



## Severn Bridge Wave Radar

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

## Data Quality

<b>Recovery rate (%)</b>	<b>Sample interval</b>
91	30 minutes

## Monthly Averages - 2017

All times are GMT

Month	H <sub>s</sub> (m)	T <sub>p</sub> (s)	T <sub>z</sub> (s)	Dir. (°)	SST (°C)	No. of days
January	0.09	5.8	2.2	-	-	13
February	0.13	5.1	2.3	-	-	25
March	0.13	4.1	2.3	-	-	29
April	0.08	6.5	2.2	-	-	27
May	0.10	4.3	2.2	-	-	30
June	0.12	4.8	2.2	-	-	29
July	0.11	4.0	2.2	-	-	30
August	0.11	4.2	2.3	-	-	30
September	0.11	4.7	2.2	-	-	29
October	0.13	4.2	2.3	-	-	29
November	0.10	4.3	2.3	-	-	29
December	0.11	4.2	2.3	-	-	30

## Monthly Averages - All Years (August 2011 – December 2016)

Month	H <sub>s</sub> (m)	T <sub>p</sub> (s)	T <sub>z</sub> (s)	Dir. (°)	SST (°C)
January	0.12	4.6	2.2	-	-
February	0.12	5.0	2.3	-	-
March	0.10	5.9	2.2	-	-
April	0.10	5.0	2.2	-	-
May	0.11	5.0	2.2	-	-
June	0.11	4.8	2.2	-	-
July	0.11	4.5	2.2	-	-
August	0.11	8.5	2.2	-	-
September	0.11	8.0	2.2	-	-
October	0.11	8.2	2.2	-	-
November	0.11	4.8	2.3	-	-
December	0.13	4.8	2.3	-	-

## Storm Analysis

Date/Time	H <sub>s</sub> (m)	T <sub>p</sub> (s)	T <sub>z</sub> (s)	Dir. (°)	Water level elevation* (OD)	Tidal stage (hours re. HW)	Tidal range (m)	Tidal surge* (m)	Max. surge* (m)
13-Sep-2017 00:30	1.30	5.8	4.9	-	5.17	HW +1	10.18	0.87	1.23
23-Feb-2017 11:00	0.94	6.1	4.7	-	-2.67	HW +6	7.65	0.64	1.30
21-Oct-2017 09:00	0.88	5.1	4.7	-	6.15	HW +1	11.73	0.19	1.15
16-Oct-2017 17:30	0.76	5.1	4.2	-	5.24	HW +1	10.52	0.40	1.09
30-Dec-2017 05:00	0.74	5.1	3.8	-	5.16	HW +1	9.97	0.35	0.87
23-Nov-2017 10:30	0.71	4.9	4.0	-	4.85	HW +1	9.59	0.11	0.43
03-Aug-2017 09:00	0.71	5.3	4.8	-	-2.32	HW +6	6.56	0.23	0.57

\* Tidal information is obtained from the Severn Bridge Wave Radar. The surge shown is the residual at the time of the highest H<sub>s</sub>. The maximum tidal surge is the largest positive surge during the storm event.

## Annual Statistics

Year	Annual H <sub>s</sub> exceedance* (m)						Annual Maximum H <sub>s</sub>	
	0.05%	0.5%	1%	2%	5%	10%	Date	A <sub>max</sub> (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
2016	0.82	0.47	0.40	0.32	0.23	0.18	08-Feb-2016 08:00	1.26
2017	0.80	0.52	0.43	0.35	0.24	0.18	13-Sep-2017 00:30	1.30

\* i.e. 5 % of the H<sub>s</sub> values measured in 2011 exceeded 0.31 m

## Distribution plots

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

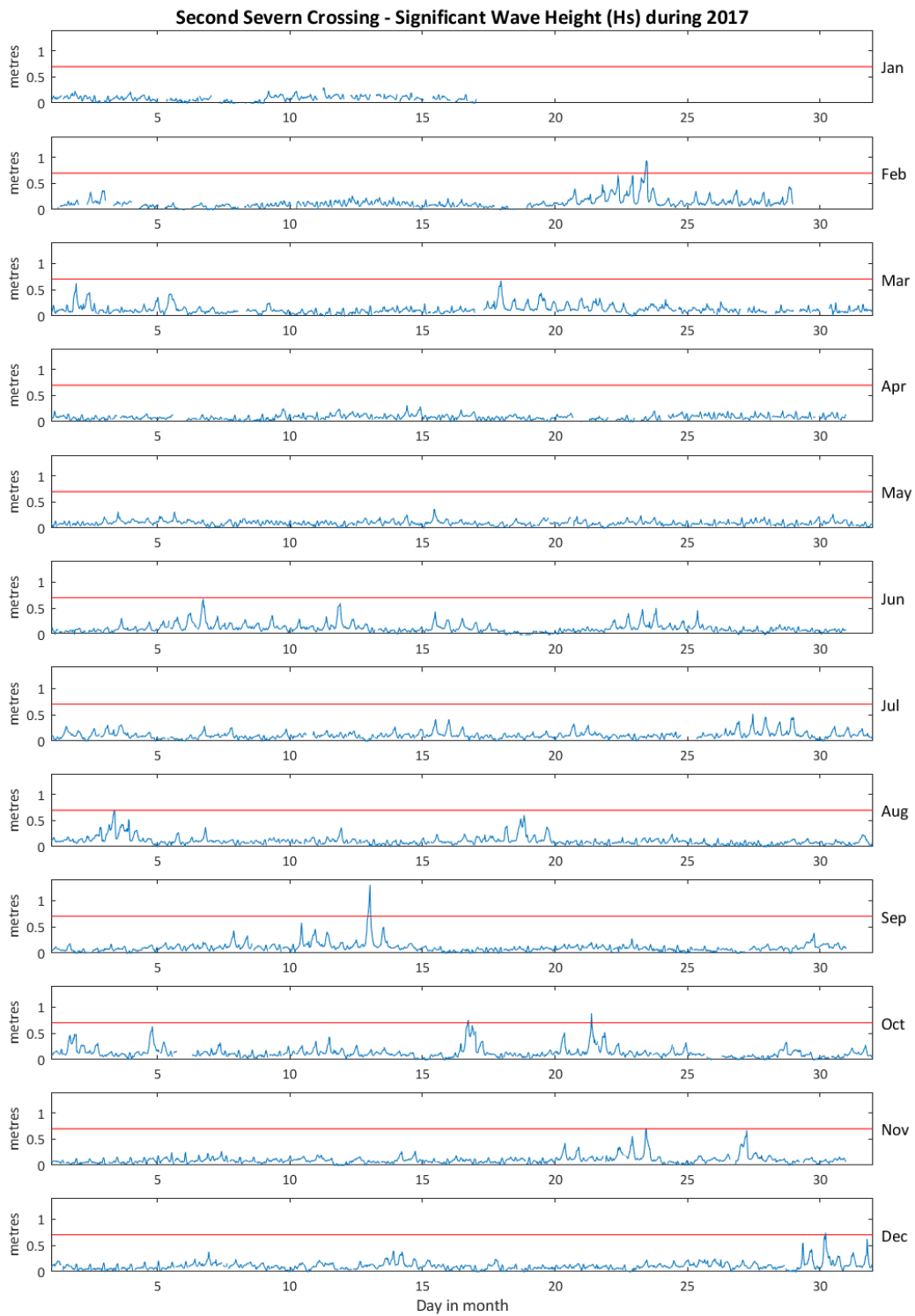
- Annual time series of H<sub>s</sub> (red line is 0.70 m storm alert threshold)
- Incidence of storm waves for 2017. Storm events are defined using the Peaks-over-Threshold method. The highest H<sub>s</sub> of each storm event is shown
- Wave height exceedance each year since deployment
- Percentage of occurrence of H<sub>s</sub>, T<sub>p</sub>, T<sub>z</sub> and Direction for 2017
- Joint distribution of all parameters for all measured data, given as percentage of occurrence

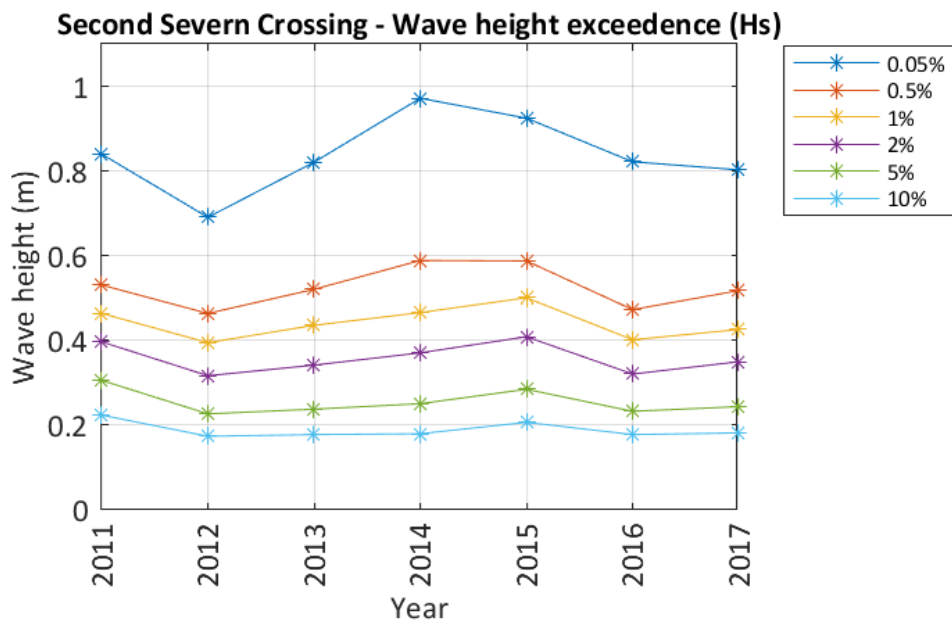
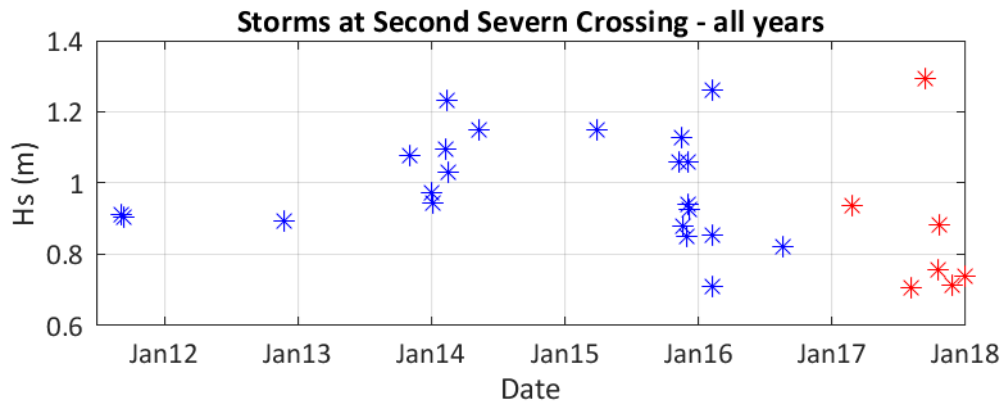
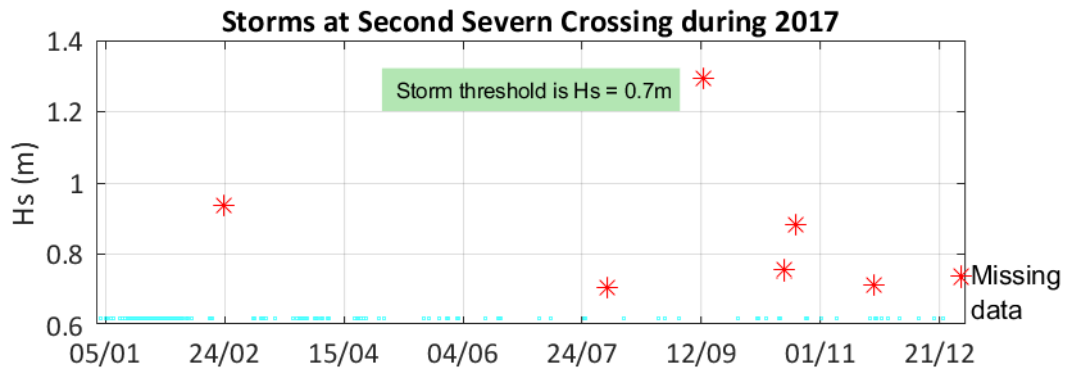
## General

The WaveRadar REX was installed on 1 August 2011.

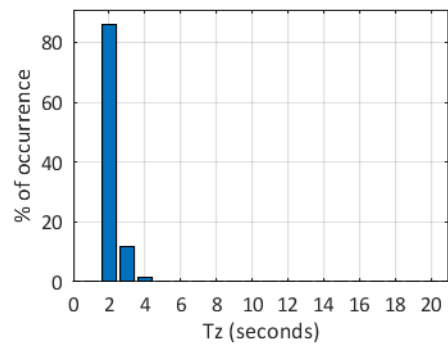
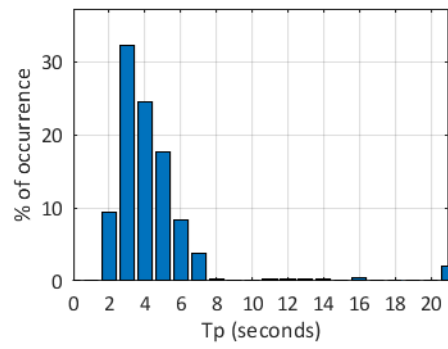
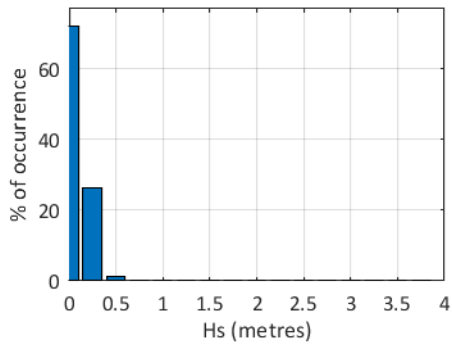
## Acknowledgements

The WaveRadar REX is installed on the Severn Bridge by kind permission of Second Severn Crossing Partnership. Tidal predictions were supplied by Fugro GB Marine Limited.





### Second Severn Crossing 2017



### Second Severn Crossing 2011 to 2017 - Joint distribution (% of occurrence)

