



## Boscombe Directional Waverider Buoy

<b>Location</b>			
OS	411410 E 90213 N		
WGS84	Latitude: 50° 42.69' N Longitude: 01° 50.39' W		
<b>Instrument type</b>			
Datawell Directional Waverider Mk III			
<b>Water depth</b>	~10m CD	Buoy in situ off Boscombe 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>
100	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	0.48	7.8	4.0	176	7.8	0	31
February	0.71	10.4	4.4	182	7.6	5	28
March	0.62	9.2	4.2	181	9.1	0	31
April	0.29	6.8	3.7	176	11.3	0	30
May	0.41	5.9	3.6	174	13.5	0	31
June	0.47	6.5	3.6	185	16.9	0	30
July	0.46	5.0	3.4	184	19.0	0	31
August	0.41	5.2	3.5	186	18.4	0	31
September	0.54	6.9	3.8	184	17.1	0	30
October	0.59	7.9	3.9	185	15.5	3	31
November	0.45	6.9	4.1	184	12.6	0	30
December	0.59	8.8	4.3	182	9.2	3	31

## Monthly Averages - All Years (July 2003 – December 2016)

Month	H <sub>s</sub> (m)	T <sub>p</sub> (s)	T <sub>z</sub> (s)	Dir. (°)	SST (°C)	Bimodal seas (%)
January	0.76	9.4	4.4	180	8.2	6
February	0.63	9.9	4.5	179	7.2	4
March	0.52	8.7	4.2	178	7.7	1
April	0.43	7.3	3.9	178	9.9	1
May	0.45	6.1	3.6	178	12.6	0
June	0.41	5.7	3.5	180	15.7	0
July	0.44	5.4	3.4	185	17.9	0
August	0.44	5.5	3.5	184	18.7	0
September	0.46	6.5	3.7	179	17.7	0
October	0.63	6.8	3.9	176	15.2	2
November	0.68	7.7	4.3	179	12.5	3
December	0.71	8.7	4.3	181	9.6	5

## 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)
25-Dec-2017 20:30	3.19	7.7	5.7	177	0.14	HW -6	0.39	0.30	0.34
03-Feb-2017 18:00	2.61	6.7	5.6	142	0.42	HW -5	1.00	0.17	0.47
26-Dec-2017 21:30	2.43	7.1	5.5	170	0.23	HW -6	0.60	0.36	0.36
22-Mar-2017 07:30	2.40	6.7	5.2	162	0.52	HW +1	0.48	0.26	0.27
21-Oct-2017 12:30	2.36	20.0	5.5	190	0.62	HW +4	1.65	0.22	0.36

\* Tidal information is obtained from the WaveRadar REX on Swanage Pier. 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)
2003	-	2.17	1.95	1.53	1.19	0.98	14-Nov-2003 11:00	2.79
2004	2.98	2.28	1.96	1.69	1.30	1.02	08-Jan-2004 09:30	3.62
2005	2.62	1.81	1.59	1.40	1.11	0.90	02-Nov-2005 01:00	2.84
2006	2.82	2.24	2.03	1.82	1.47	1.17	29-Dec-2006 23:00	3.14
2007	2.94	2.07	1.84	1.63	1.33	1.07	18-Nov-2007 14:00	3.19
2008	3.08	2.32	2.02	1.71	1.34	1.05	10-Mar-2008 07:00	3.84
2009	2.87	2.18	1.93	1.72	1.39	1.10	13-Nov-2009 23:30	3.10
2010	2.75	2.13	1.76	1.48	1.14	0.90	08-Nov-2010 08:30	3.21
2011	2.61	2.11	1.91	1.57	1.26	1.04	10-Jan-2011 22:30	2.88
2012	3.06	2.25	2.04	1.76	1.34	1.07	25-Apr-2012 10:30	3.31
2013	3.14	2.40	2.04	1.78	1.38	1.09	18-Dec-2013 20:00	3.35
2014	3.64	2.72	2.43	2.08	1.63	1.24	05-Feb-2014 01:00	3.95
2015	2.90	2.13	1.89	1.68	1.44	1.17	30-Dec-2015 08:00	3.13
2016	3.72	2.41	1.98	1.69	1.25	0.99	28-Mar-2016 03:30	4.53
2017	2.44	2.03	1.78	1.55	1.21	0.95	25-Dec-2017 20:30	3.19

\*\* i.e. 5 % of the H<sub>s</sub> values measured in 2003 exceeded 1.19 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 records and are calculated for periods up to 10 times the record length using a peaks-over-threshold method and Weibull distribution.

Observation period	July 2003 to June 2017	
Return period (years)	Significant wave height (m)	Comments
0.25	2.82	No depth limitation
1	3.40	
2	3.66	
5	3.99	Depth-limited at MLWS
10	4.23	Depth-limited at MHWS
20	4.46	
50	4.75	Depth-limited at HAT
100	4.97	

## Distribution plots

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

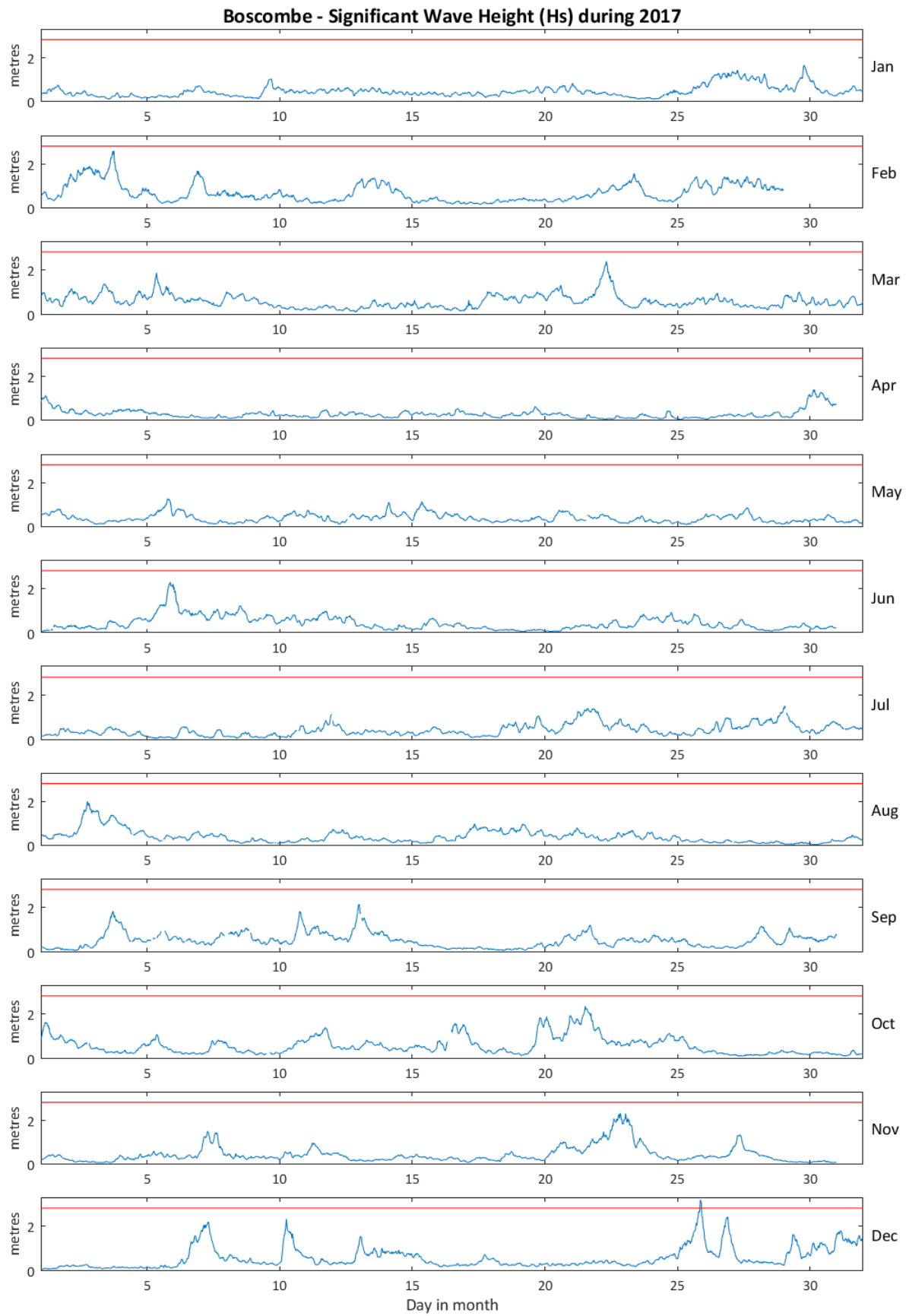
- Annual time series of  $H_s$  (red line is 2.82 m storm alert threshold)
- Incidence of storm waves for 2017. Storm events are defined using the Peaks-over-Threshold method. The highest  $H_s$  of each storm event is shown
- Wave height exceedance each year since deployment
- Percentage of occurrence 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

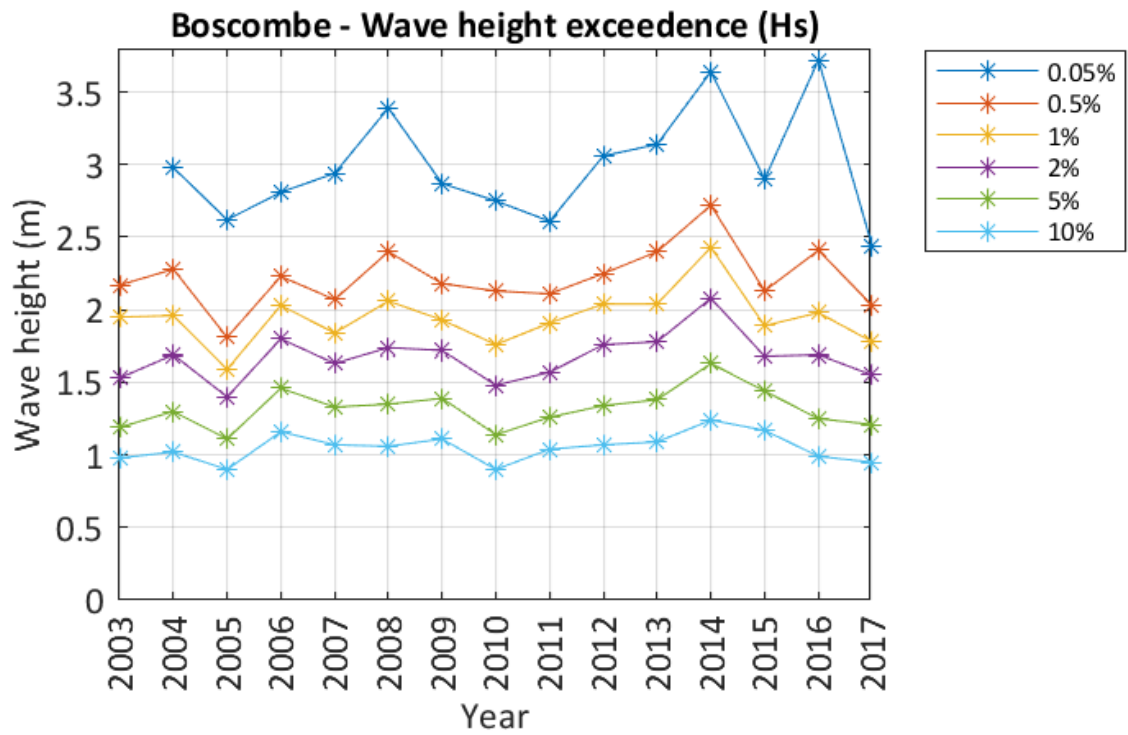
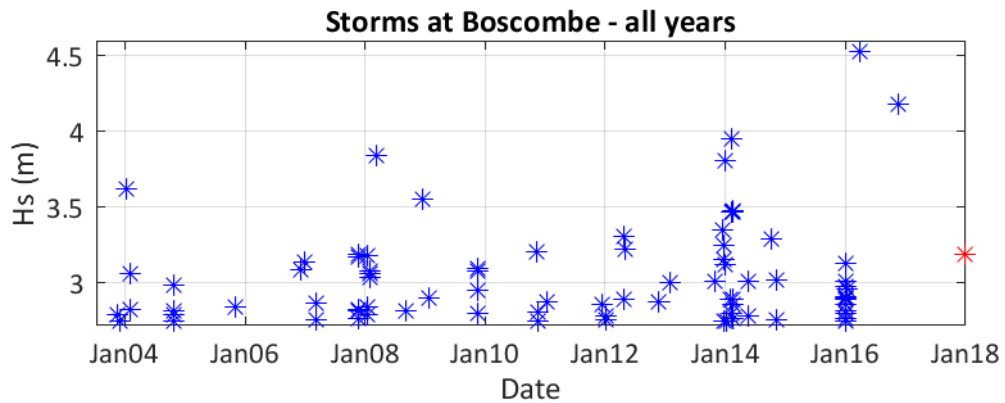
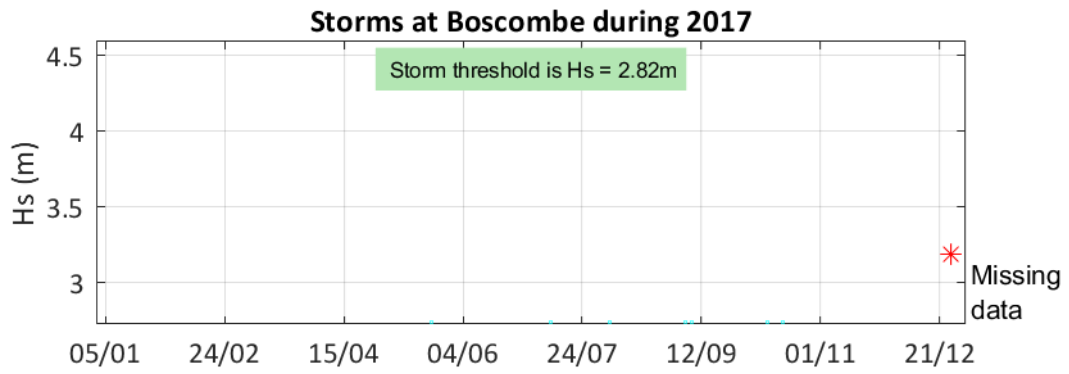
## General

The buoy, owned by New Forest District Council, was first deployed on 11 July 2003, at which time the magnetic declination at the site was 3.2° west, changing by 0.15° east per year.

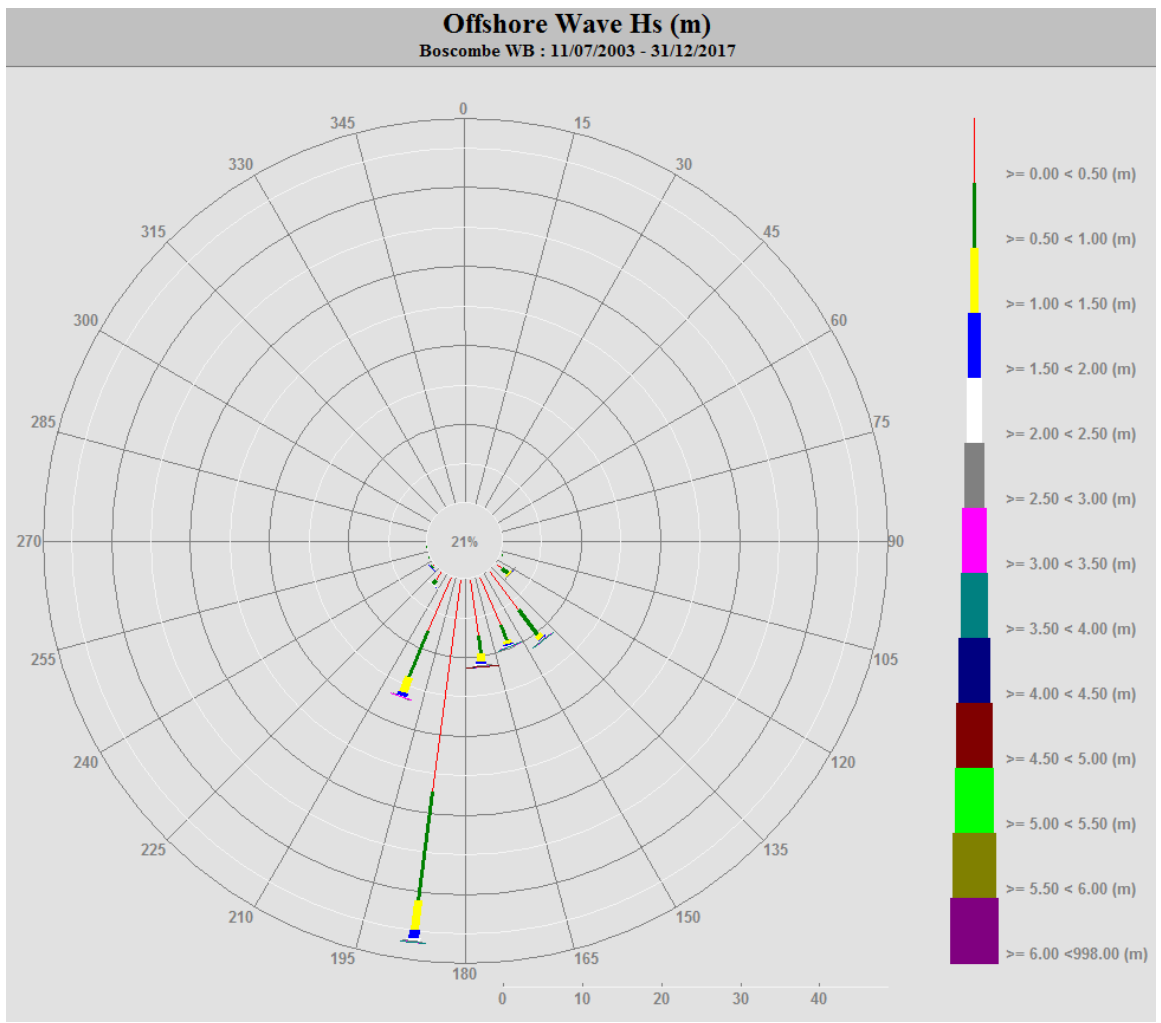
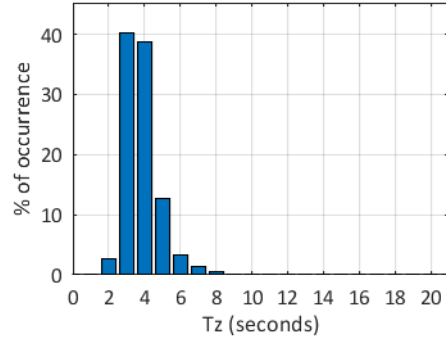
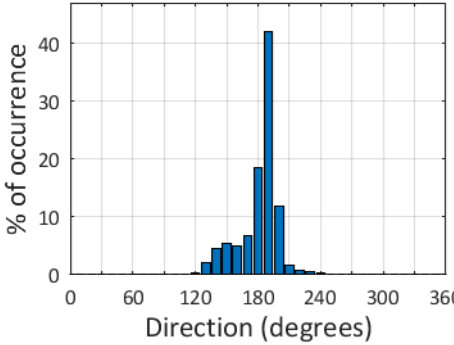
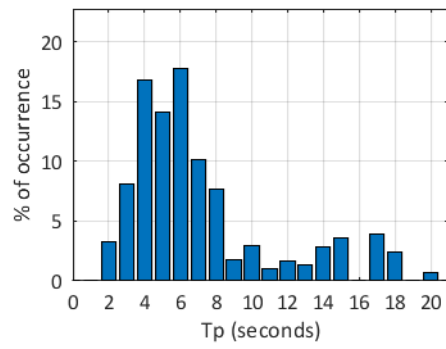
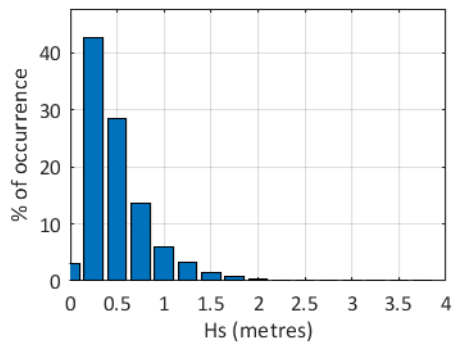
## Acknowledgements

Tidal predictions were supplied by Fugro GB Marine Limited.





Boscombe 2017



Boscombe 2003 to 2017 - Joint distribution (% of occurrence)

