West Bay Directional Waverider Buoy

Location

OS: 347123E 88451N

WGS84: *Latitude:* 50° 41.597' N *Longitude:* 02° 44.999' W

Water Depth

~10 m CD

Instrument Type

Datawell Directional Waverider Mk III

Data Quality

Recovery rate (%)	Sample interval
99	30 minutes

Statistics - 2011

All times are GMT

Month	H_s (m)	T_p (s)	T_z (s)	Dir. (^{o})	SST (^{o}C)	No. of days
January	0.92	9.2	5.1	199	7.1	31
February	1.31	11.2	5.4	211	7.5	28
March	0.50	8.5	4.5	192	8.5	31
April	0.52	10.2	4.8	204	10.9	29
May	0.76	6.3	3.7	208	12.5	31
June	0.79	6.6	4.0	207	14.6	30
July	0.57	6.5	3.9	209	16.5	31
August	0.62	6.3	3.8	209	17.4	31
September	1.00	7.0	4.1	211	16.7	30
October	0.96	7.3	4.2	209	15.7	31
November	1.13	9.1	4.8	206	13.4	30
December	1.40	7.9	4.7	216	11.0	31

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)
13-Dec-2011 01:00	4.84	10.5	7.4	218	-	HW -6	2.9	-	-
08-Jan-2011 10:30	4.54	13.3	9.3	204	1.46	HW +2	2.8	0.19	0.21

* *Tidal information is obtained from the nearest recording tide gauge (the step 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 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)
2007	4.70	3.69	3.30	2.91	2.45	2.03	06-Mar-2007 02:30	5.61+
2008	4.73	3.60	3.16	2.74	2.20	1.71	10-Mar-2008 13:30	5.05
2009	4.85	3.59	3.29	2.92	2.30	1.83	14-Nov-2009 15:30	6.00+
2010	4.00	2.95	2.66	2.37	1.82	1.46	11-Nov-2010 09:00	4.29
2011	4.34	3.10	2.82	2.44	2.04	1.67	13-Dec-2011 01:00	4.84

** i.e. 5 % of the H_s values measured in 2007 exceeded 2.45 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 4.4 m storm threshold)
- Wave roses (Direction vs. H_s and vs. T_p) for all measured data
- Percentage of occurrence of H_s, T_p, T_z and Direction for 2011
- 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
- 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.

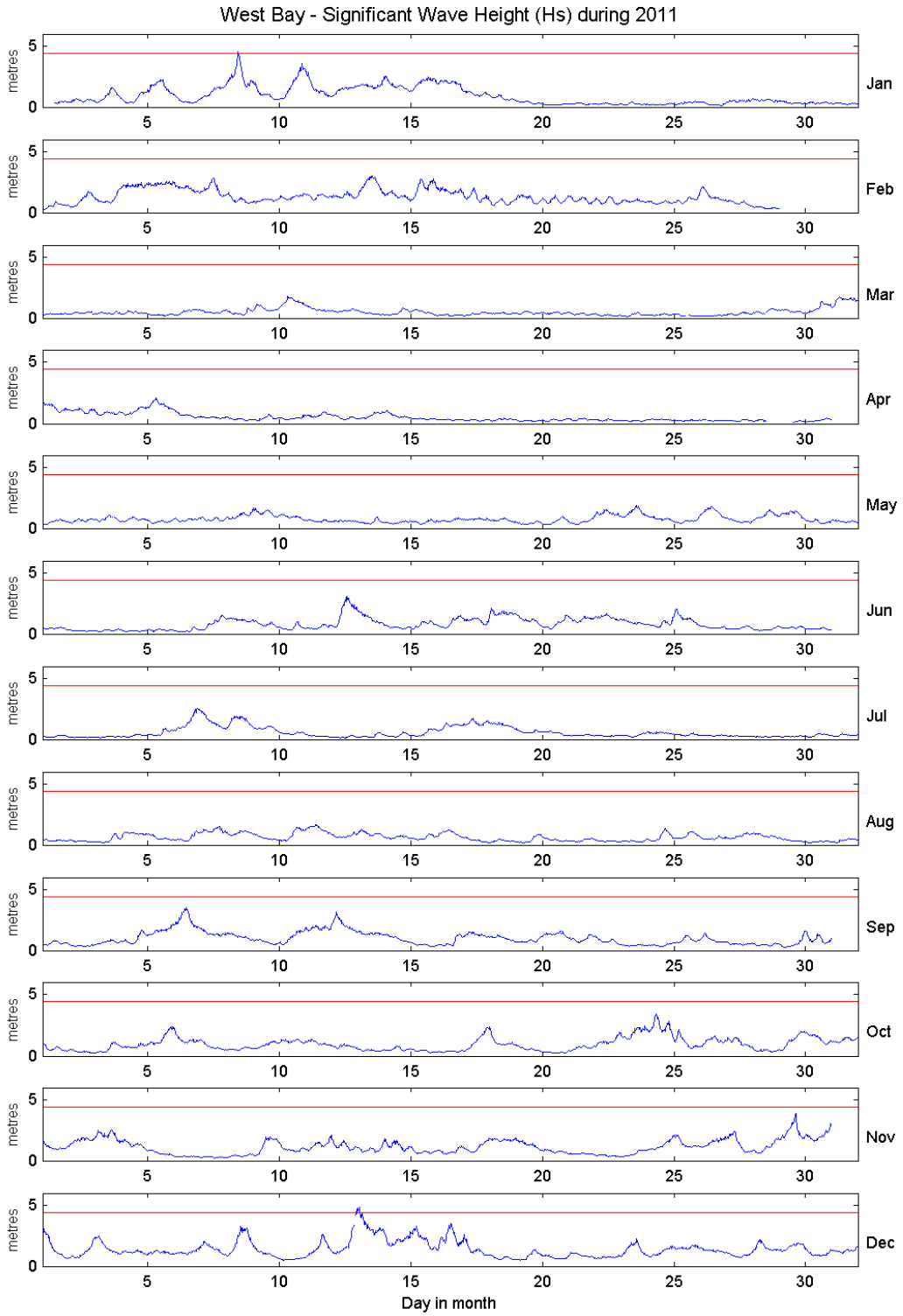
Return period (years)	Significant wave height (m)	Comments
1	4.90	Depth-limited at MLWS
2	5.14	
5	5.45	Depth-limited at MHWS
10	5.68	Depth-limited at HAT
20	5.90	
50	6.18	

General

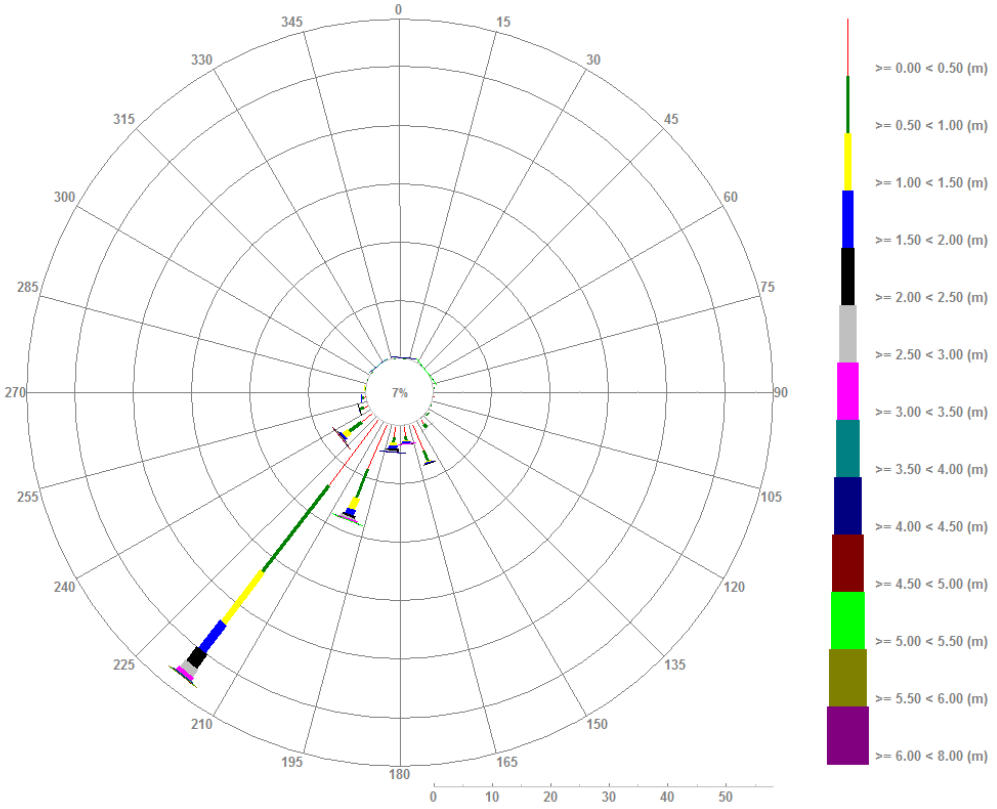
The buoy was first deployed on 19 November 2006.

Acknowledgements

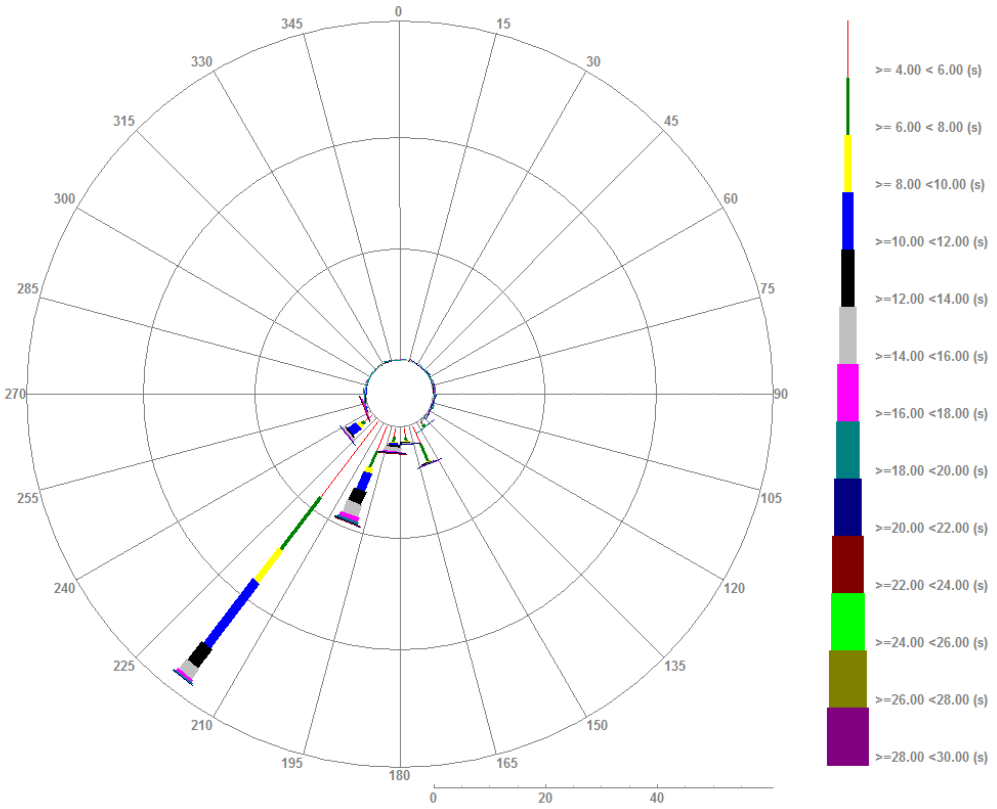
TASK2000 tidal prediction software was kindly provided by the Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory.

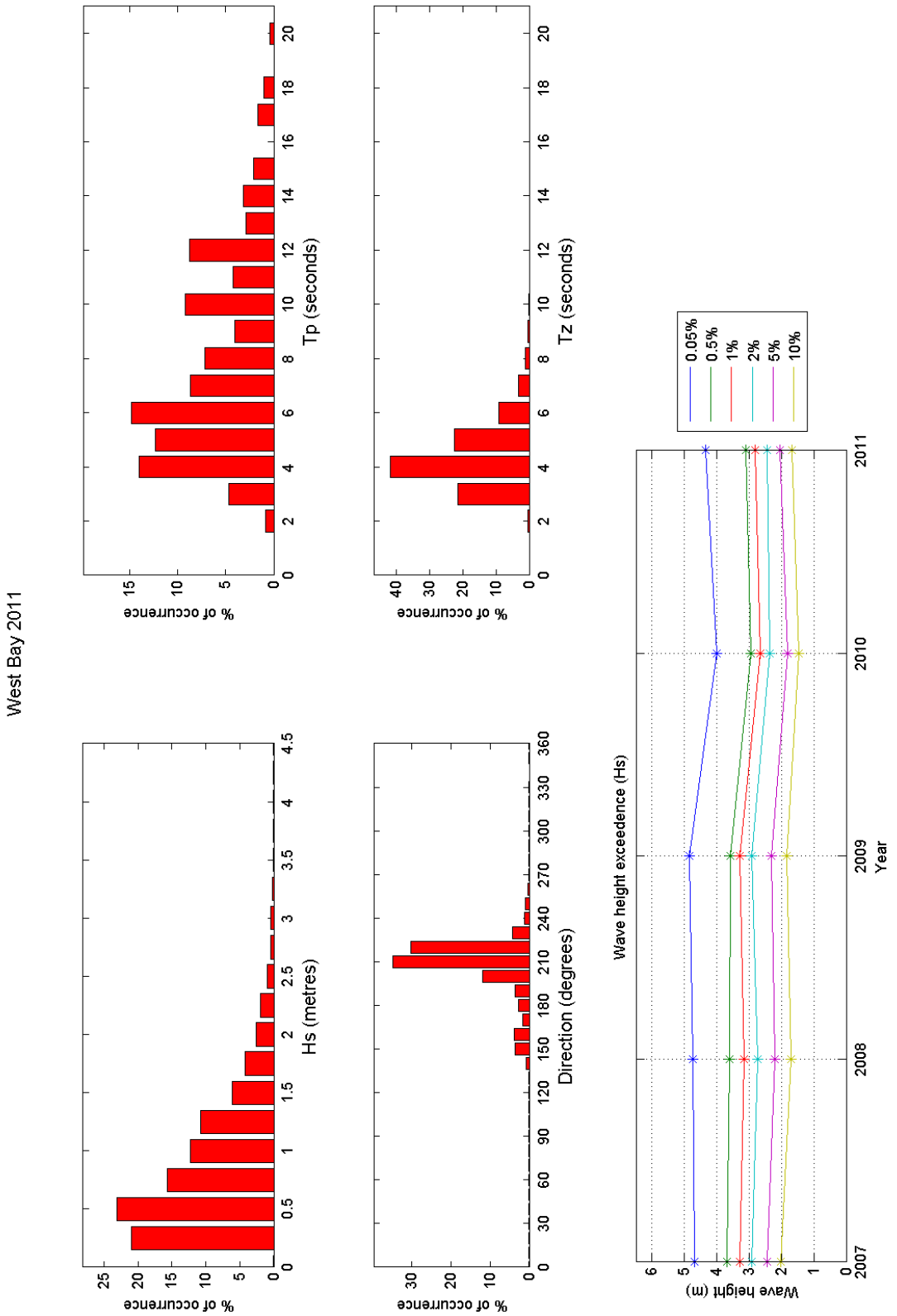

West Bay - Significant Wave Height (Hs) during 2011
metres
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
0
5
10
15
20
25
30
Day in month

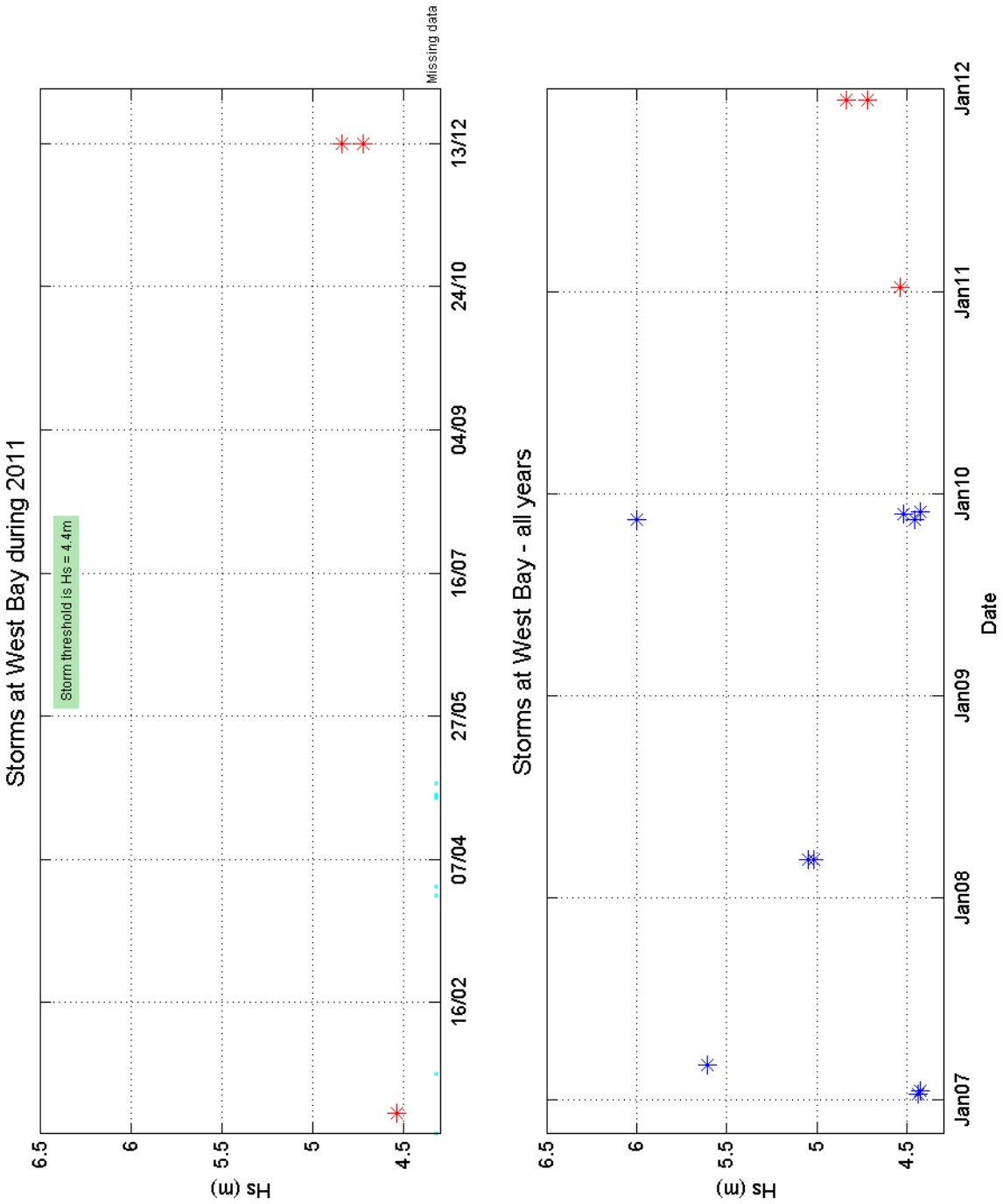
Offshore Wave Hs (m)
West Bay WB : 19/11/2006 - 31/12/2011

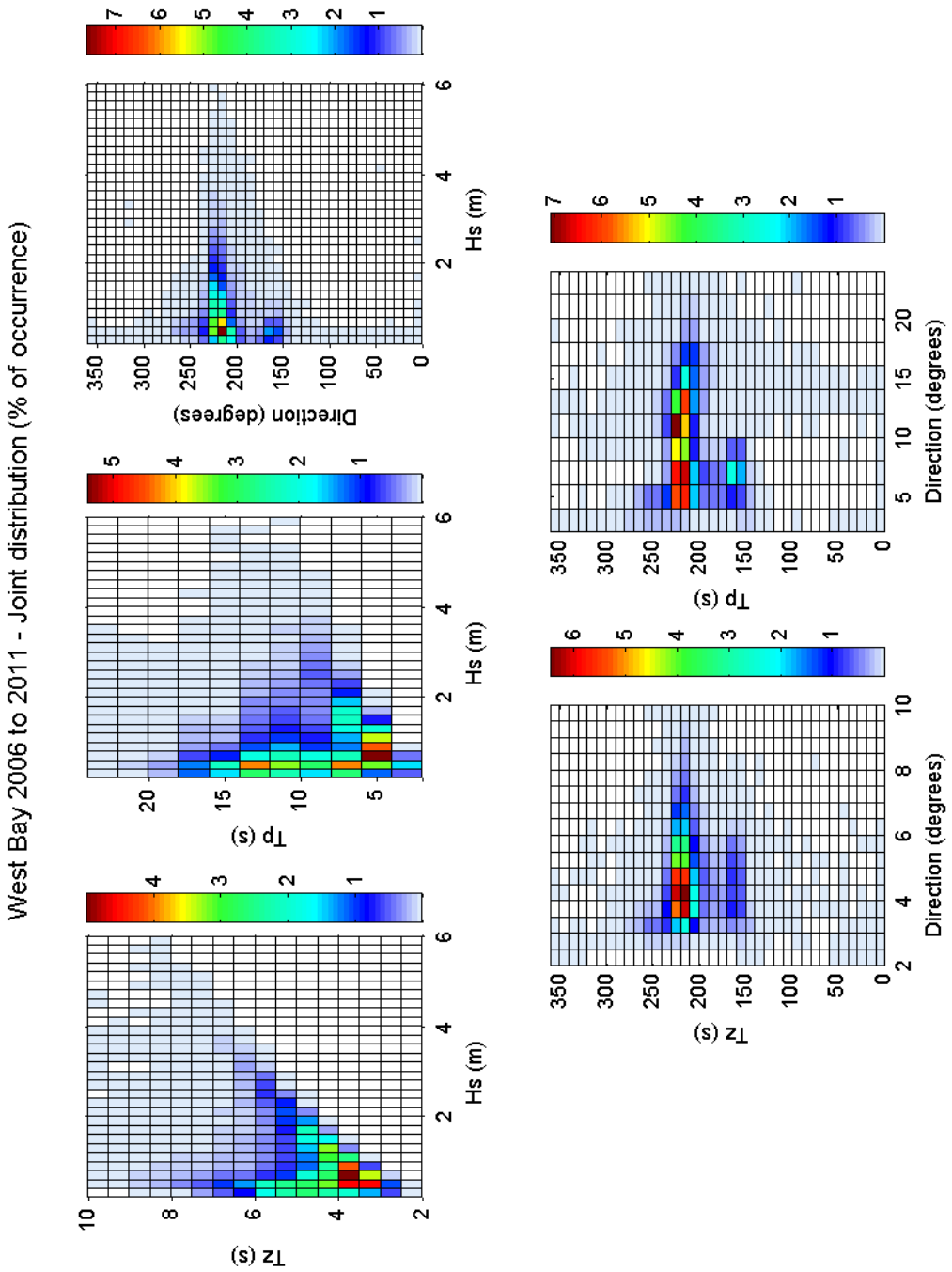


Offshore Wave Tp (s)
West Bay WB : 19/11/2006 - 31/12/2011




West Bay 2011
% of occurrence
Hs (metres)
Tp (seconds)
Direction (degrees)
Tz (seconds)
Wave height exceedence (Hs)
Wave height (m)
Year
0.05%
0.5%
1%
2%
5%
10%


Storms at West Bay during 2011
Storm threshold is Hs = 4.4m
Missing data
Hs (m)
6.5
6
5.5
5
4.5
16/02
07/04
27/05
16/07
04/09
24/10
13/12
Storms at West Bay - all years
Hs (m)
Jan07
Jan08
Jan09
Jan10
Jan11
Jan12
Date


West Bay 2006 to 2011 - Joint distribution (% of occurrence)
Direction (degrees)
Hs (m)
Tp (s)
Tz (s)