Rustington Directional Waverider Buoy

Location

OS: 506333E 93783N

WGS84: *Latitude:* 50° 44.036' N *Longitude:* 00° 29.677' W

Water Depth

~10 m CD

Instrument Type

Datawell Directional Waverider Mk III

Data Quality

Recovery rate (%)	Sample interval
98	30 minutes

Statistics - 2012

All times are GMT

Month	H_s (m)	T_p (s)	T_z (s)	Dir. (^{o})	SST (^{o}C)	No. of days
January	1.01	6.7	3.9	200	8.5	30
February	0.64	7.6	3.8	197	6.3	28
March	0.52	9.1	3.9	200	8.3	30
April	0.91	6.5	3.8	191	10.0	29
May	0.51	4.9	3.3	182	12.1	30
June	0.91	6.1	3.8	193	14.9	29
July	0.71	5.5	3.6	207	16.8	30
August	0.70	6.0	3.6	202	18.7	30
September	0.71	5.3	3.4	208	17.1	29
October	0.97	6.9	3.9	199	14.4	31
November	1.02	6.8	4.0	203	11.8	29
December	1.21	8.5	4.4	208	8.4	29

Storm Analysis

Date/Time	H_s (m)	T_p (s)	T_z (s)	Dir. (^{o})	Water level elevation* (OD)	Tidal stage (hours re. HW)	Tidal range (m)	Tidal surge* (m)	Max. surge* (m)
03-Jan-2012 09:30	3.86	10.0	6.7	218	0.29	HW +4	2.4	0.23	0.44
22-Nov-2012 22:00	3.65	8.3	6.5	193	0.10	HW +4	3.3	0.30	0.30

* *Tidal information is obtained from the nearest recording tide gauge (the tide gauge on Arun Platform). The surge shown is the residual at the time of the highest H_s. The maximum tidal surge is the largest positive 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	-	2.76	2.47	2.27	1.85	1.45	29-Nov-2003 13:00	3.34
2004	3.83	2.82	2.62	2.38	2.03	1.65	08-Jan-2004 11:30	4.17
2005	3.64	3.01	2.56	2.19	1.79	1.42	02-Dec-2005 19:00	3.84
2006	3.78	3.01	2.75	2.44	2.05	1.67	03-Dec-2006 08:00	4.81
2007	3.89	2.98	2.70	2.41	2.03	1.69	18-Jan-2007 10:00	4.32
2008	3.70	3.02	2.74	2.46	2.05	1.70	13-Dec-2008 12:00	4.01
2009	3.72	3.09	2.87	2.47	2.01	1.66	14-Nov-2009 13:00	3.91
2010	3.53	2.78	2.38	1.98	1.62	1.30	08-Nov-2010 11:00	3.86
2011	3.43	2.61	2.39	2.15	1.81	1.54	13-Dec-2011 00:30	4.55+
2012	3.59	2.94	2.67	2.36	1.94	1.59	03-Jan-2012 09:30	3.86

** i.e. 5 % of the H_s values measured in 2003 exceeded 1.85 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 3.5 m storm threshold)
- Wave roses (Direction vs. H_s and vs. T_p) for all measured data from 01 April 2004
- Percentage of occurrence of H_s, T_p, T_z and Direction for 2012
- Incidence of storm waves for 2012. 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

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.

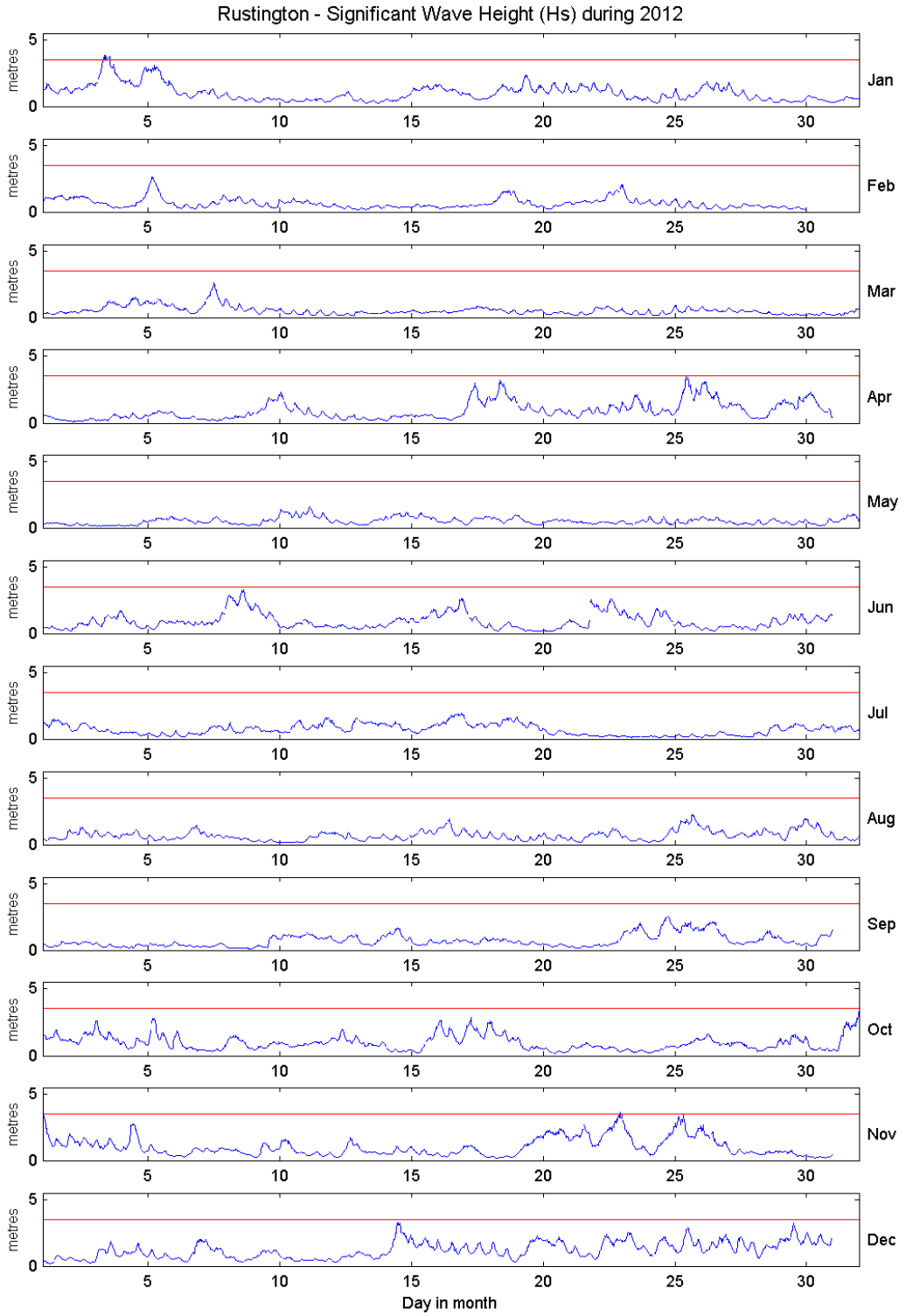
Return period (years)	Significant wave height (m)	Comments
1	4.0	No depth limitation
2	4.1	
5	4.4	
10	4.5	Depth-limited at MLWS
20	4.7	
50	4.9	

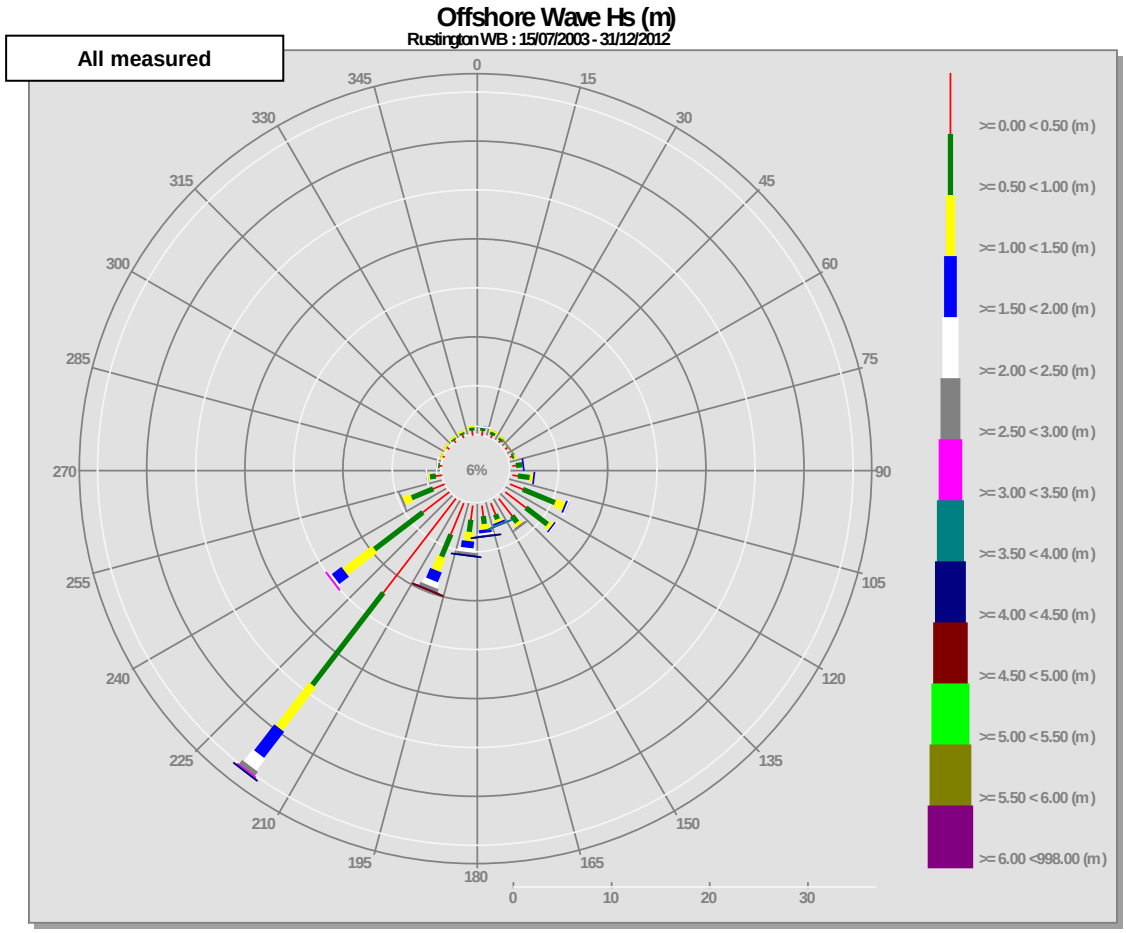
General

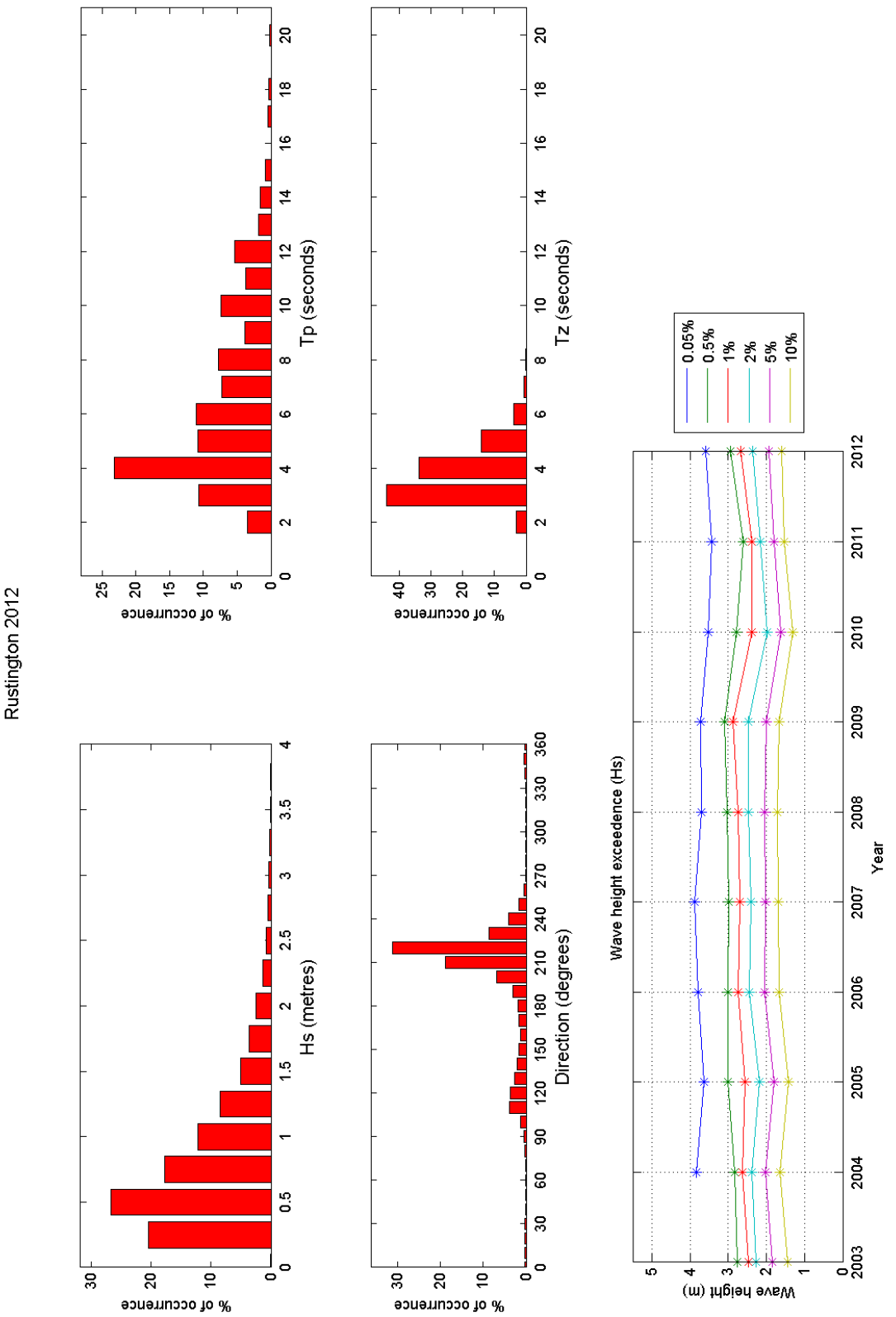
The buoy was first deployed on 15 July 2003, at which time the magnetic declination at the site was 2.7° west, changing by 0.14° east per year.

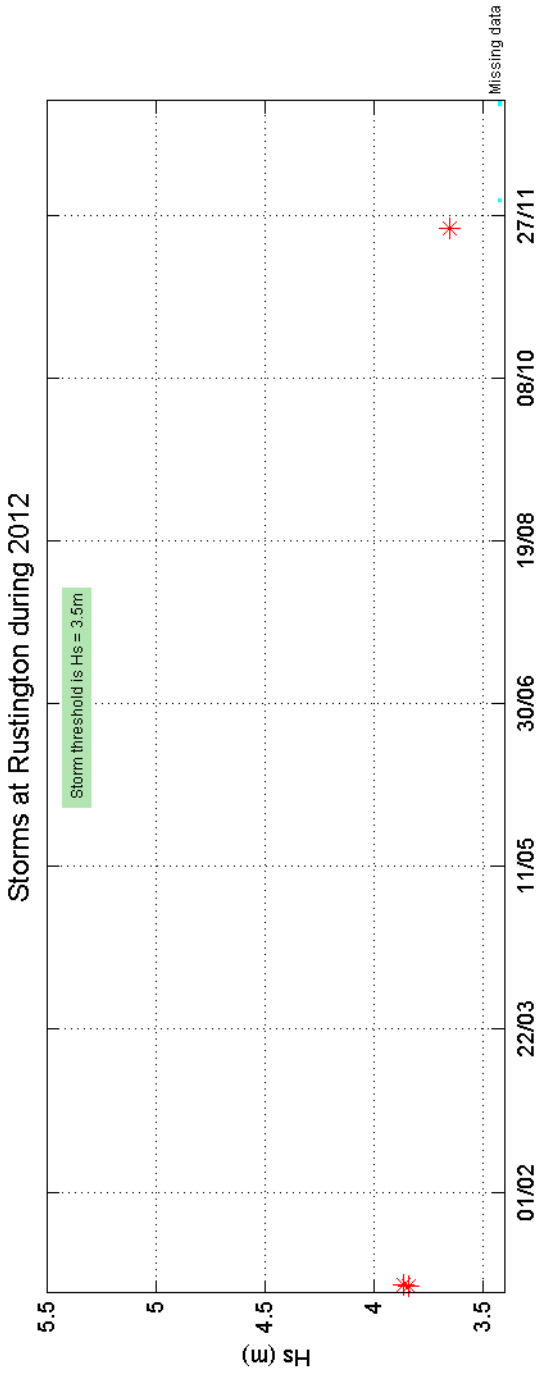
Acknowledgements

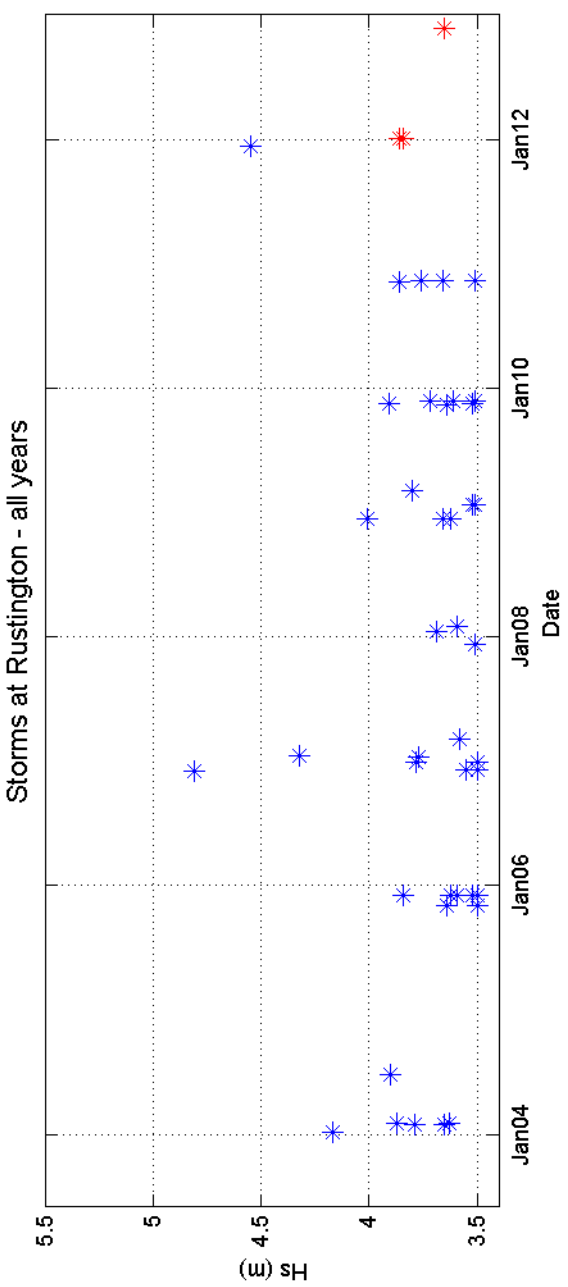
TASK2000 tidal prediction software was kindly provided by the Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory.

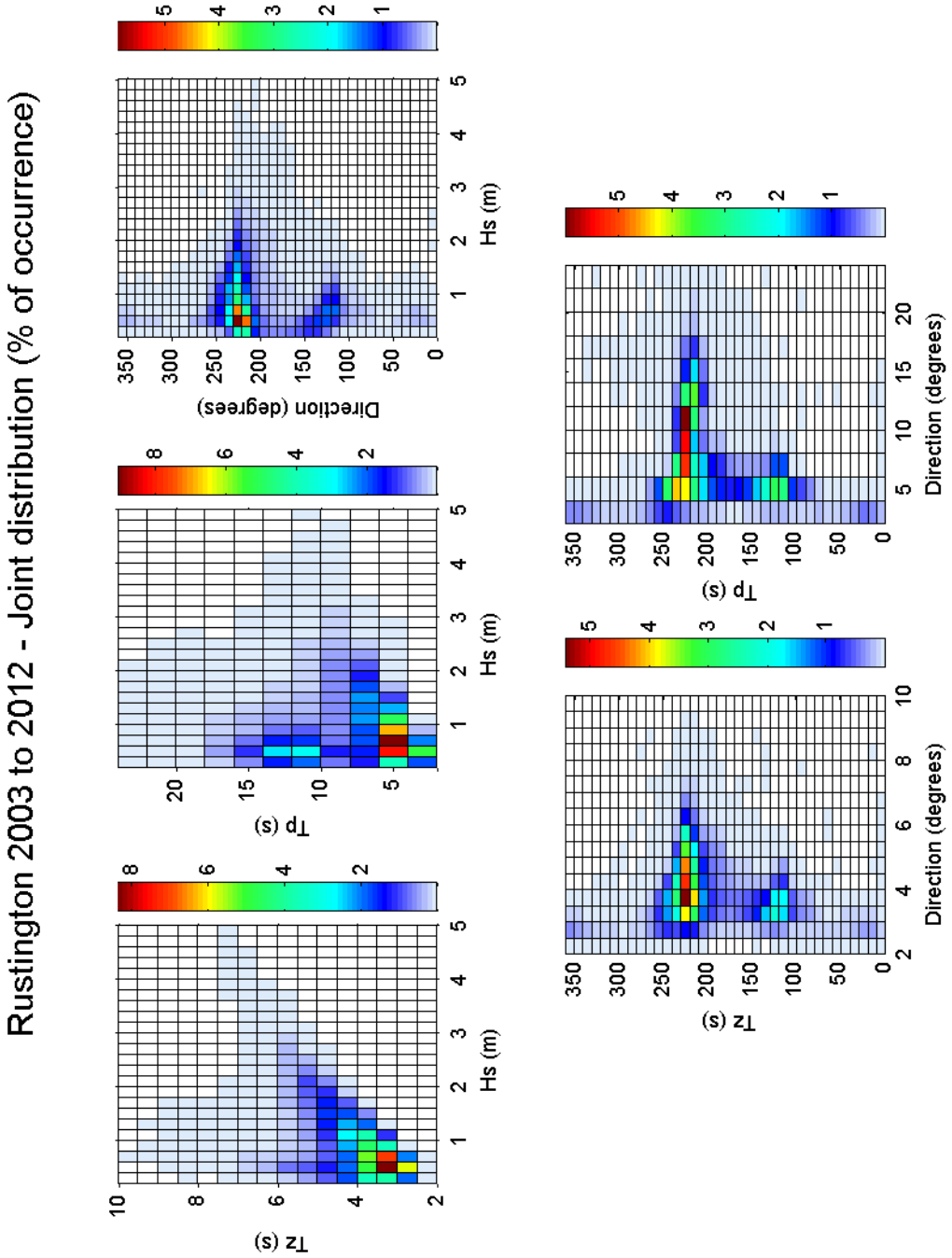

Rustington - Significant Wave Height (Hs) during 2012
metres
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
0
5
10
15
20
25
30
Day in month


Offshore Wave Hs (m)
Rustington WB : 15/07/2003 - 31/12/2012
All measured
0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
6%
0
10
20
30
>= 0.00 < 0.50 (m)
>= 0.50 < 1.00 (m)
>= 1.00 < 1.50 (m)
>= 1.50 < 2.00 (m)
>= 2.00 < 2.50 (m)
>= 2.50 < 3.00 (m)
>= 3.00 < 3.50 (m)
>= 3.50 < 4.00 (m)
>= 4.00 < 4.50 (m)
>= 4.50 < 5.00 (m)
>= 5.00 < 5.50 (m)
>= 5.50 < 6.00 (m)
>= 6.00 <998.00 (m)


Rustington 2012
% of occurrence
Hs (metres)
% of occurrence
Direction (degrees)
% of occurrence
Tp (seconds)
% of occurrence
Tz (seconds)
Wave height exceedence (Hs)
Wave height (m)
Year
0.05%
0.5%
1%
2%
5%
10%


Storms at Rustington during 2012
Storm threshold is Hs = 3.5m
Missing data
Hs (m)
5.5
5
4.5
4
3.5
01/02
22/03
11/05
30/06
19/08
08/10
27/11


Storms at Rustington - all years
Hs (m)
5.5
5
4.5
4
3.5
Jan04
Jan06
Jan08
Jan10
Jan12
Date


Rustington 2003 to 2012 - Joint distribution (% of occurrence)
Direction (degrees)
Hs (m)
Tp (s)
Tz (s)