



Blakeney Overfalls Directional Waverider Buoy

Location			
OS	608075 E 355639 N		
WGS84	Latitude: 53° 03.45' N Longitude: 01° 06.21' E		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~23m 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
100	30 minutes

Monthly Averages - 2013

All times are GMT

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)	No. of days
January	0.97	5.8	3.9	148	5.8	-	31
February	1.18	6.3	4.2	110	4.5	-	28
March	1.55	7.6	4.8	72	4.2	-	31
April	0.88	6.3	3.8	135	5.4	-	30
May	0.87	6.1	3.9	145	9.1	-	31
June	0.73	5.4	3.8	117	11.9	-	30
July	0.44	5.1	3.5	103	15.1	-	31
August	0.56	5.0	3.4	165	16.9	-	31
September	0.92	5.7	3.9	161	15.5	-	30
October	1.15	6.2	4.0	141	13.4	-	31
November	1.15	6.6	4.1	188	10.1	-	30
December	0.94	5.8	3.6	185	7.4	-	31

Monthly Averages - All Years (September 2006 – December 2019)

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)
January	1.09	6.4	4.1	156	6.1	-
February	0.99	6.5	4.1	139	5.4	-
March	0.93	6.8	4.0	137	6.2	-
April	0.83	6.2	3.9	122	8.2	-
May	0.86	5.7	3.9	129	10.8	-
June	0.74	5.7	3.8	123	13.5	-
July	0.68	5.2	3.6	146	16.0	-
August	0.71	5.1	3.5	167	17.0	-
September	0.85	5.6	3.8	155	15.8	-
October	1.00	6.2	4.0	140	13.5	-
November	1.09	6.2	4.0	151	10.5	-
December	1.04	6.1	3.9	170	7.6	-

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)
10-Oct-2013 21:00:00	4.45	10.0	6.5	11	1.05	HW -2	3.40	-	-
23-Mar-2013 06:00:00	3.96	9.1	6.9	76	0.27	HW +2	1.92	-0.41	-0.40
05-Dec-2013 17:30:00	3.75	7.7	5.6	342	0.65	HW -1	4.50	-	-
10-Sep-2013 19:00:00	3.74	8.3	6.0	352	-0.75	HW -4	3.70	-	-
30-Nov-2013 02:00:00	3.68	8.3	6.1	345	1.25	HW -2	2.70	-	-
20-Jan-2013 17:00:00	3.50	8.3	6.0	76	-0.05	HW +4	1.67	0.03	0.19
13-Oct-2013 17:00:00	3.30	8.3	6.2	55	0.75	HW +2	2.20	-	-

* Tidal information is obtained from the National Network gauge at Cromer and/or estimated from the predicted tide levels (Admiralty Total Tide). The surge shown is the residual at the time of the highest H_s. The maximum tidal surge is the large 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)
2006	2.56	2.34	2.18	1.88	1.52	1.34	12-Nov-2006 03:00:00	2.56
2007	4.16	3.20	3.01	2.69	2.22	1.83	09-Nov-2007 04:30:00	4.69
2008	3.67	3.16	2.85	2.48	1.97	1.64	01-Feb-2008 19:30:00	3.99
2009	4.56	3.10	2.86	2.49	1.87	1.53	17-Dec-2009 20:00:00	5.44
2010	4.04	3.35	3.11	2.82	2.35	1.87	01-Dec-2010 16:00:00	4.63
2011	2.79	2.44	2.31	2.13	1.83	1.55	07-Dec-2011 14:30:00	3.12
2012	3.71	3.13	2.82	2.46	1.98	1.59	29-Apr-2012 00:00:00	4.05
2013	3.86	3.46	3.17	2.87	2.23	1.76	10-Oct-2013 21:00:00	4.45
2014	3.14	2.57	2.27	1.98	1.68	1.44	13-Oct-2014 10:00:00	3.54
2015	3.79	2.77	2.53	2.21	1.76	1.51	21-Nov-2015 11:30:00	4.13
2016	4.15	2.91	2.67	2.40	1.96	1.63	14-Jan-2016 21:00:00	4.61
2017	3.89	3.09	2.77	2.57	2.15	1.78	13-Jan-2017 18:00:00	4.28
2018	3.55	3.00	2.72	2.24	1.82	1.53	20-Nov-2018 06:30:00	3.89
2019	4.05	3.03	2.76	2.40	1.93	1.59	27-Jan-2019 21:00:00	4.42

** i.e. 5 % of the H_s values measured in 2006 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	September 2006 to December 2019	
Return period (years)	Significant wave height (m)	Comments
0.25	3.29	No depth limitation
1	4.00	
2	4.31	
5	4.66	
10	4.89	
20	5.10	
50	5.35	
100	5.51	

Distribution plots

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

- Annual time series of H_s (red line is 3.29 m storm threshold)
- Incidence of storm waves for 2013. 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 2013
- 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

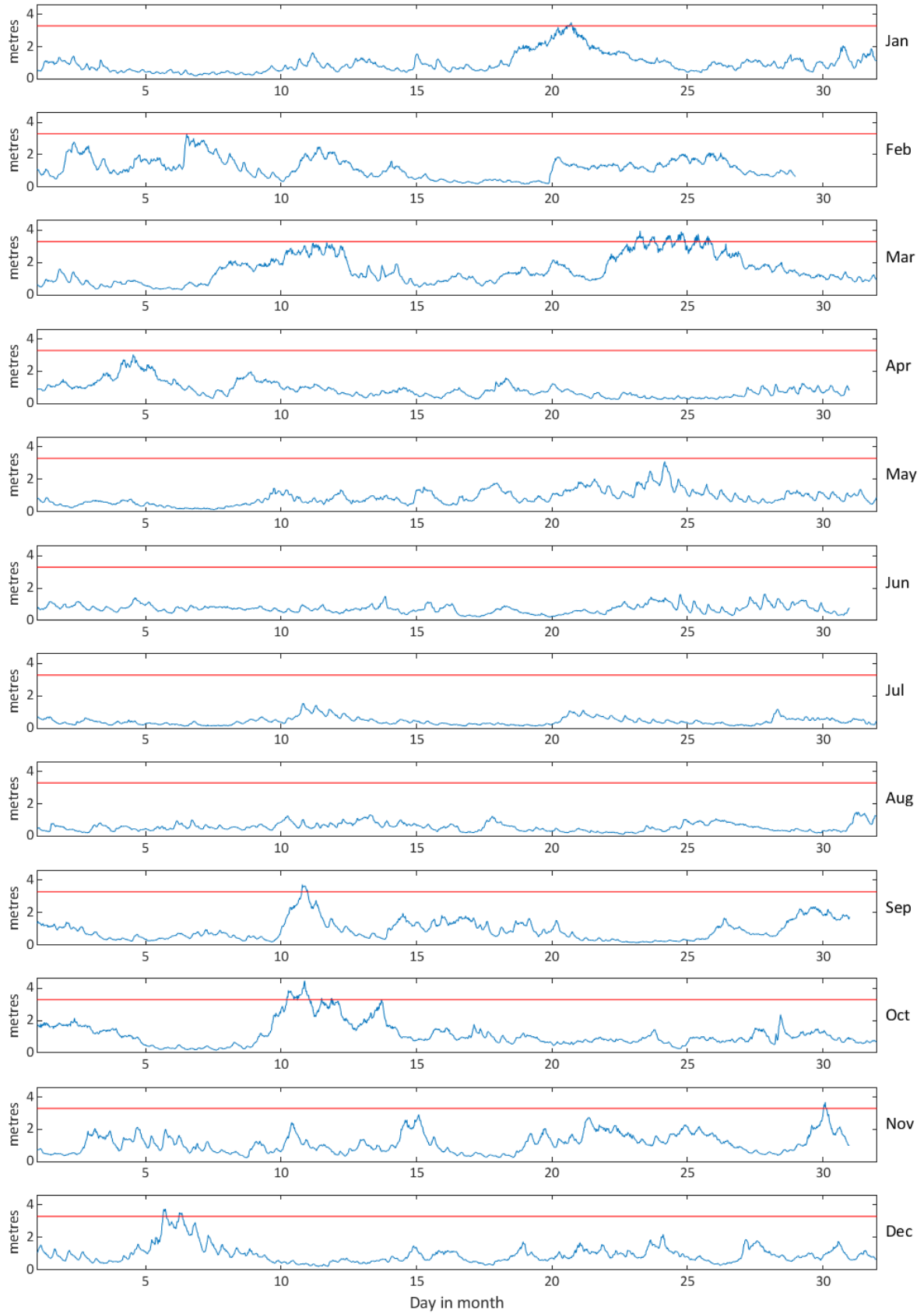
General

The buoy, owned by the Environment Agency, was first deployed on 27 September 2006, at which time the magnetic declination at the site was 2.14° west, changing by 0.14° east per year.

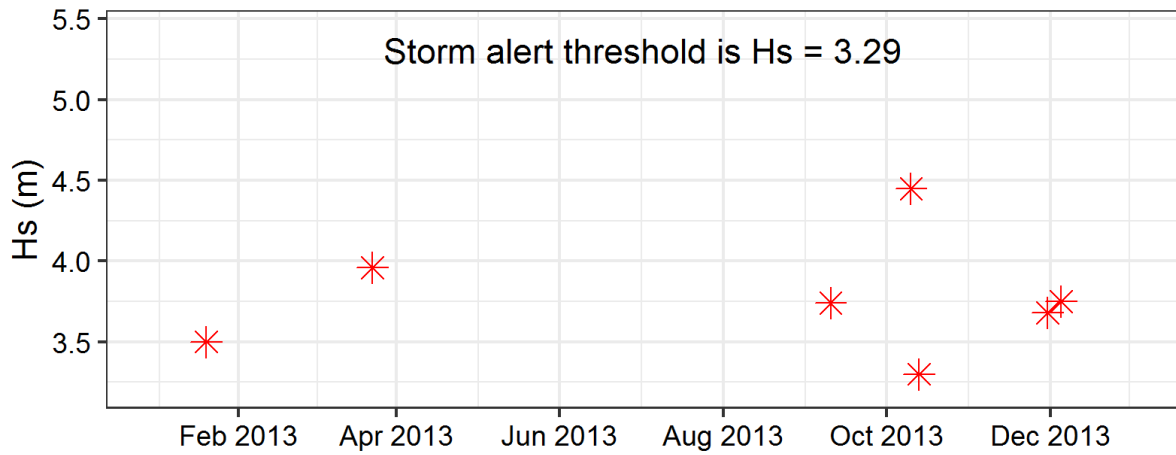
Acknowledgements

The shore station is kindly hosted by Wells-Next-the-Sea RNLI Lifeboat Station.

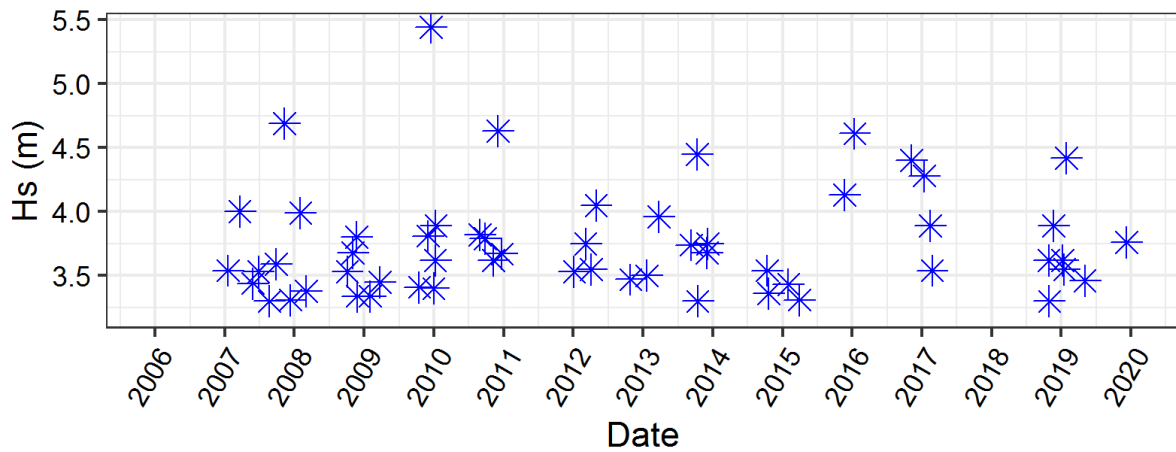
Blakeney Overfalls - Significant Wave Height (Hs) during 2013



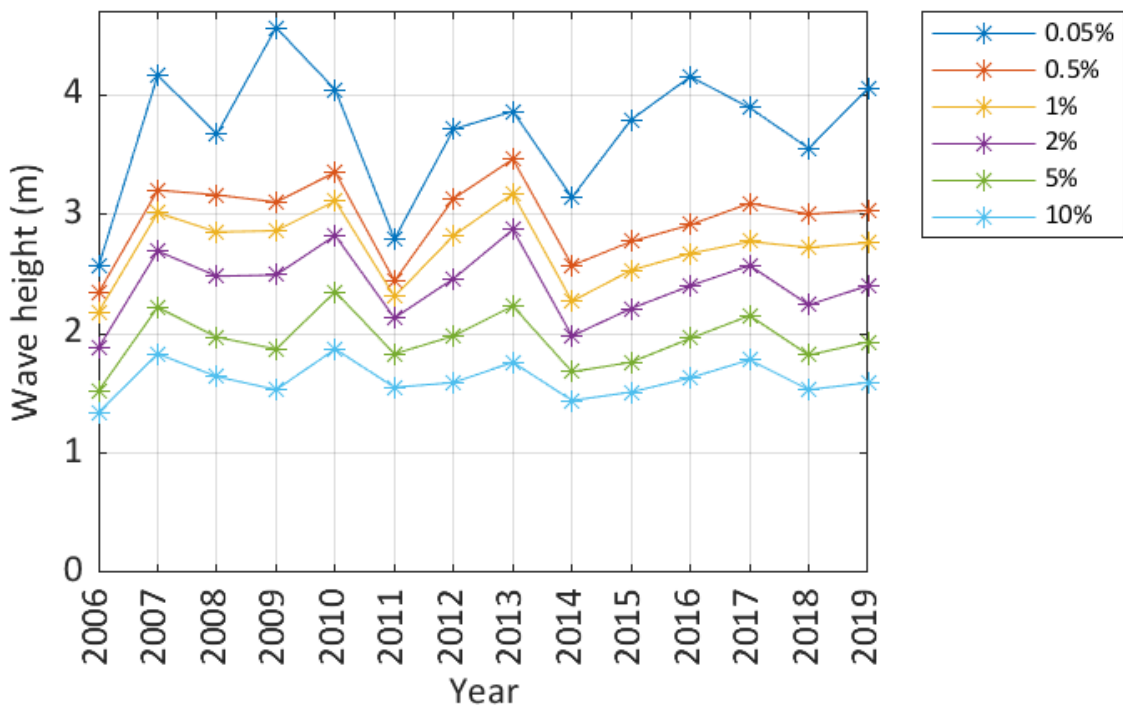
Storms at Blakeney Overfalls during 2013



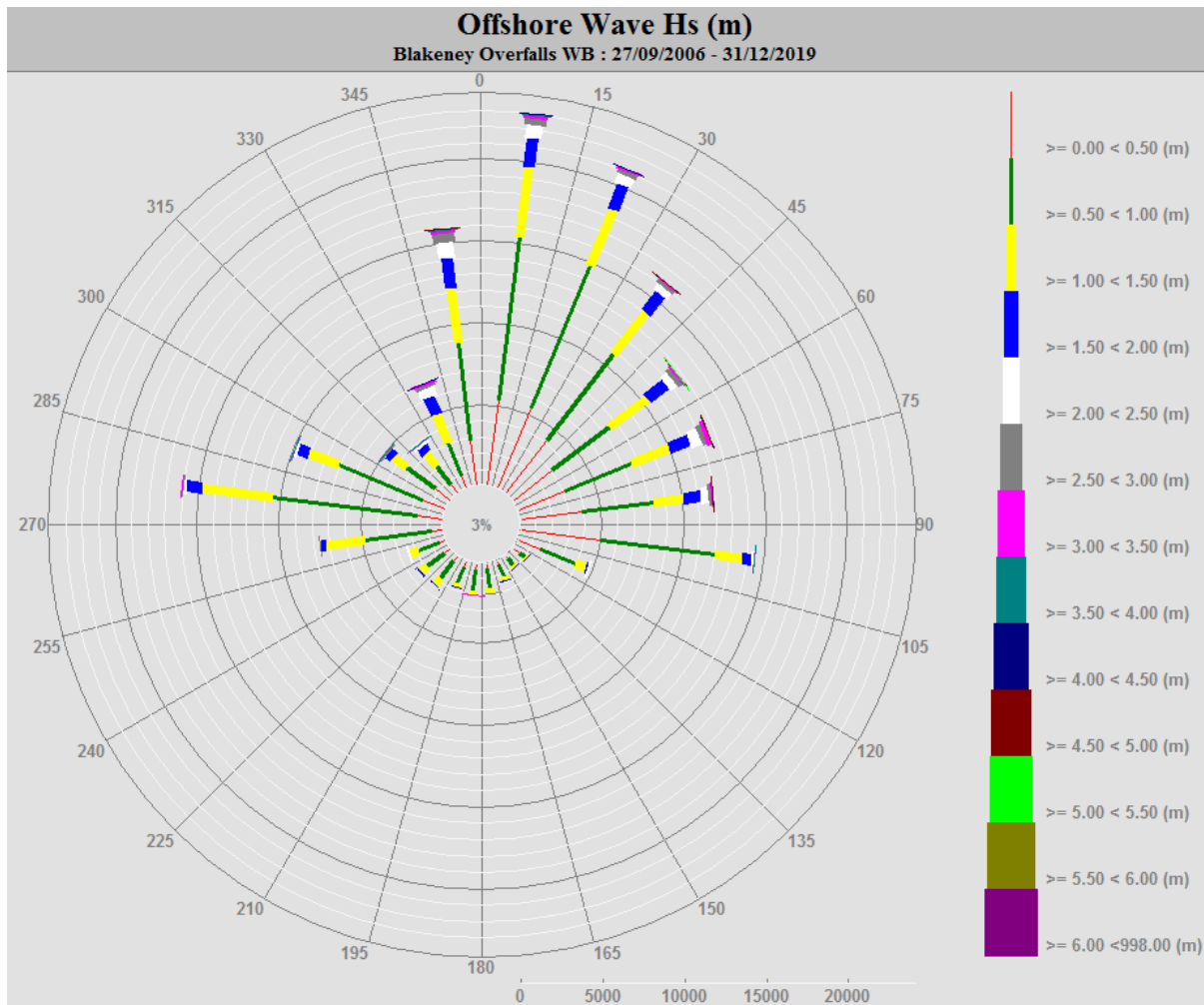
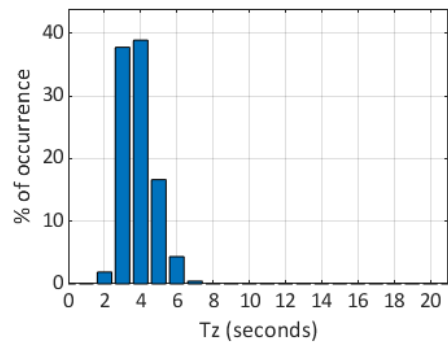
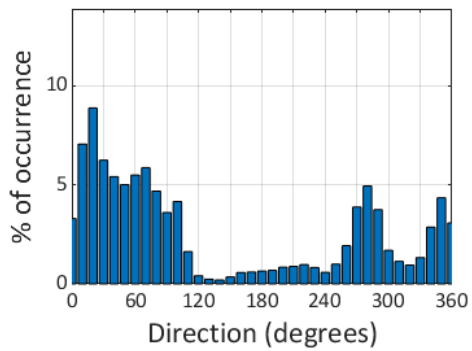
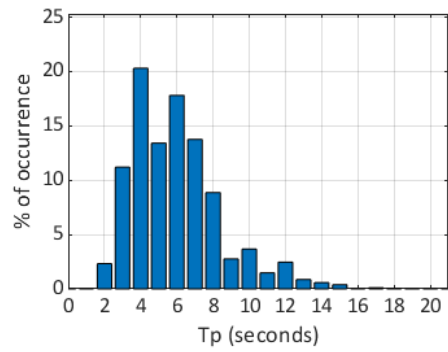
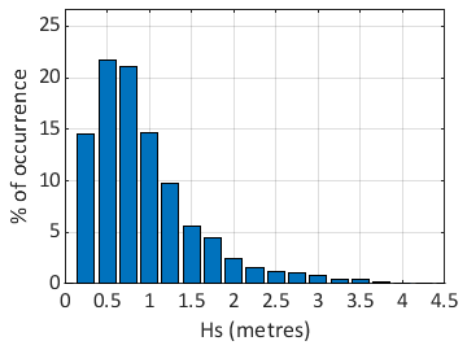
Storms at Blakeney Overfalls - all years



Blakeney Overfalls - Wave height exceedence (H_s)



Blakeney Overfalls 2013



Blakeney Overfalls 2006 to 2019 - Joint distribution (% of occurrence)

