Tor Bay Directional Waverider Buoy

Location
OS: 292266 E 60380 N
WGS84: *Latitude:* 50°26.00' N *Longitude:* 003° 31.09' W

Water Depth
Approx. 10 m CD

Instrument Type
Datawell Directional Waverider Buoy Mk III

Data Quality

C1 (%)	Sample interval
90	30 minutes

Monthly Means *All times GMT*

Month	H_s (m)	T_p (s)	T_z (s)	Direction (°)	SST (°C)	No. of days
January	0.67	6.6	4.0	113	7.3	31
February	0.56	6.8	3.8	120	7.1	28
March	0.59	5.6	3.6	127	7.2	31
April	0.39	5.8	3.4	128	9.5	29
May	0.34	5.5	3.5	119	11.6	31
June	0.31	6.0	3.4	121	15.1	30
July	0.22	4.8	3.2	150	15.7	31
August	0.25	4.0	3.1	167	16.4	26
September	0.26	3.3	2.9	149	15.9	0
October	0.61	5.2	3.6	130	15.1	31
November	0.63	6.0	3.8	129	12.8	30
December	0.65	5.9	3.9	115	8.6	31

Tables and plots of these values, together with the minimum and maximum values and the standard deviation are available on the website.

Highest storm events in 2010

Date/Time	H_s	T_p	T_z	Dir.	Water level elevation * (OD)	Tidal stage (hours re. HW)	Tidal range (m)	Tidal surge* (m)	Max. surge* (m)
12-Jan-2010 22:30	2.70	7.7	6.2	117	-0.66	HW +6	2.29	0.18	0.44
17-Nov-2010 09:00	2.53	8.3	6.0	127	-0.19	HW -6	1.70	0.29	0.57
03-Mar-2010 17:30	2.30	7.1	5.5	108	0.06	HW -2	4.53	-0.08	0.31
12-Oct-2010 06:30	2.19	7.7	5.6	110	0.71	HW -2	3.61	-0.03	0.12

* *Tidal information is obtained from the nearest recording tide gauge (the WaveRadar Rex on Teignmouth Pier). 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.*

Year	Annual H_s exceedance* (m)						Annual Maximum H_s (m)	
	0.05%	0.5%	1%	2%	5%	10%	Date	A_{max}
2008	-	2.20	2.10	2.01	1.22	0.88	28-Dec-2008 04:00	2.60
2009	2.56	1.79	1.60	1.43	1.10	0.84	12-May-2009 05:00	2.88
2010	2.50	1.96	1.85	1.67	1.40	1.10	12-Jan-2010 22:30	2.70

** i.e. 5 % of the measured H_s values in 2008 exceeded 1.22m*

Distribution plots

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

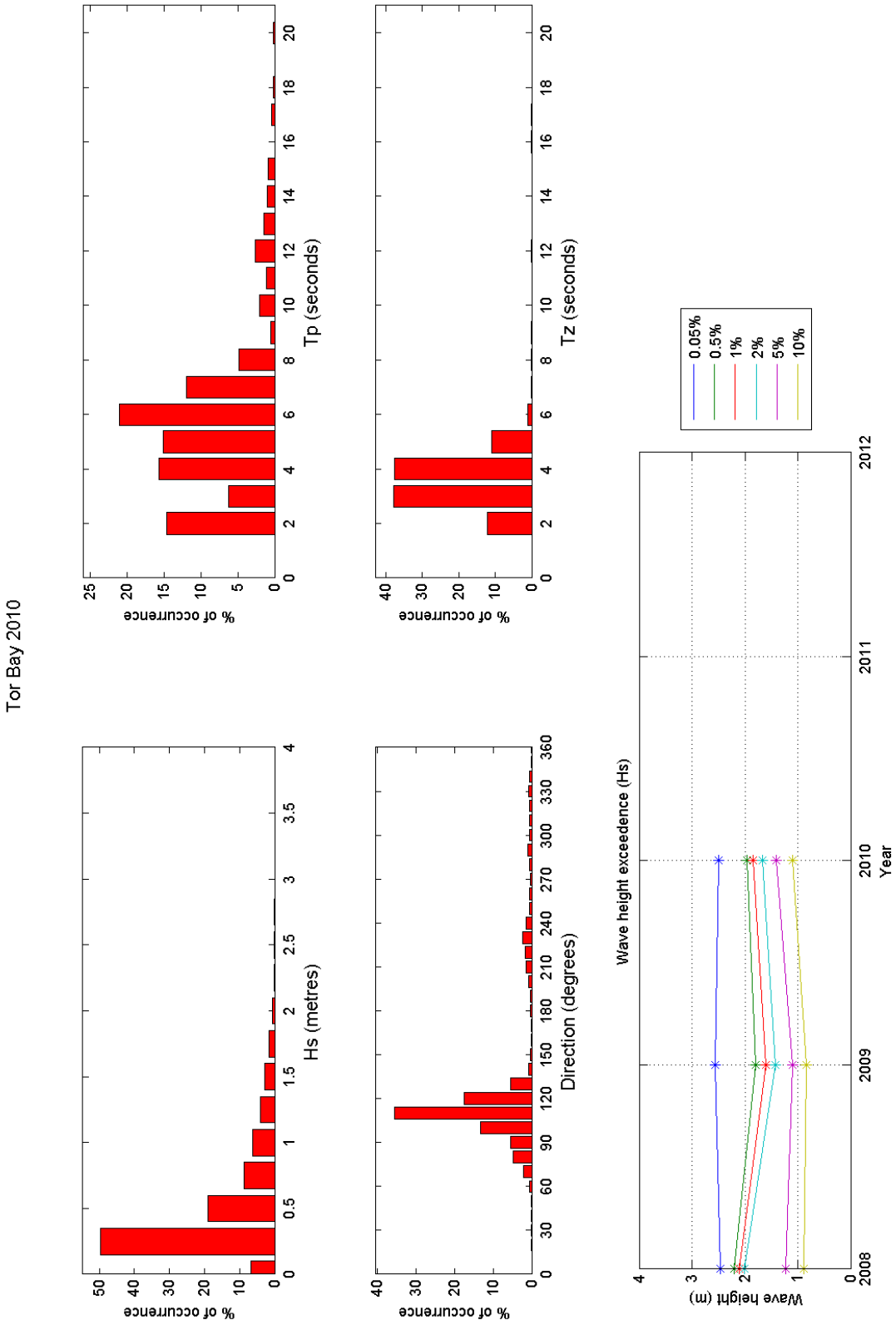
- Percentage of occurrence of H_s, T_p, T_z and Direction for 2010
- Percentage wave height exceedance (all recorded years)
- Joint distribution of all parameters for 2010, given both as number of observations and as percentage of occurrence
- Cumulative joint distribution of parameters from start of records (percentage of occurrence only)
- Wave roses (Direction vs. H_s and vs. T_p) for all measured data
- Incidence of storms during 2010 and for all previous years. Storms are defined using the Peaks-over-Threshold method. The highest H_s of each storm is shown.
- Annual time series of H_s (red line is storm threshold)

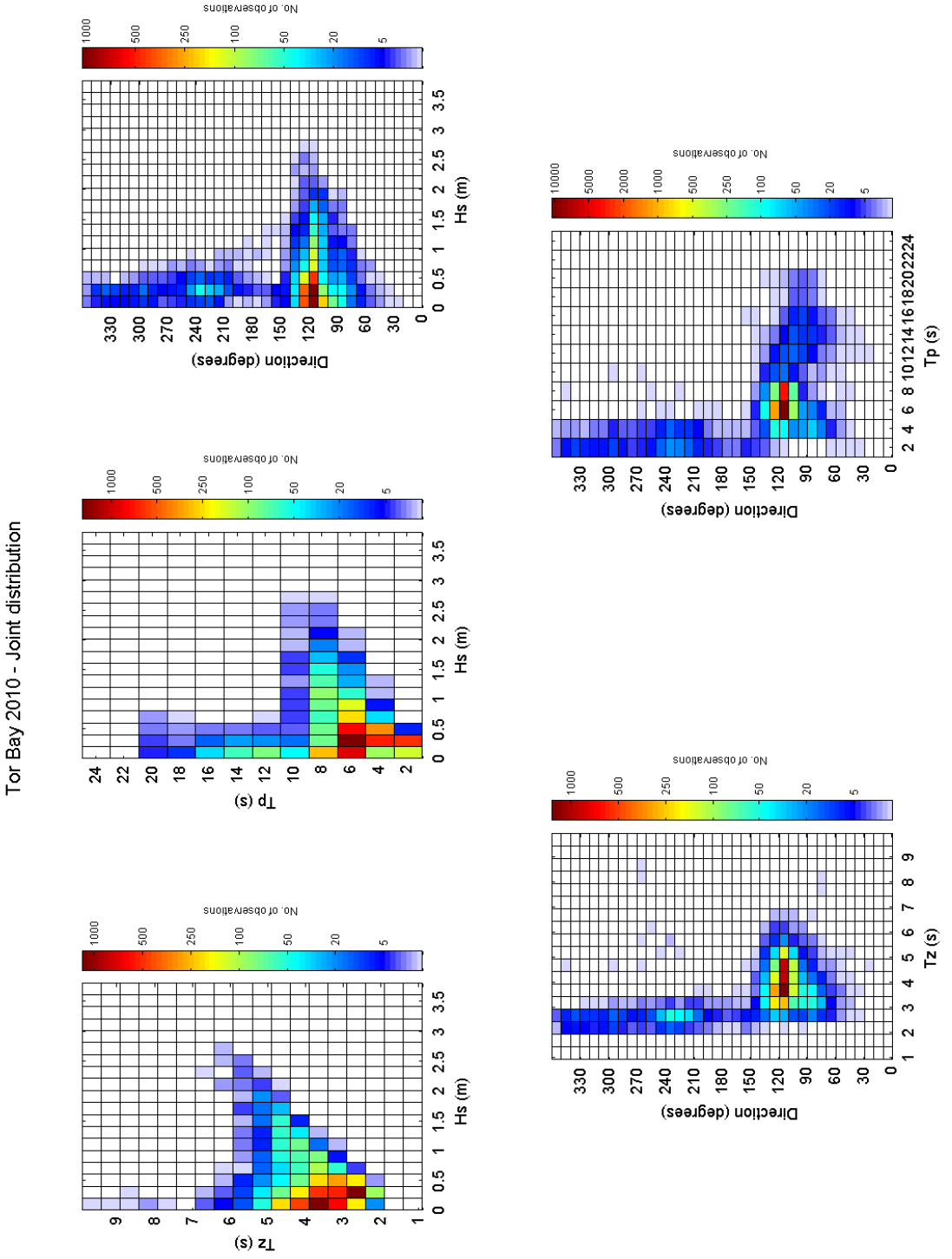
General

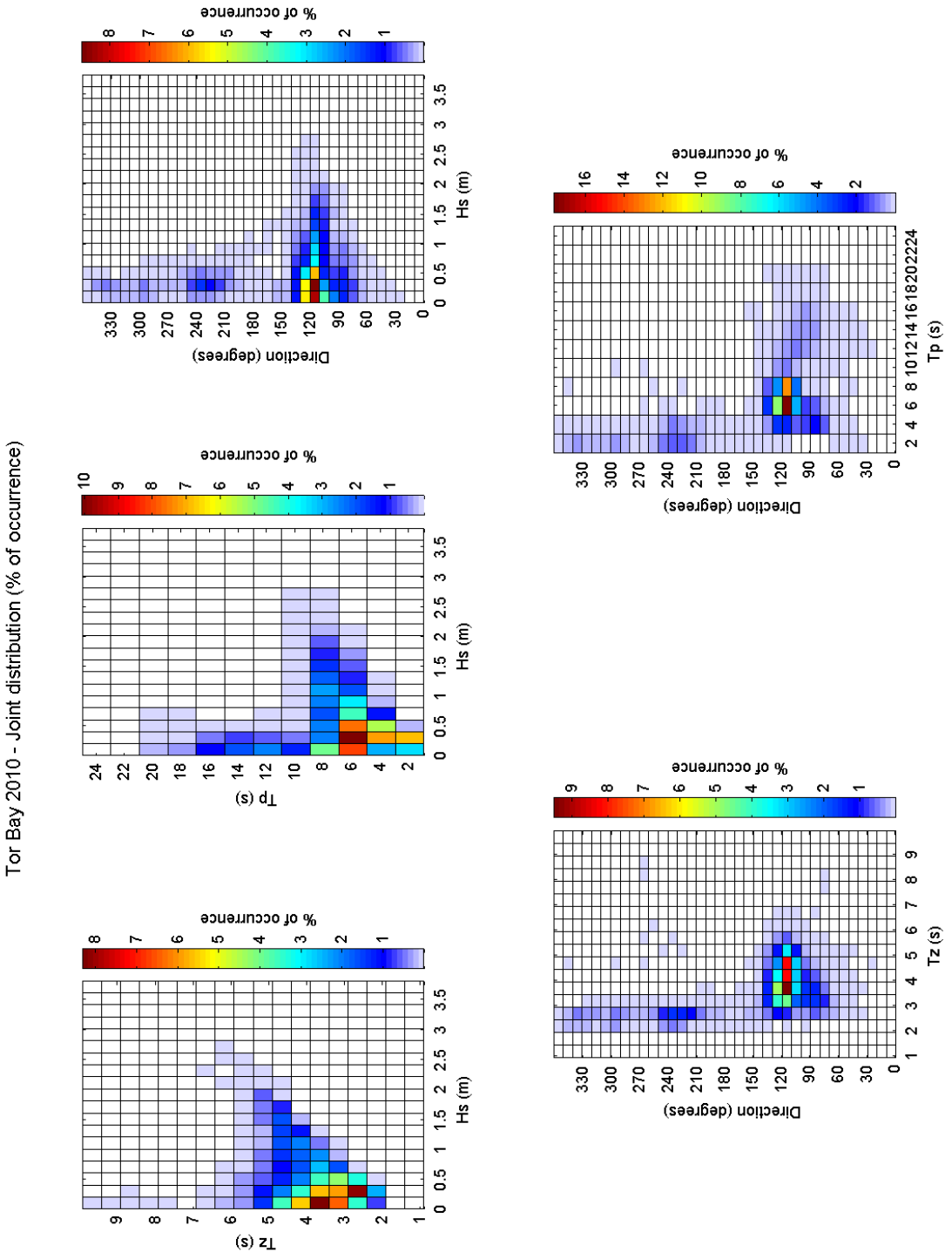
The Waverider buoy, owned jointly by Torbay Council and the Environment Agency (Southwest Region), was deployed on 24 June 2008. At the end of July and beginning of August 2010 the buoy was cut adrift 3 times in as many days, possibly due to the high number of pleasure craft in the vicinity. Because of this, deployment was delayed until the summer holidays and power boating season were over.

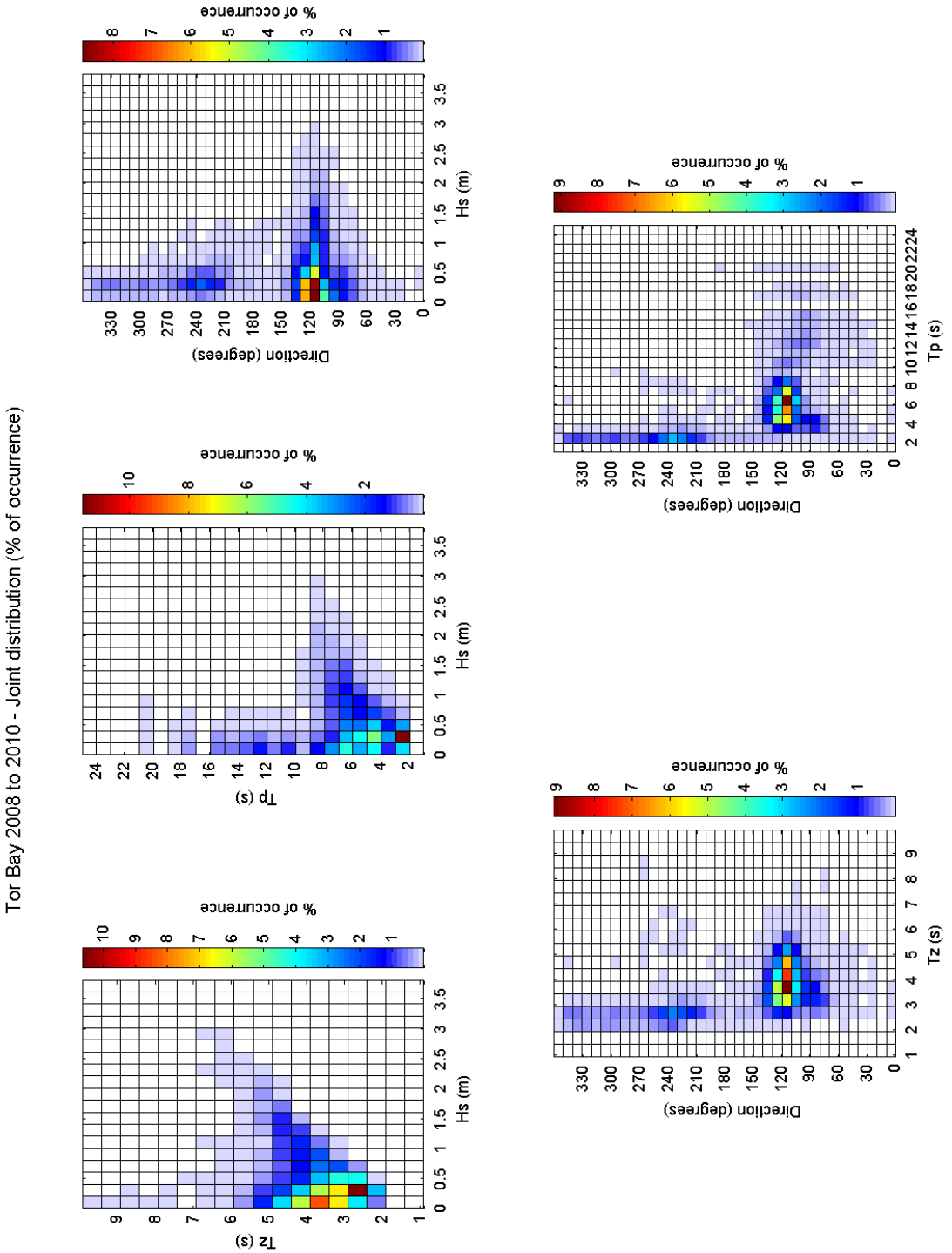
Acknowledgements

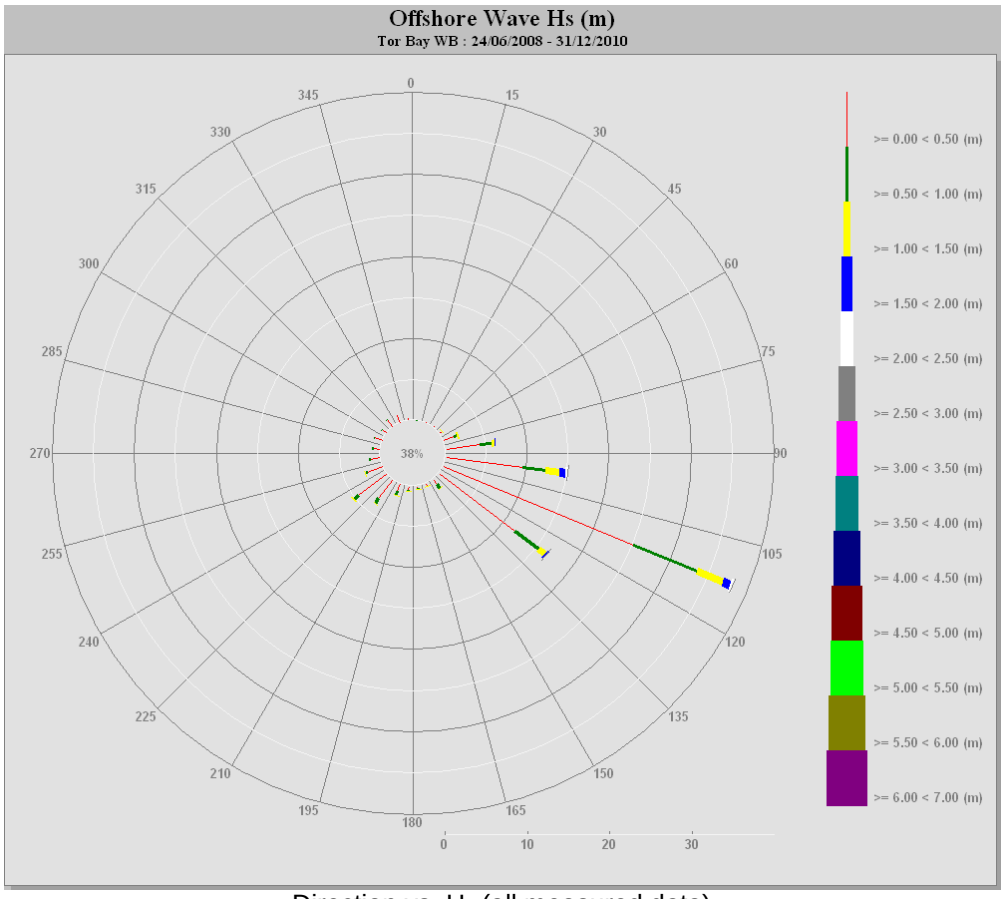
TASK2000 tidal prediction software was kindly provided by the Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory.


Tor Bay 2010
% 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%

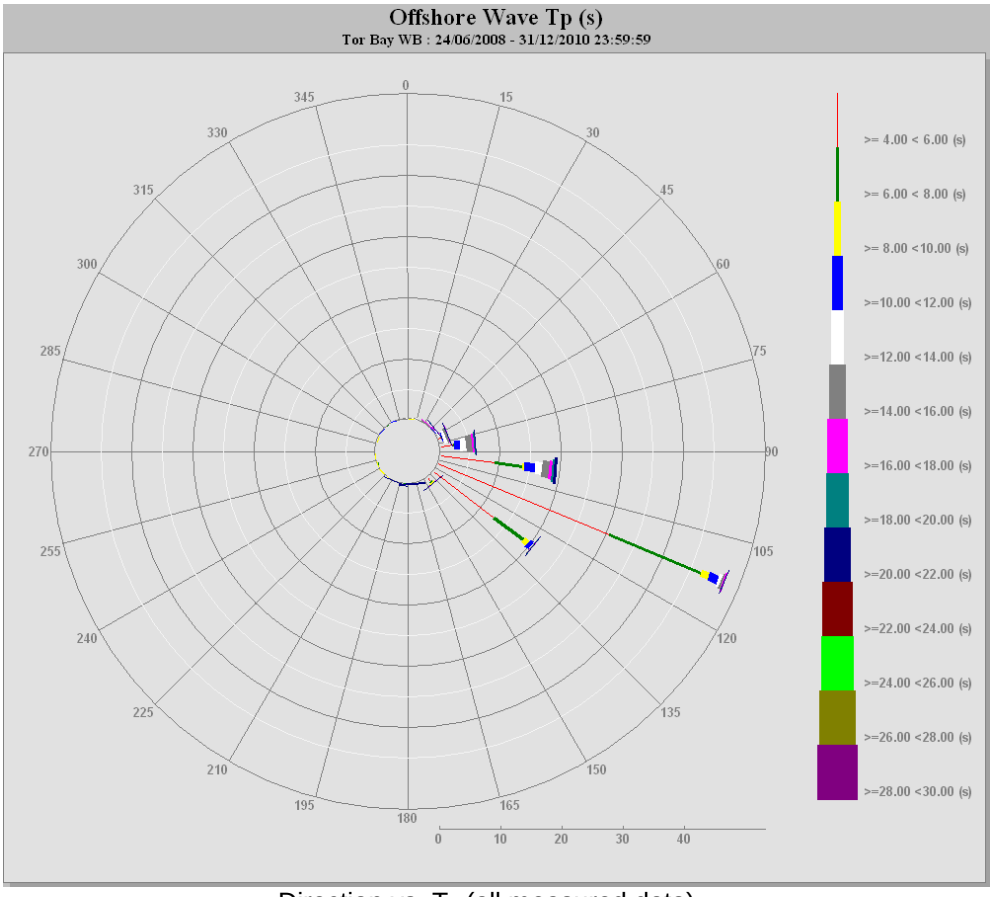

Tor Bay 2010 - Joint distribution
Direction (degrees)
Hs (m)
Tp (s)
Tz (s)
No. of observations


Tor Bay 2010 - Joint distribution (% of occurrence)
Direction (degrees)
Hs (m)
Tp (s)
Tz (s)
% of occurrence

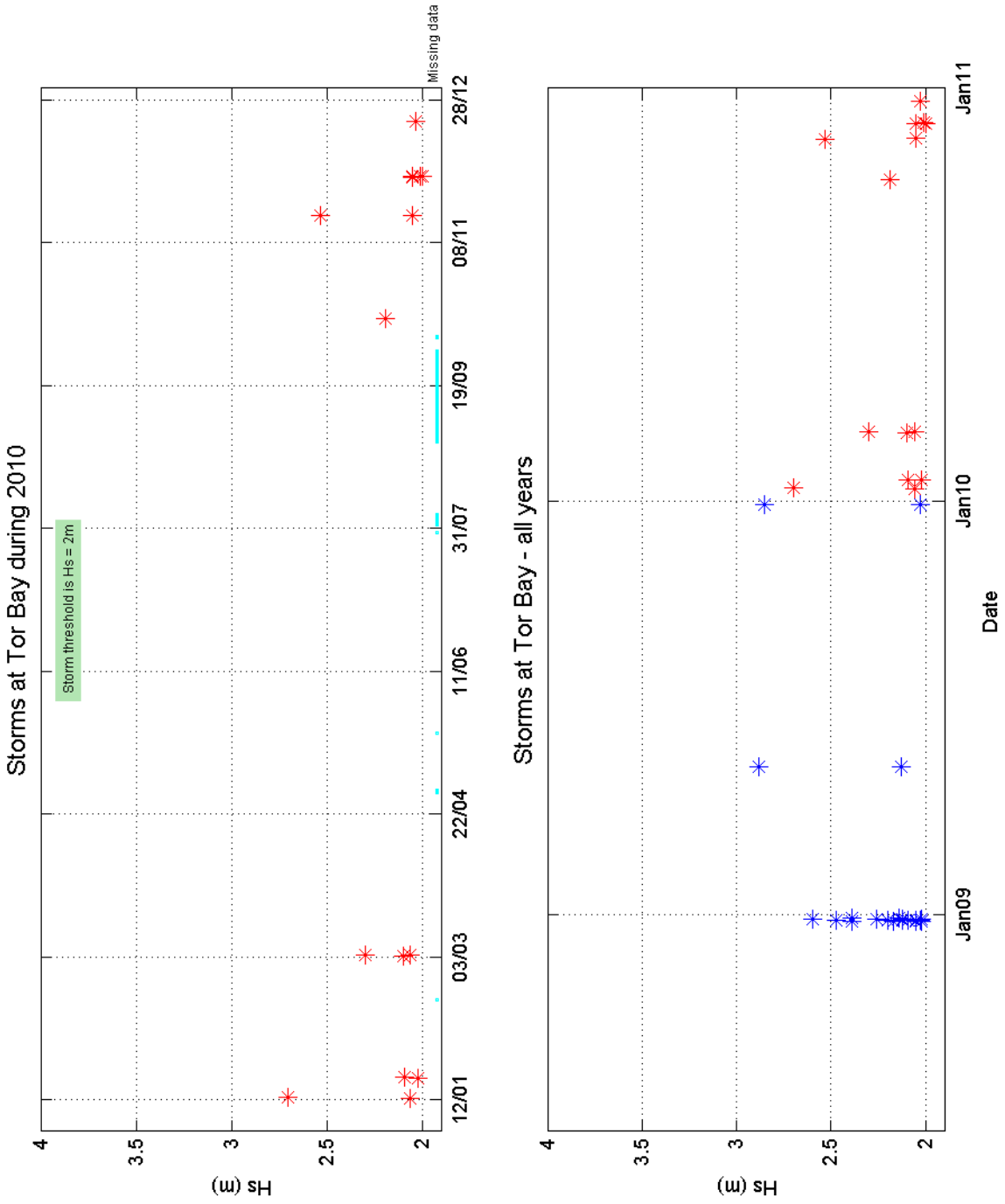

Tor Bay 2008 to 2010 - Joint distribution (% of occurrence)
% of occurrence
Direction (degrees)
Hs (m)
Tp (s)
Tz (s)

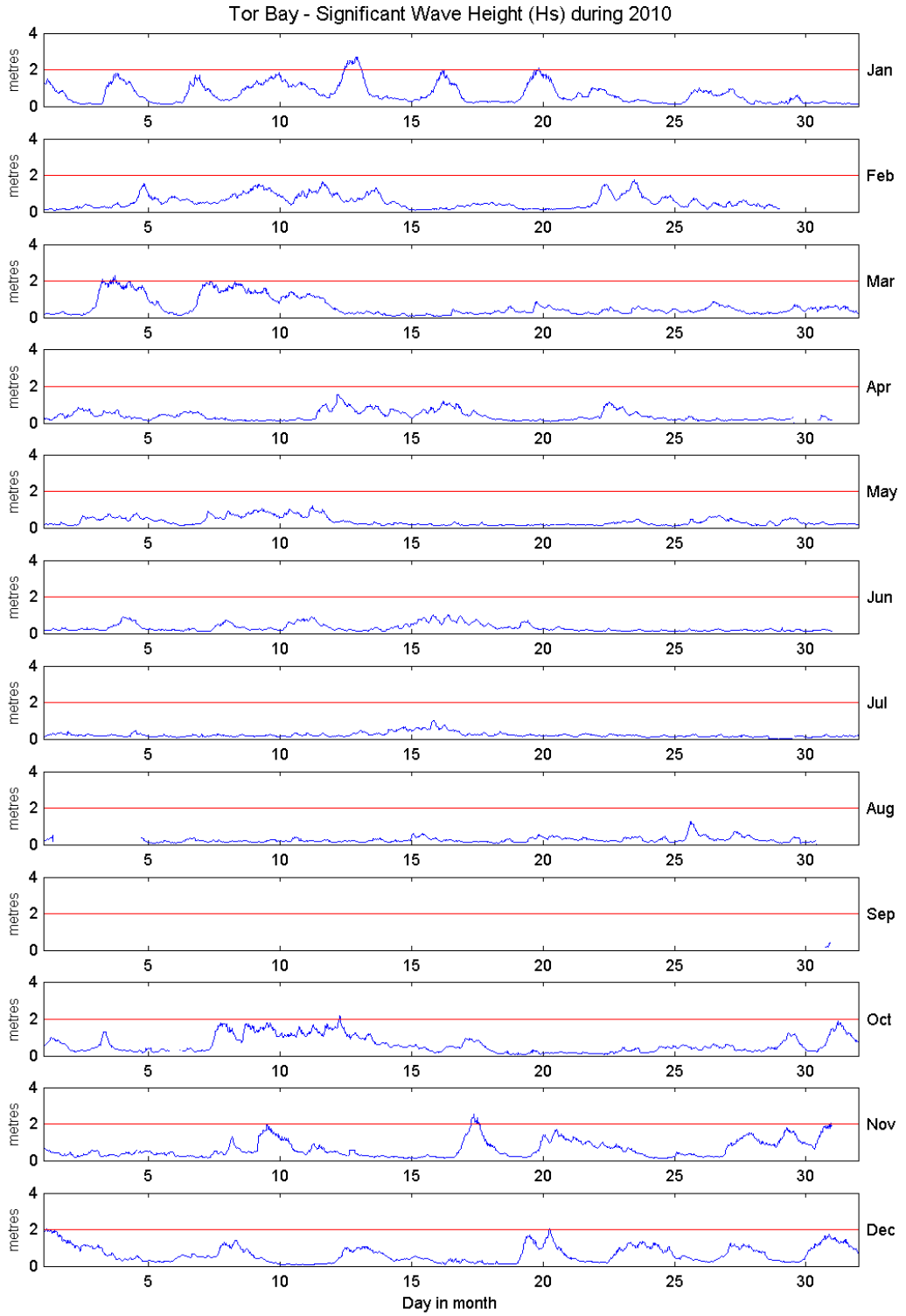


Direction vs. H_s (all measured data)



Direction vs. T_p (all measured data)


Storms at Tor Bay during 2010
Storm threshold is Hs = 2m
Missing data
Hs (m)
4
3.5
3
2.5
2
12/01
03/03
22/04
11/06
31/07
19/09
08/11
28/12
Storms at Tor Bay - all years
Hs (m)
Jan09
Jan10
Jan11
Date


Tor Bay - Significant Wave Height (Hs) during 2010
metres
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
0
2
4
5
10
15
20
25
30
Day in month