



Folkestone Directional Waverider Buoy

Location			
OS	619260 E 133909 N		
WGS84	Latitude: 51° 03.76' N Longitude: 01° 07.67' E		
Instrument type			
Datawell Directional Waverider Mk III		Buoy in situ off Sandgate beach. Photo courtesy of Fugro GB Marine Limited	Location of buoy (Google mapping, image ©2016 TerraMetrics)
Water depth	~13m CD		

Data Quality

Recovery rate (%)	Sample interval
67	30 minutes

Monthly Averages – 2004

All times are GMT

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)	No. of days
January	0.81	5.9	3.8	156	8.4	0	30
February	0.72	7.0	4.0	143	7.9	-	20
March	0.70	5.3	3.6	143	7.9	-	19
April	0.45	6.0	3.6	128	-	0	30
May	0.42	5.2	3.5	127	12.8	-	31
June	0.43	4.8	3.4	151	15.3	-	23
July	-	-	-	-	-	-	0
August	-	-	-	-	-	-	0
September	-	-	-	-	-	-	0
October	0.87	4.9	3.6	164	14.6	0	31
November	0.45	5.5	3.7	143	12.0	0	30
December	0.52	5.8	3.6	153	9.9	-	31

Monthly Averages - All Years (July 2003 – December 2019)

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)
January	0.75	5.9	3.8	156	7.8	0
February	0.66	6.1	3.7	148	6.8	0
March	0.57	5.7	3.6	145	7.4	0
April	0.44	5.4	3.4	140	9.6	0
May	0.45	5.0	3.4	141	12.2	0
June	0.45	4.8	3.3	145	14.9	0
July	0.46	4.5	3.3	156	17.3	0
August	0.47	4.5	3.3	159	18.3	0
September	0.48	4.9	3.4	148	17.7	0
October	0.64	5.3	3.6	151	15.2	0
November	0.71	5.7	3.8	153	12.3	0
December	0.75	5.9	3.8	156	9.3	0

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)
08-Jan-2004 11:30:00	3.25	7.1	5.6	153	2.16	HW	4.72	-0.34	-0.11
23-Jun-2004 15:00:00	3.18	10.5	6.2	198	1.97	HW +1	4.01	-0.27	0.17
31-Jan-2004 12:30:00	2.71	7.7	5.1	163	-0.99	HW +6	2.72	0.34	0.37
18-Apr-2004 09:30:00	2.64	6.7	5.3	188	2.25	HW -1	-0.02	5.17	0.28
14-Oct-2004 09:00:00	2.49	9.1	5.0	186	1.33	HW -2	5.45	0.24	0.37

* Tidal information is obtained from the National Network gauge at Dover. 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)
2003	2.79	2.23	2.03	1.75	1.37	1.17	29-Nov-2003 13:00:00	3.07
2004	2.91	2.26	1.94	1.73	1.43	1.18	08-Jan-2004 11:30:00	3.25
2005	2.90	2.15	1.81	1.54	1.25	0.97	30-Dec-2005 13:30:00	3.15
2006	2.55	2.08	1.89	1.67	1.41	1.16	03-Dec-2006 09:00:00	3.13
2007	2.56	2.06	1.83	1.59	1.34	1.11	08-Dec-2007 16:30:00	2.86
2008	2.98	2.40	2.10	1.84	1.43	1.16	10-Mar-2008 10:00:00	3.58
2009	2.65	2.14	1.88	1.69	1.39	1.13	22-Jan-2009 08:30:00	2.98
2010	2.66	1.95	1.69	1.43	1.15	0.94	08-Nov-2010 12:00:00	2.92
2011	2.87	1.98	1.73	1.52	1.31	1.08	13-Dec-2011 01:00:00	3.11
2012	2.69	2.12	1.94	1.71	1.38	1.10	14-Dec-2012 12:30:00	2.87
2013	3.24	2.35	2.04	1.76	1.40	1.10	24-Dec-2013 02:00:00	3.57+
2014	2.82	2.42	2.21	1.94	1.60	1.27	05-Feb-2014 03:30:00	3.64+
2015	2.47	1.95	1.82	1.67	1.43	1.18	15-Jan-2015 05:30:00	2.71
2016	3.21	2.24	1.86	1.65	1.33	1.04	20-Nov-2016 08:00:00	3.92
2017	2.35	2.00	1.78	1.54	1.22	0.97	26-Dec-2017 00:30:00	2.76
2018	2.77	2.17	1.93	1.68	1.33	1.10	15-Dec-2018 20:30:00	3.08
2019	2.50	2.02	1.83	1.67	1.40	1.14	02-Nov-2019 13:00:00	2.86

** i.e. 5 % of the H_s values measured in 2003 exceeded 1.37 m

* 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 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	July 2003 to December 2019	
Return period (years)	Significant wave height (m)	Comments
0.25	2.45	No depth limitation
1	2.99	
2	3.21	
5	3.47	
10	3.63	
20	3.78	
50	3.95	
100	4.06	

Distribution plots

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

- Annual time series of H_s (red line is 2.45 m storm alert threshold)
- Incidence of storm waves for 2004. 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 2004
- 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

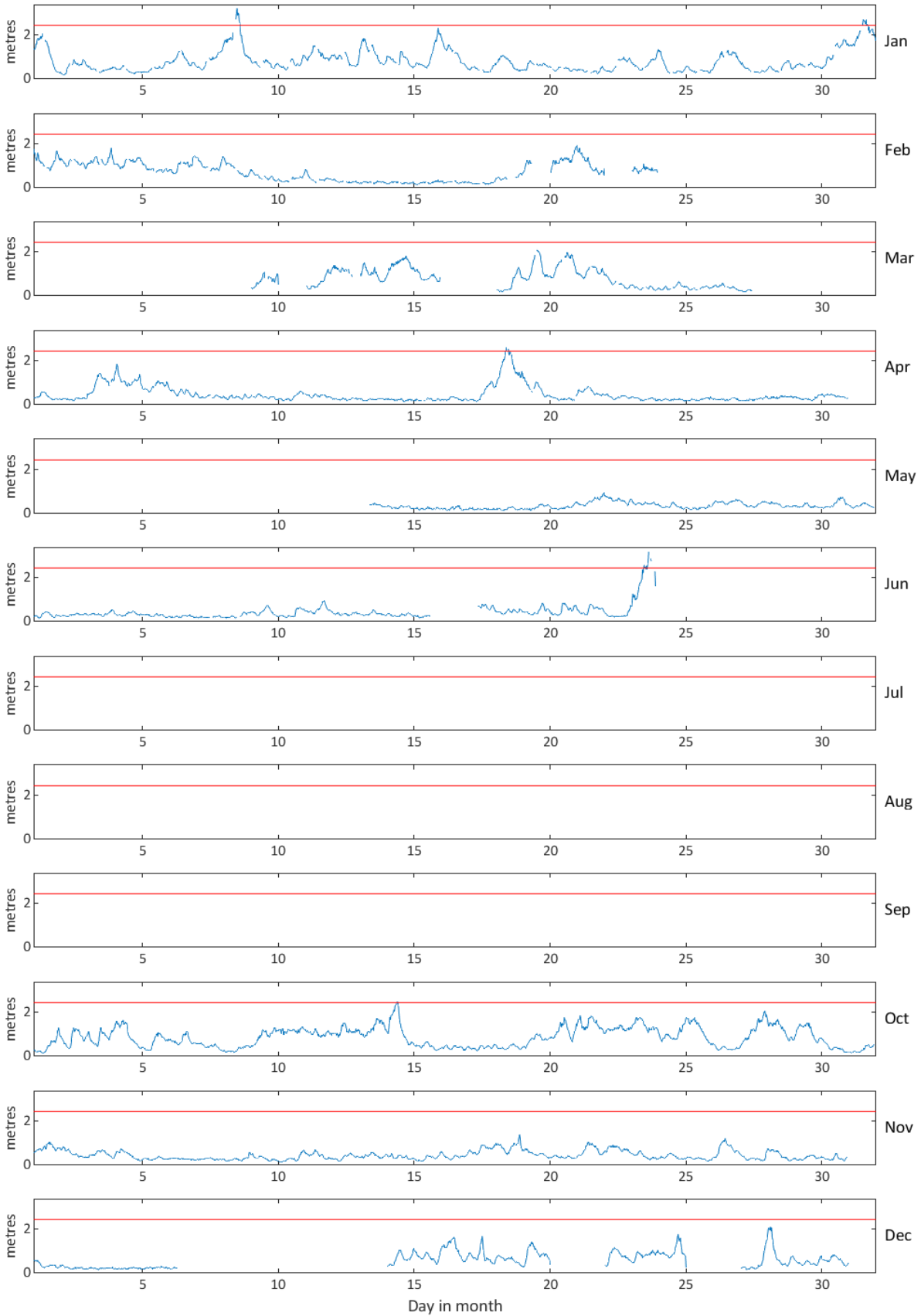
The buoy, owned by New Forest District Council, was first deployed on 8 July 2003, at which time the magnetic declination at the site was 2.1° west, changing by 0.14° east per year.

Acknowledgements

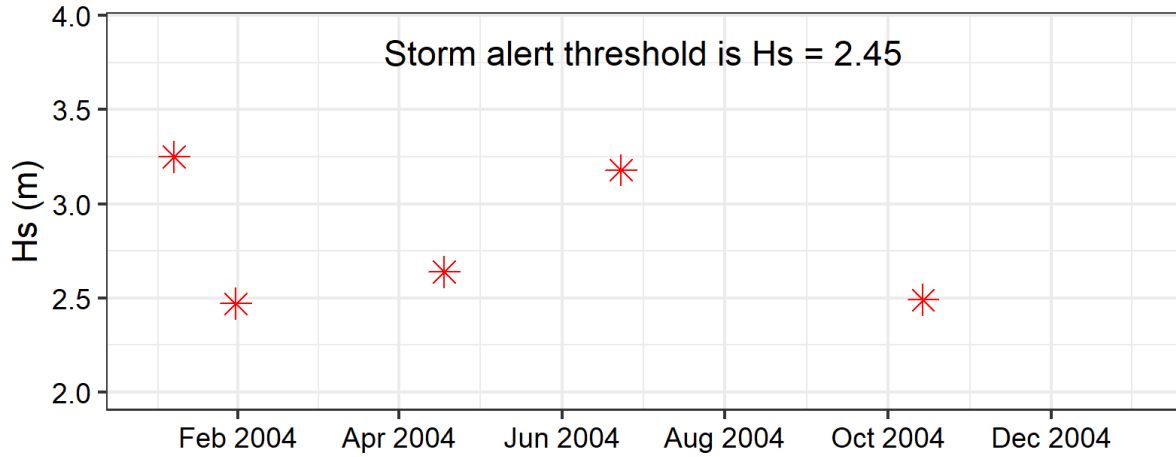
The shore station is kindly hosted by Shepway District Council Offices.

Tidal data at Dover were provided by the British Oceanographic Data Centre from the UK national tide gauge network, owned and operated by the Environment Agency.

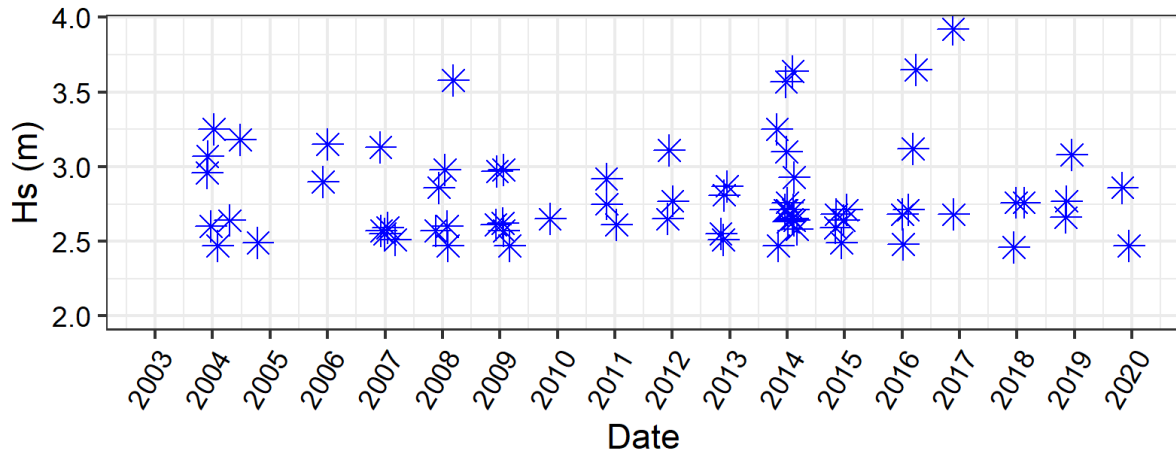
Folkestone - Significant Wave Height (Hs) during 2004



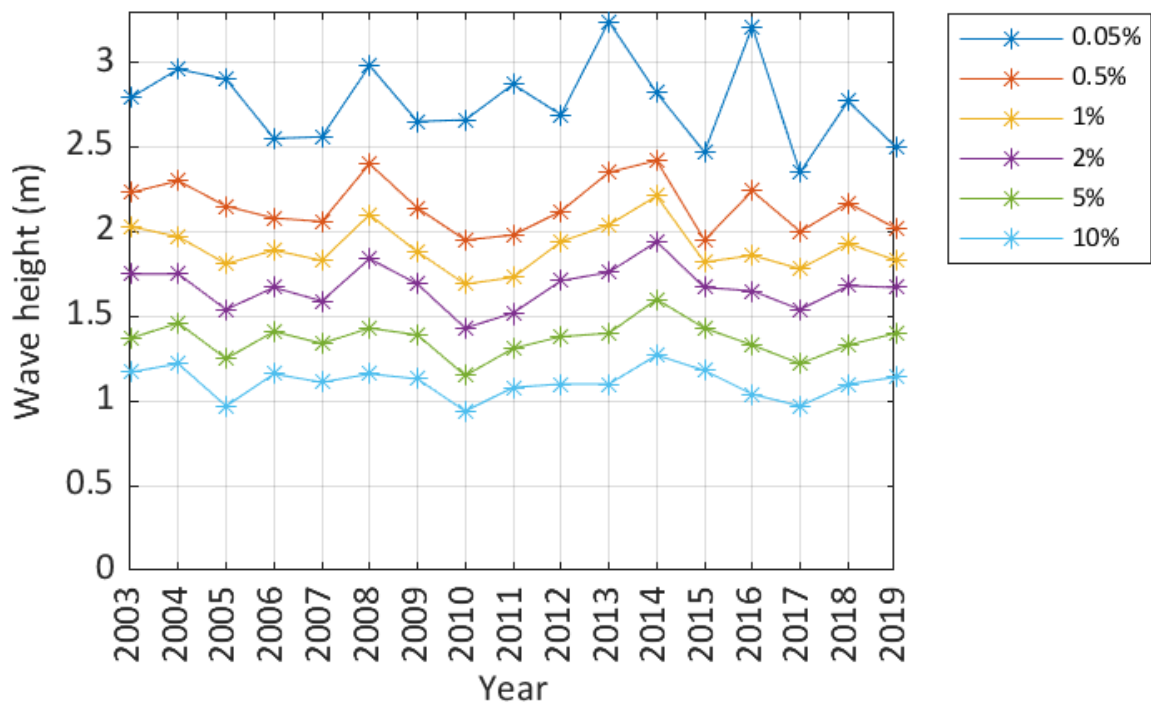
Storms at Folkestone during 2004



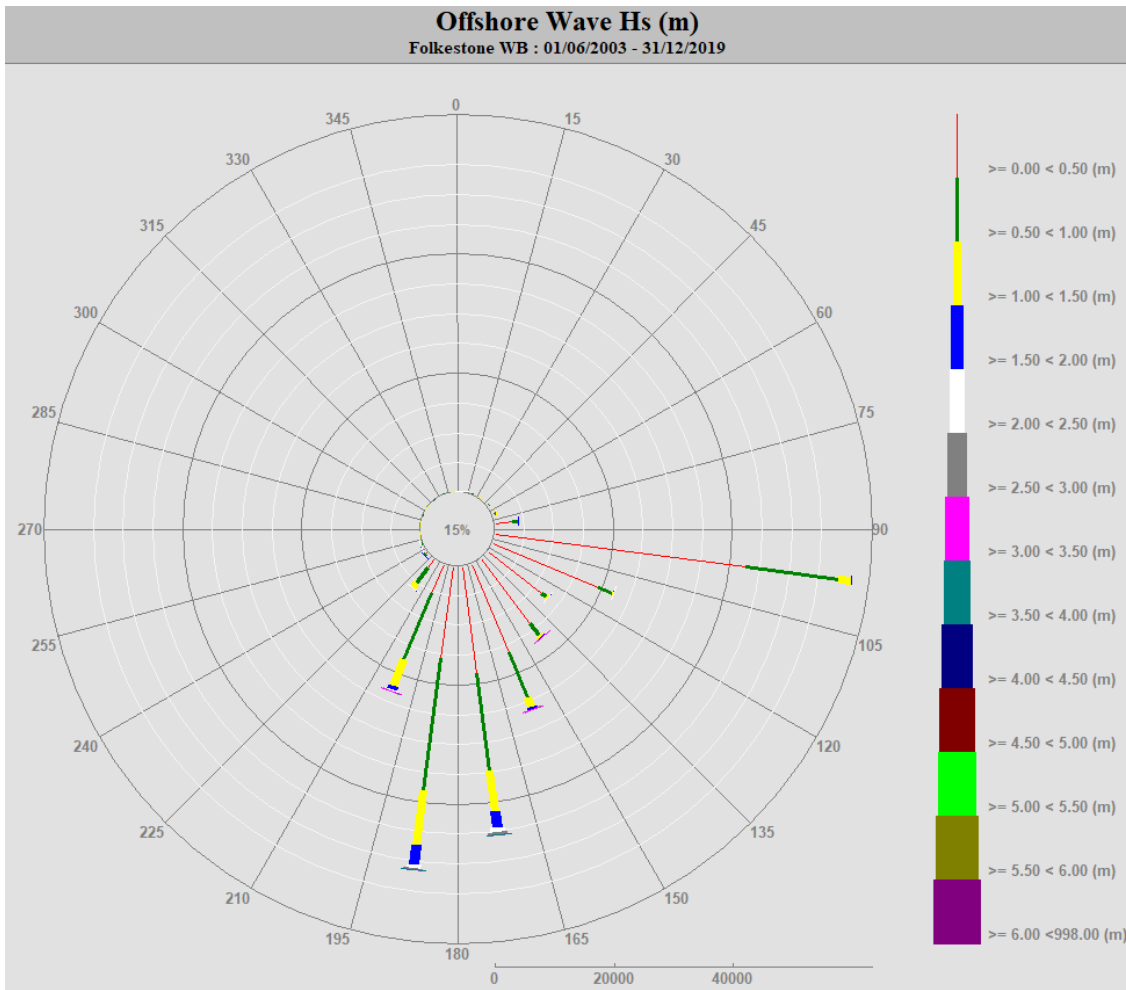
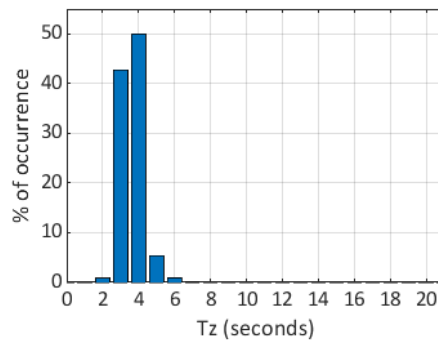
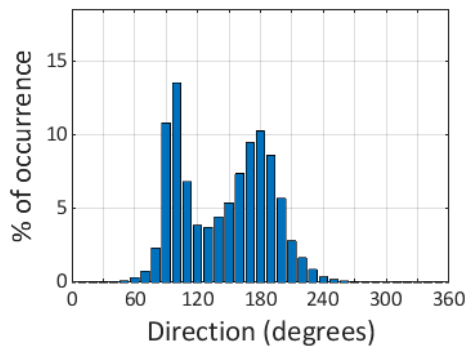
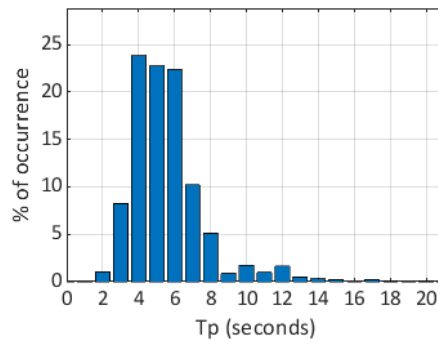
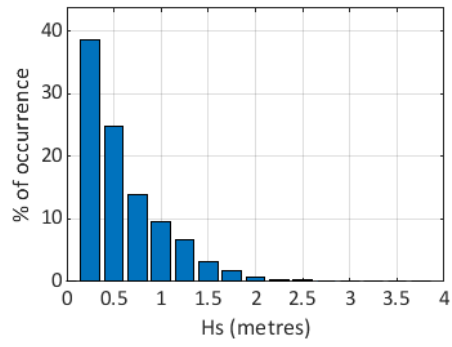
Storms at Folkestone - all years



Folkestone - Wave height exceedance (H_s)



Folkestone 2004



Folkestone 2003 to 2019 - Joint distribution (% of occurrence)

