



Severn Bridge Wave Radar

Location			
OS	351587 E 186390 N		
WGS84	Latitude: 51° 34.456' N Longitude: 02° 41.999' W		
Instrument type			
Rosemount WaveRadar REX			
Water depth	N/A	Rosemount WaveRadar REX	Location of radar (Google mapping)

Data Quality

Recovery rate (%)	Sample interval
98	30 minutes

Monthly Averages - 2015

All times are GMT

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	No. of days
January	0.14	5.1	2.3	-	-	31
February	0.09	6.6	2.3	-	-	27
March	0.13	5.4	2.3	-	-	29
April	0.10	5.3	2.2	-	-	29
May	0.13	5.0	2.2	-	-	31
June	0.11	5.4	2.2	-	-	30
July	0.12	4.3	2.2	-	-	31
August	0.10	4.6	2.2	-	-	31
September	0.09	5.6	2.2	-	-	30
October	0.09	6.5	2.2	-	-	30
November	0.16	4.9	2.4	-	-	29
December	0.17	4.8	2.4	-	-	31

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)
30-Mar-2015 21:30	1.15	5.8	4.5	-	-2.42	HW +5	6.8	-0.40	1.30
17-Nov-2015 15:00	1.13	6.4	5.8	-	-1.47	HW +5	8.7	0.41	1.25
07-Nov-2015 10:00	1.06	5.6	4.7	-	-2.85	HW +6	7.0	-0.05	0.53
05-Dec-2015 07:30	1.06	5.3	5.4	-	-2.19	HW +6	5.9	-0.08	0.57
03-Dec-2015 18:00	0.94	5.3	5.6	-	-2.82	HW +6	7.1	-0.21	0.73

Annual Statistics

Year	Annual H _s exceedance* (m)						Annual Maximum H _s	
	0.05%	0.5%	1%	2%	5%	10%	Date	A _{max} (m)
2011	-	-	-	0.40	0.31	0.22	06-Sep-2011 06:40	0.91
2012	0.69	0.46	0.40	0.32	0.23	0.17	22-Nov-2012 15:00	0.90
2013	0.82	0.52	0.44	0.34	0.24	0.18	02-Nov-2013 17:30	1.08
2014	0.97	0.59	0.47	0.37	0.25	0.18	12-Feb-2014 11:30	1.23
2015	0.93	0.59	0.50	0.41	0.29	0.21	30-Mar-2015 21:30	1.15

* i.e. 5 % of the H_s values measured in 2011 exceeded 0.31 m

Distribution plots

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

- Annual time series of H_s (red line is 0.85 m storm threshold)
- Incidence of storm waves for 2015. Storm events are defined using the Peaks-over-Threshold method. The highest H_s of each storm event is shown
- Wave height exceedance each year since deployment
- Percentage of occurrence of H_s, T_p, T_z and Direction for 2015
- Joint distribution of all parameters for all measured data, given as percentage of occurrence

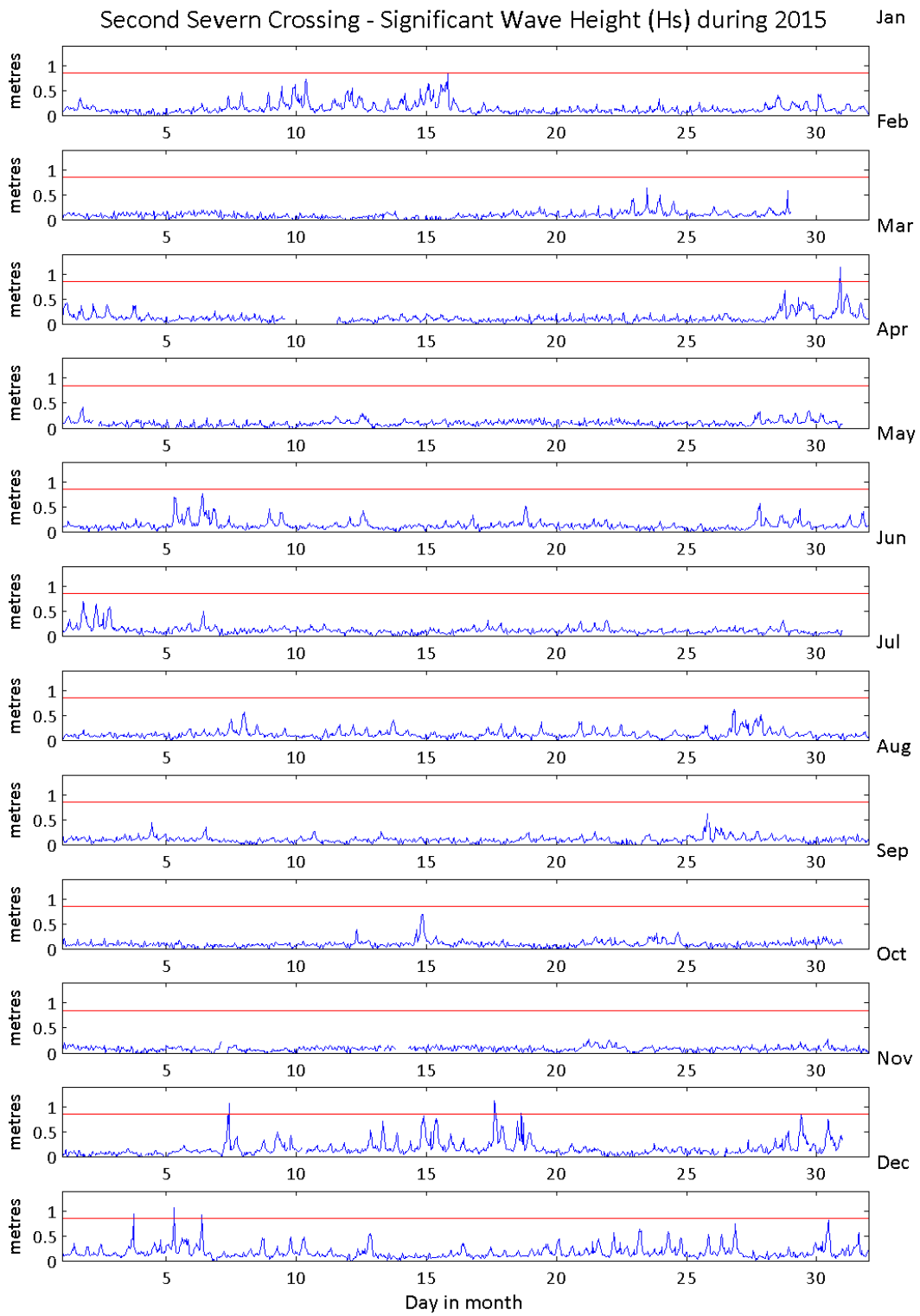
General

The WaveRadar REX was installed on 1 August 2011.

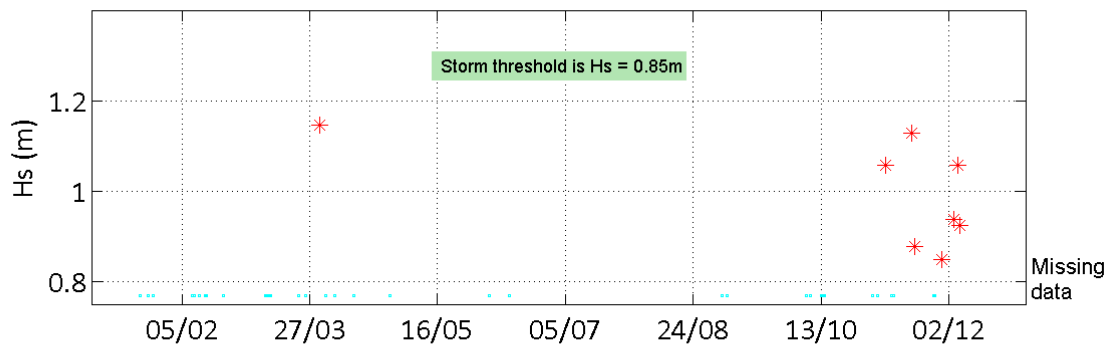
* Tidal information is obtained from the nearest recording tide gauge (the radar also provides tidal data). The surge shown is the residual at the time of the highest H_s. The maximum tidal surge is the largest positive surge during the storm event.

Acknowledgements

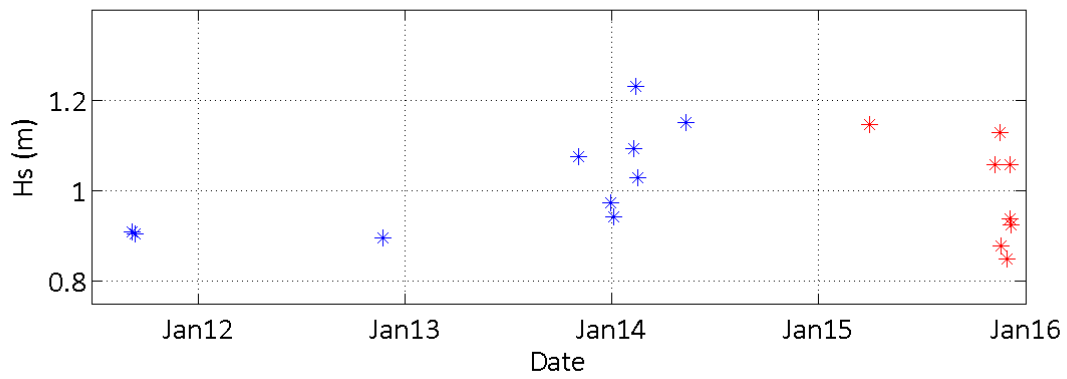
The WaveRadar REX is installed on the Severn Bridge by kind permission of Second Severn Crossing Partnership. TASK2000 tidal prediction software was kindly provided by the Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory.



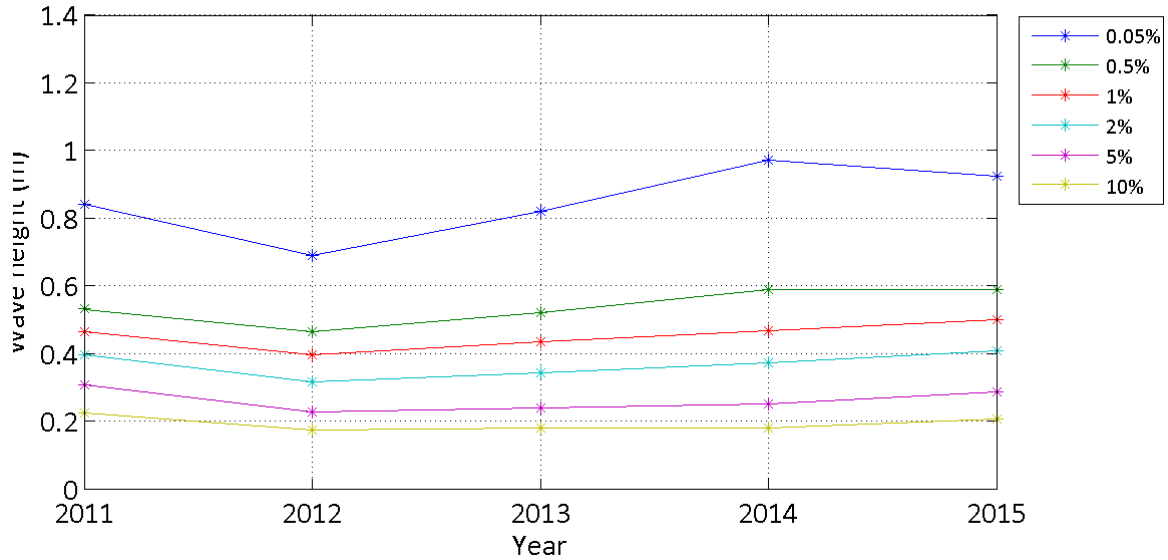
Storms at Second Severn Crossing during 2015



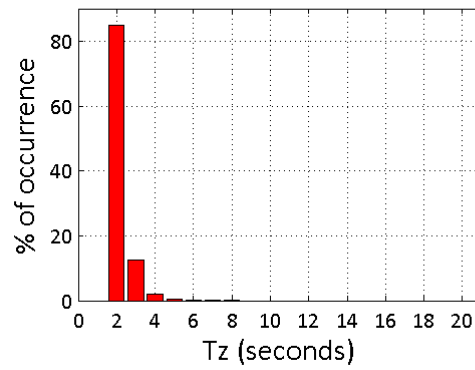
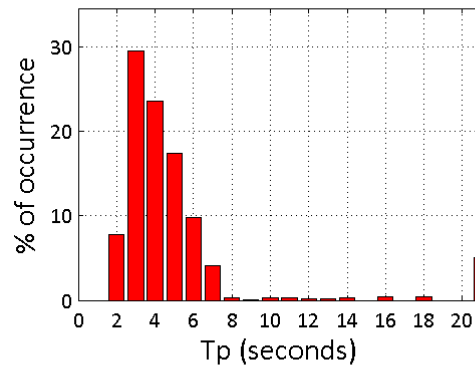
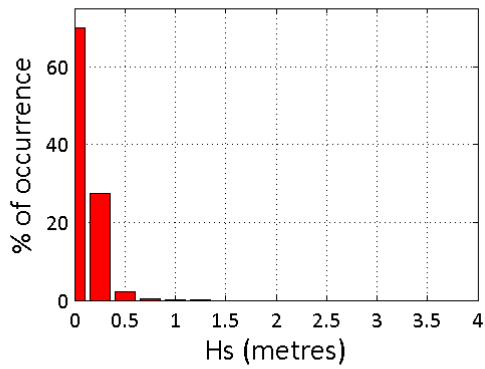
Storms at Second Severn Crossing - all years



Second Severn Crossing - Wave height exceedance (H_s)



Second Severn Crossing 2015



Second Severn Crossing 2011 to 2015 - Joint distribution (% of occurrence)

