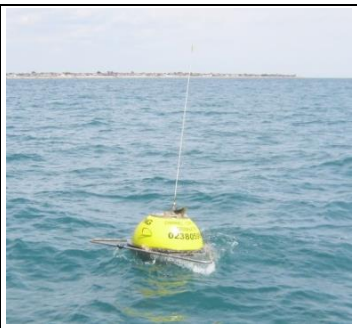
Bracklesham Bay Directional Waverider Buoy

Location			
OS	482208 E 92092 N		
WGS84	*Latitude:* 50° 43.358' N *Longitude:* 00° 50.204' W		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~10m CD	Buoy in situ in Bracklesham Bay. Photo courtesy of Fugro EMU Limited	Location of buoy (Google mapping)

Data Quality

Recovery rate (%)	Sample interval
96	30 minutes

Monthly Averages - 2014

All times are GMT

Month	H_s (m)	T_p (s)	T_z (s)	Dir. (°)	SST (°C)	No. of days
January	1.38	8.9	4.8	204	8.6	30
February	1.70	9.7	5.2	204	7.9	27
March	0.69	10.0	4.4	206	9.0	29
April	0.55	7.8	3.9	200	11.4	29
May	0.65	6.5	3.7	210	13.8	30
June	0.39	6.0	3.5	201	17.2	29
July	0.42	5.5	3.2	218	19.8	30
August	0.74	5.5	3.5	218	19.1	30
September	0.34	7.2	3.5	195	18.3	29
October	0.91	7.2	4.0	204	16.0	30
November	0.93	8.6	4.4	196	12.8	29
December	0.99	7.2	4.1	213	9.6	30

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-Feb-2014 00:00	4.47	12.5	7.4	208	2.53	HW +1	3.8	0.83	1.21
05-Feb-2014 14:00	4.07	14.3	7.1	204	2.02	HW	3.2	0.67	0.83
09-Feb-2014 06:00	3.92	12.5	7.1	208	1.01	HW	1.3	0.04	0.70
03-Jan-2014 23:30	3.89	13.3	7.4	207	1.67	HW -1	4.0	0.23	0.67
12-Dec-2014 04:30	3.65	10.0	6.7	207	1.68	HW +2	2.8	0.37	0.42

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	-	2.83	2.51	2.25	1.90	1.56	09-Nov-2008 23:00	3.28
2009	3.60	2.97	2.70	2.37	1.96	1.58	23-Nov-2009 13:00	3.83
2010	3.15	2.56	2.23	1.85	1.47	1.17	31-Mar-2010 09:30	3.46
2011	3.32	2.59	2.39	2.13	1.76	1.50	13-Dec-2011 00:00	3.64+
2012	3.42	2.80	2.58	2.31	1.90	1.52	03-Jan-2012 09:00	3.67
2013	3.79	2.98	2.71	2.41	1.93	1.50	24-Dec-2013 02:00	4.13
2014	4.03	3.21	2.88	2.55	2.10	1.70	15-Feb-2014 00:00	4.47+

** i.e. 5 % of the H_s values measured in 2008 exceeded 1.90 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.

Distribution plots

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

- Annual time series of H_s (red line is 3.0 m storm threshold)
- Wave rose (percentage of occurrence of Direction vs. H_s) for all measured data
- Percentage of occurrence of H_s, T_p, T_z and Direction for 2014
- Incidence of storm waves for 2014. Storm events are defined using the Peaks-over-Threshold method. The highest H_s of each storm event is shown
- Joint distribution of all parameters for all measured data, given as percentage of occurrence

** Tidal information is obtained from the nearest recording tide gauge (the National Network gauge at Portsmouth). 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.

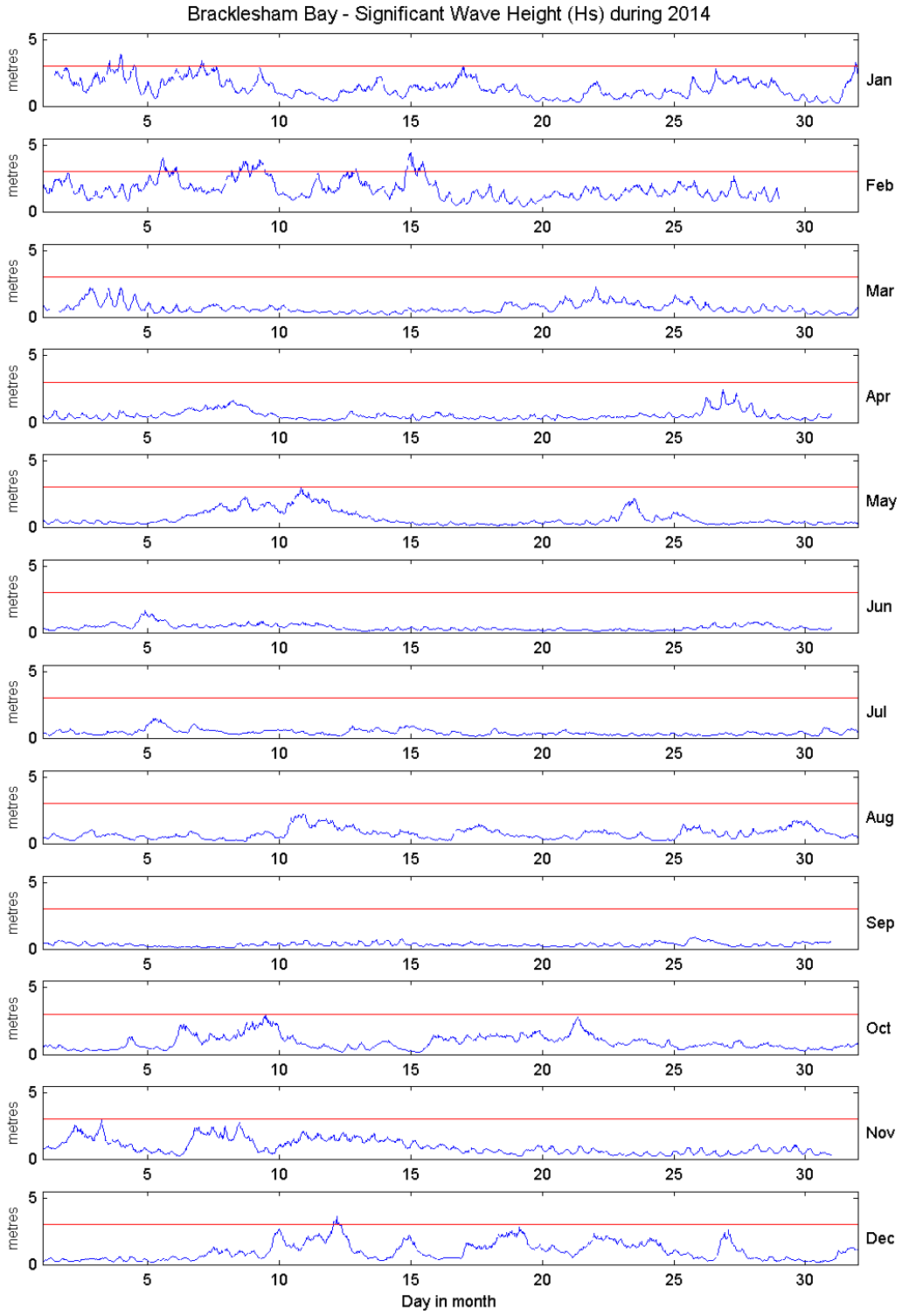
Return period (years)	Significant wave height (m)	Comments
1	3.9	No depth limitation
2	4.1	
5	4.4	Depth-limited at MLWS
10	4.5	
20	4.7	
50	4.9	

General

The buoy was first deployed on 22 August 2008, at which time the magnetic declination at the site was 2.1° west, changing by 0.14° east per year.

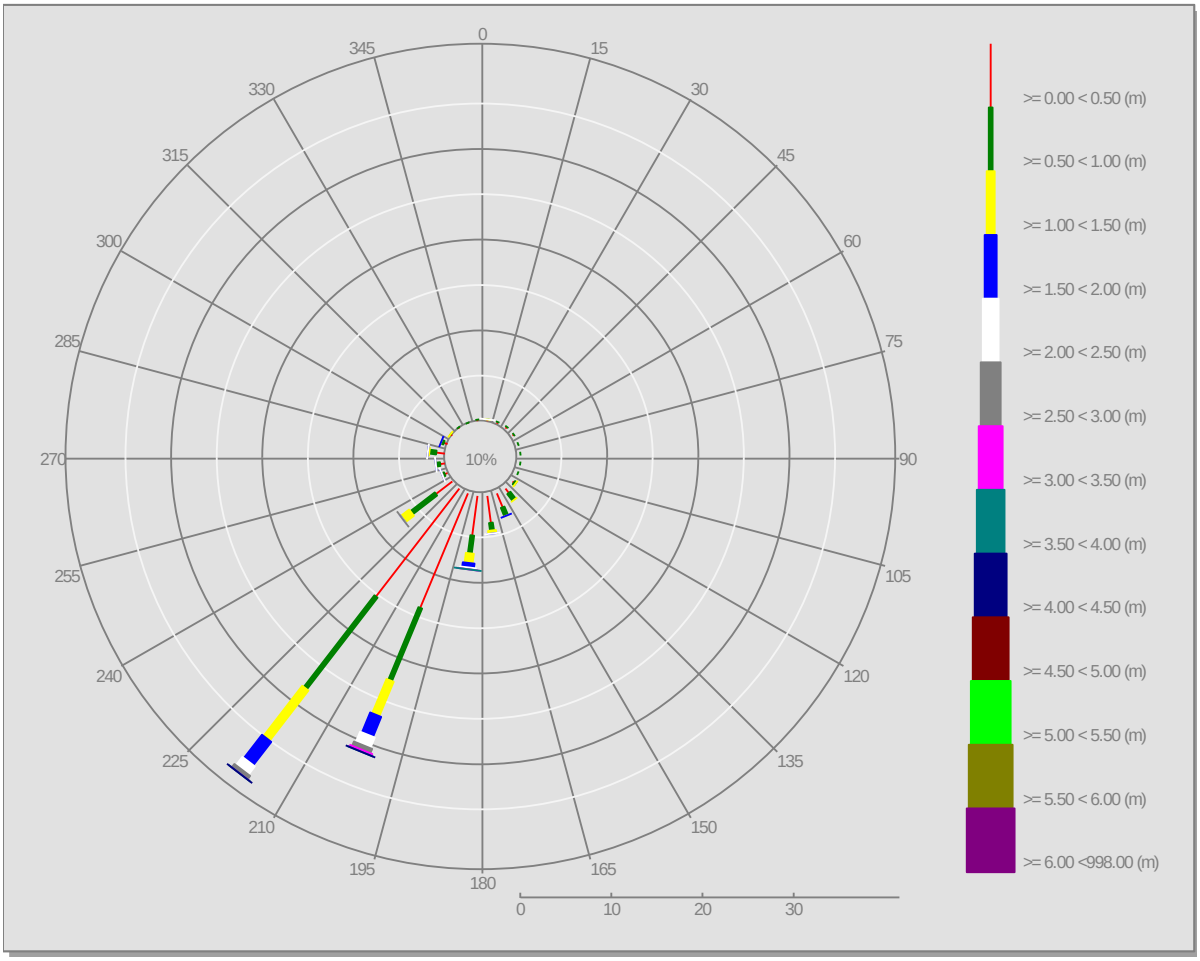
Acknowledgements

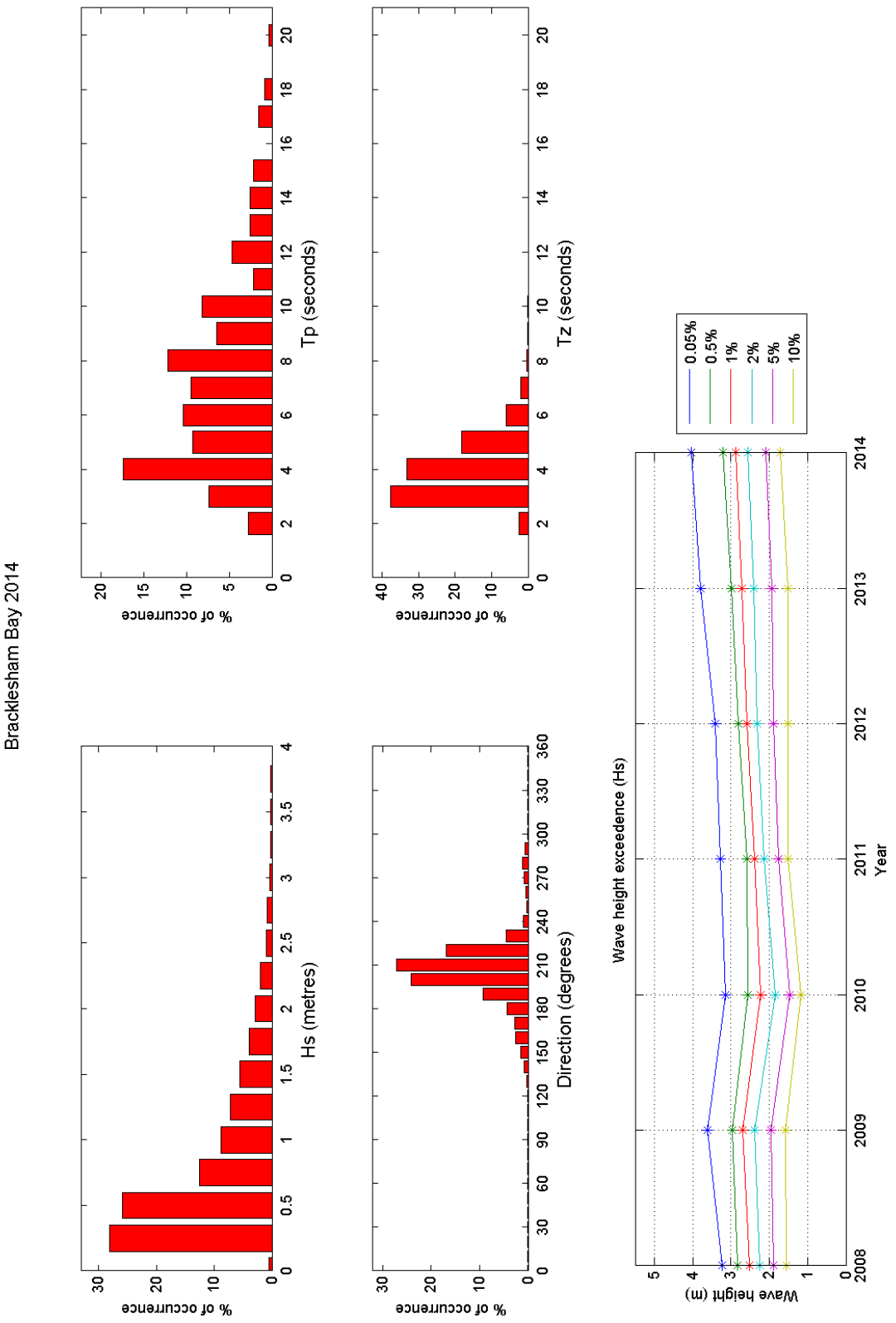
The shore station is kindly hosted by Fugro EMU Limited. Tidal data were supplied by the British Oceanographic Data Centre as part of the function of the National Tidal and Sea Level Facility, hosted by the Proudman Oceanographic Laboratory and funded by DEFRA and the Natural Environment Research Council.

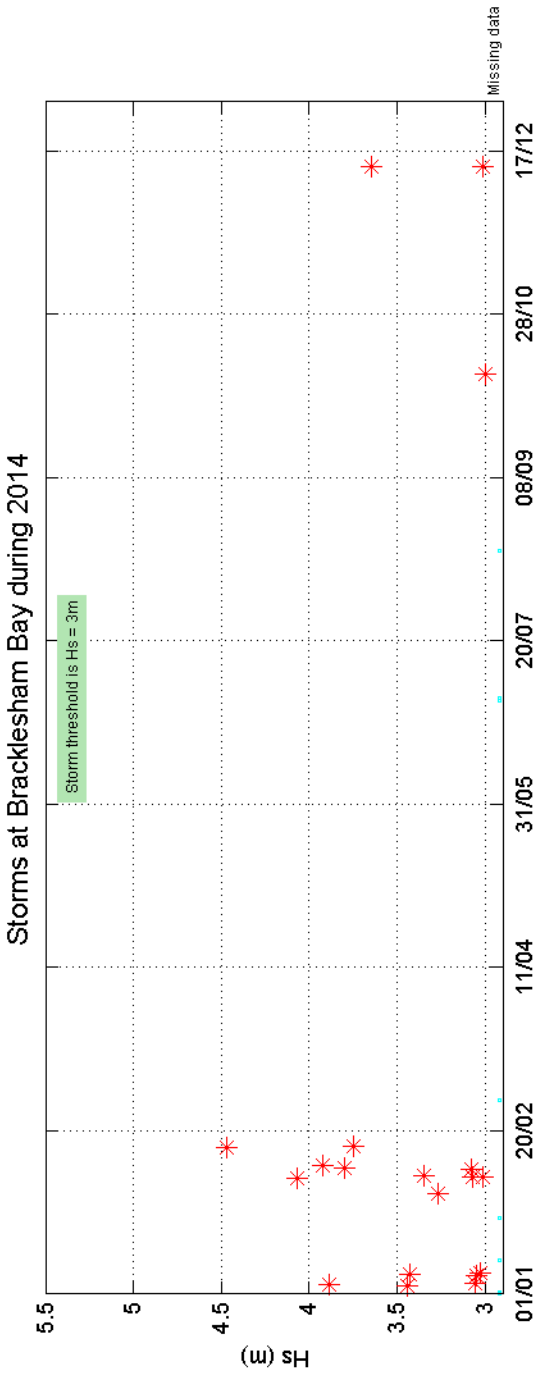

Bracklesham Bay - Significant Wave Height (Hs) during 2014
metres
5
0
5
10
15
20
25
30
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day in month

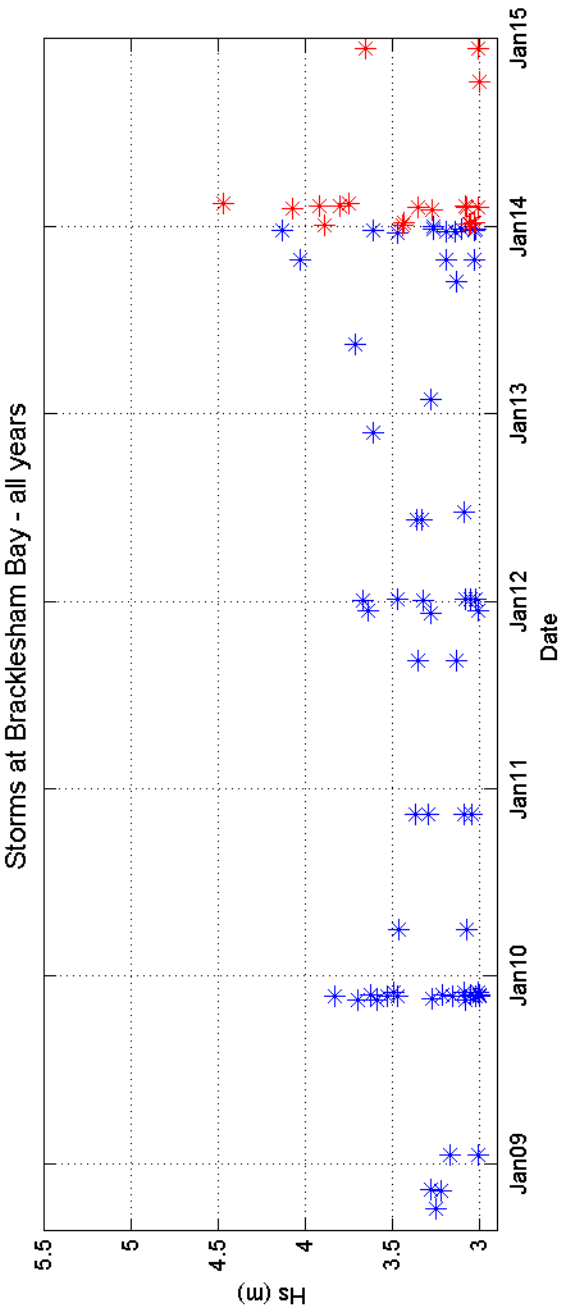
Offshore Wave Hs (m)

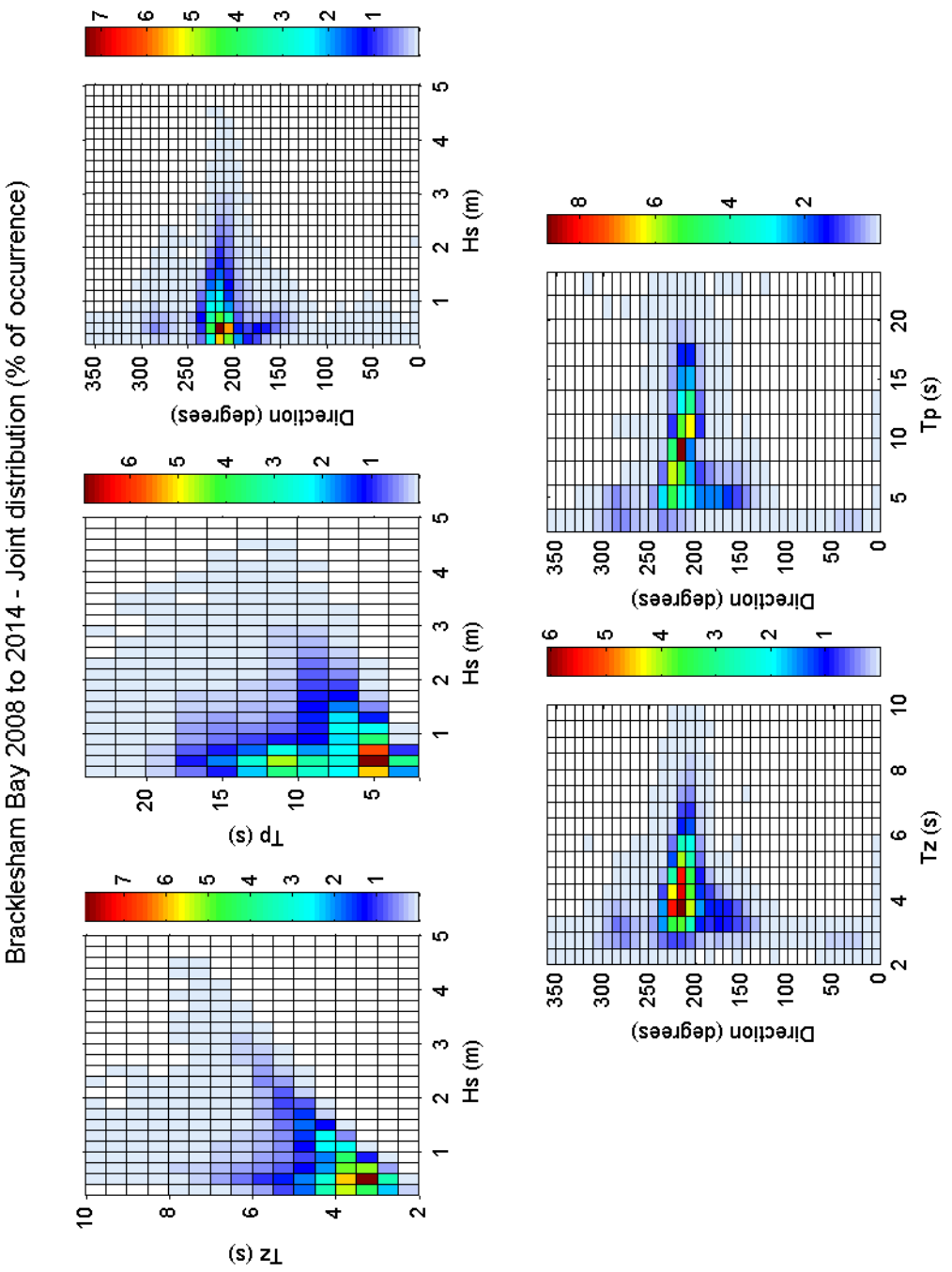
Bracklesham Bay WB : 22/08/2008 - 31/12/2014




Bracklesham Bay 2014
% of occurrence
Hs (metres)
Direction (degrees)
Tp (seconds)
Tz (seconds)
Wave height exceedence (Hs)
Wave height (m)
Year
0.05%
0.5%
1%
2%
5%
10%


Storms at Bracklesham Bay during 2014
Storm threshold is Hs = 3m
Missing data
Hs (m)
5.5
5
4.5
4
3.5
3
01/01
20/02
11/04
31/05
20/07
08/09
28/10
17/12


Storms at Bracklesham Bay - all years
Hs (m)
5.5
5
4.5
4
3.5
3
Jan09
Jan10
Jan11
Jan12
Jan13
Jan14
Jan15
Date


Bracklesham Bay 2008 to 2014 - Joint distribution (% of occurrence)
Direction (degrees)
Hs (m)
Tp (s)
Tz (s)