



Hornsea Directional Waverider Buoy

Location			
OS	527071 E 448455 N		
WGS84	Latitude: 53° 55.00' N Longitude: 00° 04.01' W		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~12m CD	Buoy in situ off Hornsea beach. Photo courtesy of Fugro GB Marine Limited	Location of buoy (Google mapping, image ©2016 TerraMetrics)

Data Quality

Recovery rate (%)	Sample interval
99	30 minutes

Monthly Averages - 2016

All times are GMT

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)	No. of days
January	1.20	7.5	4.3	91	7.8	3	31
February	1.01	8.9	4.5	70	6.7	8	29
March	0.86	7.0	4.2	68	6.6	2	30
April	0.90	7.6	4.3	58	7.7	7	30
May	0.87	6.9	4.2	59	9.5	3	30
June	0.73	7.1	4.2	52	11.9	1	30
July	0.41	5.1	3.2	112	14.5	0	31
August	0.59	6.4	3.6	86	15.5	1	30
September	0.55	5.1	3.3	103	15.5	0	30
October	1.16	7.6	4.6	61	13.3	7	31
November	1.04	7.4	4.2	69	10.5	3	30
December	0.63	9.8	3.8	71	8.7	2	30

Monthly Averages - All Years (June 2008 – December 2015)

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)
January	1.02	8.0	4.3	79	6.2	4
February	1.01	8.0	4.4	72	5.4	4
March	0.86	8.4	4.4	72	6.0	3
April	0.76	7.6	4.2	69	7.5	3
May	0.73	6.5	3.9	85	9.7	3
June	0.66	6.4	4.0	71	12.2	1
July	0.62	6.1	3.8	77	14.2	0
August	0.59	5.9	3.6	90	14.9	0
September	0.71	6.9	3.9	79	14.2	1
October	0.94	7.5	4.1	82	12.8	4
November	1.00	7.8	4.2	80	10.7	4
December	1.01	8.2	4.3	77	8.0	5

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)
06-Nov-2016 20:30	4.08	10.0	6.9	44	1.65	HW	2.9	-	-
14-Jan-2016 18:30	3.33	10.0	5.8	23	2.45	HW -1	4.7	-	-
06-Jan-2016 03:00	3.22	10.5	6.3	59	1.05	HW +1	2.7	-	-
21-Nov-2016 17:30	3.08	7.7	5.7	51	-0.45	HW -4	2.7	-	-

* Tidal information is estimated from the predicted tide levels (Admiralty Total Tide).

Annual Statistics

Year	Annual H _s exceedance** (m)						Annual Maximum H _s	
	0.05%	0.5%	1%	2%	5%	10%	Date	A _{max} (m)
2008	-	3.03	2.78	2.52	1.77	1.44	22-Nov-2008 13:30	3.78
2009	4.34	3.37	2.93	2.34	1.77	1.44	17-Dec-2009 14:30	4.87
2010	3.78	3.39	3.12	2.77	2.24	1.80	10-Jan-2010 04:00	4.08
2011	2.83	2.41	2.17	1.93	1.65	1.38	23-Jul-2011 21:00	2.99
2012	4.30	3.08	2.73	2.34	1.88	1.51	04-Apr-2012 04:30	4.99
2013	4.22	3.74	3.34	2.90	2.32	1.76	23-Mar-2013 07:00	4.52
2014	3.21	2.44	2.17	1.97	1.67	1.40	14-Oct-2014 05:00	3.40
2015	3.39	2.41	2.14	1.92	1.56	1.31	21-Nov-2015 08:30	3.76
2016	3.81	2.70	2.51	2.24	1.92	1.56	06-Nov-2016 20:30	4.08

** i.e. 5 % of the H_s values measured in 2008 exceeded 1.77 m

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 0.5-hourly and 3-hourly records and are calculated for periods up to 10 times the record length, using a Weibull distribution.

0.5-hourly records June 2008 – December 2016		
Return period (years)	Significant wave height (m)	Comments
1	4.7	No depth limitation
2	4.9	Depth-limited at MLWS
5	5.1	
10	5.3	
20	5.4	
50	5.6	

3-hourly records June 2008 – December 2016		
Return period (years)	Significant wave height (m)	Comments
1	4.3	No depth limitation
2	4.6	
5	4.8	
10	5.1	Depth-limited at MLWS
20	5.3	
50	5.6	

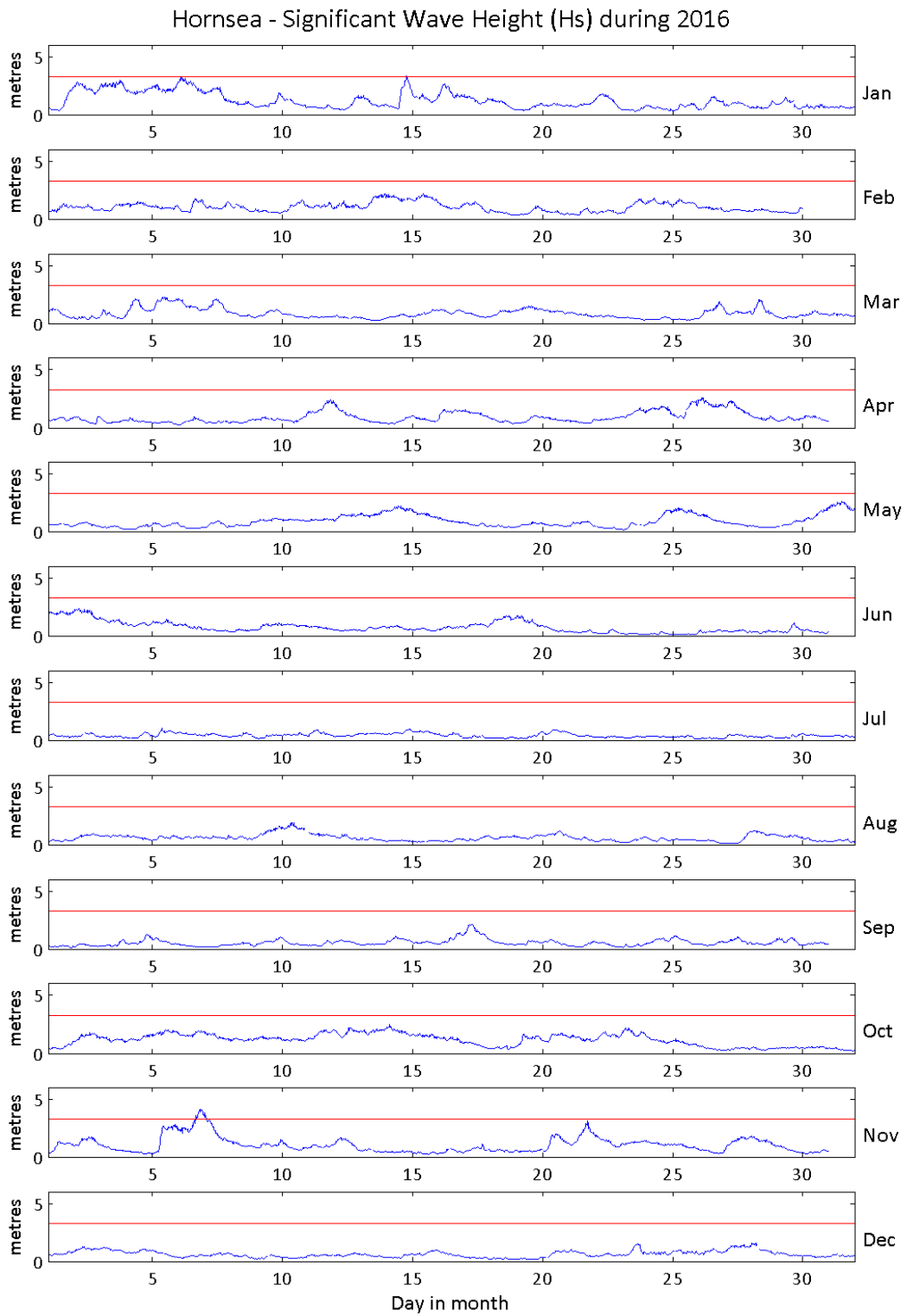
Distribution plots

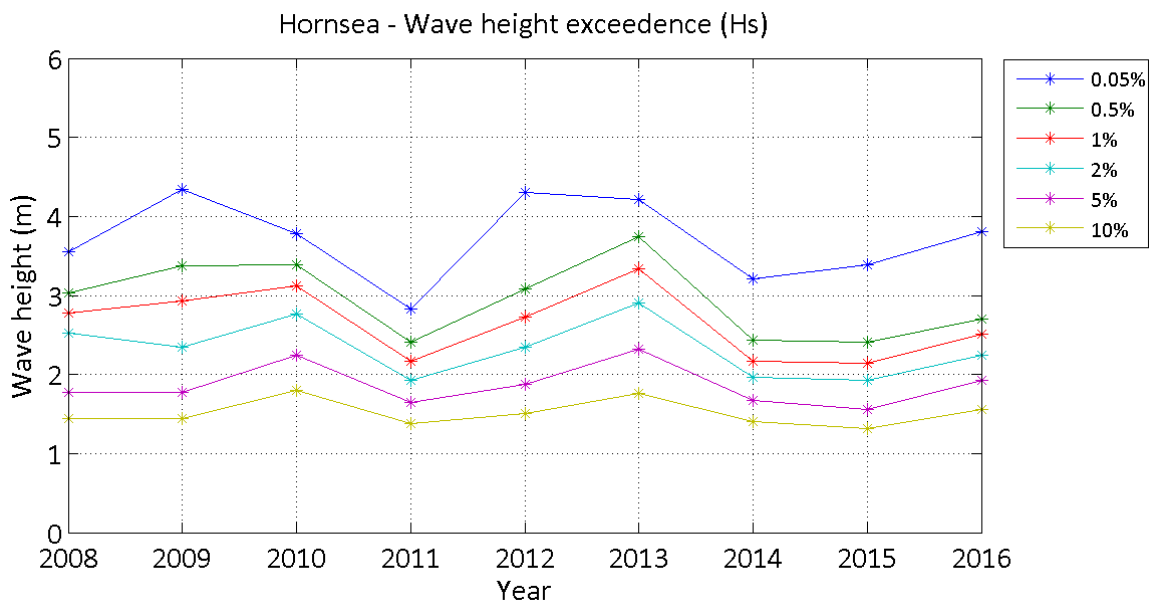
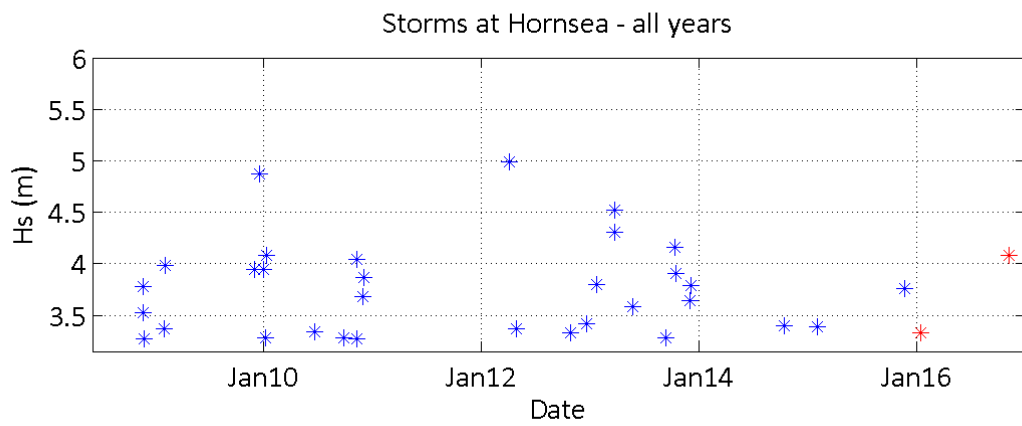
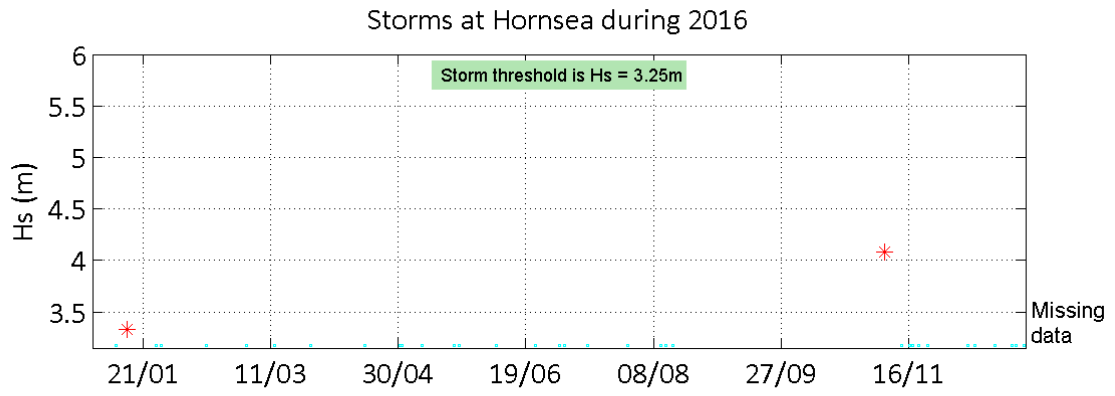
The distribution of wave parameters are shown in the accompanying graphs/tables of:

- Annual time series of H_s (red line is 3.25 m storm threshold)
- Incidence of storm waves for 2016. 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 2016
- 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

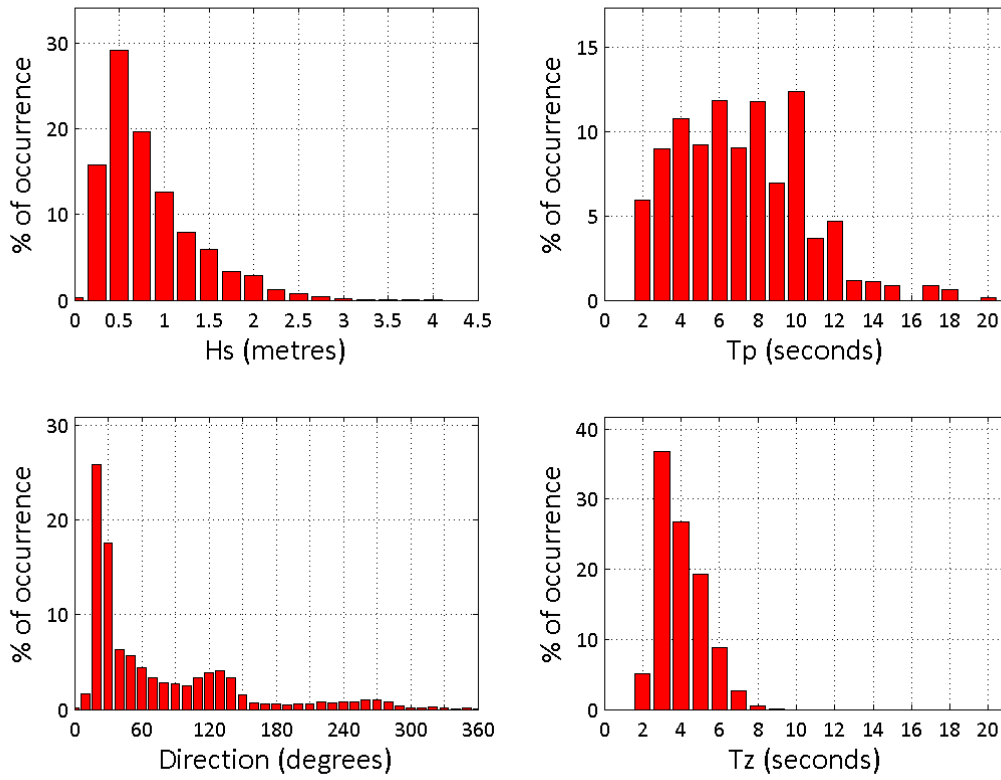
General

The buoy, owned by East Riding of Yorkshire Council, was deployed on 5 June 2008, at which time the magnetic declination at the site was 2.2° west, changing by 0.15° east per year.





Hornsea 2016



Hornsea 2008 to 2016 - Joint distribution (% of occurrence)

