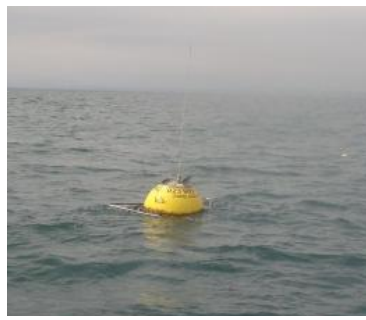
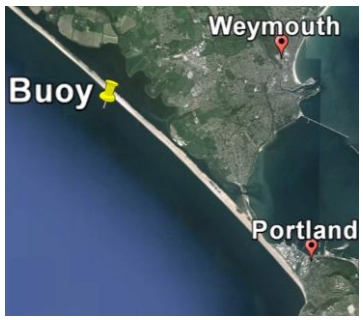


Chesil Directional Waverider Buoy

Location			
OS	363094 E 78173 N		
WGS84	Latitude: 50° 36.13' N Longitude: 02° 31.37' W		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	12 m CD	Buoy in situ off Chesil beach. Photo courtesy of Fugro GB Marine Limited	Location of buoy (Google mapping, image ©2016 TerraMetrics)

Data Quality

Recovery rate (%)	Sample interval
100	30 minutes

Monthly Averages - 2011

All times are GMT

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)	No. of days
January	0.98	9.3	5.3	208	7.0	9	31
February	1.40	11.3	5.6	219	7.4	28	28
March	0.55	8.9	5.0	198	8.2	1	31
April	0.57	10.0	5.3	205	10.2	4	30
May	0.87	6.4	4.1	219	12.3	2	31
June	0.92	6.8	4.3	222	14.3	1	30
July	0.66	7.0	4.2	225	16.0	1	31
August	0.72	6.5	4.1	223	17.2	0	31
September	1.16	7.1	4.5	223	16.7	5	30
October	1.07	7.3	4.4	223	15.6	7	31
November	1.20	9.1	5.1	221	13.4	15	30
December	1.71	7.8	4.8	228	10.7	11	31

Monthly Averages - All Years (January 2007 – December 2019)

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)
January	1.36	9.3	5.2	218	9.0	15
February	1.19	10.3	5.4	214	8.2	15
March	0.97	9.5	5.1	213	8.4	7
April	0.77	8.8	4.9	213	9.8	5
May	0.68	7.8	4.5	215	11.8	2
June	0.70	7.6	4.4	217	14.3	1
July	0.74	6.8	4.1	220	16.4	1
August	0.81	6.5	4.1	222	17.4	2
September	0.81	7.4	4.3	214	17.0	3
October	1.00	8.1	4.8	216	15.3	6
November	1.22	8.3	4.9	216	12.7	9
December	1.41	9.0	5.2	219	10.2	13

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)
13-Dec-2011 00:00:00	5.35	10.5	7.5	225	-0.28	HW +5	~3.31	0.72	0.79
08-Jan-2011 10:30:00	4.45	12.5	8.3	217	1.46	HW +2	~2.85	0.19	~0.21

* Tidal information is obtained from the tide gauge at West Bay Harbour. 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.

Annual Statistics

Year	Annual H _s exceedance** (m)						Annual Maximum H _s	
	0.05%	0.5%	1%	2%	5%	10%	Date	A _{max} (m)
2007	4.48	3.55	3.29	3.04	2.47	1.91	02-Dec-2007 10:30:00	4.87
2008	4.84	3.76	3.43	3.03	2.57	2.06	10-Mar-2008 12:30:00	5.37
2009	5.57	4.02	3.56	3.14	2.56	2.03	14-Nov-2009 13:30:00	6.95
2010	3.97	3.13	2.82	2.46	1.94	1.56	11-Nov-2010 09:30:00	4.40
2011	4.37	3.43	3.01	2.66	2.23	1.85	13-Dec-2011 00:00:00	5.35
2012	5.01	3.64	3.21	2.90	2.40	1.94	03-Jan-2012 10:30:00	5.88
2013	5.55	3.92	3.59	3.11	2.47	1.96	23-Dec-2013 23:30:00	6.65
2014	6.24	4.61	4.03	3.42	2.70	2.21	05-Feb-2014 11:30:00	6.99
2015	4.77	3.78	3.55	3.31	2.79	2.30	15-Jan-2015 01:00:00	5.71
2016	4.94	4.02	3.49	2.92	2.31	1.86	02-Jan-2016 13:00:00	5.25
2017	4.84	3.65	3.14	2.79	2.28	1.83	02-Feb-2017 23:30:00	6.41
2018	4.37	3.53	3.26	2.97	2.43	2.06	09-Nov-2018 21:00:00	5.24
2019	4.89	3.80	3.46	3.08	2.60	2.13	02-Nov-2019 10:30:00	5.53

** i.e. 5 % of the H_s values measured in 2007 exceeded 2.47 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	December 2006 to December 2019	
Return period (years)	Significant wave height (m)	Comments
0.25	4.10	No depth limitation
1	5.02	
2	5.42	
5	5.91	Depth-limited at MLWS
10	6.24	
20	6.55	
50	6.92	Depth-limited at HAT
100	7.17	

Distribution plots

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

- Annual time series of H_s (red line is 4.10 m storm alert threshold)
- Incidence of storm waves for 2011. 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 2011
- 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

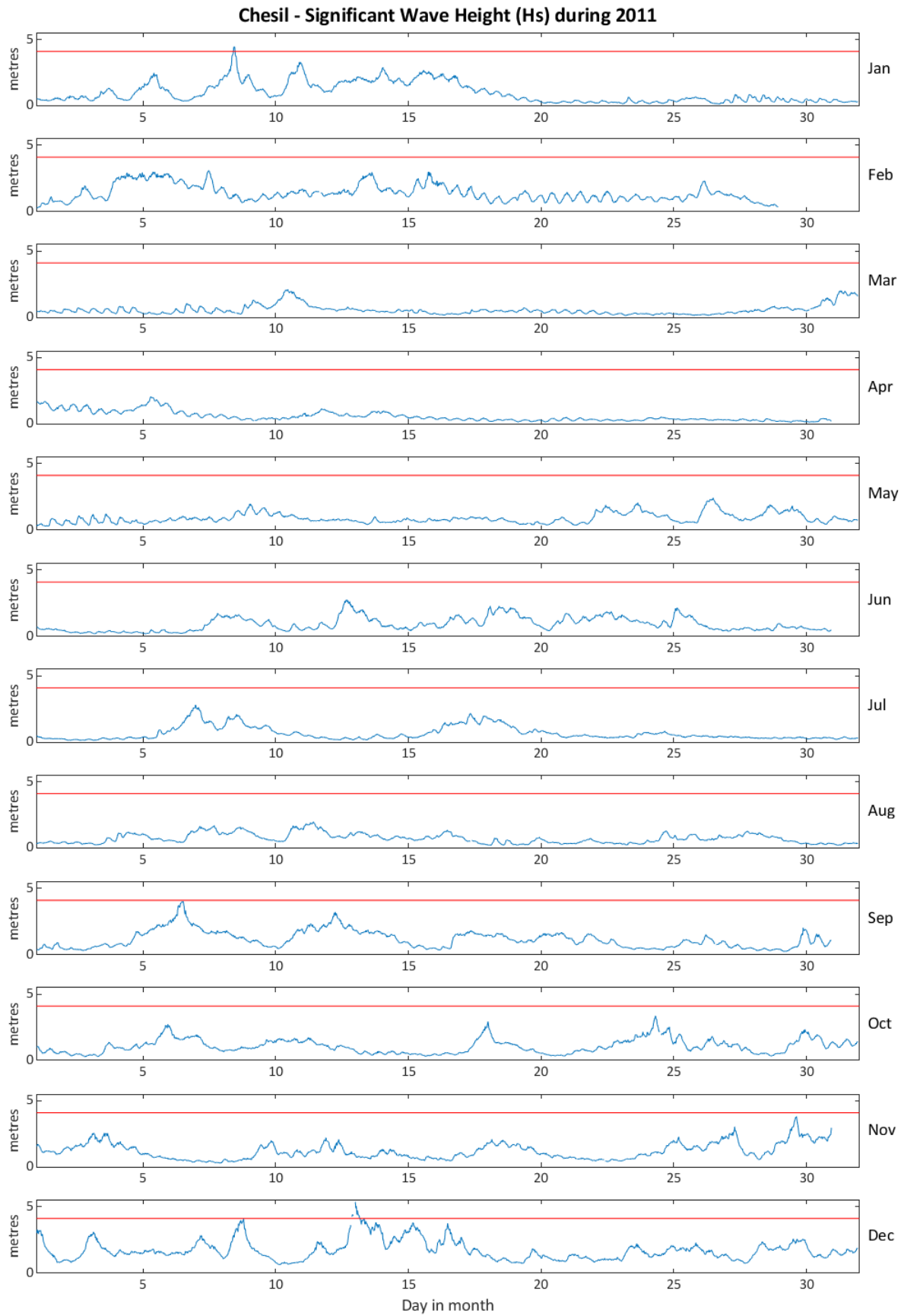
General

The wave buoy at Chesil, owned by Teignbridge District Council, was deployed on 22 December 2006 at which time the magnetic declination at the site was 2.9° west, changing by 0.15° east per year.

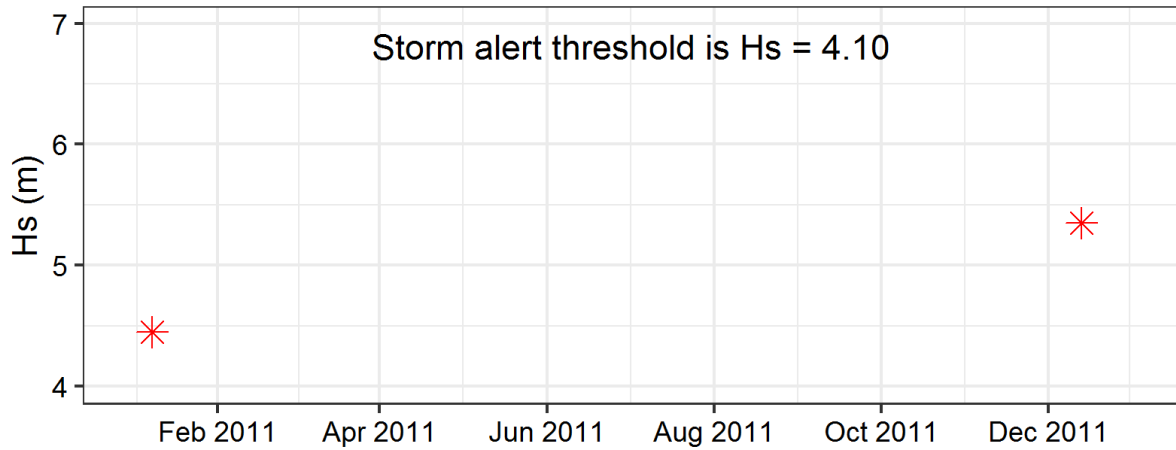
Acknowledgements

The shore station is kindly hosted by the Weymouth & Portland National Sailing Academy.

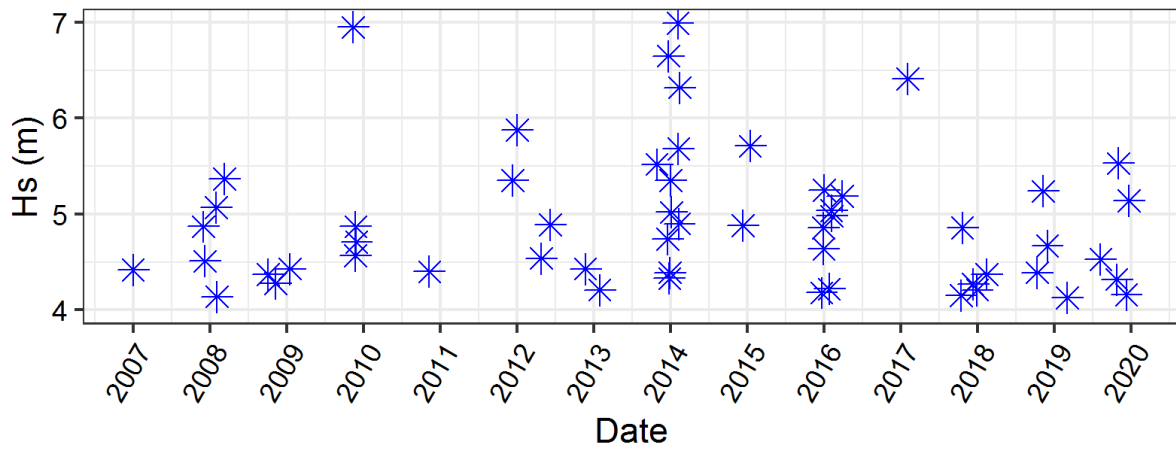
Tidal predictions were supplied by Fugro GB Marine Limited.



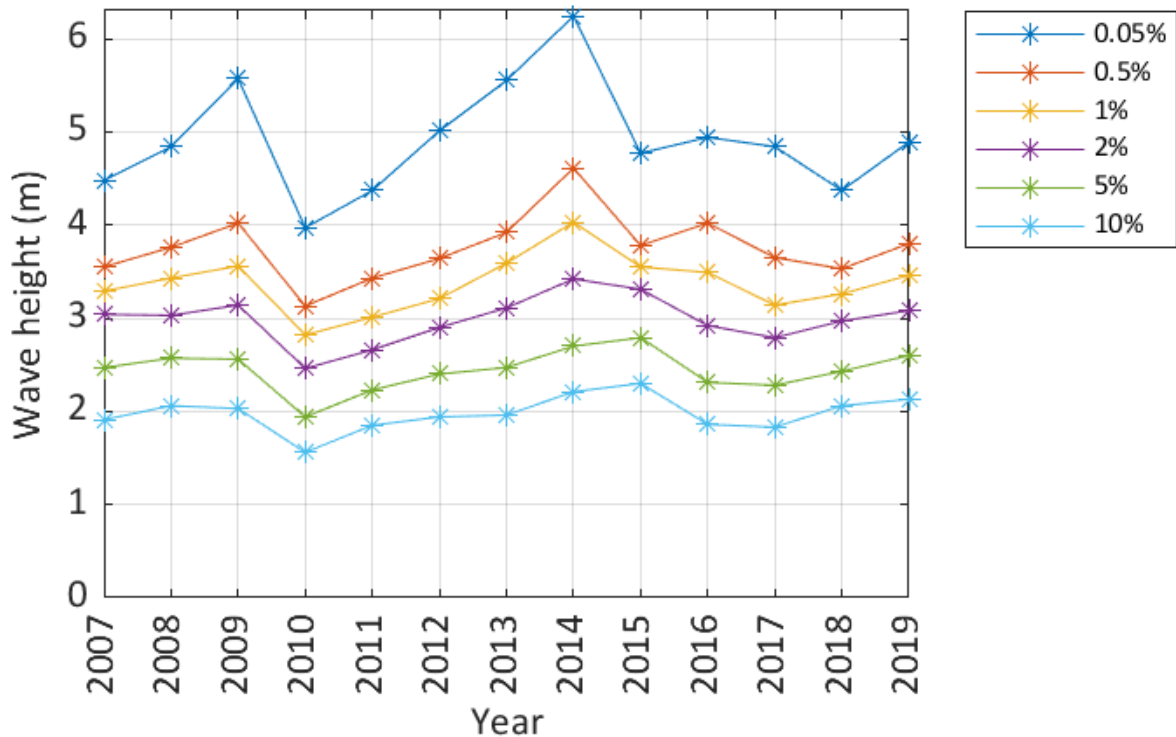
Storms at Chesil during 2011



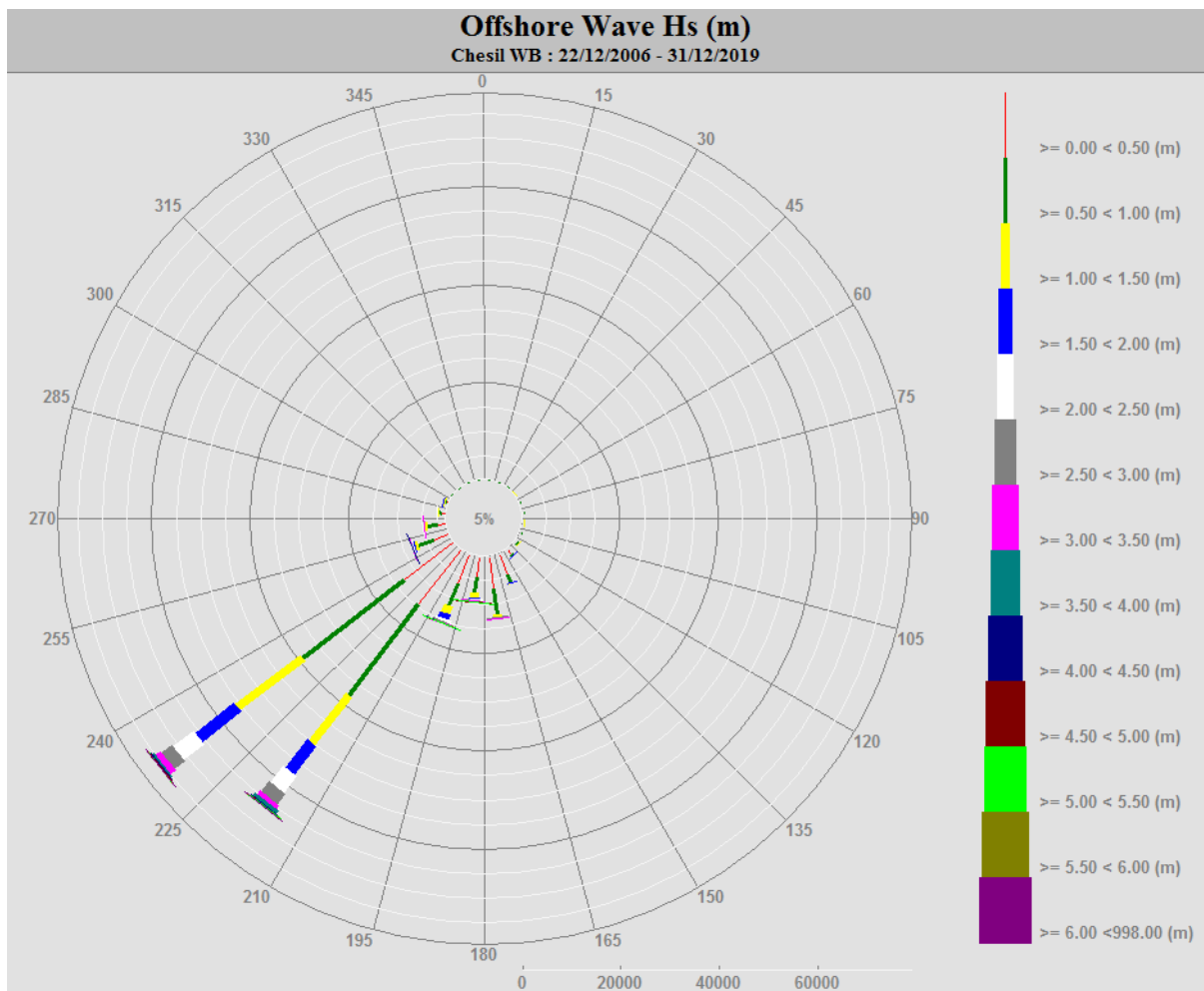
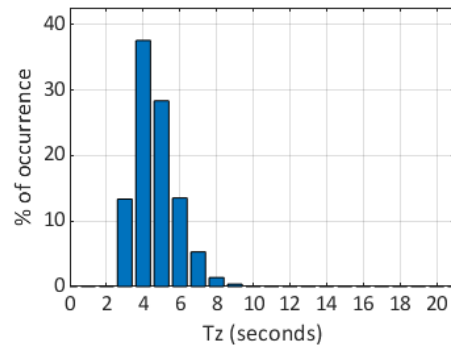
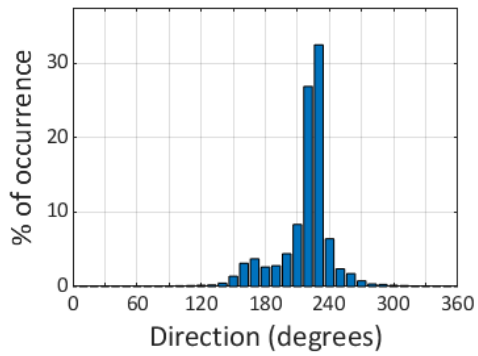
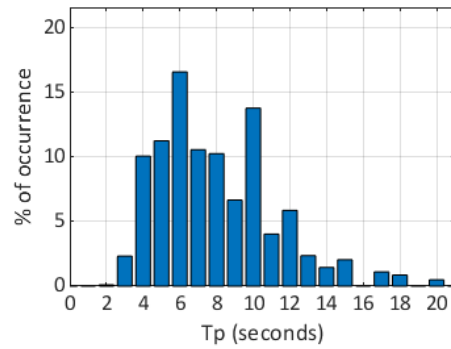
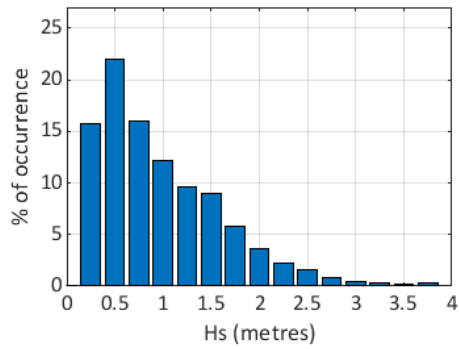
Storms at Chesil - all years



Chesil - Wave height exceedance (Hs)



Chesil 2011



Chesil 2007 to 2019 - Joint distribution (% of occurrence)

