



Chapel Point Directional Waverider Buoy

Location			
OS	563362 E 374881 N		
WGS84	Latitude: 53° 14.75' N Longitude: 00° 26.81' E		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~13m CD	Example buoy in situ. Photo courtesy of Fugro Marine GB Limited	Location of buoy (Google mapping, image ©2019 Landsat / Copernicus)

Data Quality

Recovery rate (%)	Sample interval
97	30 minutes

Monthly Averages – 2019

All times are GMT

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)	No. of days
January	1.00	8.5	4.4	62	6.0	-	30
February	0.61	6.7	3.9	99	-	-	28
March	0.82	7.6	4.1	101	7.1	-	31
April	0.83	5.7	3.8	74	9.3	-	30
May	0.75	7.5	4.2	53	12.3	-	30
June	0.67	5.2	3.4	100	15.4	-	29
July	0.59	5.6	3.7	93	18.4	-	31
August	0.57	4.6	3.2	139	18.8	0	30
September	0.72	5.9	3.6	108	16.6	1	30
October	0.84	6.2	3.7	97	13.2	7	31
November	1.05	6.9	4.4	72	9.4	2	27
December	0.73	6.2	3.6	114	6.9	3	30

Monthly Averages - All Years (June 2012 – December 2019)

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)
January	0.87	6.9	4.0	100	5.6	-
February	0.87	6.7	4.0	98	4.9	-
March	0.85	6.9	4.0	93	6.0	-
April	0.76	6.3	3.8	82	8.6	-
May	0.75	6.1	3.8	83	11.9	-
June	0.64	5.7	3.7	86	14.9	-
July	0.56	4.8	3.4	107	17.9	-
August	0.57	5.0	3.3	119	18.5	-
September	0.67	5.6	3.6	96	16.6	-
October	0.90	6.0	3.8	99	13.5	-
November	0.93	6.3	4.0	103	9.9	-
December	0.81	6.4	3.7	121	7.3	-

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)
27-Jan-2019 20:30:00	3.75	11.8	6.5	18	0.95	HW -2	4.40	-	-
04-May-2019 15:30:00	2.94	9.5	5.6	51	-0.45	HW -3	5.10	-	-
09-Jan-2019 06:30:00	2.87	10.0	5.5	7	1.65	HW -2	4.80	-	-
09-Dec-2019 13:30:00	2.82	10.0	5.6	25	0.35	HW -3	4.20	-	-
11-Jun-2019 10:00:00	2.78	7.7	5.0	72	1.55	HW -1	3.80	-	-
17-Jan-2019 14:00:00	2.67	10.0	5.4	18	1.65	HW -1	3.40	-	-

* Tidal information is obtained 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)
2012	2.97	2.37	2.17	1.92	1.52	1.22	27-Oct-2012 05:00:00	3.16
2013	3.45	2.71	2.56	2.34	1.86	1.49	10-Oct-2013 19:30:00	3.63
2014	2.50	2.09	1.89	1.68	1.41	1.22	02-Dec-2014 12:00:00	2.67
2015	3.10	2.08	1.88	1.70	1.43	1.23	21-Nov-2015 12:00:00	3.54
2016	3.20	2.42	2.19	1.95	1.63	1.38	14-Jan-2016 20:00:00	3.49
2017	3.23	2.72	2.53	2.30	1.94	1.63	13-Jan-2017 17:00:00	3.59
2018	2.88	2.28	2.10	1.86	1.49	1.26	27-Oct-2018 16:30:00	3.17
2019	3.06	2.47	2.18	1.93	1.59	1.33	27-Jan-2019 20:30:00	3.75

** i.e. 5 % of the H_s values measured in 2012 exceeded 1.52 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 Generalised Pareto Distribution (GPD).

Observation period	May 2012 to December 2019	
Return period (years)	Significant wave height (m)	Comments
0.25	2.67	No depth limitation
1	3.23	
2	3.41	
5	3.59	
10	3.69	
20	3.76	
50	3.84	

Distribution plots

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

- Annual time series of H_s (red line is 2.67 m storm threshold)
- Incidence of storm waves for 2019. 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 2019
- 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

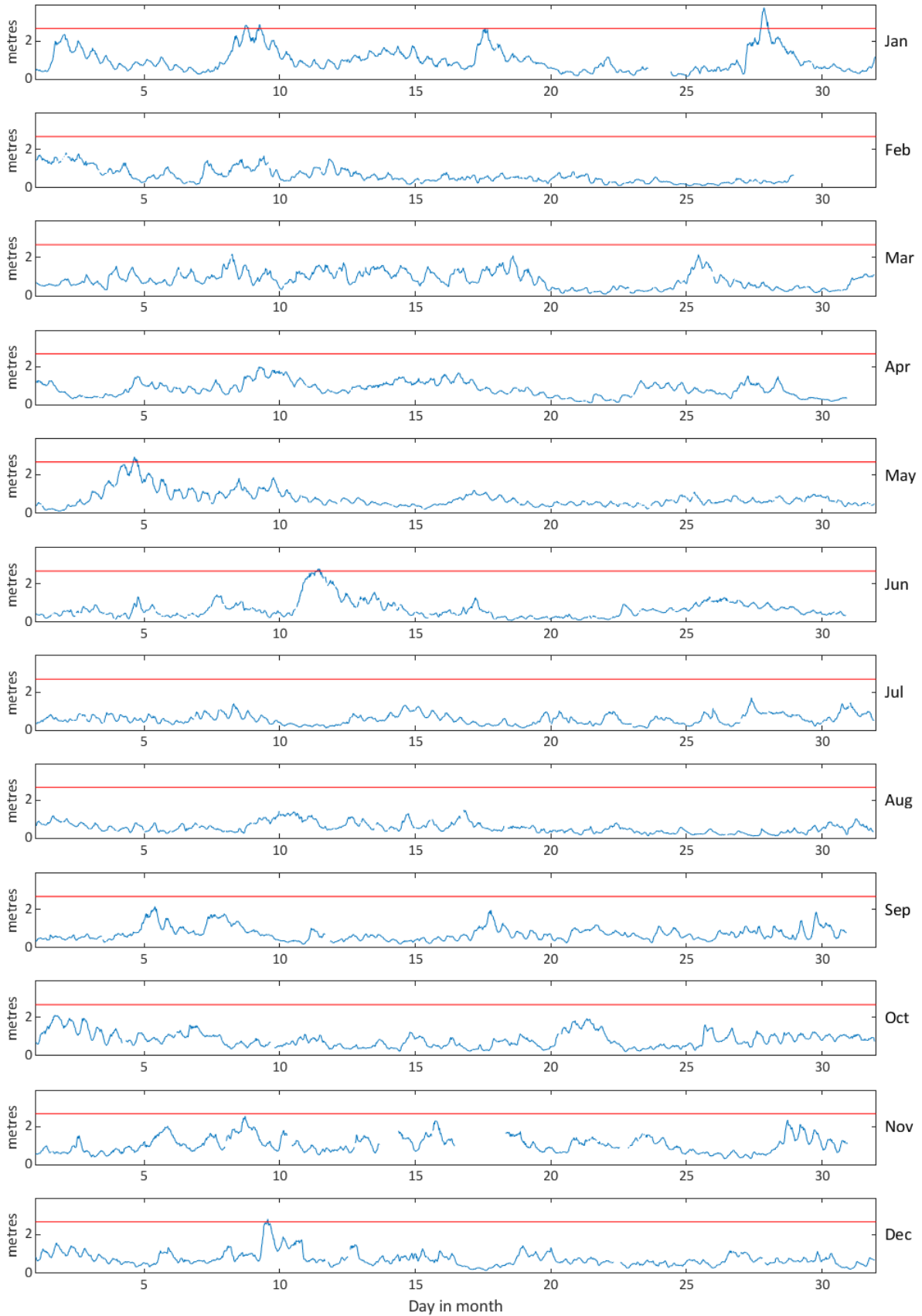
General

The buoy, owned by the Environment Agency, was first deployed on 04 September 2012, at which time the magnetic declination at the site was 1.43° west, changing by 0.18° east per year.

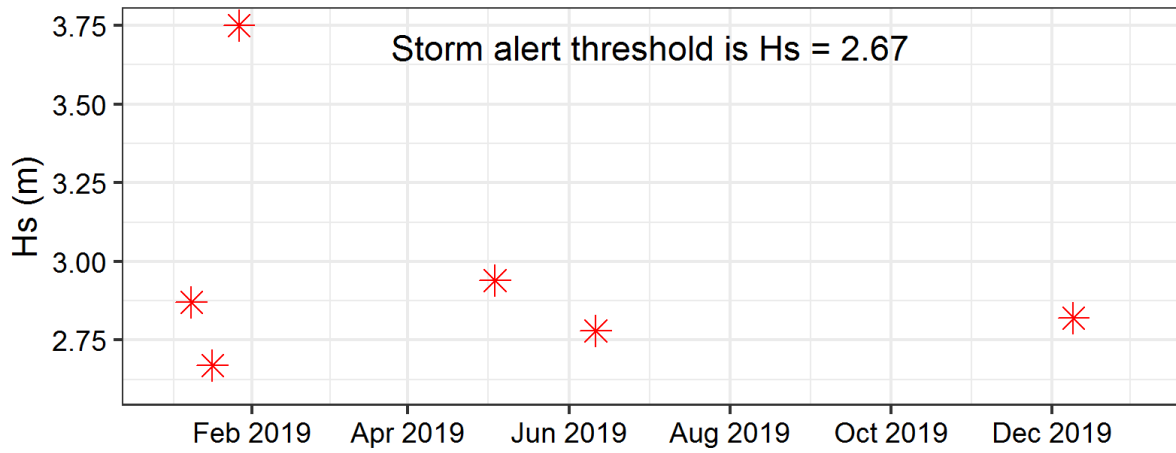
Acknowledgements

The shore station is kindly hosted by Mablethorpe RNLI Lifeboat Station.

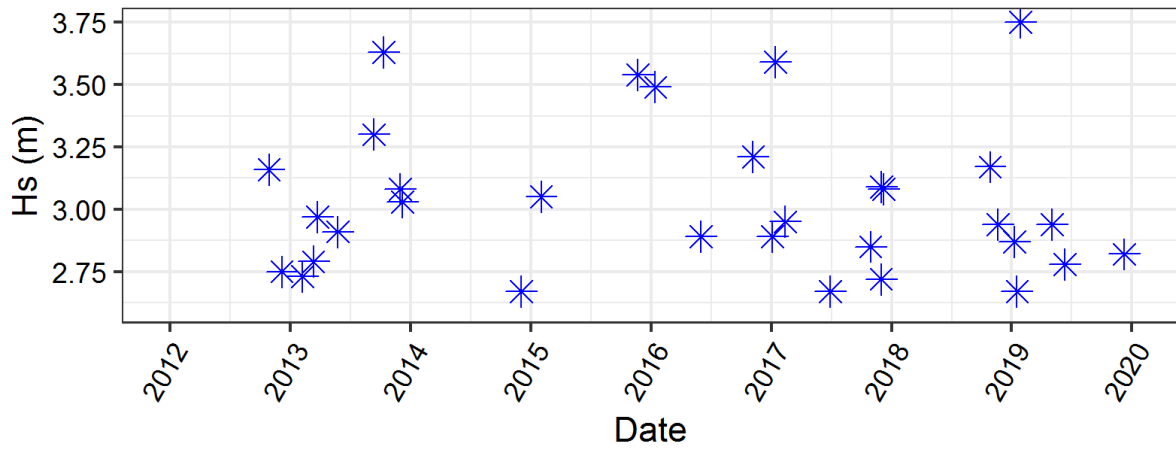
Chapel Point - Significant Wave Height (Hs) during 2019



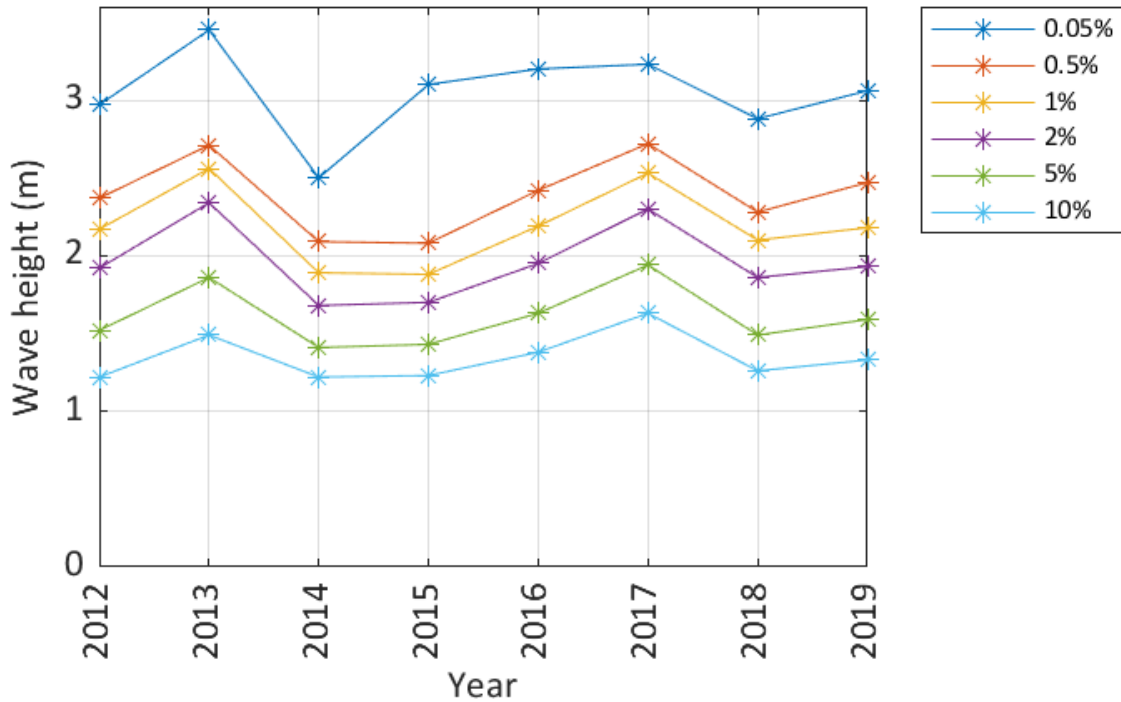
Storms at Chapel Point during 2019



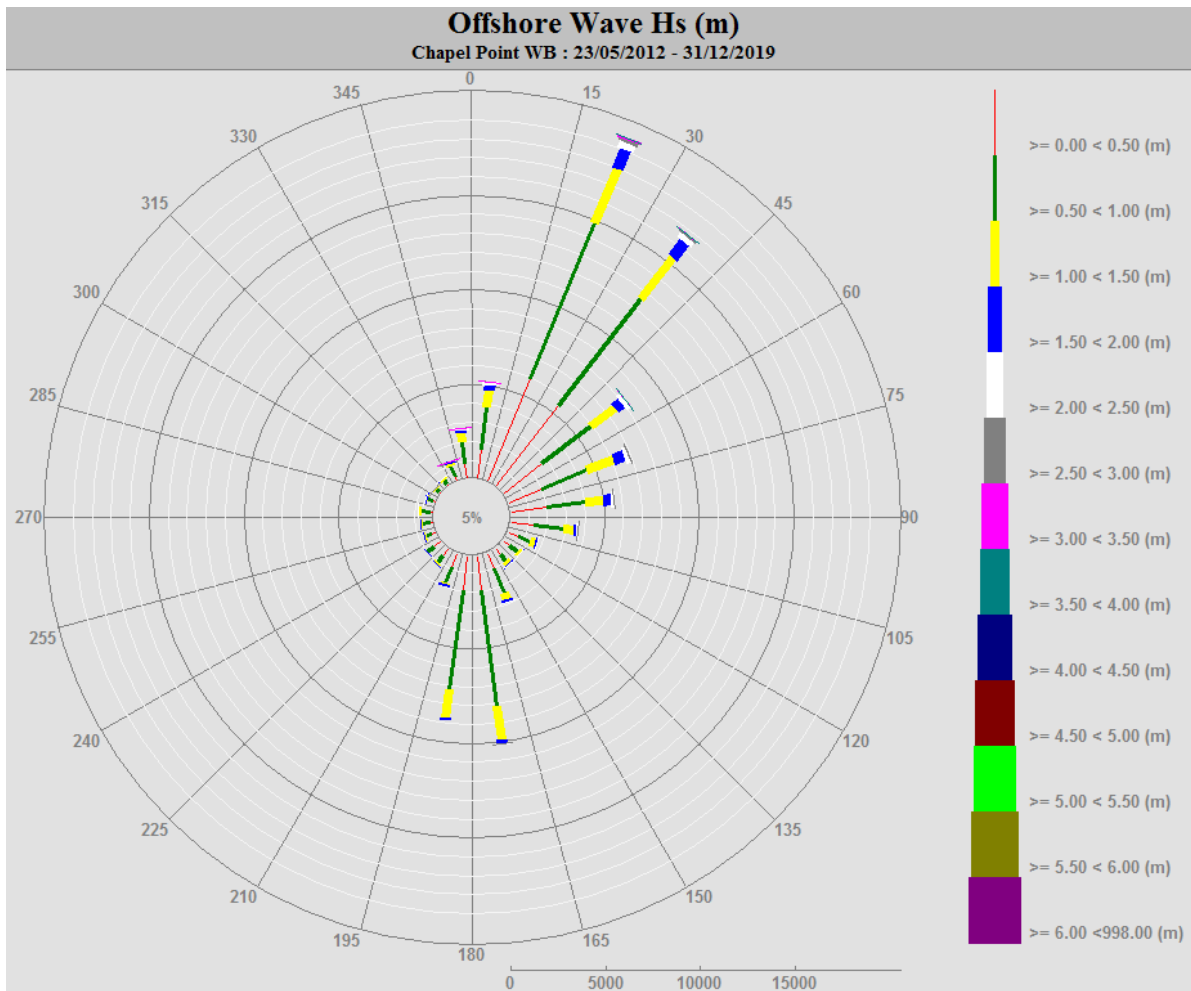
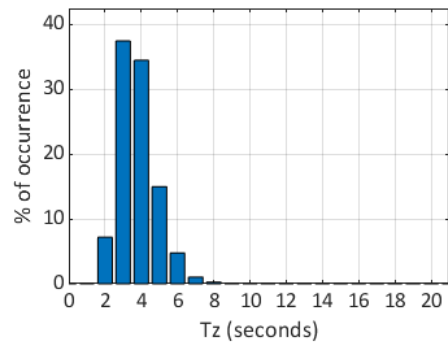
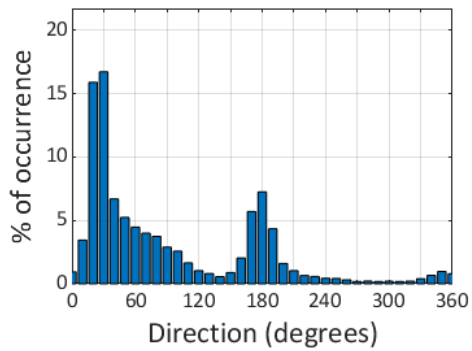
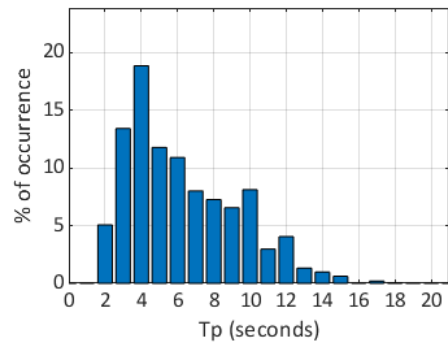
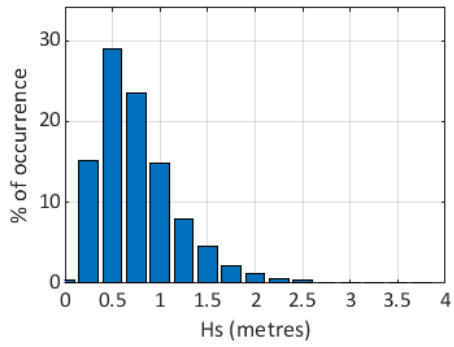
Storms at Chapel Point - all years



Chapel Point - Wave height exceedance (Hs)



Chapel Point 2019



Chapel Point 2013 to 2019 - Joint distribution (% of occurrence)

