



Whitby Directional Waverider Buoy

Location			
OS	490239 E 513067 N		
WGS84	Latitude: 54° 30.29' N Longitude: 00° 36.48' W		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~17m CD	Buoy in situ off Whitby beach. Photo courtesy of Fugro EMU Limited	Location of buoy (Google mapping)

Data Quality

Recovery rate (%)	Sample interval
76	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	1.08	10.5	4.9	107	6.8	31
February	1.22	10.9	5.3	60	5.9	28
March	0.95	8.9	4.5	103	6.1	31
April	0.79	9.6	5.0	54	7.4	30
May	1.08	8.1	5.0	65	8.6	11
June	-	-	-	-	-	0
July	1.33	7.5	5.1	35	13.0	8
August	0.61	6.4	4.2	81	13.4	31
September	1.11	7.2	4.8	74	13.5	30
October	0.73	7.5	4.7	107	12.6	18
November	0.85	8.9	4.4	106	10.9	30
December	0.83	10.0	4.7	79	9.0	31

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)
21-Nov-2015 07:30	6.68 ⁺	12.5	8.3	14	-	HW -4	~3.1	-	-
01-Feb-2015 02:30	5.69	11.8	7.8	11	2.16	HW	2.7	0.31	0.63
04-Sep-2015 07:00	3.98	9.1	6.3	24	2.78	HW -1	4.2	0.29	0.46
03-Sep-2015 18:30	3.92	10.5	6.5	27	2.52	HW -1	4.4	0.25	0.46
05-Sep-2015 20:30	3.85	10.0	6.9	27	2.11	HW -1	3.0	0.29	0.51

Annual Statistics

Year	Annual H _s exceedance* (m)						Annual Maximum H _s	
	0.05%	0.5%	1%	2%	5%	10%	Date	A _{max} (m)
2013	-	4.76	4.43	3.93	2.98	2.19	10-Oct-2013 20:00	6.26
2014	3.74	3.16	2.81	2.53	2.12	1.75	14-Oct-2014 05:30	4.10
2015	5.60	4.06	3.45	2.97	2.21	1.75	21-Nov-2015 07:30	6.68 ⁺

* i.e. 5 % of the H_s values measured in 2013 exceeded 2.98 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/tables of:

- Annual time series of H_s (red line is 3.25m 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

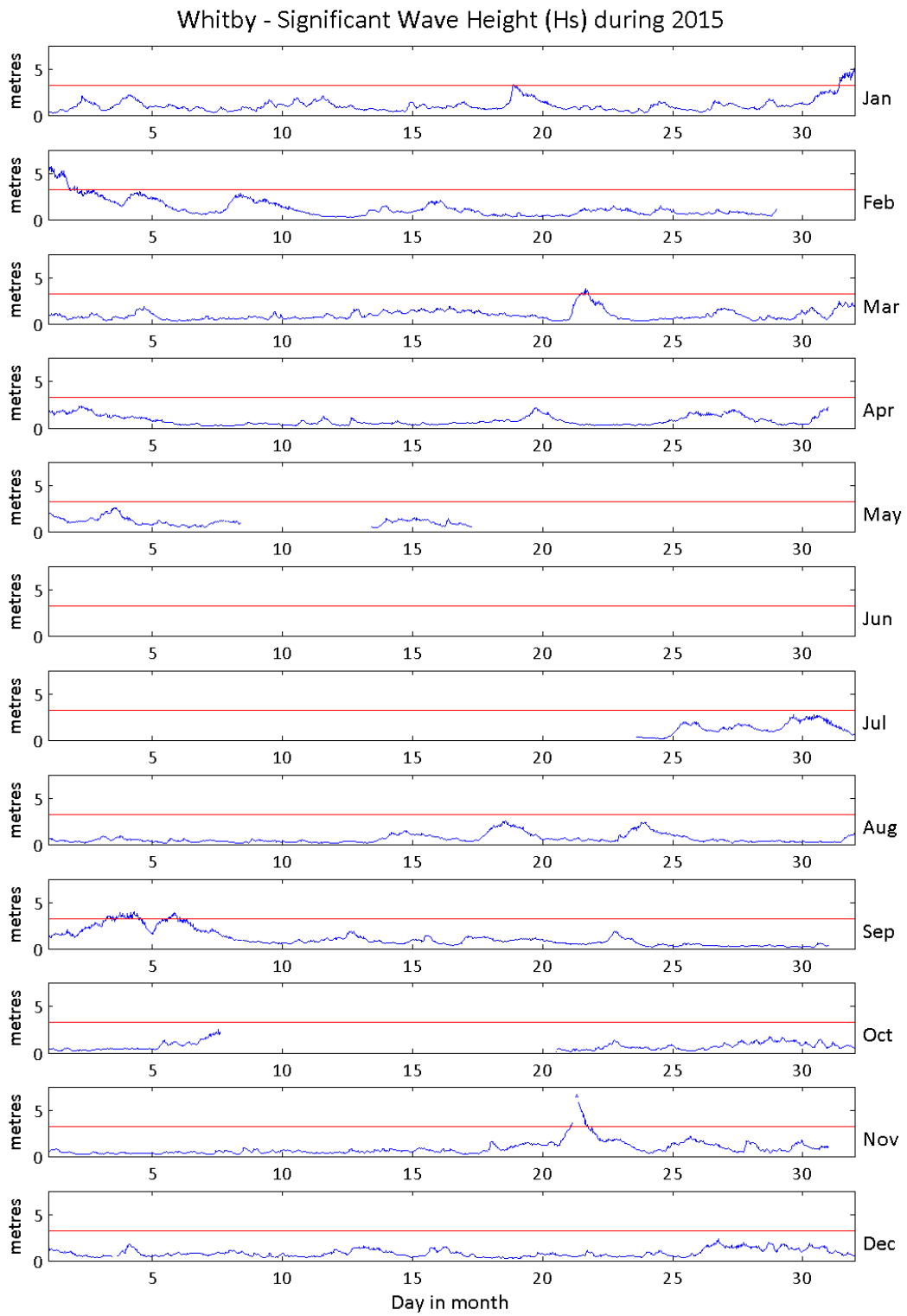
* Tidal information is obtained from the nearest recording tide gauge (the National Network gauge at Whitby). The surge shown is the residual at the time of the highest H_s. The maximum tidal surge is the largest positive surge during the storm event.

General

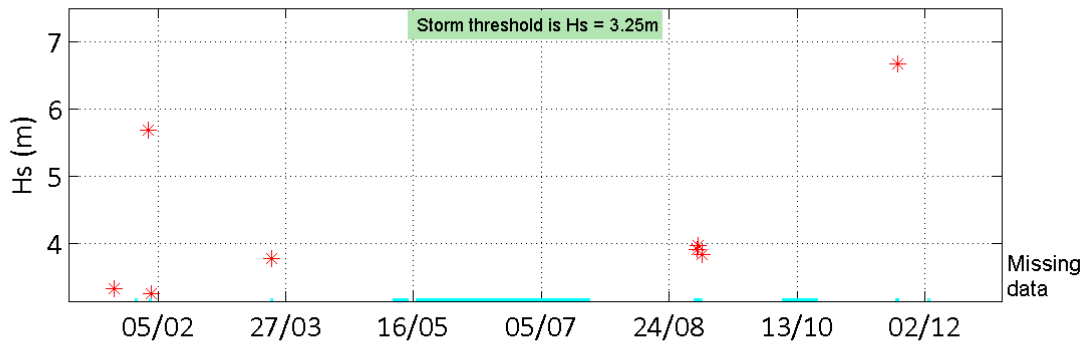
The buoy was deployed on 18 January 2013, at which time the magnetic declination at the site was 1.8° west, changing by 0.18° east per year. A DWR had previously been deployed at this location from 20 May 2010 to 04 February 2011.

Acknowledgements

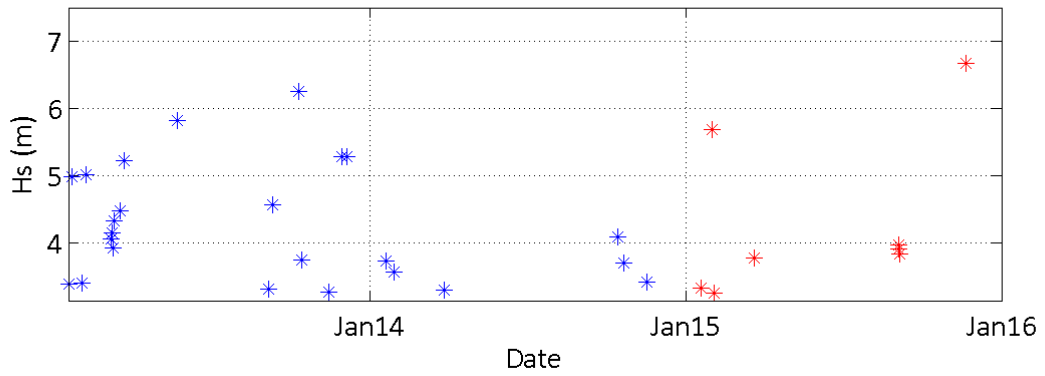
Tidal data were supplied by the British Oceanographic Data Centre as part of the function of the National Tidal and Sea Level Facility, hosted by the Proudman Oceanographic Laboratory and funded by DEFRA and the Natural Environment Research Council.



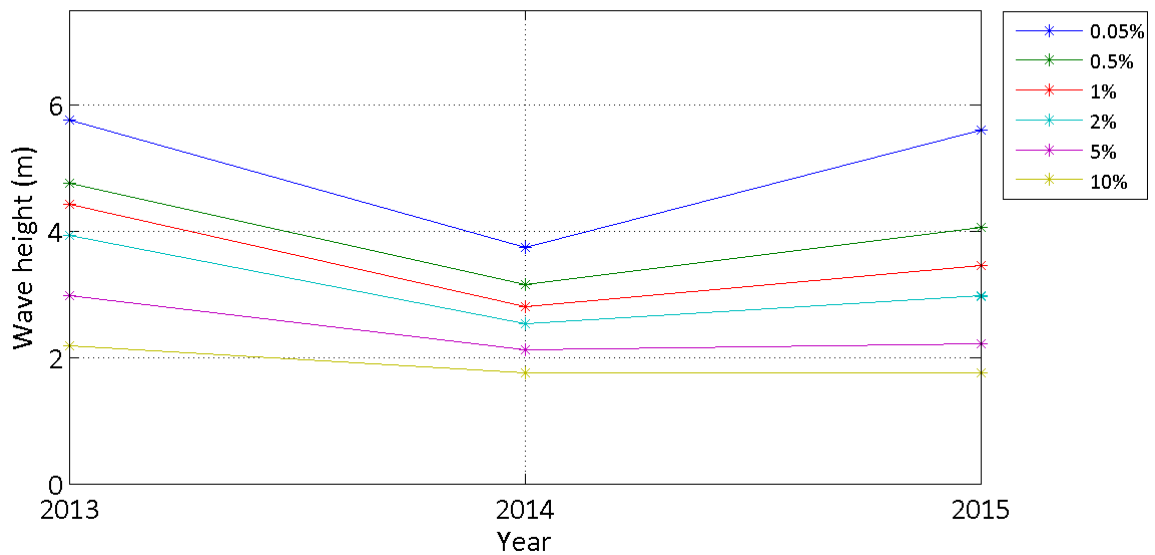
Storms at Whitby during 2015



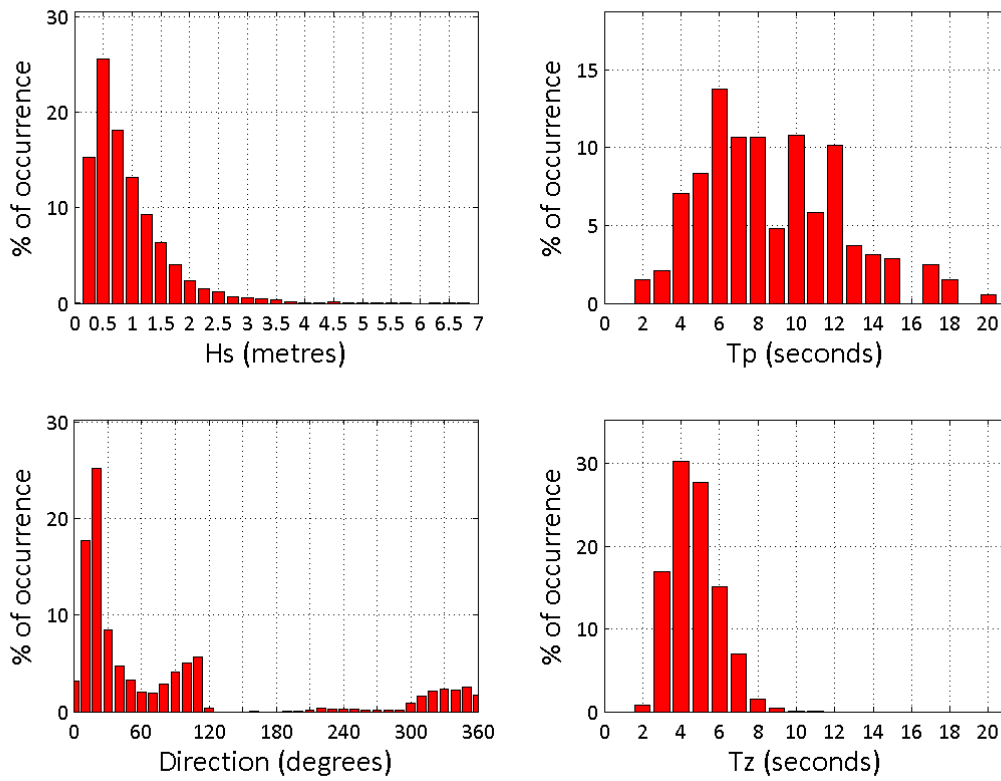
Storms at Whitby - all years



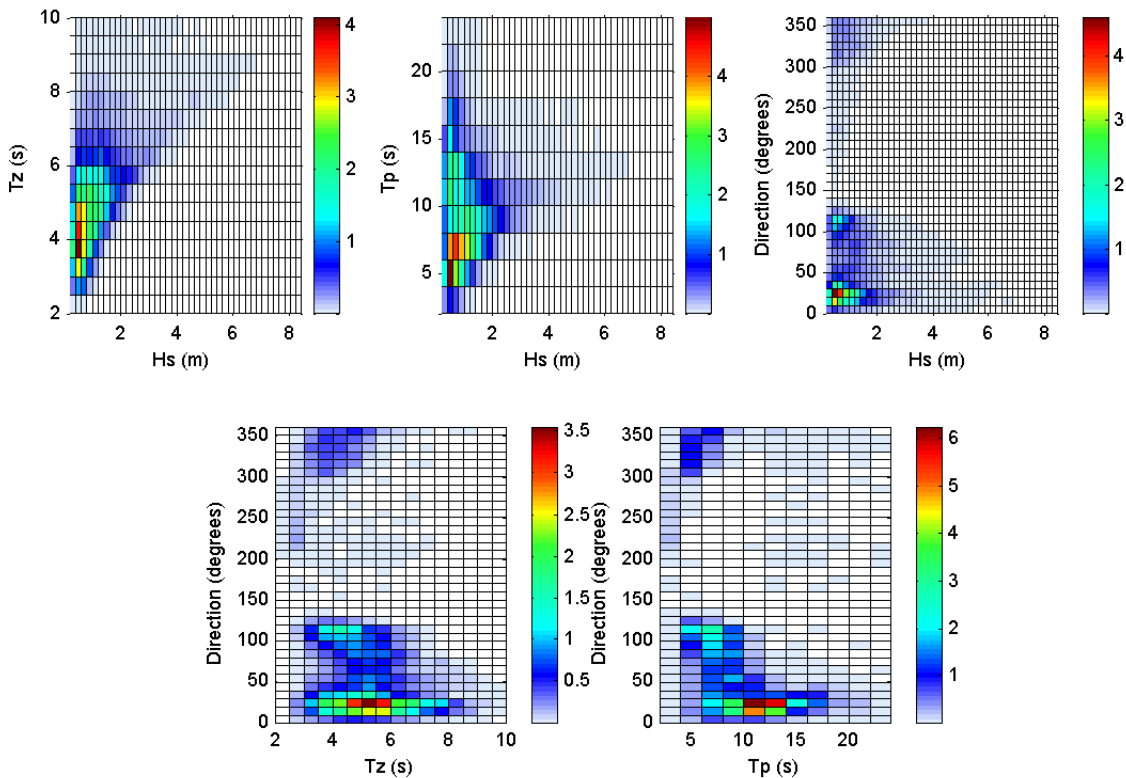
Whitby - Wave height exceedance (Hs)



Whitby 2015



Whitby 2013 to 2015 - Joint distribution (% of occurrence)



Offshore Wave Hs (m)
Whitby WB : 18/01/2013 - 31/12/2015

