



## Seaford Directional Waverider Buoy

<b>Location</b>			
OS	546458 E 98376 N		
WGS84	Latitude: 50° 45.99' N Longitude: 00° 04.53' E		
<b>Instrument type</b>			
Datawell Directional Waverider Mk III			
<b>Water depth</b>	~11m CD	Buoy in situ off Seaford beach. Photo courtesy of Fugro GB Marine Limited	Location of buoy (Google mapping, image ©2016 TerraMetrics)

## Data Quality

<b>Recovery rate (%)</b>	<b>Sample interval</b>
98	30 minutes

## Monthly Averages - 2017

All times are GMT

Month	H <sub>s</sub> (m)	T <sub>p</sub> (s)	T <sub>z</sub> (s)	Dir. (°)	SST (°C)	Bimodal seas (%)	No. of days
January	0.69	7.0	4.1	207	7.3	0	31
February	1.01	8.3	4.4	207	7.0	3	28
March	0.92	7.4	4.1	208	8.7	1	31
April	0.43	6.2	3.5	215	10.9	0	30
May	0.44	6.5	3.6	207	12.9	0	31
June	0.76	6.7	3.9	225	17.1	0	30
July	0.72	4.9	3.5	224	18.9	0	31
August	0.66	5.3	3.6	231	18.9	0	31
September	0.89	6.1	3.9	226	17.4	1	30
October	1.06	6.2	4.0	227	15.6	2	31
November	0.88	5.8	3.9	225	12.3	0	30
December	1.27	6.8	4.3	224	8.7	1	26

## Monthly Averages - All Years (January 2008 – December 2016)

Month	H <sub>s</sub> (m)	T <sub>p</sub> (s)	T <sub>z</sub> (s)	Dir. (°)	SST (°C)	Bimodal seas (%)
January	1.12	7.2	4.3	208	7.7	2
February	0.93	7.7	4.2	207	6.9	3
March	0.69	7.5	4.0	206	7.4	1
April	0.57	6.8	3.8	207	9.5	0
May	0.59	6.0	3.6	211	12.5	0
June	0.57	5.8	3.6	212	15.2	0
July	0.65	5.4	3.6	226	17.8	0
August	0.71	5.4	3.6	226	18.7	0
September	0.66	6.0	3.7	212	17.5	0
October	0.86	6.2	3.9	206	15.1	1
November	1.12	6.6	4.2	208	12.4	1
December	1.13	6.6	4.3	213	9.1	3

## 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)
10-Dec-2017 13:00	4.82	10.0	7.0	219	0.38	HW +3	3.84	0.81	0.94
13-Sep-2017 02:30	4.03	7.7	6.2	221	2.34	HW -1	4.44	0.17	0.37
07-Dec-2017 11:00	4.02	7.7	6.2	211	0.52	HW -2	5.61	0.00	0.10
21-Oct-2017 19:30	3.91	8.3	6.3	229	-1.83	HW -2	5.33	0.17	0.20
06-Jun-2017 07:30	3.75	8.3	5.9	229	1.74	HW -1	3.99	0.24	0.47

\* Tidal information is obtained from the National Network gauge at Newhaven. 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.

## 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	4.20	3.53	3.15	2.79	2.30	1.80	10-Mar-2008 10:30	4.48 <sup>+</sup>
2009	3.87	3.28	3.00	2.72	2.23	1.80	14-Nov-2009 14:00	4.53 <sup>+</sup>
2010	4.06	2.94	2.62	2.25	1.71	1.33	11-Nov-2010 13:00	4.82 <sup>+</sup>
2011	3.87	2.99	2.71	2.46	2.04	1.75	13-Dec-2011 03:00	5.21 <sup>+</sup>
2012	4.27	3.22	2.92	2.59	2.14	1.73	25-Nov-2012 06:00	4.39
2013	4.36	3.41	3.17	2.75	2.21	1.73	24-Dec-2013 02:30	5.18
2014	4.62	3.58	3.30	2.97	2.49	2.02	14-Feb-2014 23:00	5.34 <sup>+</sup>
2015	4.03	3.40	3.17	2.87	2.48	2.07	15-Jan-2015 03:30	4.61 <sup>+</sup>
2016	4.65	3.30	3.02	2.67	2.17	1.76	28-Mar-2016 04:00	5.11 <sup>+</sup>
2017	4.00	3.21	2.94	2.60	2.14	1.74	10-Dec-2017 13:00	4.82

\*\* i.e. 5 % of the H<sub>s</sub> values measured in 2008 exceeded 2.30 m

<sup>+</sup> Note that waves were breaking at the buoy 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.

## 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 records and are calculated for periods up to 10 times the record length using a peaks-over-threshold method and Weibull distribution.

Observation period	January 2008 to June 2017	
Return period (years)	Significant wave height (m)	Comments
0.25	4.06	No depth limitation
1	4.72	Depth-limited at MLWS
2	5.00	
5	5.34	
10	5.58	
20	5.81	
50	6.10	Depth-limited at MHWS

## Distribution plots

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

- Annual time series of  $H_s$  (red line is 4.06 m storm threshold)
- Incidence of storm waves for 2017. 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 2017
- Wave rose (percentage of occurrence of direction vs.  $H_s$ ) for all measured data
- Joint distribution of all parameters for all measured data, given as percentage of occurrence

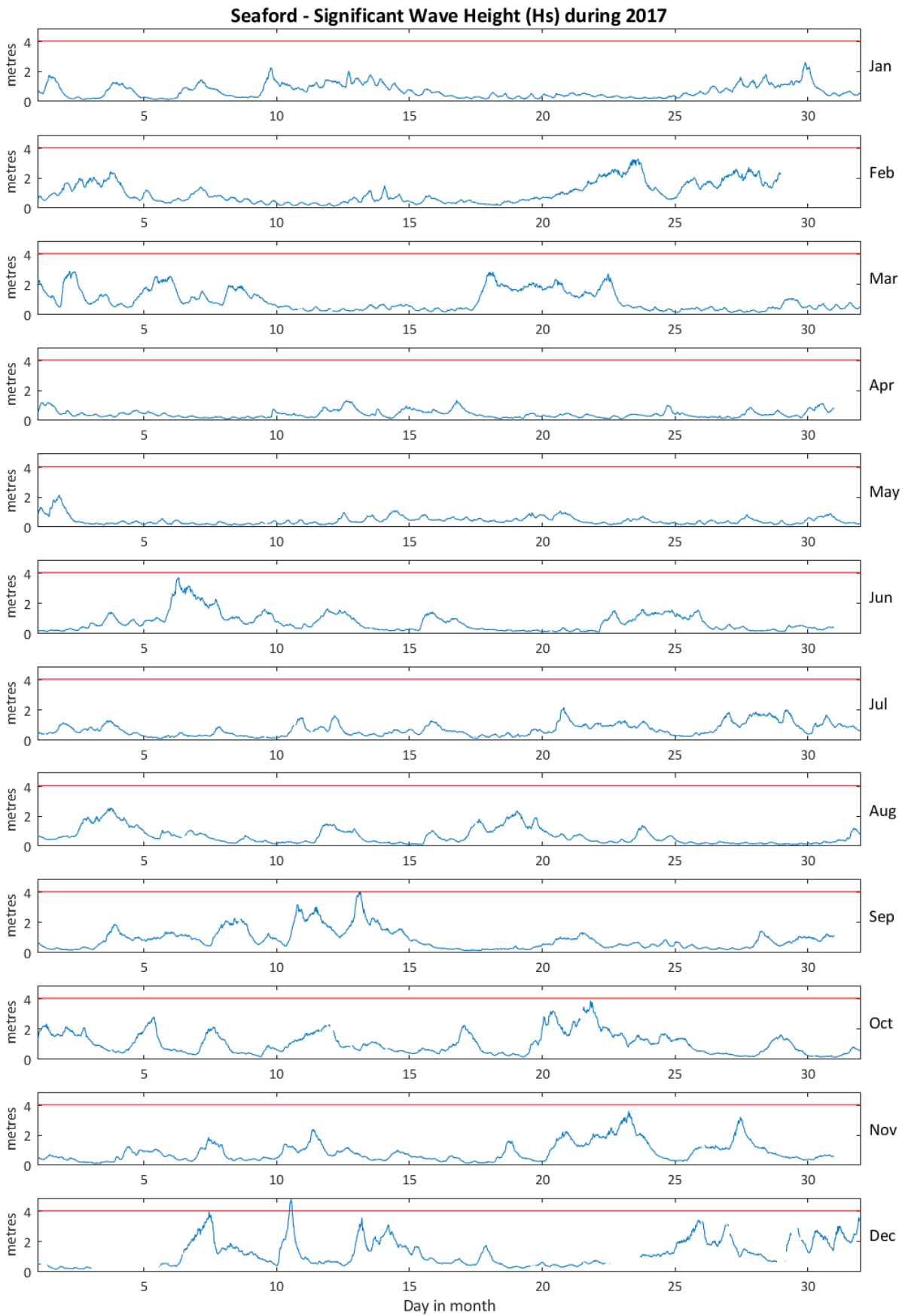
## General

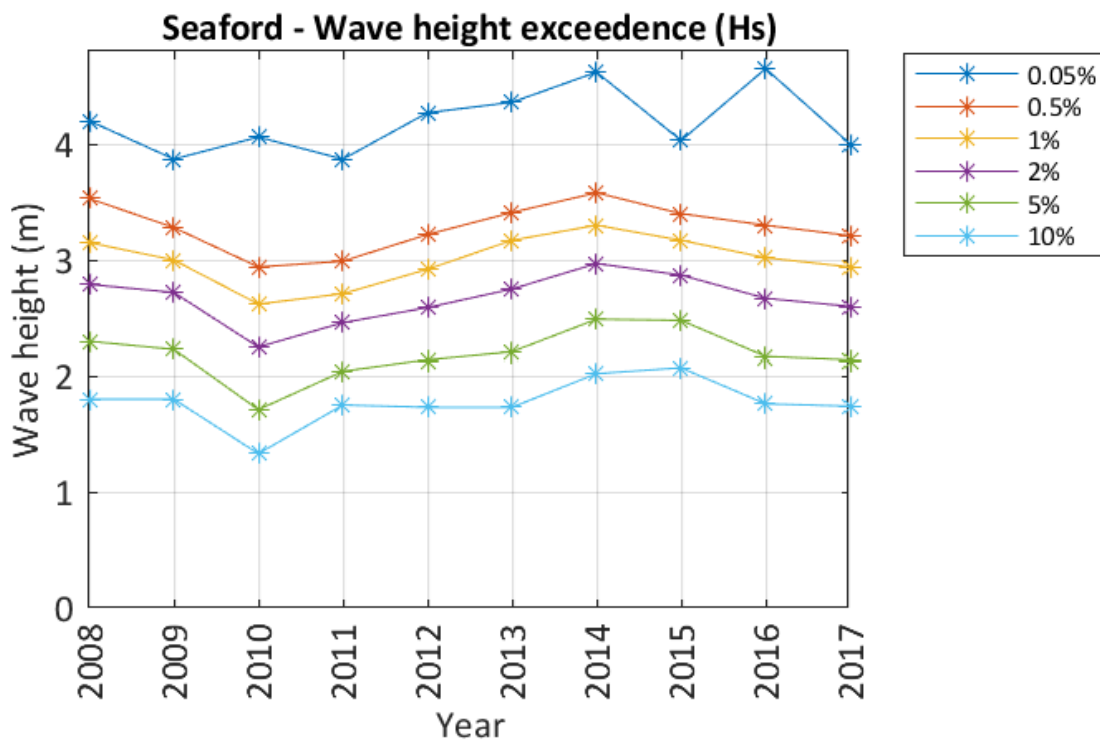
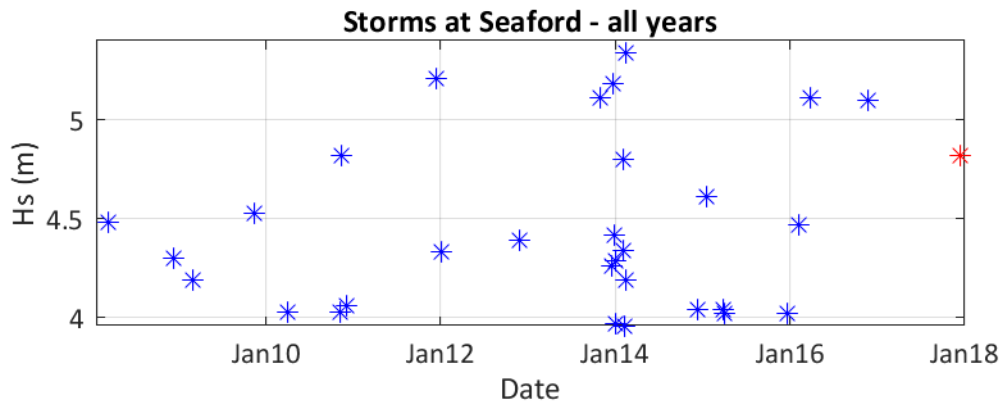
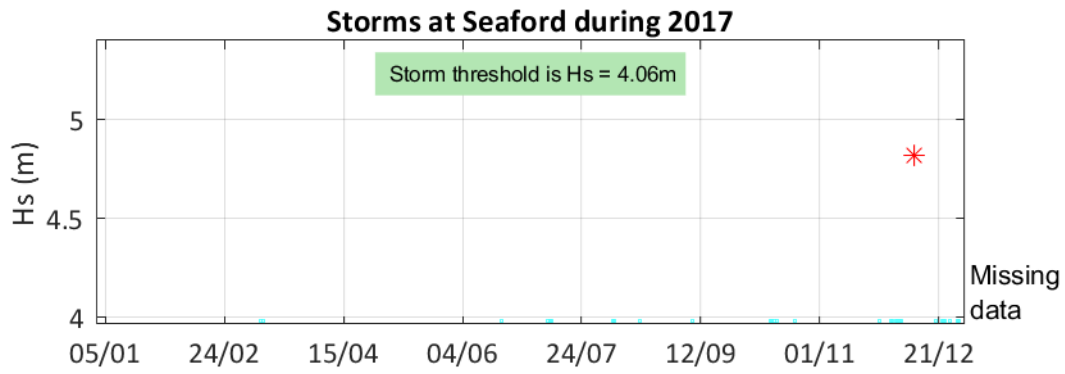
The buoy, owned by Adur & Worthing Councils, was first deployed on 22 January 2008, at which time the magnetic declination at the site was 1.8° west, changing by 0.14° east per year.

## Acknowledgements

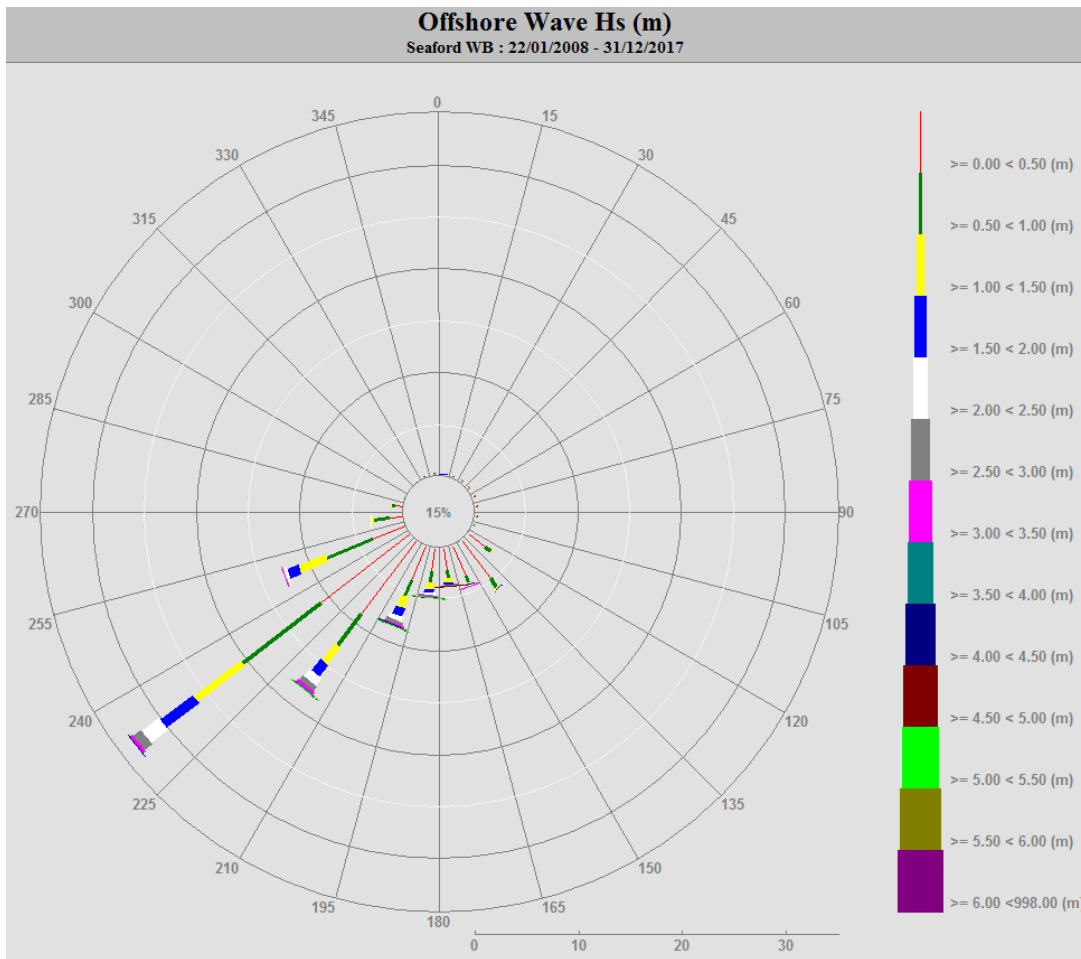
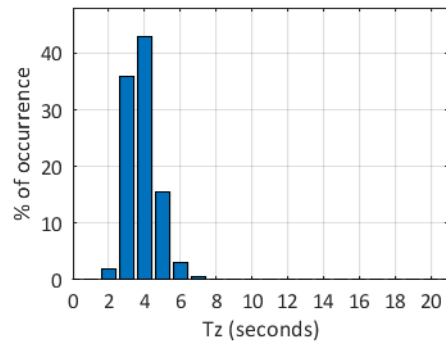
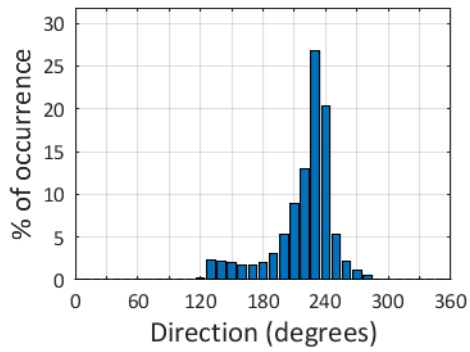
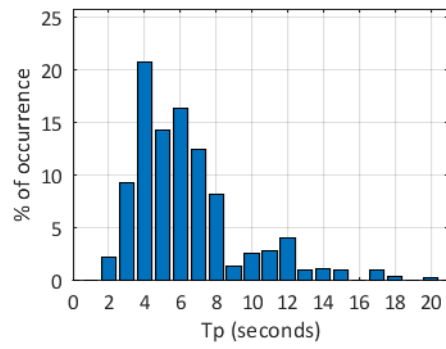
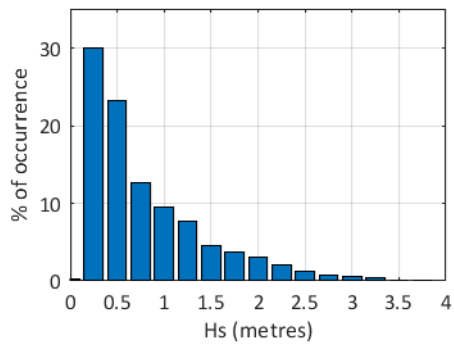
The shore station is kindly hosted by Newhaven Fort.

Tidal data at Newhaven were provided by the British Oceanographic Data Centre from the UK national tide gauge network, owned and operated by the Environment Agency.





Seaford 2017



Seaford 2008 to 2017 - Joint distribution (% of occurrence)

