

STORM EVENT

— 10th March 2008 —

South coast event causing floods from Cornwall to West Sussex, and the Channel Islands



Severity Ranking



Social	<u>Loss of life</u>	Over a dozen properties flooded in Cornwall
	<u>Residential property</u>	*
	<u>Evacuation & rescue</u>	30 people evacuated from caravan park on Selsey Bill
Economic	<u>Cost</u>	Damage to sea defences in Jersey estimated at approximately £0.5 million
	<u>Ports</u>	*
	<u>Transport</u>	*
	<u>Energy</u>	*
	<u>Public services</u>	*
	<u>Water & wastewater</u>	*
	<u>Livestock</u>	*
	<u>Agricultural land</u>	*
Environmental	<u>Coastal erosion</u>	Significant erosion at Chilling Cliff near Lee-on-the-Solent and Fareham
	<u>Natural environment</u>	*
	<u>Cultural heritage</u>	*
	<u>Coastal defences</u>	*

**No known sources of information available*

Source

The “Johanna” storm developed over the east coast of the US on 8th March 2008 and travelled northeastward towards the southwest of Greenland. The storm then changed direction and travelled eastward towards the UK, strengthening whilst interacting with another low pressure system over Ireland, before crossing central Ireland and England on 10th March and dissipating in the North Sea on 11th March. The central pressure dropped rapidly to less than 950 mbar. While over Ireland the storm generated strong westerly winds along the coast of southwest England, with gusts of 83 knots [43 m/s] recorded near the Needles, Isle of Wight.

The storm generated a skew surge of between 0.5 and 1.0 m at several sites along the south coast of the UK and in the Bristol Channel and Irish Sea. Water levels exceeded the 1 in 5 year return level at 7 sites, 5 along the south coast. The highest return period water level was at Weymouth and was 1 in 40 years. The next largest return period of 1 in 23 years was at Bournemouth. This event generated the highest recorded water level return periods at three sites, Bournemouth, Weymouth and Milford Haven. The highest skew surge was at Bournemouth and was 0.66 m. At Weymouth the skew surge was 0.53 m. The storm occurred around peak spring tides.

We are unaware of any sources describing the wave conditions during this event

Pathway

A combination of overtopping and breaching occurred at defences along many areas of the south coast, and more notably in the Solent, Hampshire.

Receptor & Consequence

There was a serious event for the south coast with flooding in the western and central Channel including Teignmouth (Devon), Flushing (Cornwall), Portsmouth and other locations in the Solent (Ruocco *et al.*, 2011; Haigh *et al.*, 2011; Wadey *et al.*, 2013) and South downs regions (Environment Agency, 2010). There was also flooding in several small towns along the Brittany coastline (Le Roy *et al.*, 2014) and the Channel Islands. Flooding was most extensive on the Isle of Wight and in the Channel Islands. The effects were not extreme but there was major wave action and localised sea flooding around the English Channel, most notable at a caravan park on Selsey Bill where around 30 persons were evacuated following a breach of defences. The end of Sandbanks peninsula (in Poole, Dorset) was temporarily cut off from the mainland, and overtopping and much infiltration was reported for Chesil Beach (West, 2014). In the Solent the storm caused much erosion at Chilling Cliff near Lee-on-the-Solent and Fareham. In Cornwall, the high spring tides combined with strong winds and a storm surge resulted in flooding at both north and south coasts affecting Bude, Boscastle, Port Gaverne, Port Isaac and Port Quin, Polzeath, Padstow and Trevone, Sladesbridge and Wadebridge, Porth (Newquay), Perranporth, Portreath, Hayle and St Ives, Gweek, Swanpool, Penryn and Mylor Bridge, Tresillian, Fowey, Golant, Lerryn and Lostwithiel, Looe and Saltash. In Fowey, 8 properties were flooded along with 6 in Perranporth where the sea front had to be closed by emergency services. In Polzeath, 3 properties flooded and a road was badly damaged in Port Gaverne. In Port Isaac, at least 7 properties flooded including the life boat station. In Jersey, the damage to defences was estimated at approximately £0.5 million (Le Blanq and Searson, 2008).

Table 1: High water levels (m CD) recorded at the UK National Tide Gauge sites that reached or exceeded a 1 in 5 year return level during the event.

Tide gauge Site	Date and time (GMT)	Return period (years)	Water level (m CD)	Astronomical tide (m CD)	Skew surge (m)
Newhaven	10/03/08 13:15	<1	7.2	7.12	0.09
Portsmouth	10/03/08 13:00	7	5.5	4.92	0.58
Bournemouth	10/03/08 10:30	23	3.09	2.43	0.66
Weymouth	10/03/08 09:00	40	3.04	2.51	0.53
Devonport	10/03/08 07:30	7	6.34	5.73	0.61
Newlyn	10/03/08 06:15	15	6.35	5.89	0.46
St. Mary's	10/03/08 06:15	4	6.43	6.03	0.4
Ilfracombe	10/03/08 07:30	4	10.31	9.78	0.53
Hinkley Point	10/03/08 08:30	<1	12.92	12.4	0.52
Avonmouth	10/03/08 09:00	<1	14.54	13.95	0.58
Milford Haven	10/03/08 07:45	19	8.18	7.57	0.6
Fishguard	10/03/08 08:45	8	5.72	5.2	0.52
Barmouth	10/03/08 09:45	4	6.12	5.5	0.62
Holyhead	10/03/08 12:00	5	6.58	5.99	0.59
Llandudno	10/03/08 12:15	3	8.69	8.27	0.42
Heysham	10/03/08 12:45	1	10.81	10.33	0.48
Workington	10/03/08 13:00	2	9.36	8.9	0.45
Port Erin	10/03/08 12:45	2	6.21	5.69	0.52
Portpatrick	10/03/08 13:00	2	4.69	4.2	0.49
Millport	10/03/08 14:00	<1	4.14	3.69	0.45
Port Ellen	10/03/08 07:00	<1	1.67	0.95	0.72
Tobermory	10/03/08 07:30	1	5.43	4.93	0.5
Ullapool	10/03/08 08:30	<1	5.92	5.55	0.37
Kinlochbervie	10/03/08 08:45	<1	5.59	5.28	0.31
Lerwick	10/03/08 12:45	<1	2.61	2.39	0.22
Wick	10/03/08 13:00	<1	4.1	3.78	0.32
Aberdeen	10/03/08 15:00	<1	4.91	4.63	0.28
Leith	10/03/08 16:15	<1	6.18	5.84	0.34
North Shields	09/03/08 16:30	<1	5.64	5.47	0.18
Whitby	09/03/08 17:00	<1	6.16	6	0.16
Immingham	09/03/08 19:00	<1	7.8	7.58	0.22
Cromer	09/03/08 19:30	<1	5.57	5.46	0.11
Lowestoft	09/03/08 22:45	<1	2.83	2.65	0.18
Dover	10/03/08 00:15	<1	7.11	7.18	-0.07

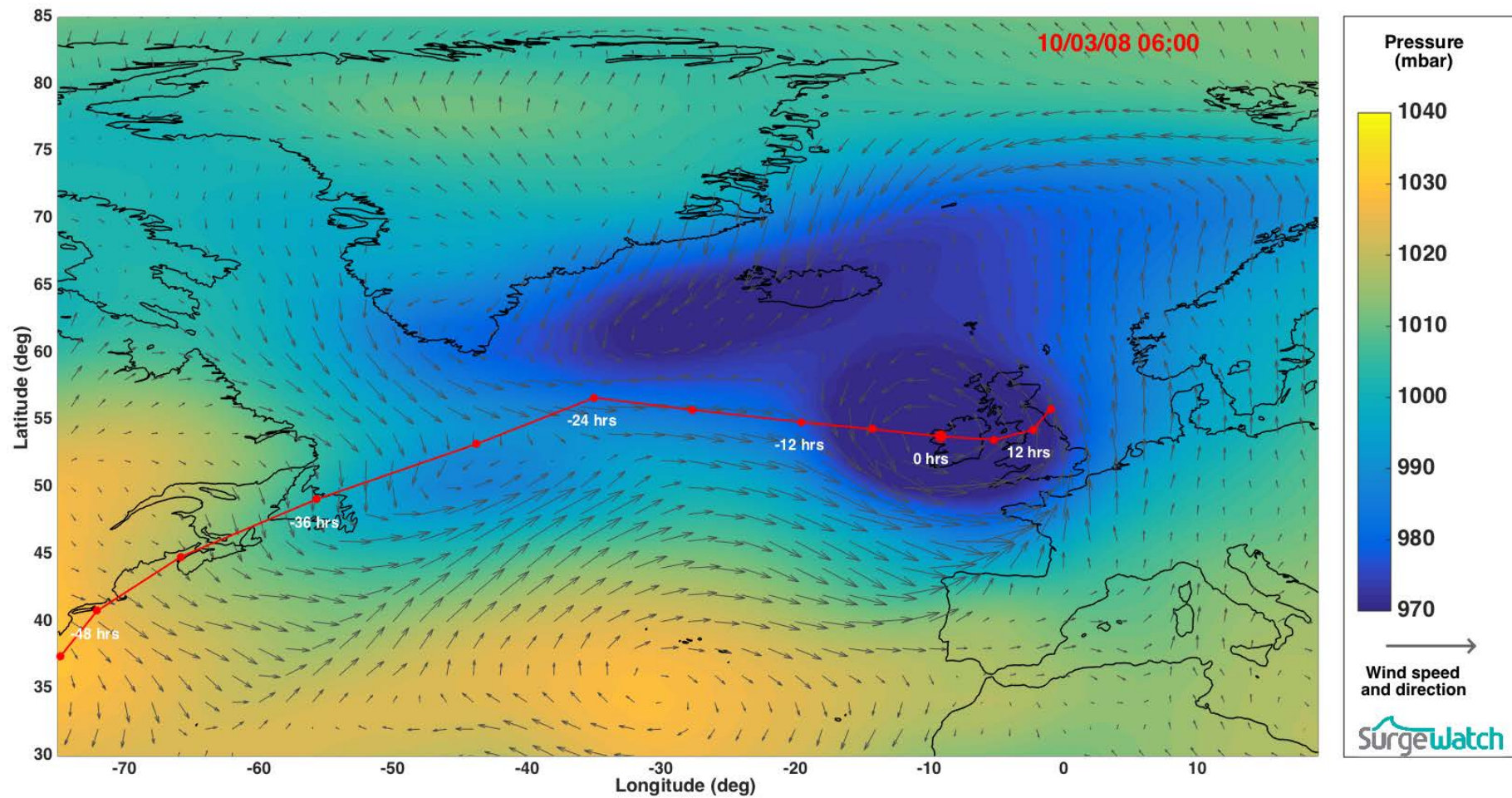


Figure 1: Meteorological conditions at time of maximum water level overlaid by the storm track

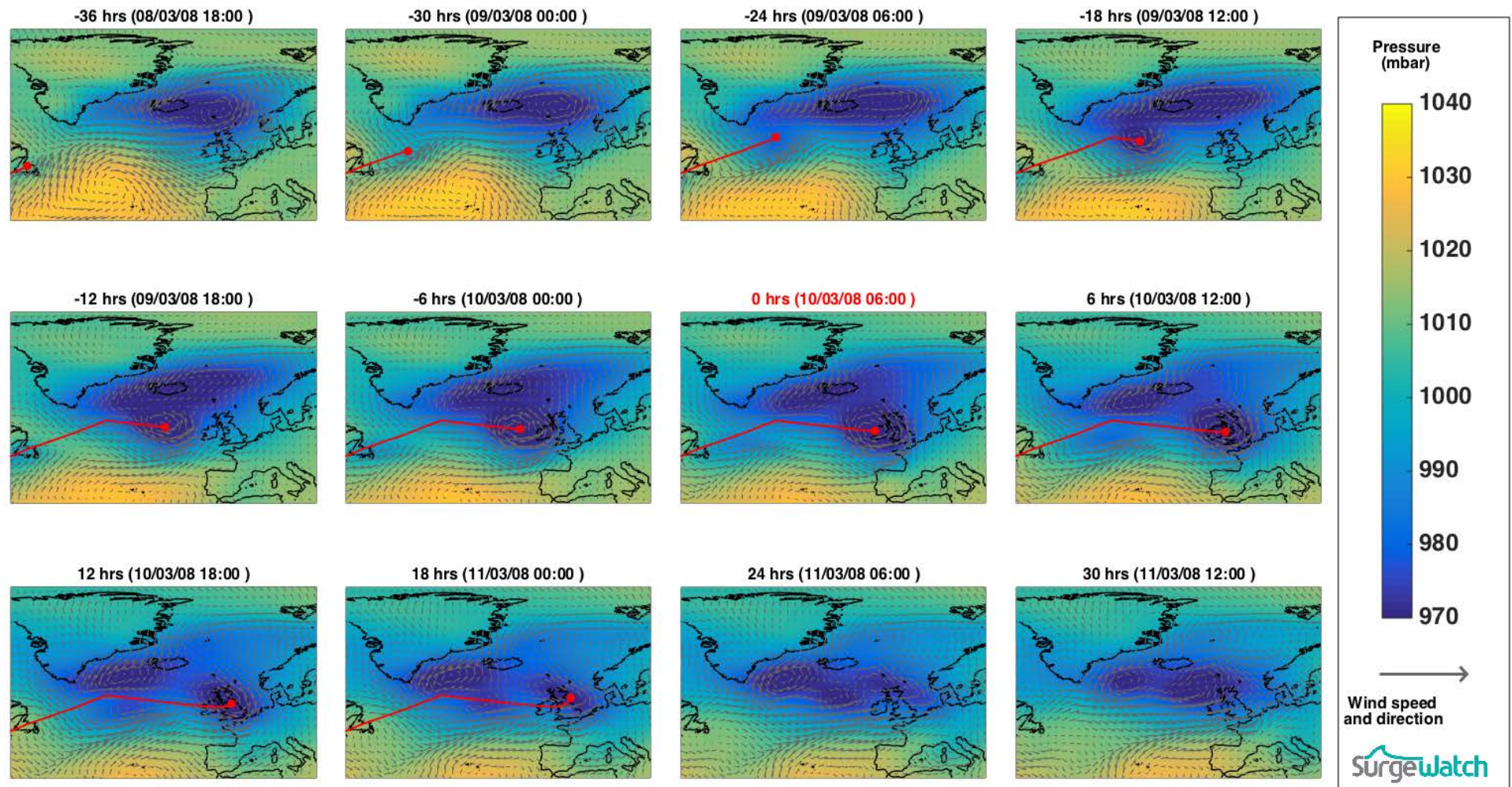


Figure 2: Meteorological conditions during event

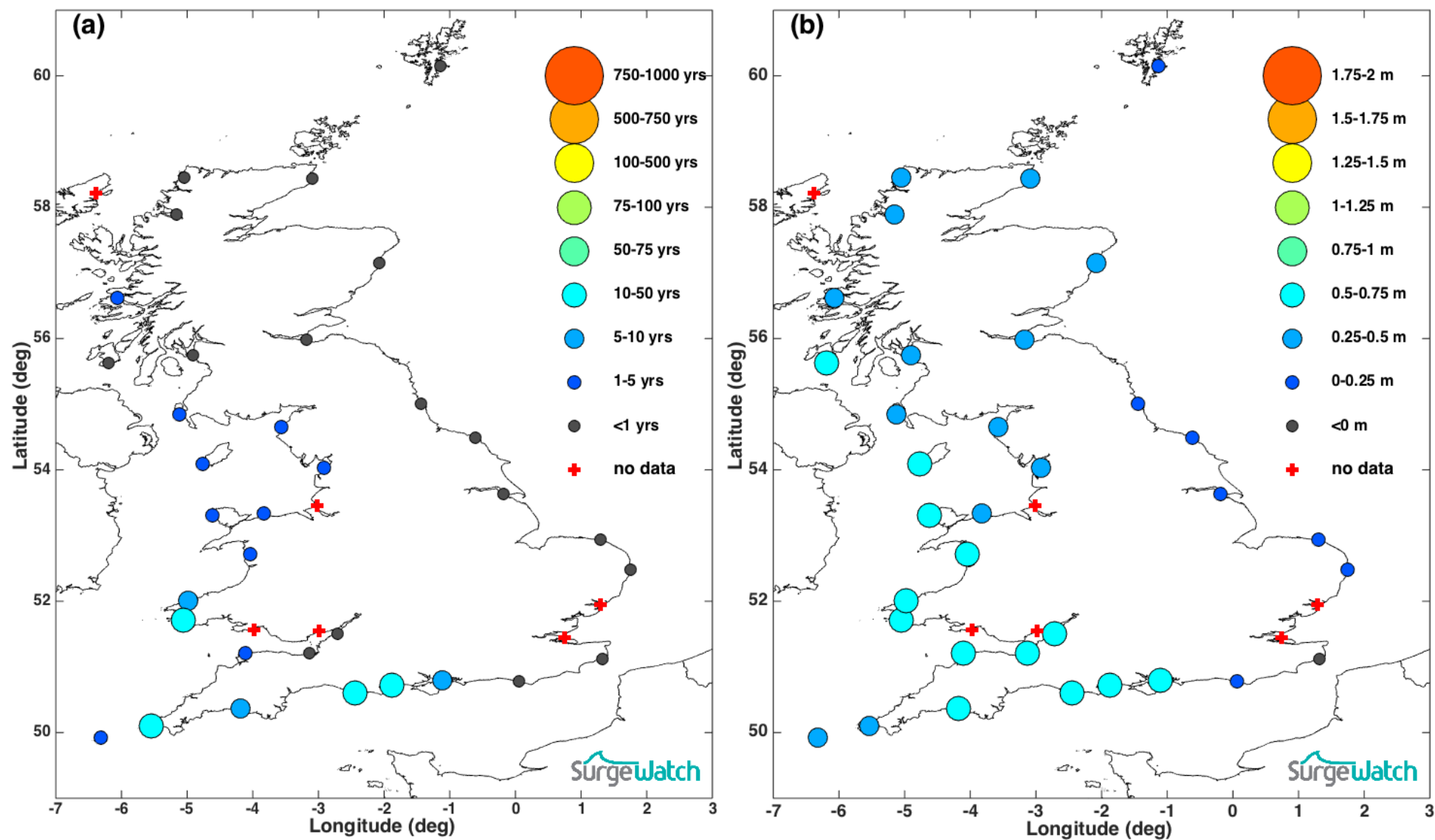


Figure 3: (a) Water level return period; (b) Skew surge levels

References

- Environment Agency, 2010. *Solent & South Downs Area Report 10 March tidal flooding event, Hampshire & Isle of Wight. A report of events, consequences and conclusions. Version 2.*,
- Haigh, I.D. et al., 2015. A user-friendly database of coastal flooding in the United Kingdom from 1915–2014. *Scientific Data*, 2, p.150021. Available at: <http://www.nature.com/articles/sdata201521>.
- Le Blancq, F.W. & Searson, J., 2008. *Effects of the 10th March 2008 storm surge on defences in the Channel Islands - unpublished report*, Jersey.
- Le Roy, S. et al., 2014. Coastal flooding of urban areas by overtopping: dynamic modelling application to the Johanna storm (2008) in Gâvres (France). *Natural Hazards and Earth System Sciences Discussions*, 2(8), pp.4947–4985.
- Ruocco, A.C. et al., 2011. Reconstructing coastal flood occurrence combining sea level and media sources: a case study of the Solent, UK since 1935. *Natural Hazards*, 59(3), pp.1773–1796. Available at: <http://link.springer.com/10.1007/s11069-011-9868-7> [Accessed March 27, 2015].
- Wadey, M.P., Nicholls, R.J. & Haigh, I., 2013. Understanding a coastal flood event: The 10th March 2008 storm surge event in the Solent, UK. *Natural Hazards*, 67(2), pp.829–854.
- West, I.W., 2014. Chesil Beach - Hurricanes, Storms, and Storm Surges. *Geology of the Wessex Coast of Southern England*. Available at: <http://www.southampton.ac.uk/~imw/chestorm.htm> [Accessed March 8, 2015].

Additional sources of information

- BBC, 2008. March 2008 Storm. *BBC News*. Available at: http://www.bbc.co.uk/devon/content/image_galleries/march08_storm_gallery.shtml [Accessed November 15, 2015].
- Geology Wales, n.d. WINTER 2007-8 part 5: Significant windstorm, March 10th 2008? Added March 6th, in advance; updated March 8 th & 9th. *Geology Wales*. Available at: <http://www.geologywales.co.uk/storms/march08.htm> [Accessed November 15, 2015].
- Homewood, P., 2013. UK Storm Warning Update. *Not A Lot of People Know That*. Available at: <https://notalotofpeopleknowthat.wordpress.com/2013/10/24/uk-storm-warning-update/> [Accessed November 15, 2015].
- Rush, A., 2008. Storm at Trebarwith 10th March 2008. *YouTube*. Available at: http://www.youtube.com/watch?v=_KBbaYb5gYk [Accessed November 15, 2015].
- Zuke100, 2008. St Ives in the Storm of 10 March 2008. *YouTube*. Available at: <http://www.youtube.com/watch?v=8Qrc7VrHPro> [Accessed November 15, 2015].