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
85	30 minutes

Monthly Means *All times GMT*

Month	H_s (m)	T_p (s)	T_z (s)	Direction (°)	SST (°C)	No. of days
January	0.74	6.5	3.8	121	7.7	18
February	-	-	-	-	-	-
March	0.32	5.2	3.3	156	9.1	19
April	0.34	5.7	3.5	119	10.6	30
May	0.38	5.4	3.2	155	12.0	31
June	0.29	4.7	3.3	126	15.3	30
July	0.28	3.9	3.0	165	15.6	31
August	0.24	4.5	3.1	141	16.7	31
September	0.45	5.4	3.5	128	16.3	30
October	0.42	5.3	3.4	130	15.7	31
November	0.52	5.6	3.2	163	13.8	30
December	0.60	7.1	3.9	117	10.4	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 2009

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-May-2009 05:00	2.88	8.3	6.3	106	-	HW +3	3.50	-	-
29-Dec-2009 05:00	2.85	7.7	5.8	108	1.45	HW +2	2.21	0.28	0.78
06-Jan-2009 01:00	1.99	7.7	5.1	106	0.87	HW +1	1.75	-0.30	-0.30

* *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

** 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:

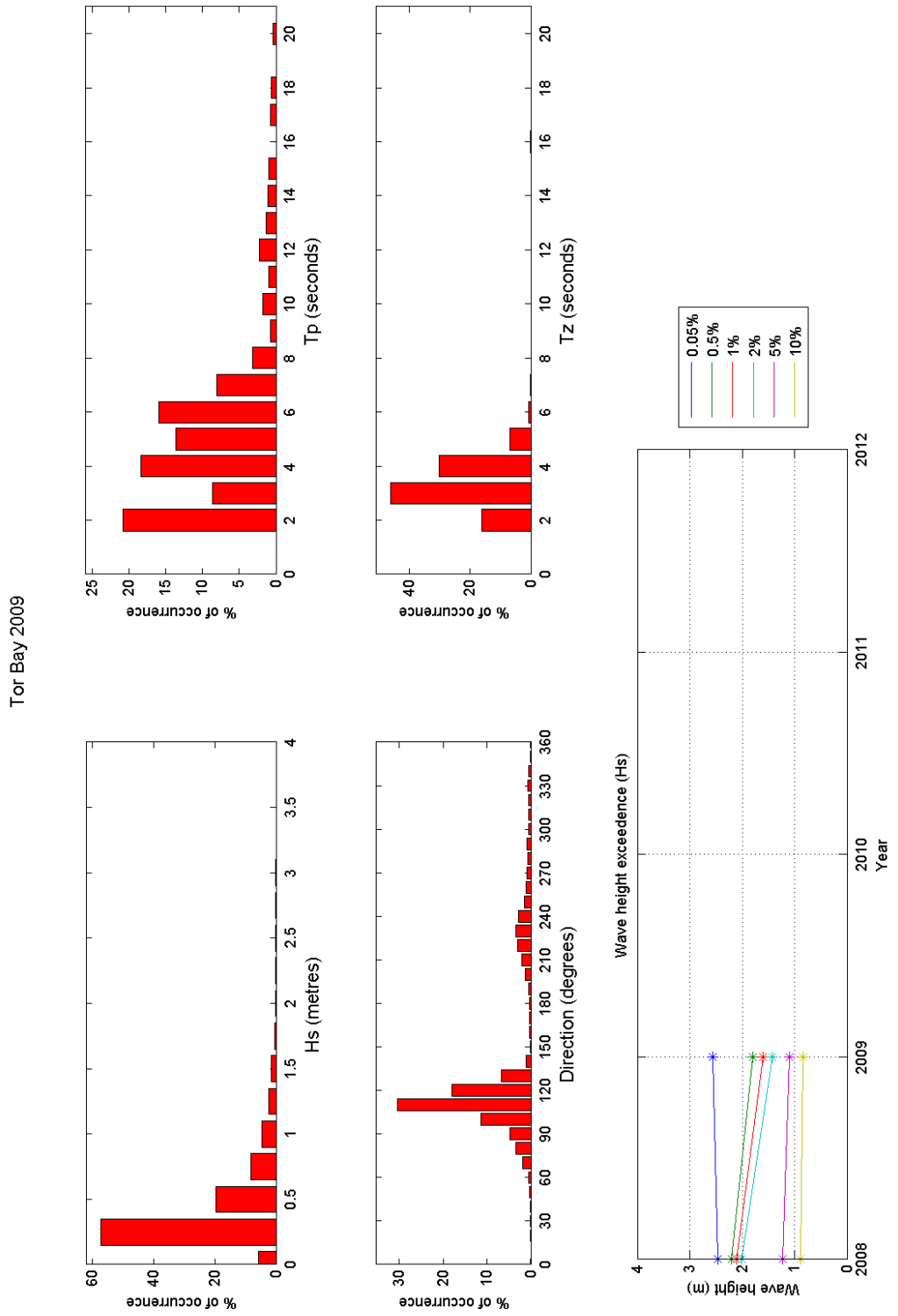
- Percentage of occurrence of H_s, T_p, T_z and Direction for 2009
- Percentage wave height exceedance (all recorded years)
- Joint distribution of all parameters for 2009, given both as number of observations and as percentage of occurrence
- Cumulative joint distribution of parameters from start of records (percentage of occurrence only)
- Incidence of storms during 2009 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)

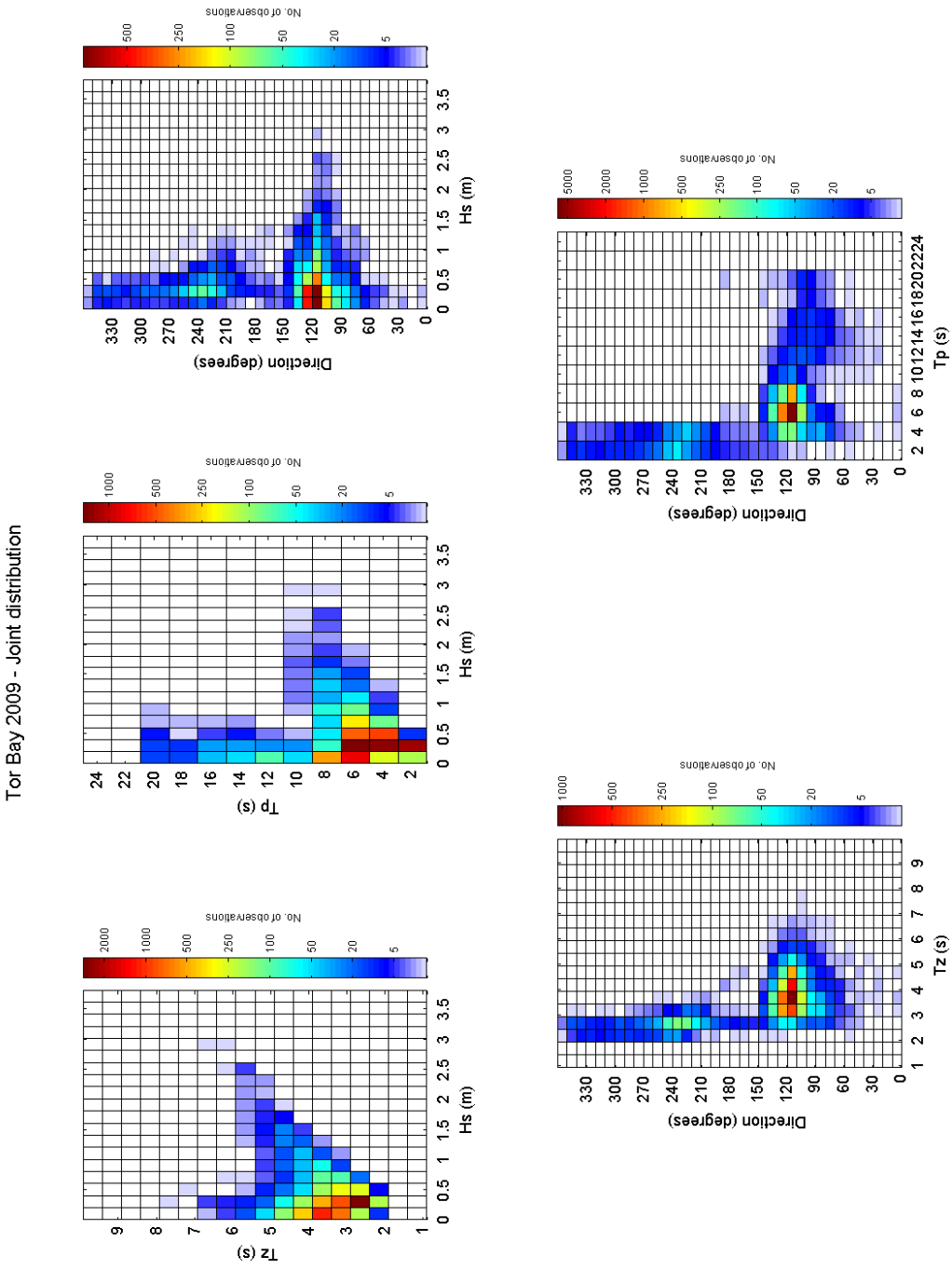
General

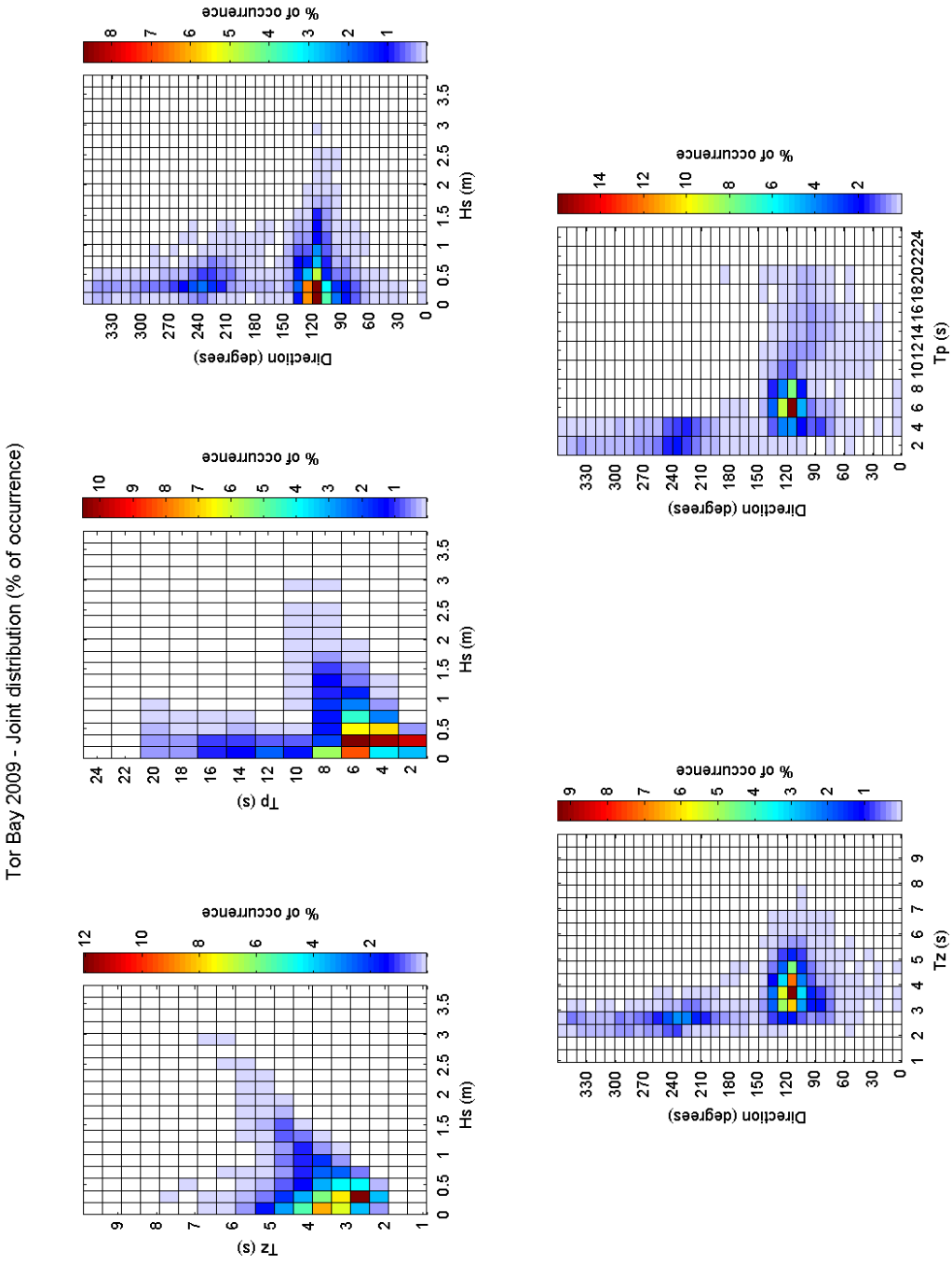
The Waverider buoy, owned jointly by Torbay Council and the Environment Agency (Southwest Region), was deployed on 24 June 2008. It was damaged on 19 January 2009 and was re-deployed on 03 March.

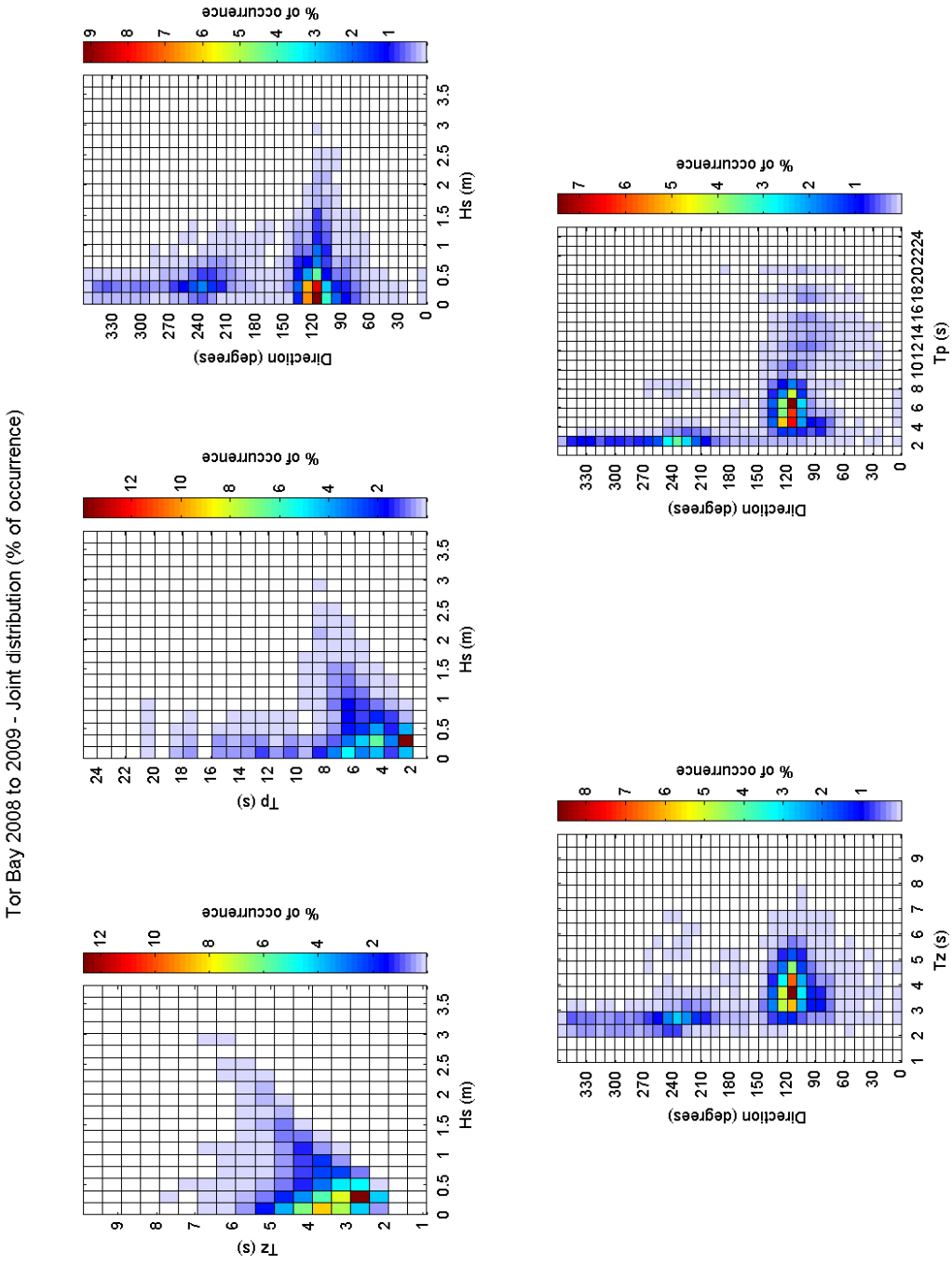
Acknowledgements

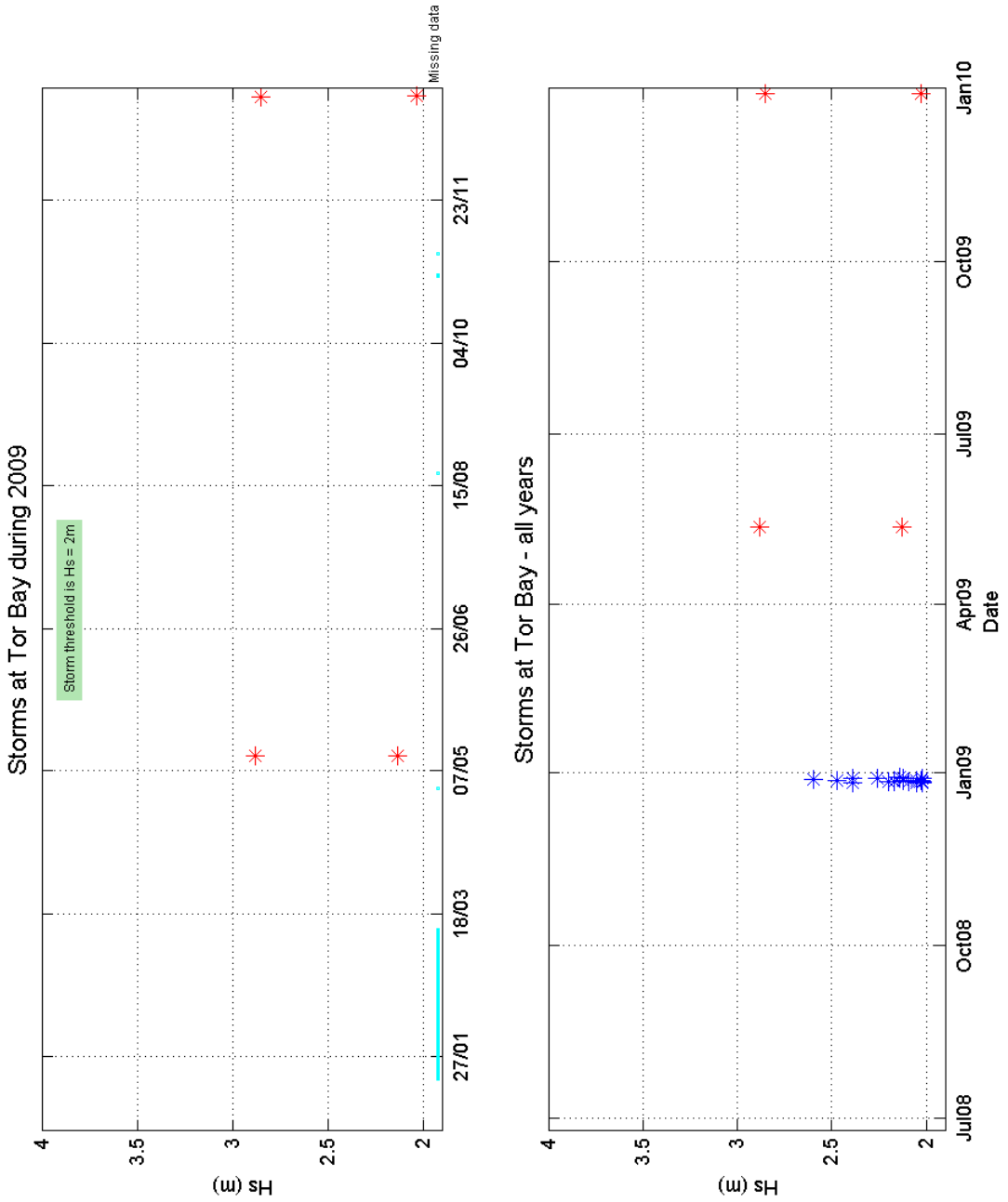
TASK2000 tidal prediction software was kindly provided by the Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory.

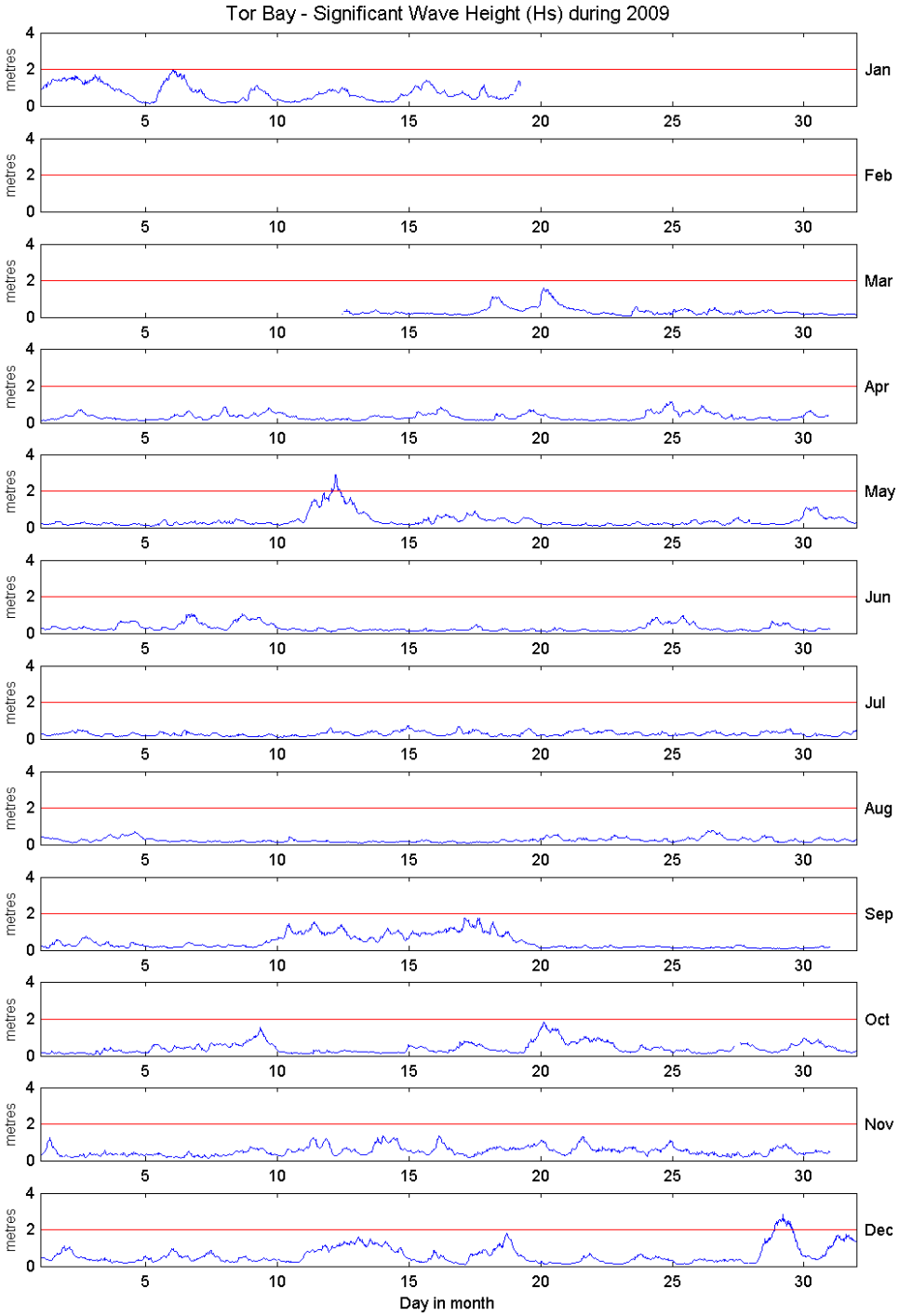

Tor Bay 2009
% of occurrence
Hs (metres)
Tp (seconds)
Direction (degrees)
Tz (seconds)
Wave height exceedence (Hs)
Wave height (m)
Year
0.05%
0.5%
1%
2%
5%
10%


Tor Bay 2009 - Joint distribution
Direction (degrees)
Hs (m)
Tp (s)
Tz (s)
Tp (s)
No. of observations


Tor Bay 2009 - Joint distribution (% of occurrence)
Direction (degrees)
Hs (m)
Tp (s)
Tz (s)
% of occurrence


Tor Bay 2008 to 2009 - Joint distribution (% of occurrence)
Direction (degrees)
Hs (m)
Tp (s)
Tz (s)
% of occurrence


Storms at Tor Bay during 2009
Storm threshold is Hs = 2m
Missing data
Hs (m)
4
3.5
3
2.5
2
27/01
18/03
07/05
26/06
15/08
04/10
23/11
Storms at Tor Bay - all years
Hs (m)
Jul08
Oct08
Jan09
Apr09
Jul09
Oct09
Jan10
Date


Tor Bay - Significant Wave Height (Hs) during 2009
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