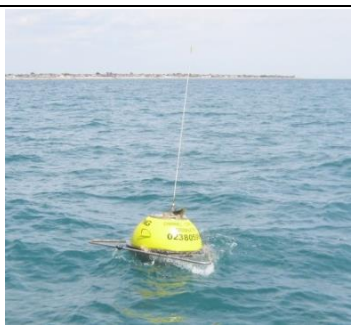



## Bracklesham Bay Directional Waverider Buoy

<b>Location</b>			
OS	482056 E 92090 N		
WGS84	Latitude: 50° 43.36' N Longitude: 00° 50.33' W		
<b>Instrument type</b>		Buoy in situ in Bracklesham Bay. Photo courtesy of Fugro EMU Limited	Location of buoy (Google mapping)
Datawell Directional Waverider Mk III			
<b>Water depth</b>	~10m CD		

### Data Quality

Recovery rate (%)	Sample interval
97	30 minutes

### Monthly Averages - 2015

*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	1.24	8.5	4.7	208	7.9	30
February	0.75	8.7	4.2	201	5.9	27
March	0.79	9.5	4.3	203	7.6	30
April	0.52	8.1	3.9	199	10.4	29
May	0.78	6.4	3.8	208	12.8	30
June	0.56	6.1	3.5	204	15.7	29
July	0.74	6.5	3.7	214	18.2	30
August	0.56	5.9	3.6	210	18.3	30
September	0.60	5.5	3.5	202	16.8	29
October	0.56	7.1	3.7	199	14.3	30
November	1.30	7.9	4.4	209	12.7	29
December	1.62	8.7	4.9	205	11.3	30

### Monthly Averages - All Years (August 2008 – December 2015)

Month	H <sub>s</sub> (m)	T <sub>p</sub> (s)	T <sub>z</sub> (s)	Dir. (°)	SST (°C)
January	0.99	9.2	4.5	204	6.9
February	0.86	10.1	4.5	205	6.1
March	0.61	8.9	4.1	201	7.4
April	0.57	8.1	4.0	201	10.1
May	0.60	6.5	3.7	209	12.9
June	0.56	6.5	3.6	204	15.9
July	0.61	6.0	3.6	214	18.3
August	0.62	5.9	3.5	215	18.6
September	0.62	6.6	3.6	205	17.1
October	0.81	7.3	4.0	207	14.9
November	1.02	8.2	4.3	206	11.9
December	1.06	8.2	4.4	208	8.6

## 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)
15-Jan-2015 05:00	3.66	10.5	6.8	212	1.33	HW -1	1.7	0.21	0.81
29-Nov-2015 13:30	3.54	10.0	6.2	205	2.16	HW	3.8	0.18	0.32
31-Mar-2015 02:30	3.45	9.1	6.3	203	-0.82	HW -6	2.0	0.15	0.28
29-Mar-2015 12:30	3.36	10.0	6.0	207	-0.25	HW +6	1.4	0.63	0.63
30-Dec-2015 13:30	3.33	11.1	6.6	197	1.66	HW	2.7	0.16	0.53

## 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	-	2.83	2.51	2.25	1.90	1.56	09-Nov-2008 23:00	3.28
2009	3.60	2.97	2.70	2.37	1.96	1.58	23-Nov-2009 13:00	3.83
2010	3.15	2.56	2.23	1.85	1.47	1.17	31-Mar-2010 09:30	3.46
2011	3.32	2.59	2.39	2.13	1.76	1.50	13-Dec-2011 00:00	3.64 <sup>+</sup>
2012	3.42	2.80	2.58	2.31	1.90	1.52	03-Jan-2012 09:00	3.67
2013	3.79	2.98	2.71	2.41	1.93	1.50	24-Dec-2013 02:00	4.13
2014	4.03	3.21	2.88	2.55	2.10	1.70	15-Feb-2014 00:00	4.47 <sup>+</sup>
2015	3.42	2.86	2.71	2.52	2.14	1.77	15-Jan-2015 05:00	3.66

\* i.e. 5 % of the H<sub>s</sub> values measured in 2008 exceeded 1.90 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.

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\* 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<sub>s</sub>. The maximum tidal surge is the largest surge during the storm event.

## Distribution plots

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

- Annual time series of  $H_s$  (red line is 3.3 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

## 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	3.9	No depth limitation
2	4.1	
5	4.3	Depth-limited at MLWS
10	4.5	
20	4.6	
50	4.9	

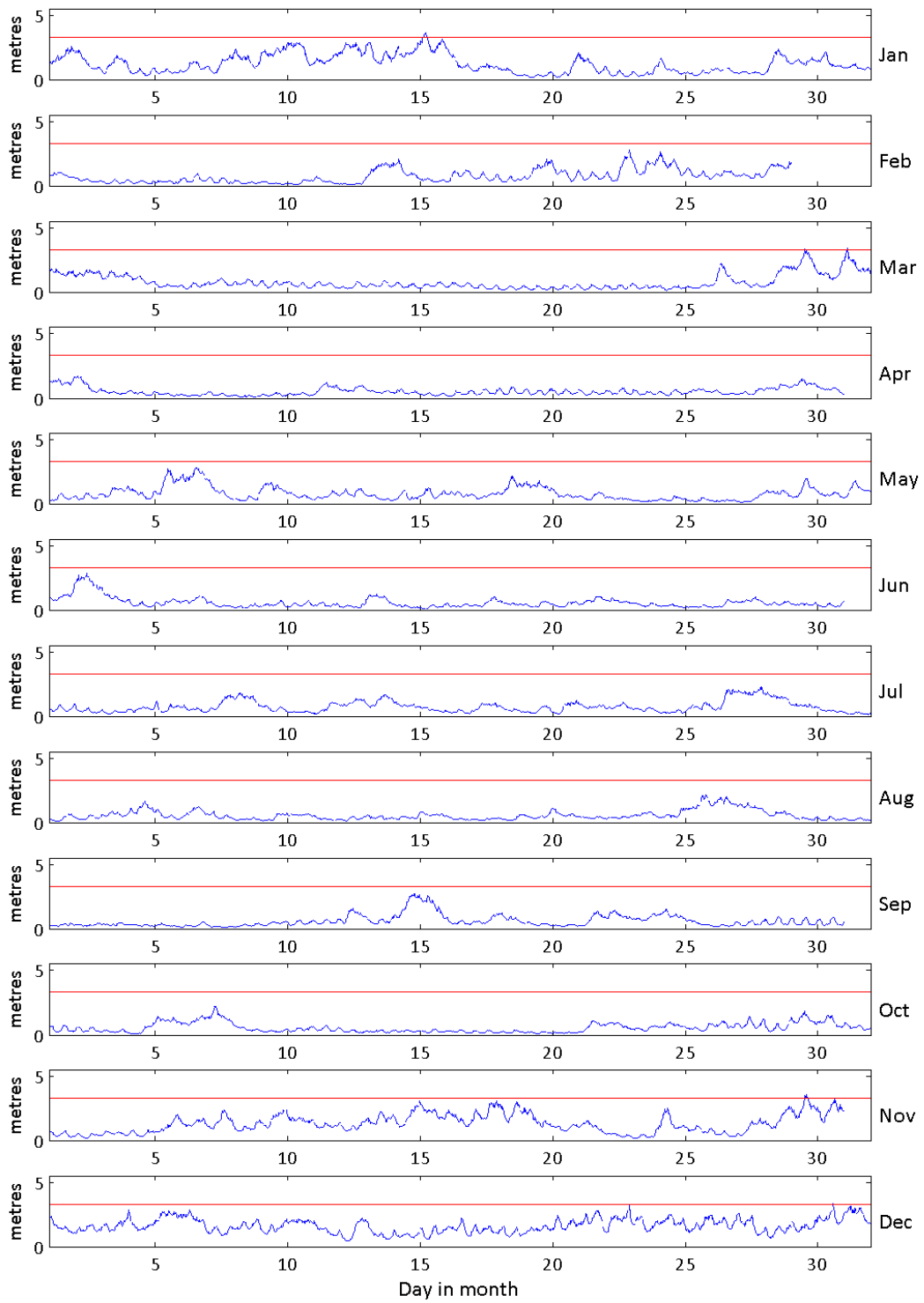
## General

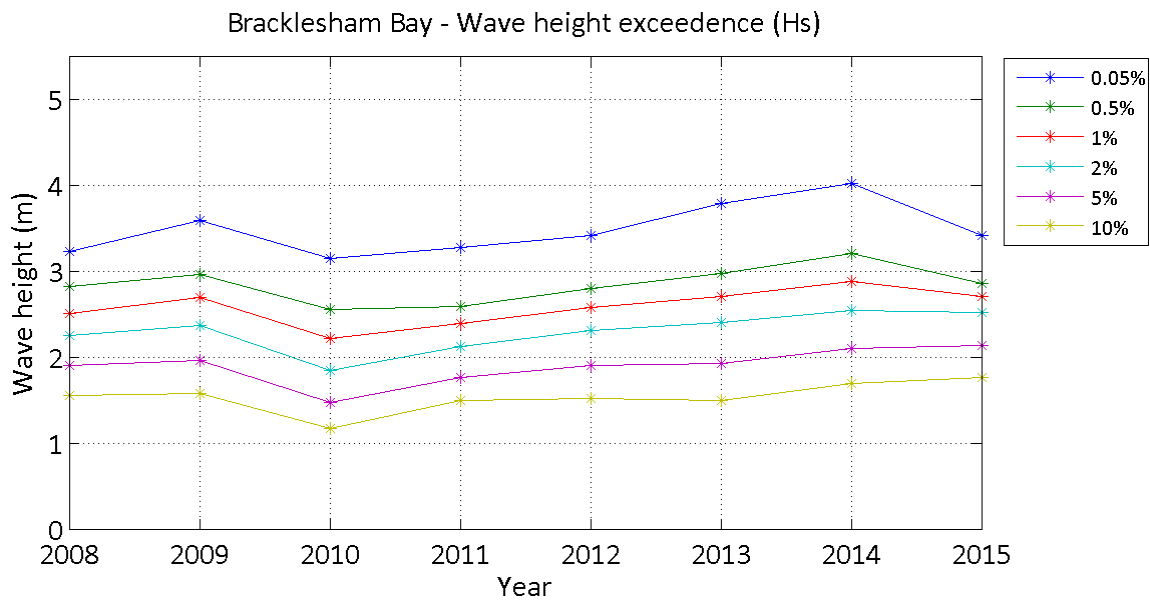
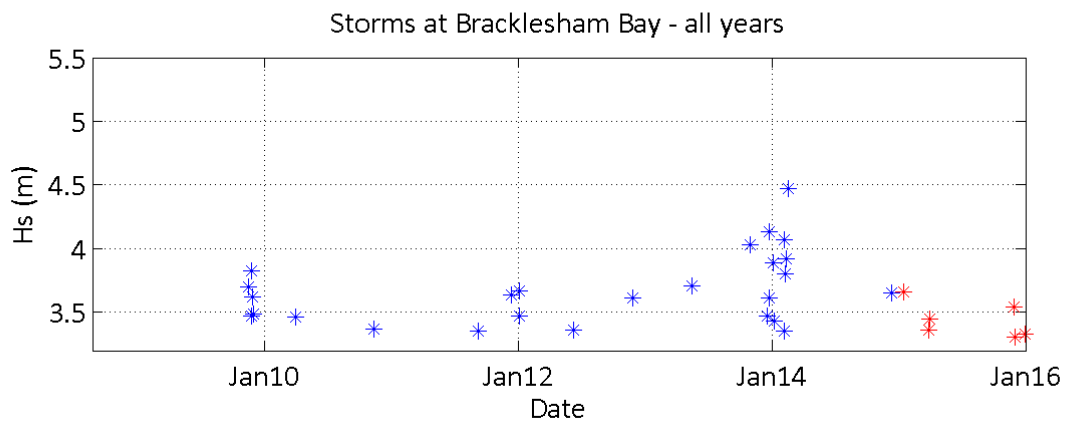
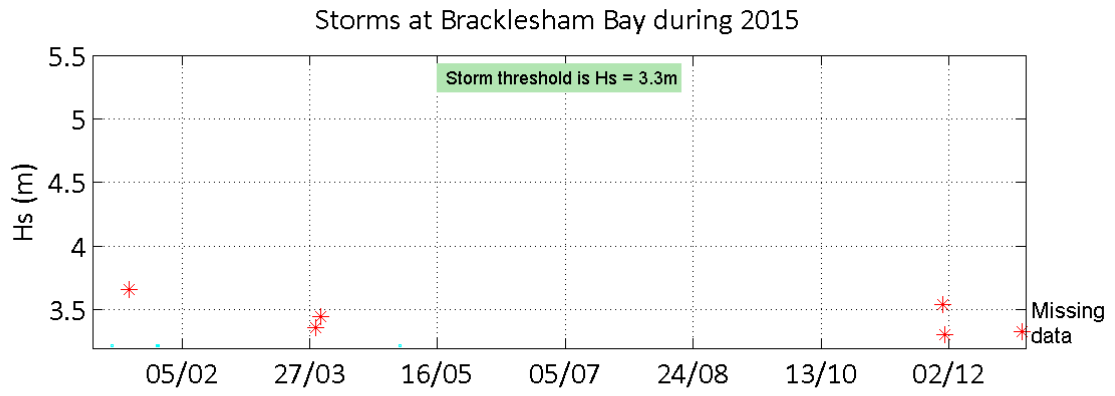
The buoy was first deployed on 22 August 2008, at which time the magnetic declination at the site was 2.1° west, changing by 0.14° east per year.

## Acknowledgements

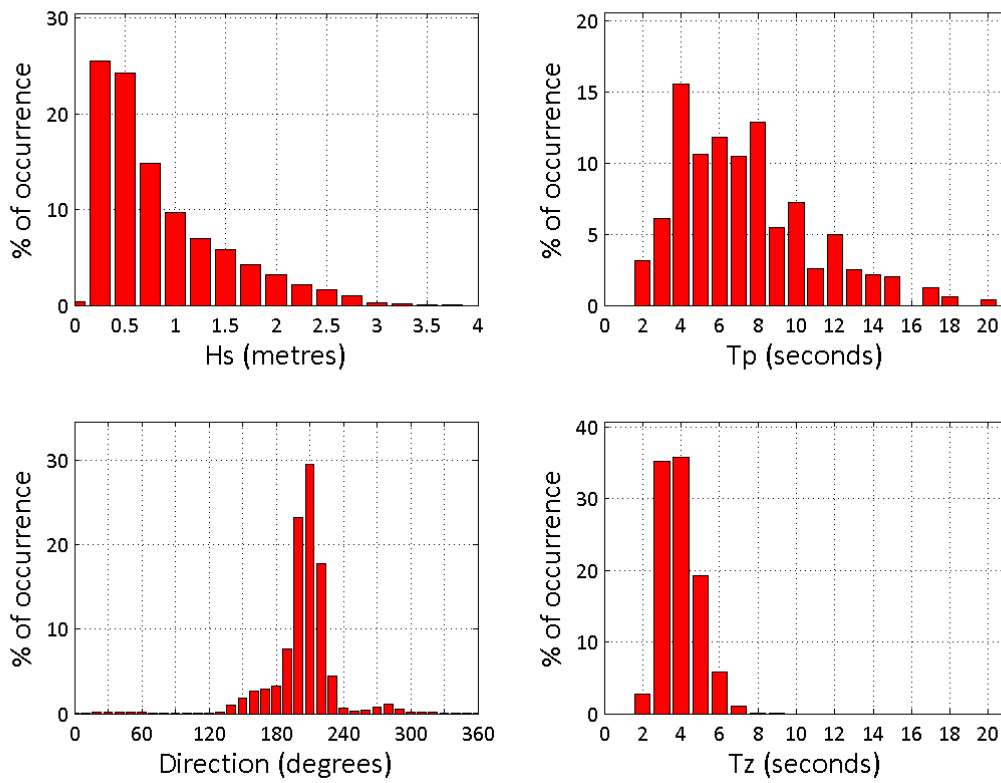
The shore station is kindly hosted by Fugro EMU Limited. Tidal data were supplied by the British Oceanographic Data Centre as part of the function of the National Tidal and Sea Level Facility, hosted by the Proudman Oceanographic Laboratory and funded by DEFRA and the Natural Environment Research Council.

### Bracklesham Bay - Significant Wave Height (Hs) during 2015

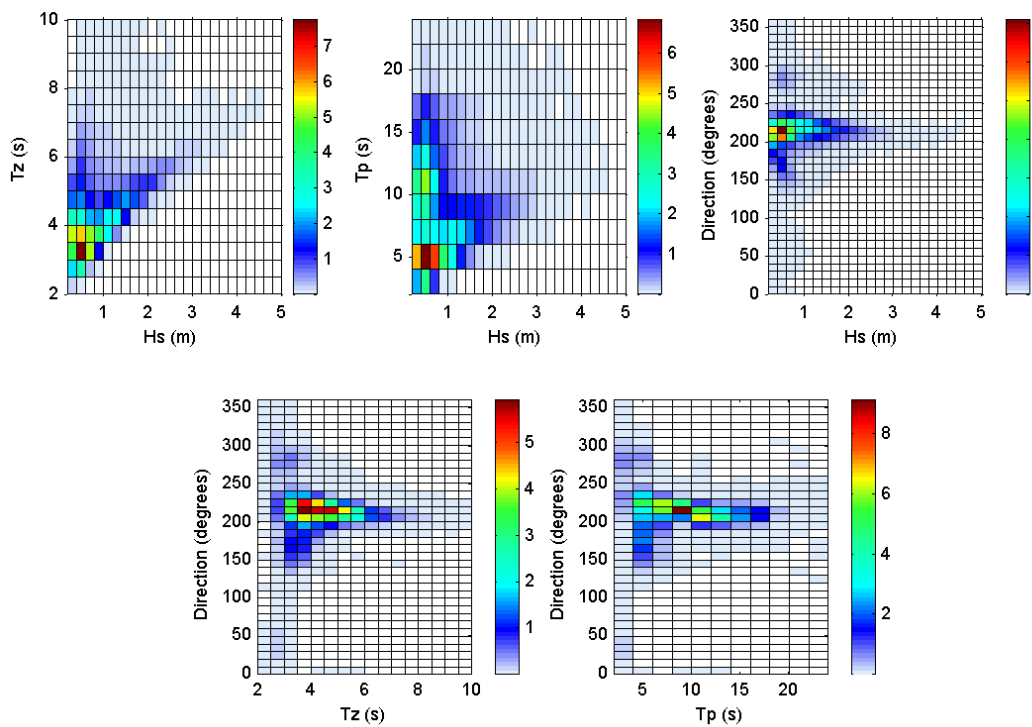




Bracklesham Bay 2015



Bracklesham Bay 2008 to 2015 - Joint distribution (% of occurrence)



Offshore Wave Hs (m)  
Bracklesham Bay WB : 22/08/2008 - 31/12/2015

