



Goodwin Sands Directional Waverider Buoy

Location			
OS	643159 E 155871 N		
WGS84	Latitude: 51° 15.01' N Longitude: 01° 28.98' E		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~10m CD	Buoy in situ over the Goodwin Sands. Photo courtesy of Fugro EMU Limited	Location of buoy (Google mapping)

Data Quality

Recovery rate (%)	Sample interval
97	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	0.87	5.8	3.8	166	8.5	30
February	0.73	5.3	3.7	137	6.1	27
March	0.69	5.1	3.5	140	7.6	30
April	0.54	4.7	3.4	124	9.3	29
May	0.63	4.9	3.4	156	11.7	30
June	0.58	4.8	3.4	138	14.4	29
July	0.58	5.1	3.5	153	16.8	30
August	0.47	4.6	3.3	137	17.9	30
September	0.64	5.4	3.6	118	16.8	29
October	0.58	5.1	3.5	116	14.6	30
November	0.89	6.0	3.9	169	13.3	29
December	1.08	5.9	4.0	182	11.7	30

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

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)
January	0.81	5.6	3.7	149	7.5
February	0.77	5.4	3.7	142	6.3
March	0.60	5.1	3.5	129	6.9
April	0.56	5.0	3.5	127	9.0
May	0.60	5.0	3.5	135	11.6
June	0.58	5.0	3.5	129	14.4
July	0.54	4.9	3.4	144	16.8
August	0.54	4.7	3.4	154	17.8
September	0.61	5.1	3.5	132	17.1
October	0.73	5.3	3.6	147	15.3
November	0.85	5.6	3.7	148	12.8
December	0.88	5.8	3.8	153	9.4

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)
15-Jan-2015 04:30	2.98	7.7	4.9	193	-	HW -1	~3.0	-	-
21-Dec-2015 17:00	2.64	8.3	5.5	173	0.32	HW -3	3.7	0.29	0.32
02-Jun-2015 09:00	2.52	7.7	4.9	188	0.66	HW -2	4.6	-0.57	-0.50

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	-	1.99	1.86	1.69	1.42	1.20	05-Oct-2008 04:00	2.37
2009	2.45	2.07	1.90	1.73	1.46	1.24	28-Nov-2009 06:00	2.57
2010	2.59	2.02	1.86	1.65	1.39	1.19	11-Nov-2010 10:30	2.81
2011	2.81	2.00	1.74	1.56	1.34	1.16	13-Dec-2011 02:00	3.16
2012	2.60	2.08	1.9	1.72	1.43	1.20	03-Jan-2012 13:00	3.00
2013	3.33	2.34	2.04	1.79	1.48	1.25	24-Dec-2013 02:30	3.69
2014	2.73	2.37	2.20	1.92	1.56	1.29	06-Jan-2014 01:30	3.01
2015	2.62	2.08	1.95	1.76	1.50	1.26	15-Jan-2015 04:30	2.98

* i.e. 5 % of the H_s values measured in 2008 exceeded 1.42 m

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 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

* Tidal information is obtained from the nearest recording tide gauge (the Wave Radar REX at Deal Pier). The surge shown is the residual at the time of the highest H_s. The maximum tidal surge is the largest surge during the storm event.

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

Return period (years)	Significant wave height (m)	Comments
1	3.1	No depth limitation
2	3.3	
5	3.5	
10	3.7	Depth-limited at MLWS
20	3.9	
50	4.1	

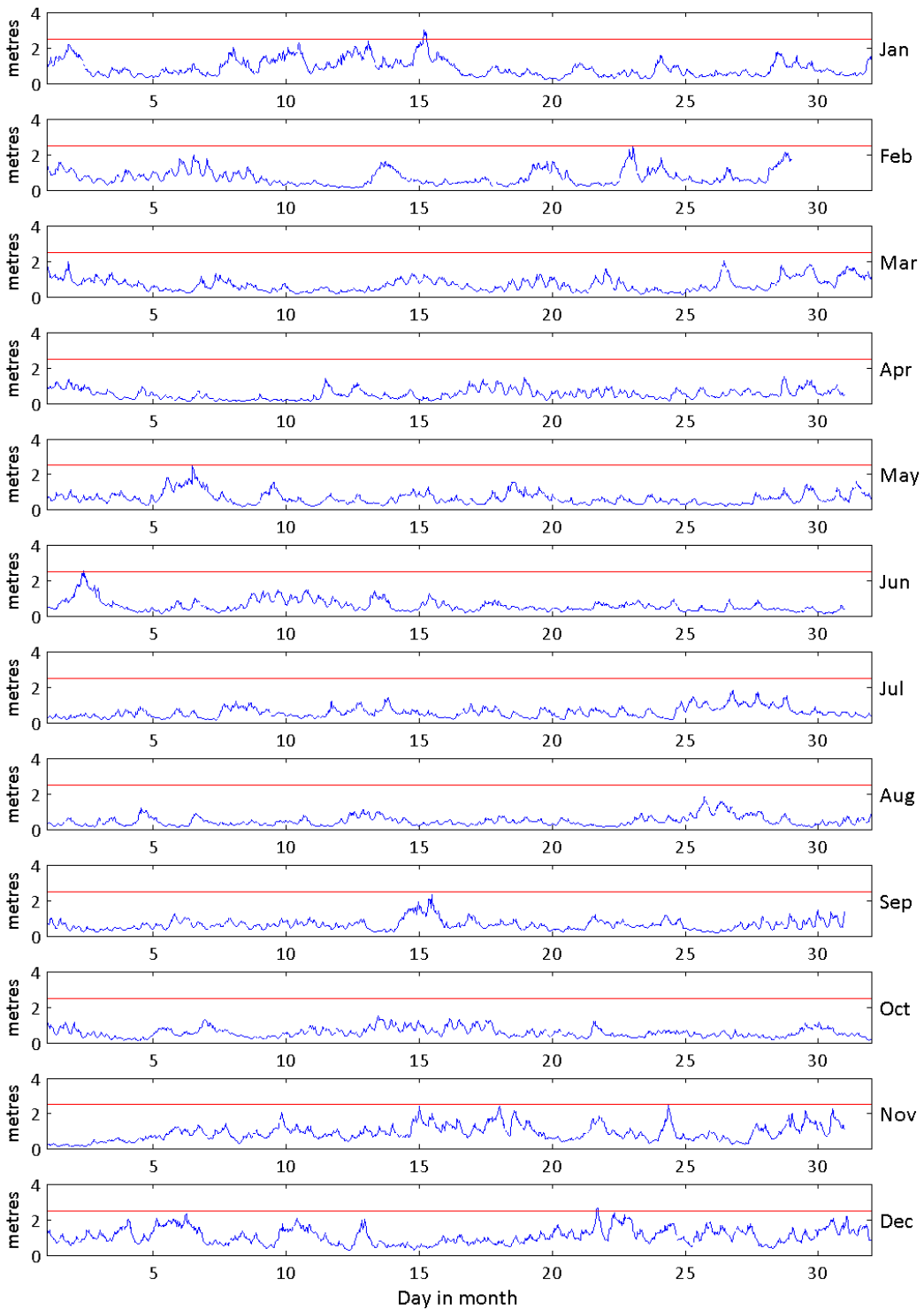
General

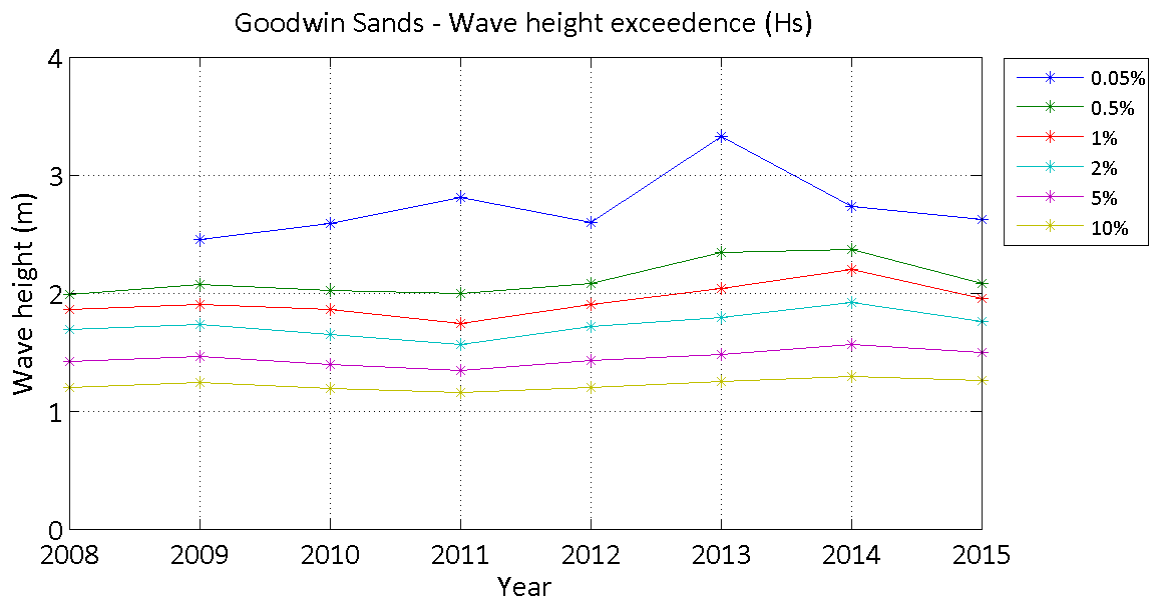
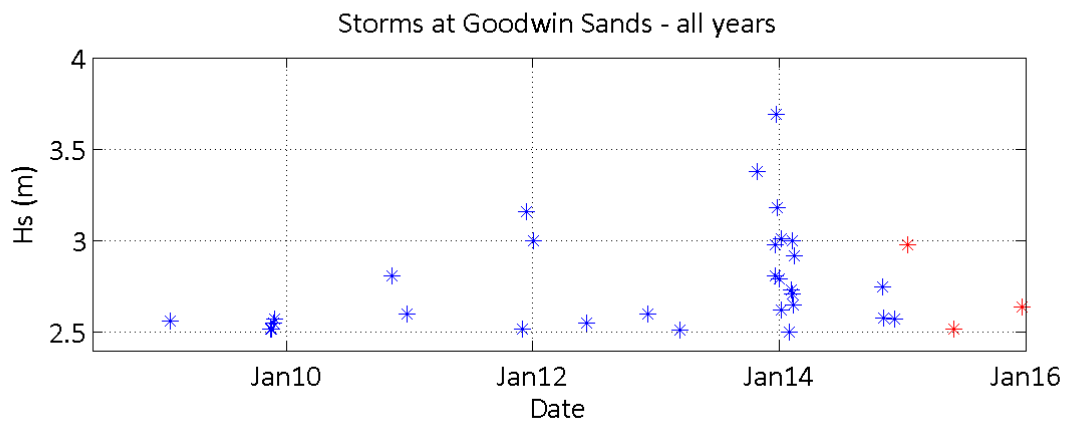
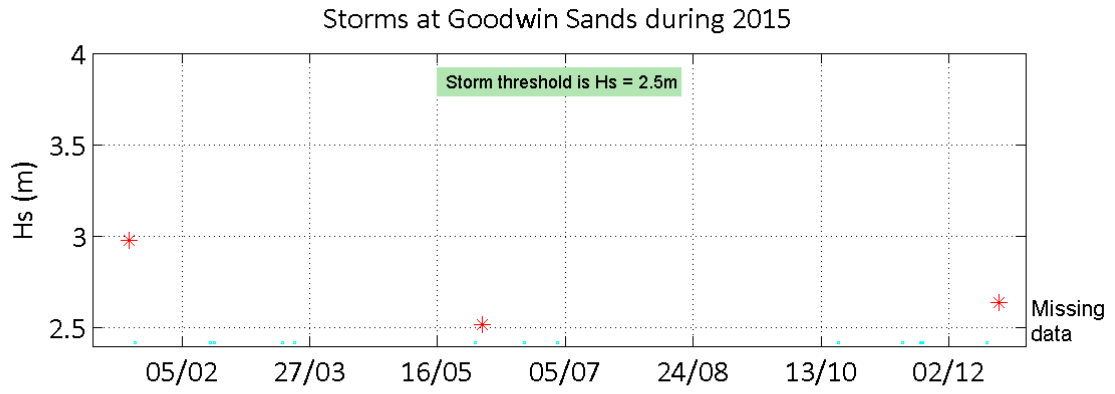
The buoy was first deployed on 4 June 2008, at which time the magnetic declination at the site was 1.3° west, changing by 0.14° east per year.

Acknowledgements

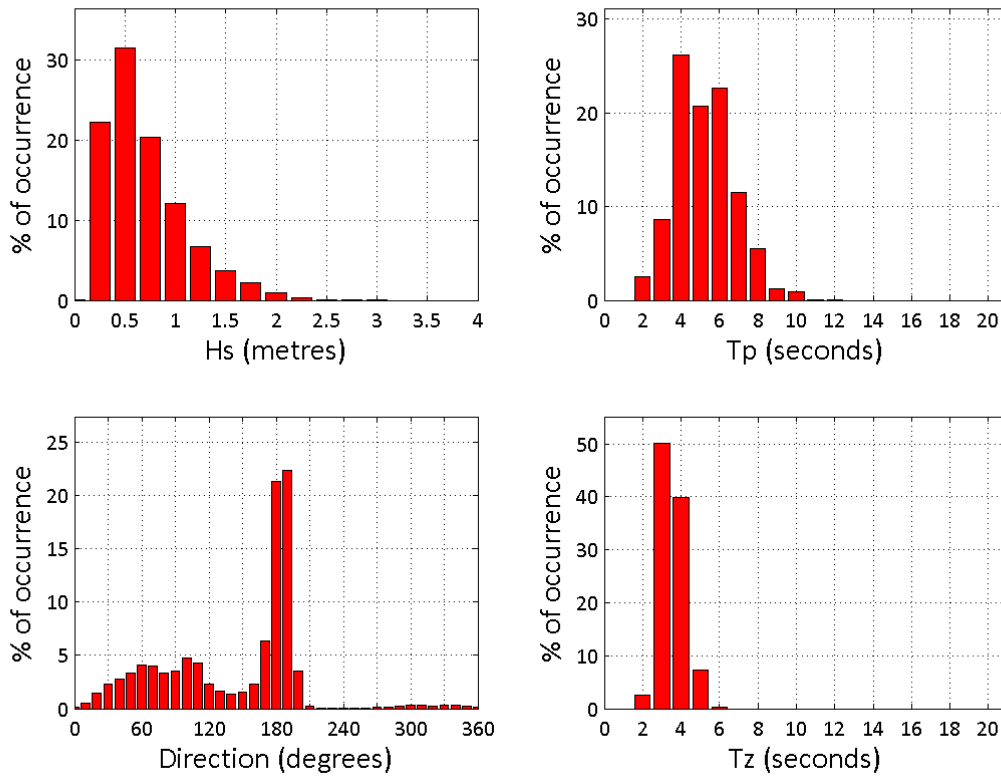
The shore station for the Waverider is kindly hosted by Ramsgate Harbourmaster. TASK2000 tidal prediction software was kindly provided by the Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory.

Goodwin Sands - Significant Wave Height (Hs) during 2015

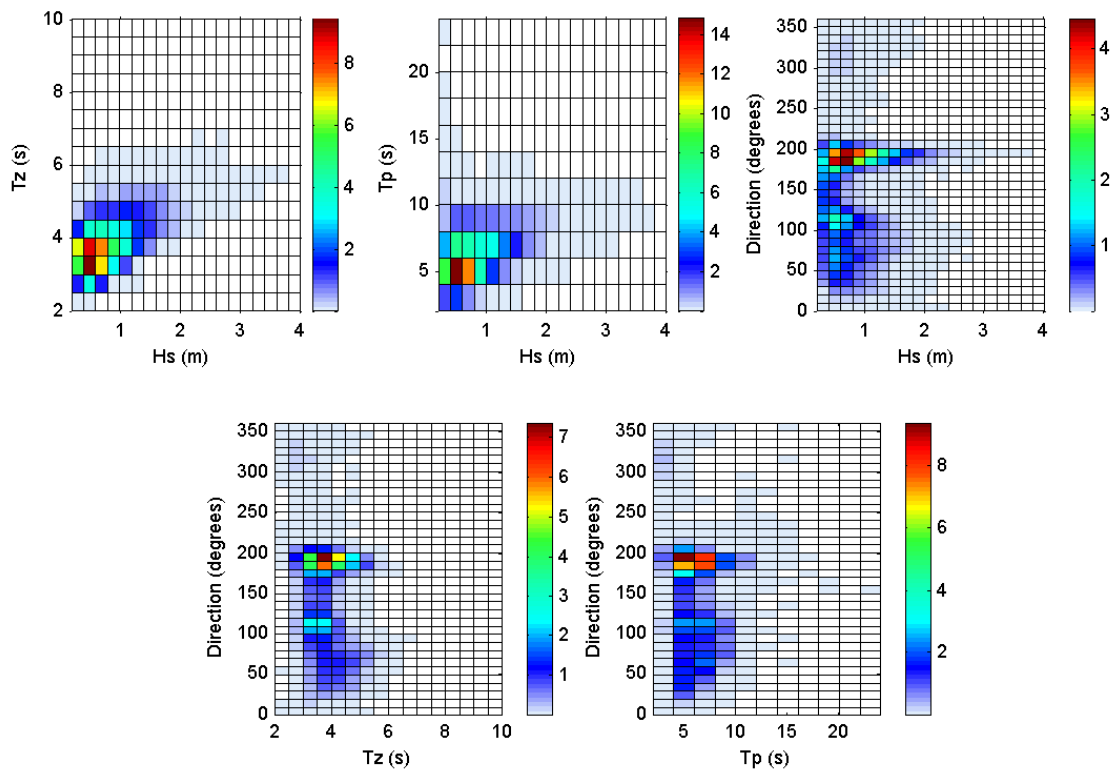




Goodwin Sands 2015



Goodwin Sands 2008 to 2015 - Joint distribution (% of occurrence)



Offshore Wave Hs (m)

Goodwin Sands WB : 13/06/2008 - 31/12/2015

