



Scarborough Directional Waverider Buoy

Location			
OS	509540 E 490003 N		
WGS84	Latitude: 54° 17.64' N Longitude: 00° 19.11' W		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~19m CD	Buoy in situ off Scarborough beach. Photo courtesy of Fugro EMU Limited	Location of buoy (Google mapping)

Data Quality

Recovery rate (%)	Sample interval
73	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	1.16	9.4	4.6	119	7.2	31
February	1.31	10.1	4.8	68	6.2	28
March	1.01	8.1	4.3	120	6.1	31
April	-	-	-	-	-	0
May	0.65	8.2	4.0	122	9.3	18
June	-	-	-	-	-	0
July	1.39	7.5	5.1	37	12.9	9
August	0.67	6.3	4.0	90	13.3	30
September	1.16	7.2	4.8	70	13.2	30
October	1.03	7.0	4.5	95	13.0	31
November	0.99	7.9	4.1	107	11.3	30
December	1.04	8.3	4.3	99	9.2	30

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 07:00	6.70	10.0	8.2	4	-	HW -5	~3.2	-	-
01-Feb-2015 13:00	5.50	10.0	7.5	3	1.44	HW -2	3.1	0.30	0.53
04-Sep-2015 07:30	4.18	10.0	6.6	21	2.77	HW	4.4	0.16	0.25
03-Sep-2015 18:30	3.97	9.1	6.7	10	2.20	HW -1	4.6	0.13	0.33
05-Sep-2015 20:00	3.82	11.1	6.9	16	1.61	HW -1	3.1	0.18	0.34

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	-	4.93	4.46	3.76	2.89	2.12	10-Oct-2013 20:30	6.03
2014	3.91	3.16	2.95	2.63	2.22	1.84	14-Oct-2014 04:30	4.45
2015	6.17	4.35	3.57	3.12	2.31	1.81	21-Nov-2015 07:00	6.70

* i.e. 5 % of the H_s values measured in 2013 exceeded 2.89 m

Distribution plots

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

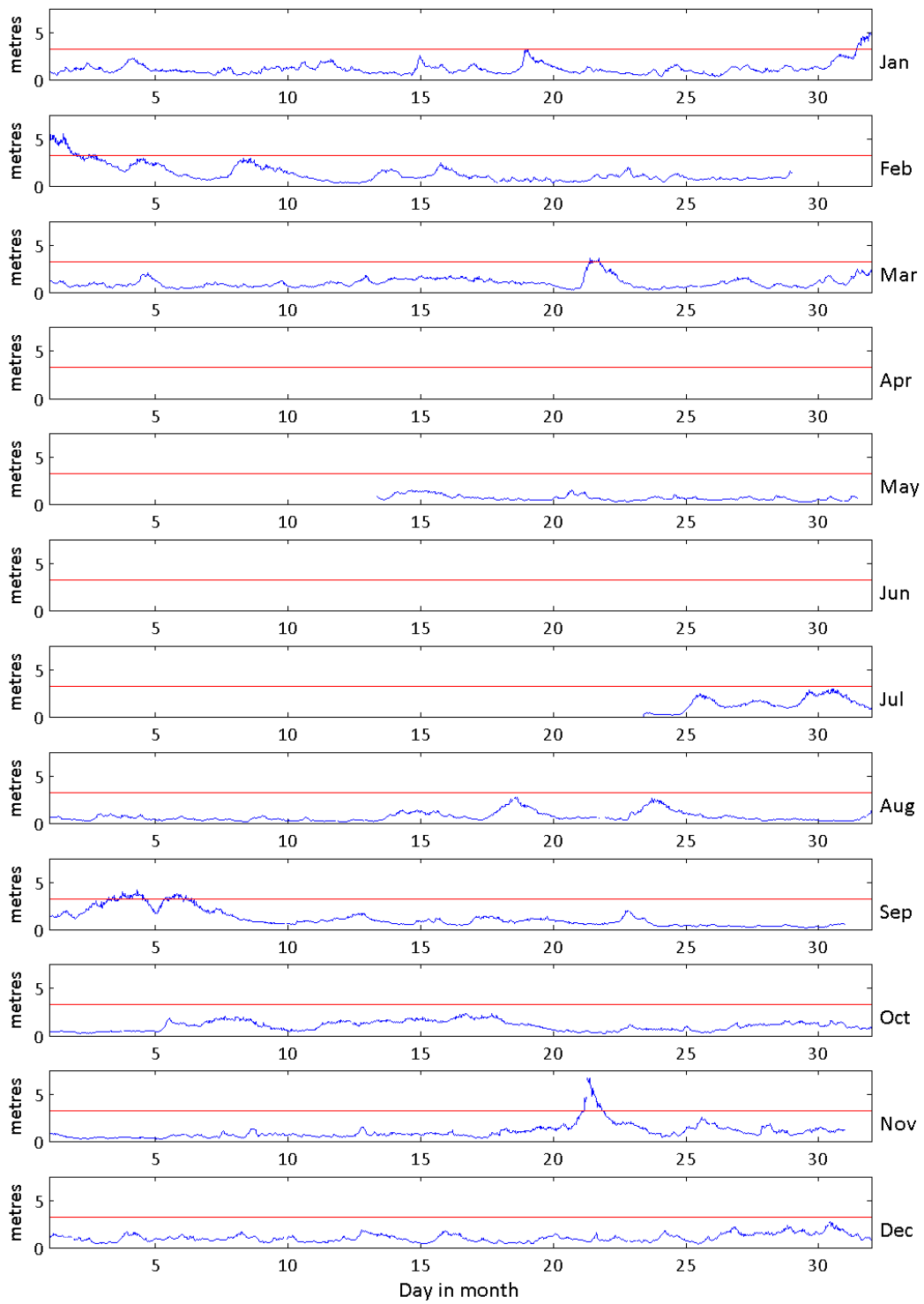
- Annual time series of H_s (red line is 3.25 m storm threshold)
- Incidence of storm waves for 2015. Storm events are defined using the Peaks-over-Threshold method. The highest H_s of each storm event is shown
- Wave height exceedance each year since deployment
- Percentage of occurrence of H_s, T_p, 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

General

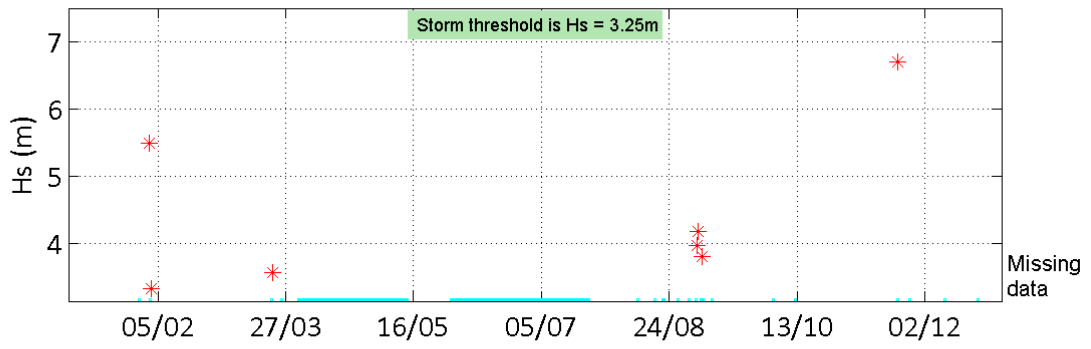
The buoy, owned by Scarborough Borough Council, was deployed on 18 January 2013, at which time the magnetic declination at the site was 1.66° west, changing by 0.18° east per year.

* Tidal information is obtained from the nearest recording tide gauge (the tide gauge at Scarborough). 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.

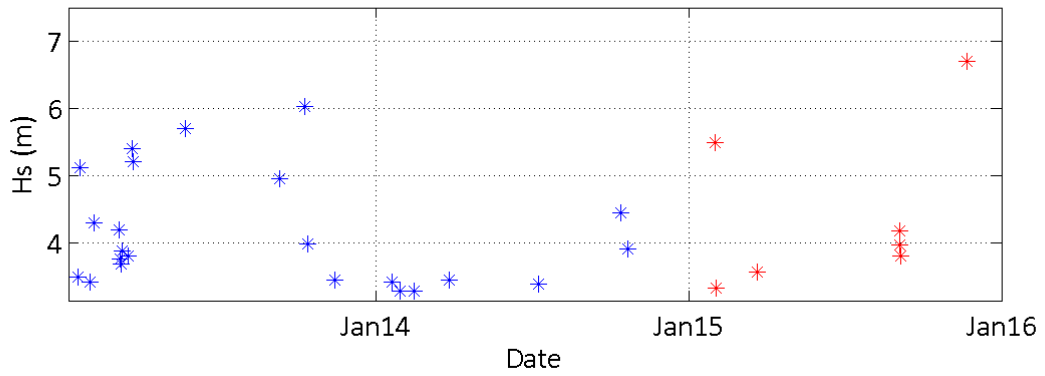
Scarborough - Significant Wave Height (Hs) during 2015



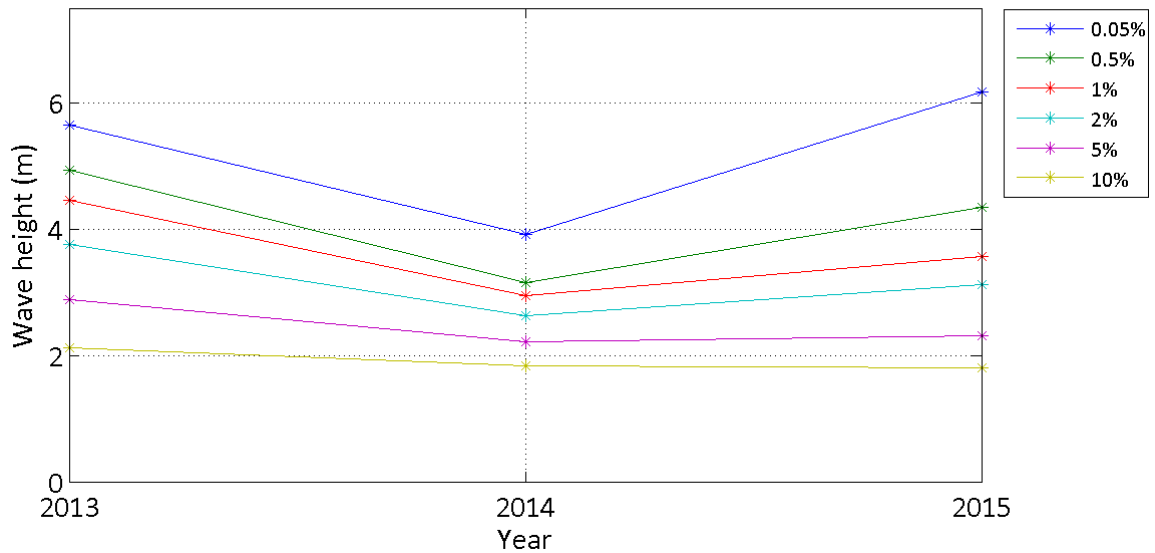
Storms at Scarborough during 2015



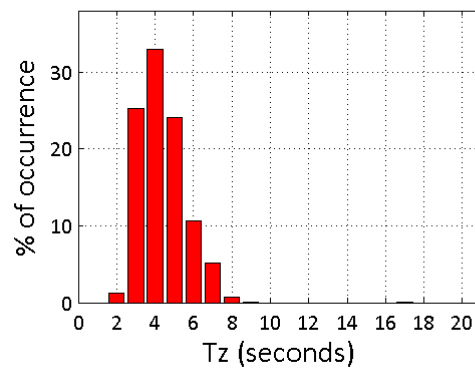
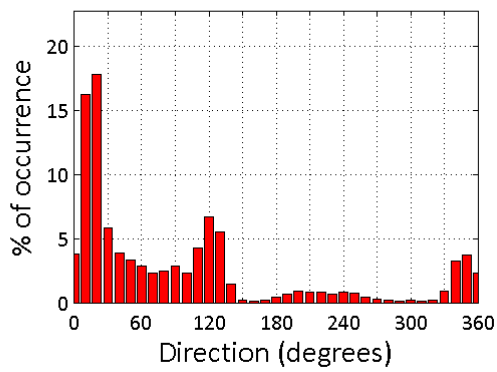
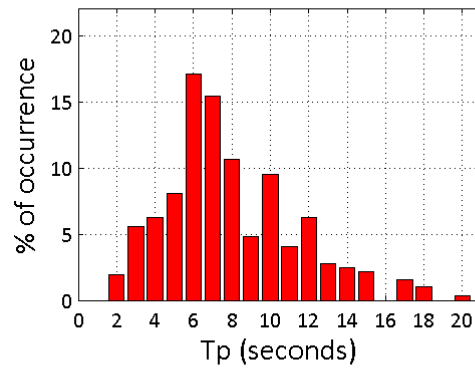
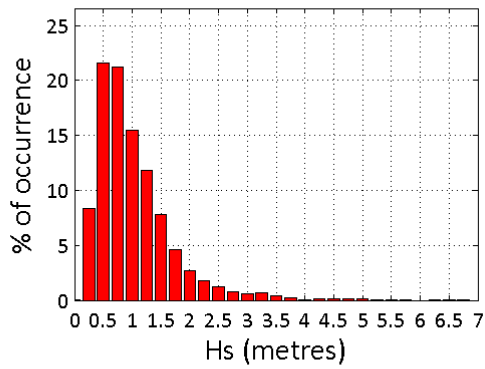
Storms at Scarborough - all years



Scarborough - Wave height exceedance (H_s)



Scarborough 2015



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

