



## Folkestone Directional Waverider Buoy

<b>Location</b>			
OS	619271 E 133887 N		
WGS84	Latitude: 51° 03.76' N Longitude: 01° 07.68' E		
<b>Instrument type</b>			
Datawell Directional Waverider Mk III			
<b>Water depth</b>	~13m CD	Buoy in situ off Sandgate 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>
99	30 minutes

## Monthly Averages – 2016

*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	0.95	6.3	3.9	167	9.1	0	29
February	0.77	6.4	3.9	152	8.2	2	28
March	0.60	5.9	3.6	135	7.7	1	31
April	0.47	5.3	3.5	144	9.9	0	29
May	0.37	5.0	3.4	130	12.3	0	31
June	0.44	4.9	3.4	148	14.8	0	30
July	0.47	4.3	3.2	170	17.2	0	31
August	0.48	4.6	3.4	154	18.5	0	31
September	0.45	5.2	3.3	163	19.1	0	30
October	0.49	5.1	3.6	125	15.7	0	31
November	0.65	5.8	3.8	138	12.0	0	30
December	0.55	5.7	3.5	160	9.2	0	31

## Monthly Averages - All Years (July 2003 – December 2015)

Month	H <sub>s</sub> (m)	T <sub>p</sub> (s)	T <sub>z</sub> (s)	Dir. (°)	SST (°C)	Bimodal seas (%)
January	0.78	5.8	3.8	157	7.7	0
February	0.65	6.1	3.7	147	6.7	0
March	0.54	5.8	3.6	143	7.1	0
April	0.44	5.4	3.4	139	9.3	0
May	0.48	5.0	3.4	143	12.1	0
June	0.45	4.9	3.4	145	14.7	0
July	0.47	4.6	3.3	157	17.0	0
August	0.47	4.6	3.3	161	18.1	0
September	0.48	5.0	3.4	146	17.5	0
October	0.66	5.2	3.6	154	15.3	0
November	0.72	5.7	3.8	154	12.4	1
December	0.75	5.9	3.8	155	9.3	0

## 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)
20-Nov-2016 08:30	3.92	10.0	6.5	180	-1.85	HW +6	5.6	-	-
28-Mar-2016 04:30	3.65	7.7	6.5	174	0.45	HW +3	5.7	-	-
09-Mar-2016 10:30	3.12	7.1	5.6	180	3.55	HW	6.8	-	-
08-Feb-2016 01:00	2.71	7.1	5.1	180	1.15	HW +3	6.0	-	-
22-Nov-2016 05:30	2.68	8.3	5.3	179	2.25	HW +1	4.2	-	-
03-Jan-2016 16:00	2.68	6.7	5.3	173	1.35	HW -1	3.6	-	-

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

## 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	-	2.23	2.03	1.75	1.37	1.16	29-Nov-2003 13:30	3.07
2004	2.91	2.30	1.97	1.75	1.44	1.18	08-Jan-2004 12:00	3.25
2005	2.90	2.15	1.81	1.54	1.25	0.97	30-Dec-2005 14:00	3.15
2006	2.55	2.08	1.84	1.68	1.42	1.17	03-Dec-2006 09:00	3.13
2007	2.56	2.06	1.83	1.59	1.34	1.11	08-Dec-2007 17:00	2.86
2008	2.98	2.40	2.10	1.85	1.44	1.16	10-Mar-2008 10:30	3.58
2009	2.65	2.14	1.88	1.68	1.39	1.12	22-Jan-2009 08:30	2.98
2010	2.66	1.95	1.69	1.42	1.15	0.94	08-Nov-2010 12:00	2.92
2011	2.91	1.99	1.73	1.52	1.31	1.09	13-Dec-2011 01:30	3.11
2012	2.69	2.12	1.94	1.71	1.38	1.1	14-Dec-2012 13:00	2.87
2013	3.16	2.31	2.02	1.75	1.40	1.10	24-Dec-2013 05:30	3.41 <sup>+</sup>
2014	2.82	2.42	2.21	1.94	1.60	1.27	05-Feb-2014 04:00	3.64 <sup>+</sup>
2015	2.47	1.95	1.82	1.67	1.44	1.18	15-Jan-2015 06:00	2.71
2016	3.18	2.23	1.86	1.65	1.33	1.04	20-Nov-2016 08:30	3.92

\*\* i.e. 5 % of the H<sub>s</sub> values measured in 2003 exceeded 1.37 m

<sup>+</sup> 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.

## 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 2003 – December 2016		
Return period (years)	Significant wave height (m)	Comments
1	3.5	No depth-limitation
2	3.7	
5	3.9	
10	4.0	
20	4.2	
50	4.3	
100	4.5	

3-hourly records June 2003 – December 2016		
Return period (years)	Significant wave height (m)	Comments
1	3.1	No depth-limitation
2	3.2	
5	3.4	
10	3.6	
20	3.7	
50	3.9	
100	4.0	

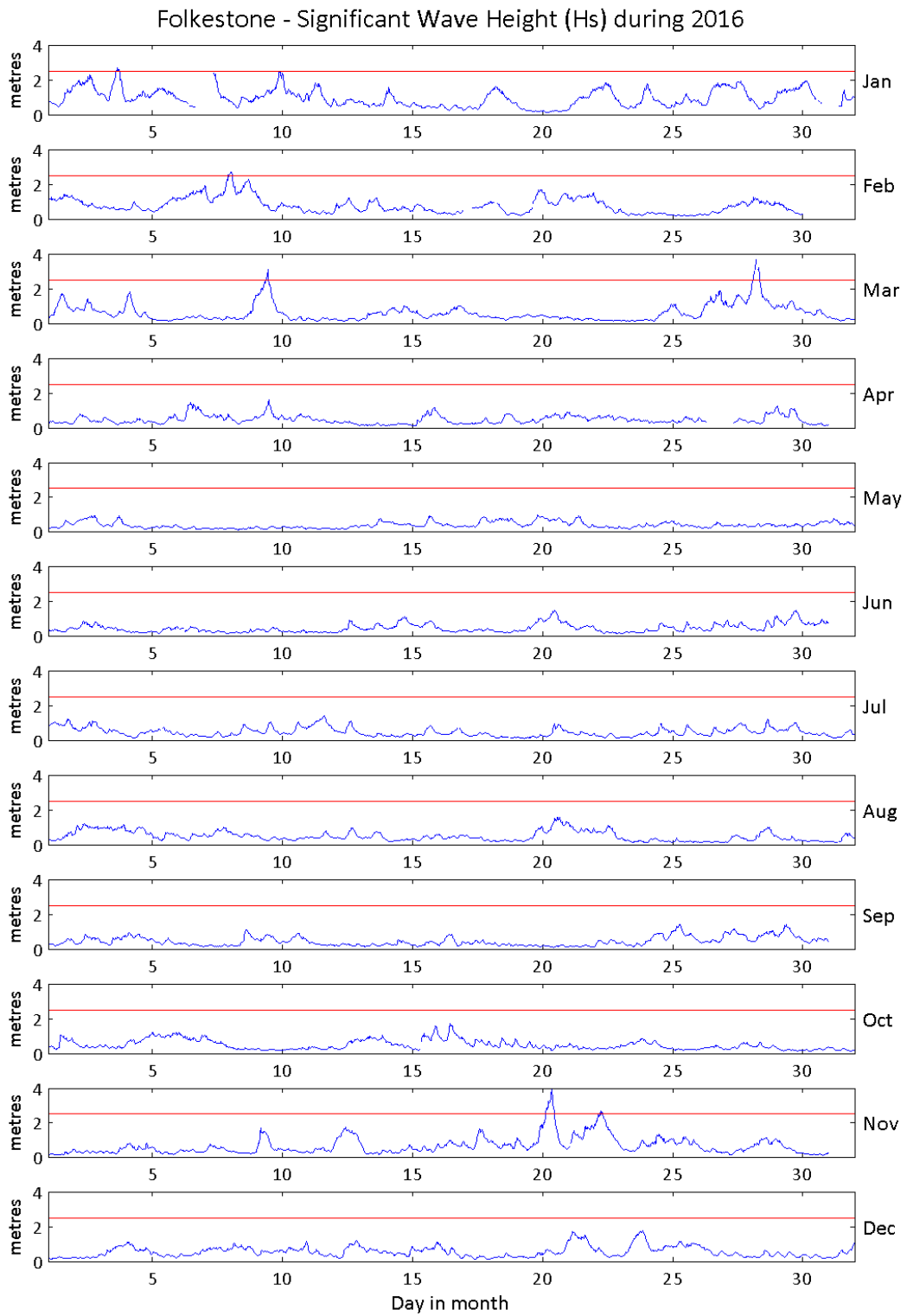
## Distribution plots

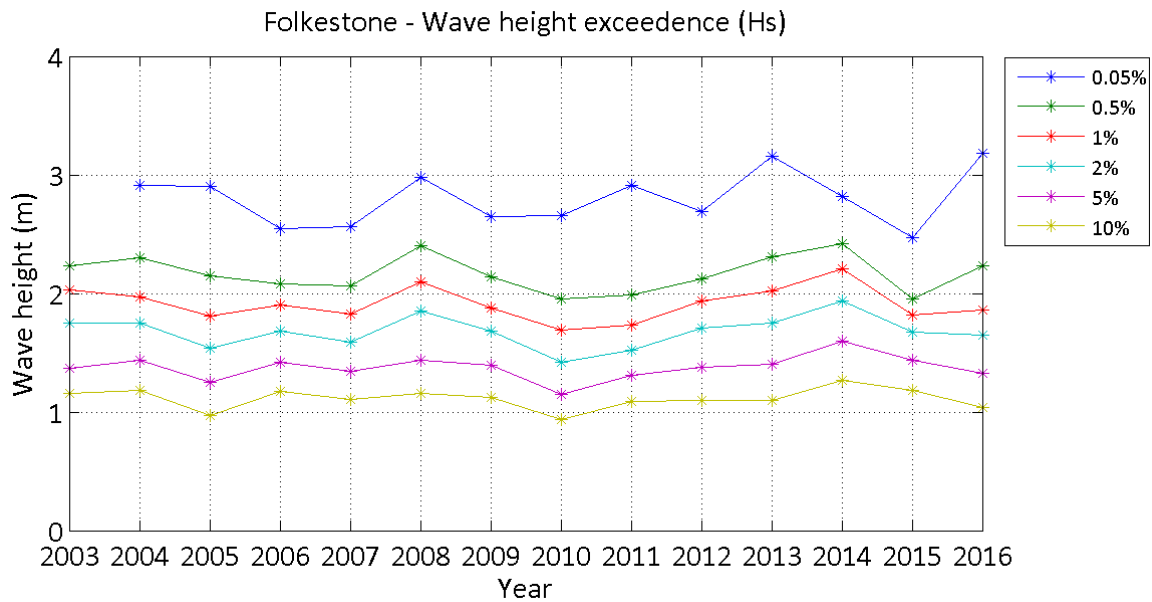
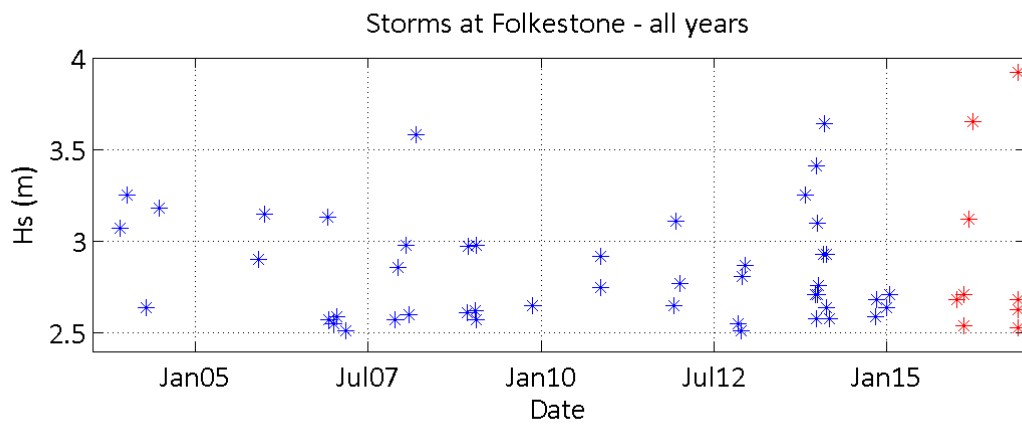
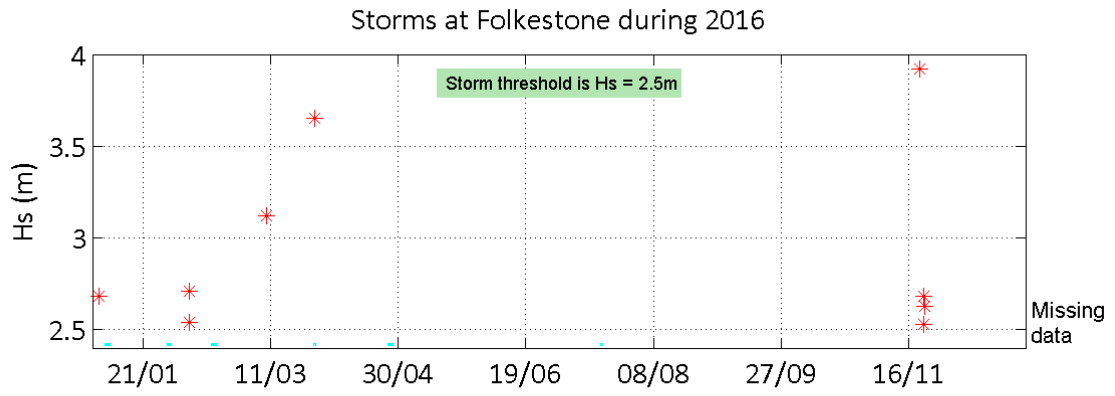
The distribution of wave parameters are shown in the accompanying graphs of:

- Annual time series of  $H_s$  (red line is 2.5 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 from 01 April 2004

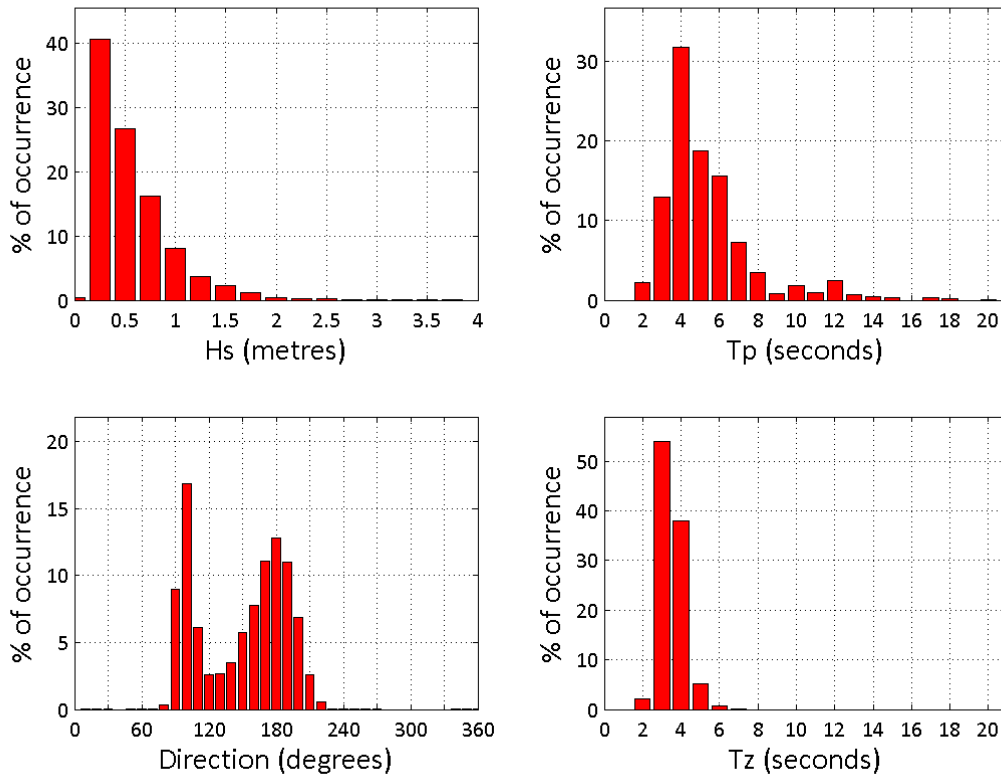
## General

The buoy, owned by Canterbury City Council, was first deployed on 1 June 2003, at which time the magnetic declination at the site was 2.1° west, changing by 0.14° east per year.





Folkestone 2016



Folkestone 2003 to 2016 - Joint distribution (% of occurrence)

