


Weymouth Directional Waverider Buoy

Location			
OS	370856 E 80452 N		
WGS84	Latitude: 50° 37.38' N Longitude: 02° 24.80' W		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~10 m CD	Buoy in situ in Weymouth Bay. 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	0.58	7.3	4.2	166	9.4	31
February	0.49	8.3	4.3	153	7.7	28
March	0.44	7.3	3.9	157	8.1	31
April	0.38	6.6	3.6	151	10.0	30
May	0.46	5.7	3.6	159	12.0	31
June	0.37	5.4	3.5	154	14.4	30
July	0.39	5.5	3.5	163	16.7	25
August	0.36	5.4	3.5	157	17.3	31
September	0.46	5.3	3.7	149	16.7	29
October	0.51	6.3	3.9	144	15.1	30
November	0.61	6.4	3.9	167	13.6	30
December	0.95	7.1	4.0	164	12.1	30

Monthly Averages - All Years (December 2006 – December 2015)

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)
January	0.64	7.8	4.2	157	8.7
February	0.57	8.5	4.2	155	7.8
March	0.46	7.1	3.9	154	8.2
April	0.41	6.5	3.7	150	9.8
May	0.39	5.6	3.6	155	12.0
June	0.36	5.7	3.6	155	14.6
July	0.35	5.4	3.5	162	16.7
August	0.36	5.3	3.5	160	17.5
September	0.40	5.7	3.6	154	17.1
October	0.53	6.3	3.8	155	15.5
November	0.58	6.6	4.0	157	13.1
December	0.62	7.2	4.1	157	10.3

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 11:30	2.72	11.1	5.9	167	-	HW +2	~1.6	-	-

Annual Statistics

Year	Annual H _s exceedance* (m)						Annual Maximum H _s	
	0.05%	0.5%	1%	2%	5%	10%	Date	A _{max} (m)
2007	2.29	1.72	1.43	1.24	1.03	0.85	18-Nov-2007 13:30	2.56
2008	2.57	1.95	1.75	1.46	1.10	0.89	03-Feb-2008 13:00	2.74
2009	2.17	1.75	1.63	1.48	1.18	0.90	13-Nov-2009 23:30	2.62
2010	2.54	1.84	1.54	1.29	1.00	0.81	17-Nov-2010 10:00	2.81
2011	2.16	1.77	1.54	1.26	1.03	0.85	24-Oct-2011 00:00	2.30
2012	2.82	1.81	1.60	1.38	1.08	0.86	30-Apr-2012 05:00	3.34
2013	2.47	1.89	1.66	1.47	1.20	0.97	18-Dec-2013 20:30	2.70
2014	3.17	2.30	1.97	1.65	1.28	0.99	05-Feb-2014 00:30	4.02 ⁺
2015	2.43	1.71	1.52	1.31	1.11	0.95	30-Dec-2015 11:30	2.72

* i.e. 5 % of the H_s values measured in 2007 exceeded 1.03 m

*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.

Distribution plots

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

- Annual time series of H_s (red line is 2.25 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 Weymouth). 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	2.9	No depth limitation
2	3.2	
5	3.4	
10	3.7	
20	3.9	
50	4.1	Depth-limited on MLWS

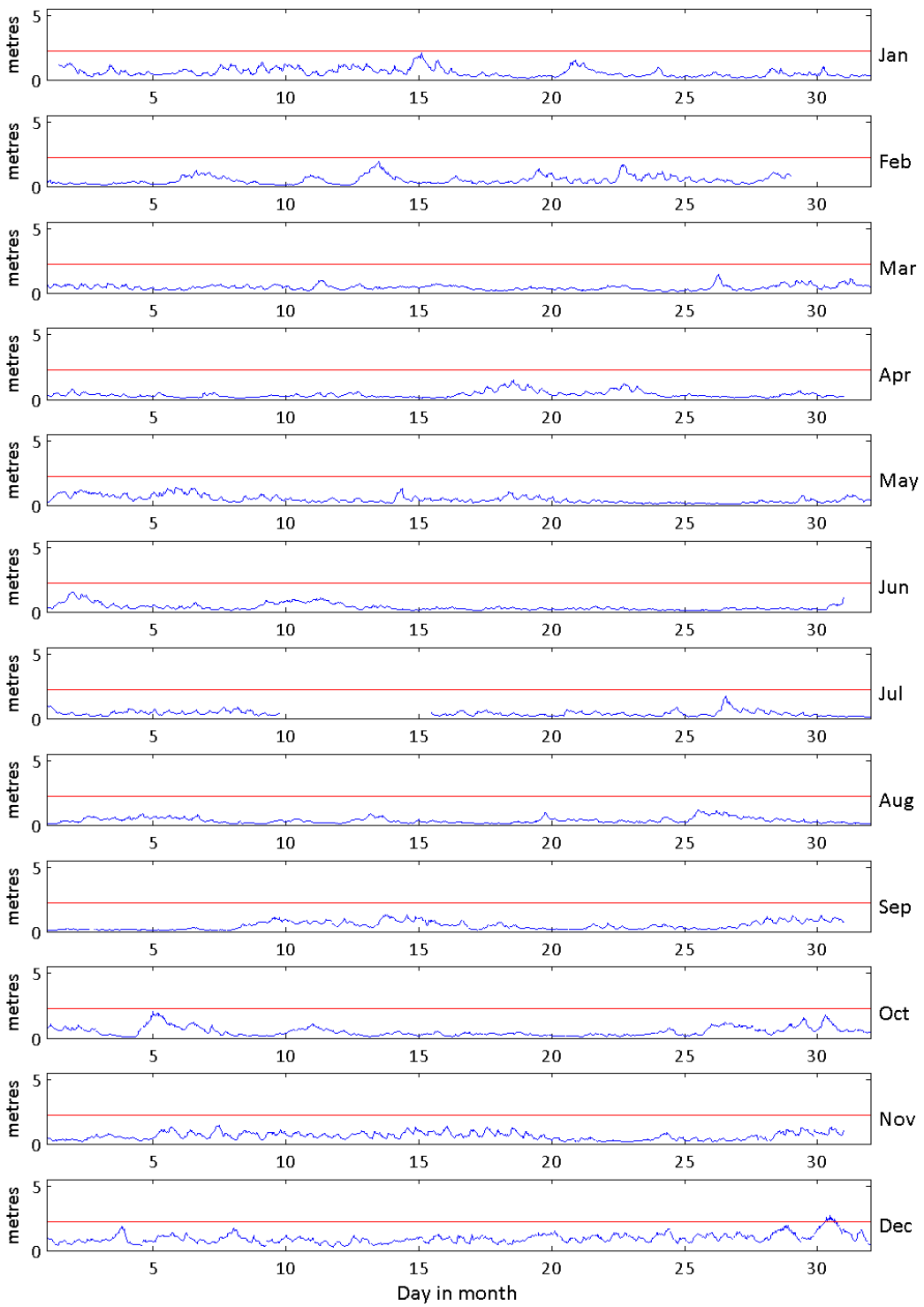
General

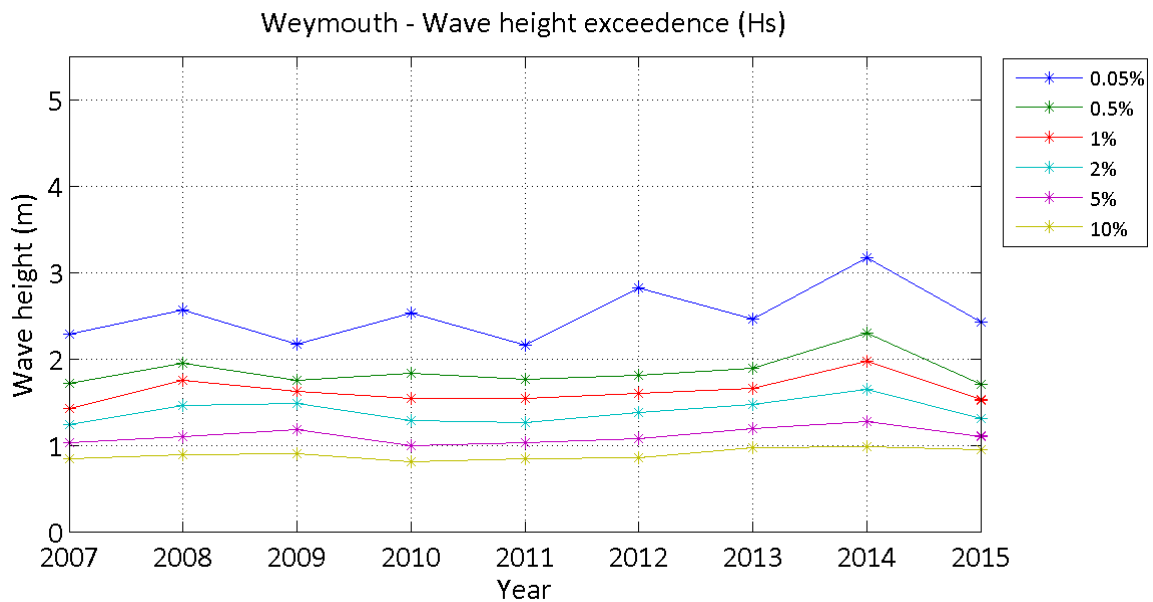
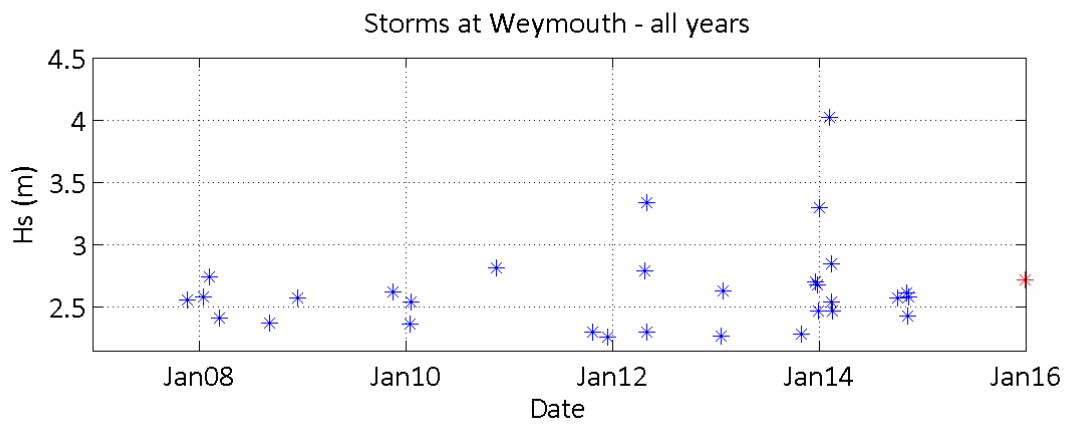
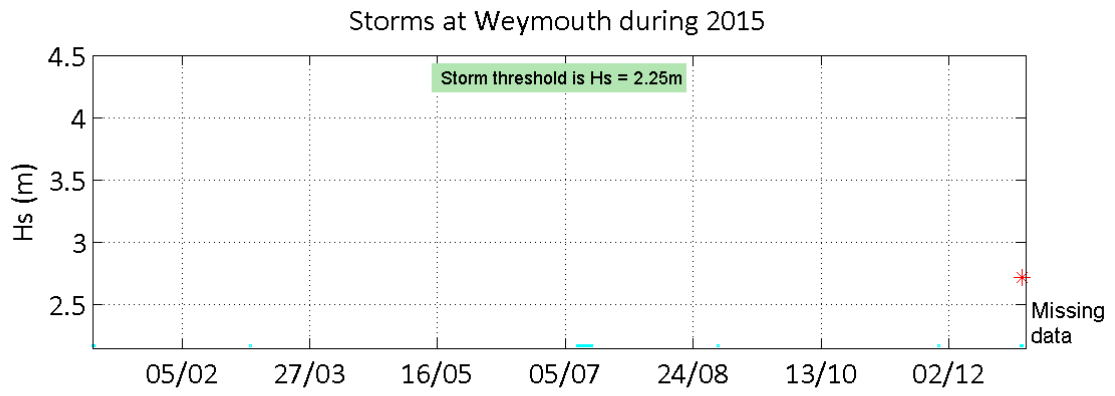
The buoy was first deployed on 18 December 2006, at which time the magnetic declination at the site was 2.9° west, changing by 0.15° east per year.

Acknowledgements

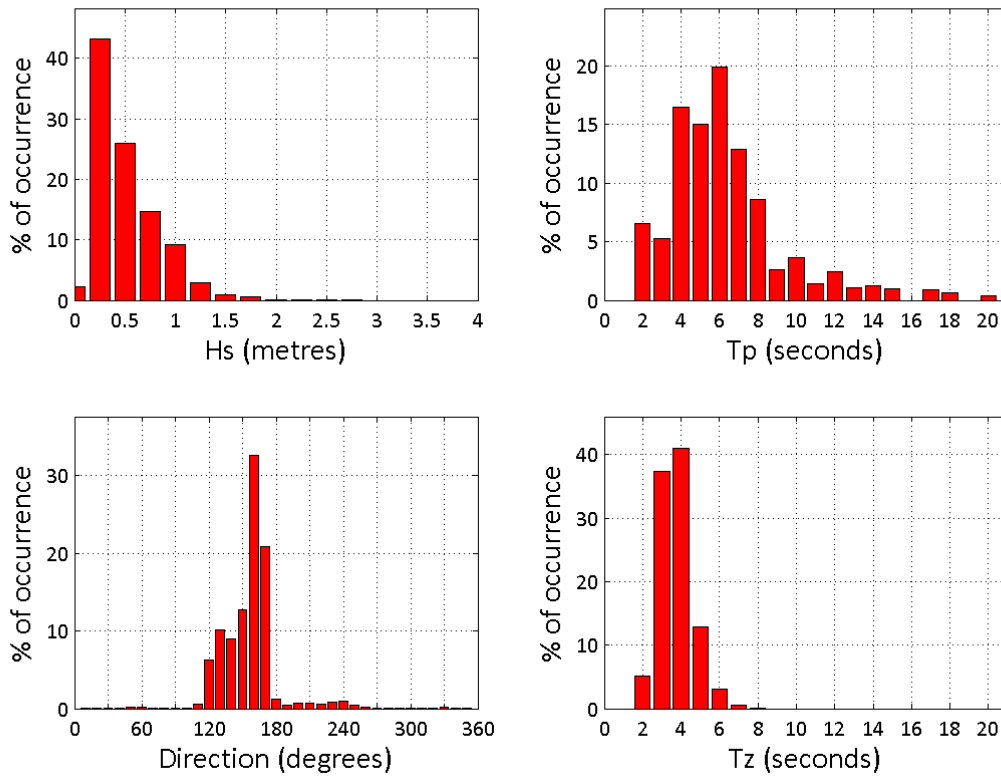
The shore station is kindly hosted by the Weymouth and Portland National Sailing Academy. Tidal data were supplied by the British Oceanographic Data Centre as part of the function of the National Tidal and Sea Level Facility, hosted by the Proudman Oceanographic Laboratory and funded by DEFRA and the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

Weymouth - Significant Wave Height (Hs) during 2015

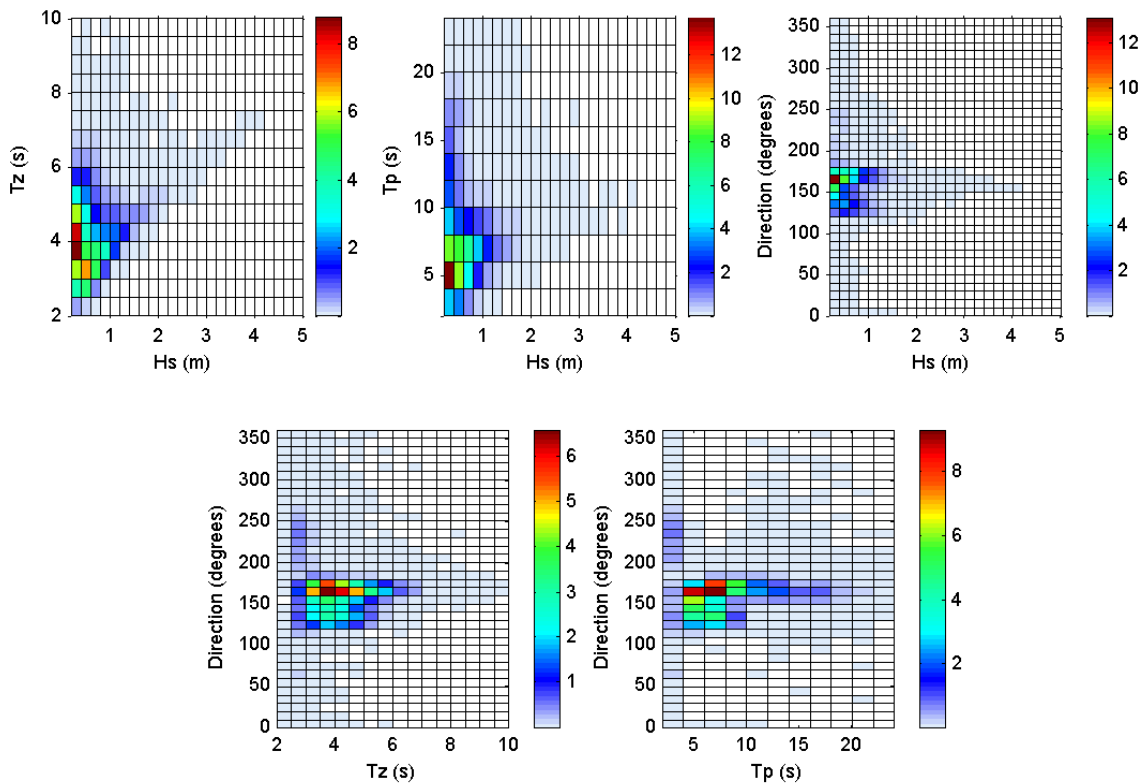




Weymouth 2015



Weymouth 2006 to 2015 - Joint distribution (% of occurrence)



Offshore Wave Hs (m)

Weymouth WB : 18/12/2006 - 31/12/2015

