SurgeWatch

STORM EVENT

1st February 2014

Residents near Aberystwyth urged to leave their homes, and there are fears of a storm surge along the River Severn

Severity Ranking

		3			

Social	Loss of life	*
	Residential property	Around 180 properties impacted by coastal and fluvial flooding during the weekend of this event
	Evacuation & rescue	Hundreds of persons evacuated in Aberystwyth
Economic	Cost	*
	Ports	*
	Transport	Coastal roads in many locations impacted including the B4213 and A417
	Energy	*
	Public services	*
	Water & wastewater	*
	Livestock	*
	Agricultural land	*
Environmental	Coastal erosion	Considerable cliff erosion at Newquay
	Natural environment	*
	Cultural heritage	*
	Coastal defences	*

**No known sources of information available*

Source	The storm developed off the east coast of the US on 29th January 2014 and moved northeastwards towards the UK. On 30th January, southwest of Iceland, the storm combined with, and was enhanced by, another low-pressure system located over Greenland. The central pressures deepened rapidly to below 950 mbar. The storm then travelled eastwards towards Ireland, before turning north and crossing northwest Scotland. It then moved northeastwards into the Norwegian Sea on 3rd February 2014. Wind gusts of almost 60 knots [31 m/s] were recorded at Dundrennan, Kirkcubrightshire, and over 50 knots [26 m/s] on the south coast (Met Office, 2014a). Winds were gusting at around 70 knots [36 m/s] in Aberystwyth (BBC, 2014). The storm was one of a series of successive storms that moved across the UK, separated by an interval of only a few days (Met Office, 2014a). The storm generated a skew surge of between 0.25–0.75 m at many sites along the UK west and south coasts, and in Scotland. Water levels exceeded the 1 in 5 year return level at 8 sites along the west coast. The highest return period water level was at Stornoway and was 1 in 35 years. The next largest return period of 1 in 20 years was at Workington. The highest skew surge was at Workington and was 0.62 m. At Stornoway, the skew surge was 0.48 m. The event occurred about a day before peak spring tides. We are unaware of any sources describing the wave conditions during this event.
Pathway	The primary mechanism of defence failure during this event was wave overtopping on the open coast and overflow (of defences and land) in estuarine areas and river catchments.
Receptor & Consequence	This event was associated with flooding around many parts along the UK southwest and west coasts, with impacts exacerbated due to the occurrence of several storms and consequent flooding during the preceding days (Haigh *et al*., 2015). In Aberystwyth, hundreds of students were, as a precaution, relocated from their homes after streets were flooded. Parts of the Bristol Harbour entrance flooded after the River Avon rose above its banks (The Guardian, 2014). An amateur video report shows flooding in several streets in Looe. In Tirley Village the B4213 and A417 roads were closed due to flooding *(*Tirley Council, 2014*)*. Another video shows that flooding occurred by waves overtopping defences at high tide in the area between Little Bispham, Blackpool, and Cleveleys at around noon on 1st February. Over the weekend of 1st February, about 180 homes were affected by river and coastal floods (Daily Mail, 2014). Also reported was damage to the promenades in Newlyn and Penzance, whilst large waves flooded houses across Cornwall. At Newgale (southwest Wales) severe flooding was reported and a bus was hit by a large wave and ten passengers needed to be rescued. In Newquay, significant cliff erosion occurred and a part of the sea wall at Towan Beach was undermined, which led to failure and damage to the adjacent road. In the River Severn, a large tidal bore was expected, which raised concern of further flooding in the area. The storms also caused significant coastal erosion in many areas (Met Office, 2014b).

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	01/02/14 12:30	<1	7.1	7.24	-0.14
Portsmouth	31/01/14 23:45	<1	5.15	4.82	0.33
Weymouth	31/01/14 19:30	<1	2.68	2.27	0.41
Devonport	01/02/14 06:45	1	6.2	6.05	0.15
Newlyn	01/02/14 05:30	2	6.18	6.12	0.06
St. Mary's	01/02/14 05:30	2	6.39	6.1	0.29
Ilfracombe	01/02/14 06:45	5	10.37	10.19	0.17
Hinkley Point	01/02/14 07:45	5	13.21	12.94	0.27
Newport	31/01/14 19:30	<1	13.11	12.79	0.32
Mumbles	01/02/14 07:15	4	10.62	10.41	0.22
Milford Haven	01/02/14 07:15	6	8.07	7.81	0.26
Fishguard	01/02/14 08:15	3	5.65	5.3	0.35
Barmouth	01/02/14 09:15	2	6.06	5.66	0.4
Holyhead	01/02/14 11:30	3	6.54	6.27	0.27
Llandudno	01/02/14 11:30	2	8.7	8.5	0.2
Liverpool	01/02/14 11:45	2	10.59	10.33	0.26
Heysham	31/01/14 23:45	<1	10.45	10.08	0.37
Workington	01/02/14 12:15	20	9.77	9.16	0.62
Port Erin	01/02/14 12:15	7	6.37	5.89	0.48
Portpatrick	01/02/14 12:30	15	4.96	4.43	0.53
Millport	01/02/14 13:00	2	4.39	3.73	0.66
Tobermory	01/02/14 06:45	4	5.58	5.11	0.47
Stornoway	01/02/14 07:30	35	5.97	5.49	0.48
Ullapool	01/02/14 07:45	9	6.25	5.8	0.45
Kinlochbervie	01/02/14 08:15	5	5.93	5.46	0.47
Lerwick	02/02/14 12:45	<1	2.67	2.41	0.27
Wick	02/02/14 13:00	2	4.18	3.87	0.31
Aberdeen	02/02/14 14:45	<1	4.86	4.68	0.19
Leith	01/02/14 15:30	<1	6.2	6.09	0.11
North Shields	02/02/14 17:00	<1	5.68	5.58	0.1
Whitby	02/02/14 17:45	<1	6.23	6.14	0.09
Immingham	01/02/14 18:45	<1	7.16	7.72	-0.56
Cromer	30/01/14 18:00	<1	5.02	5.12	-0.1
Lowestoft	30/01/14 21:00	<1	2.51	2.61	-0.1

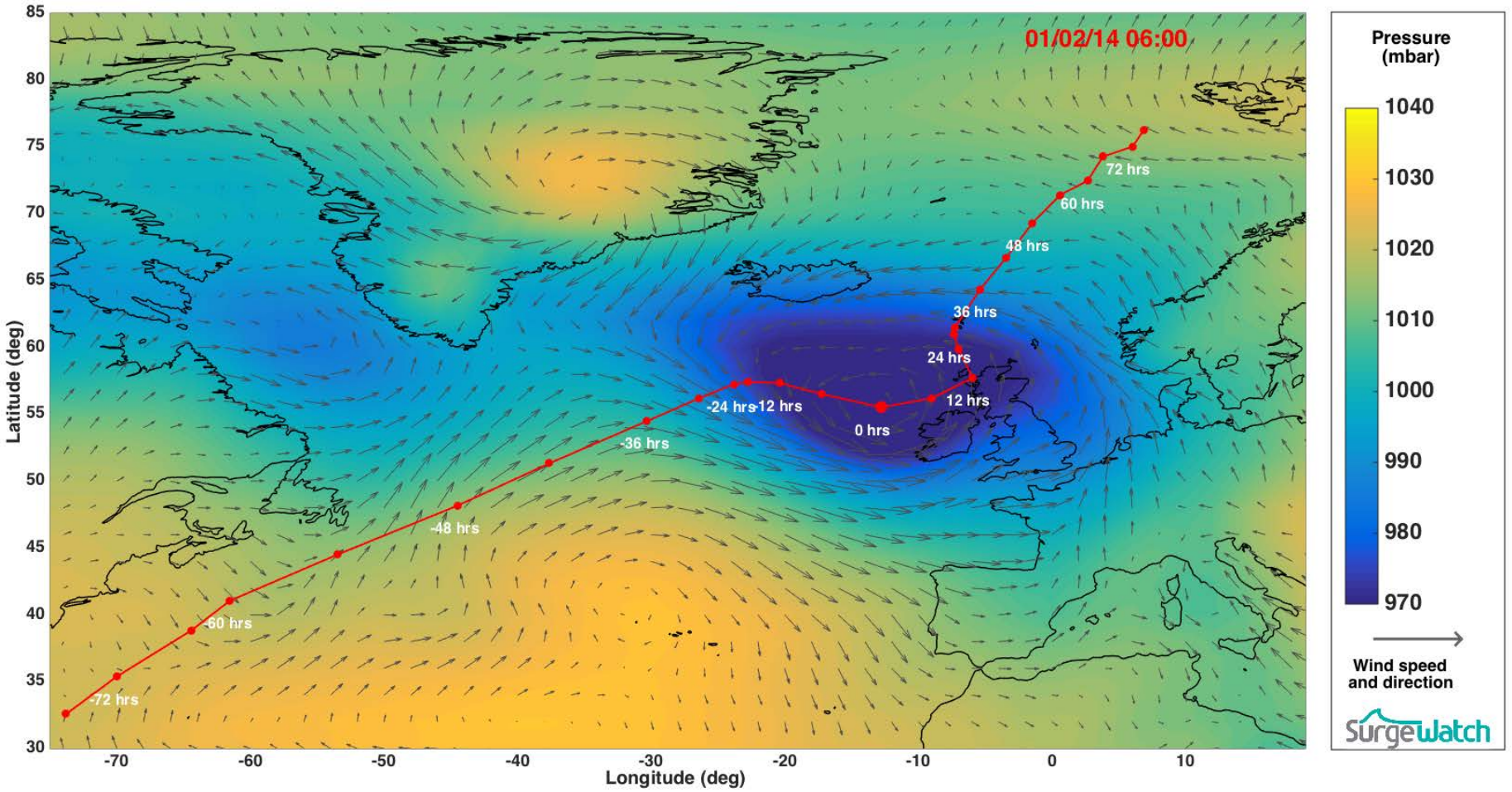

Figure 1: Meteorological conditions at time of maximum water level overlaid by the storm track

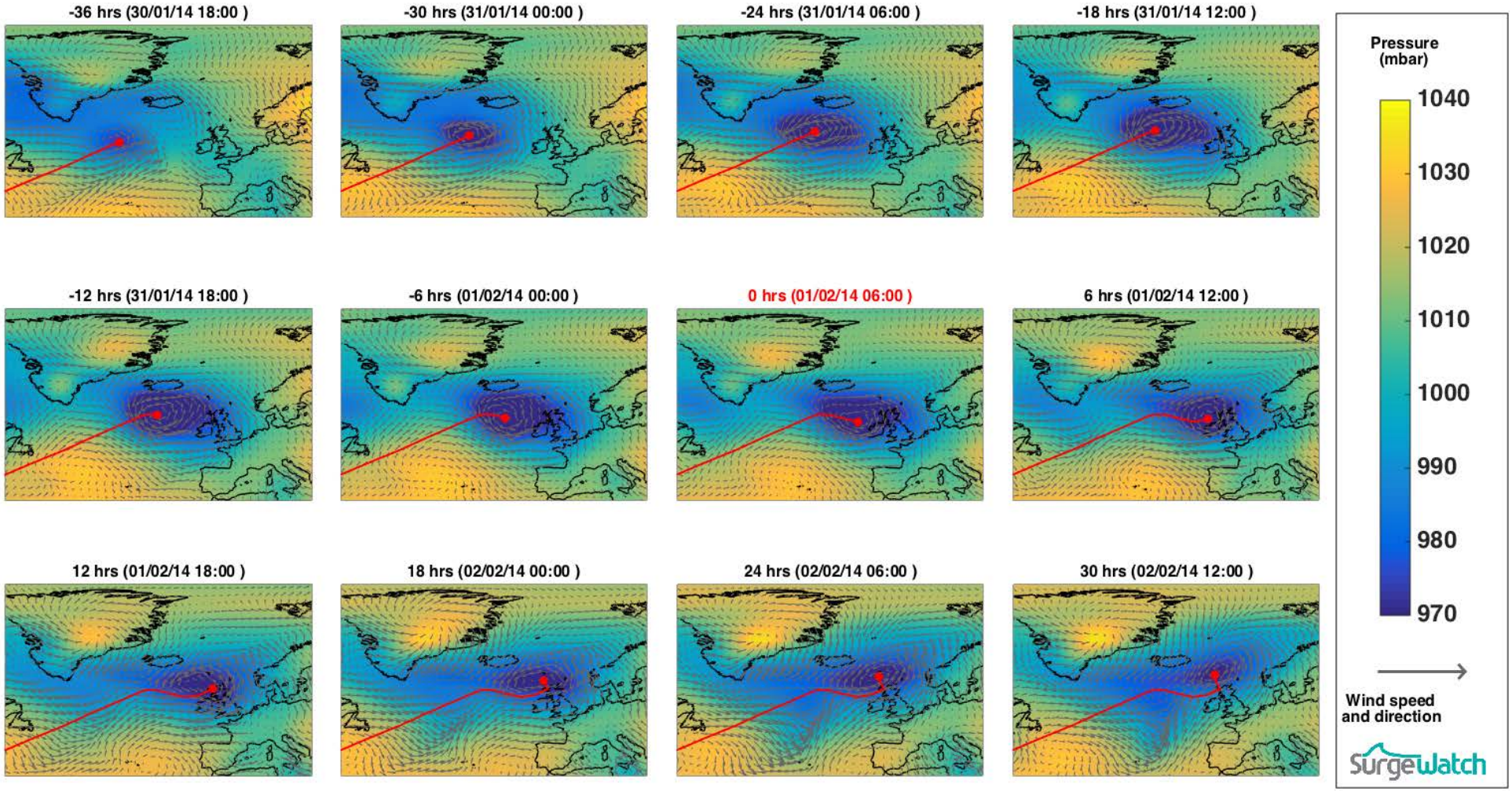

Figure 2: Meteorological conditions during event

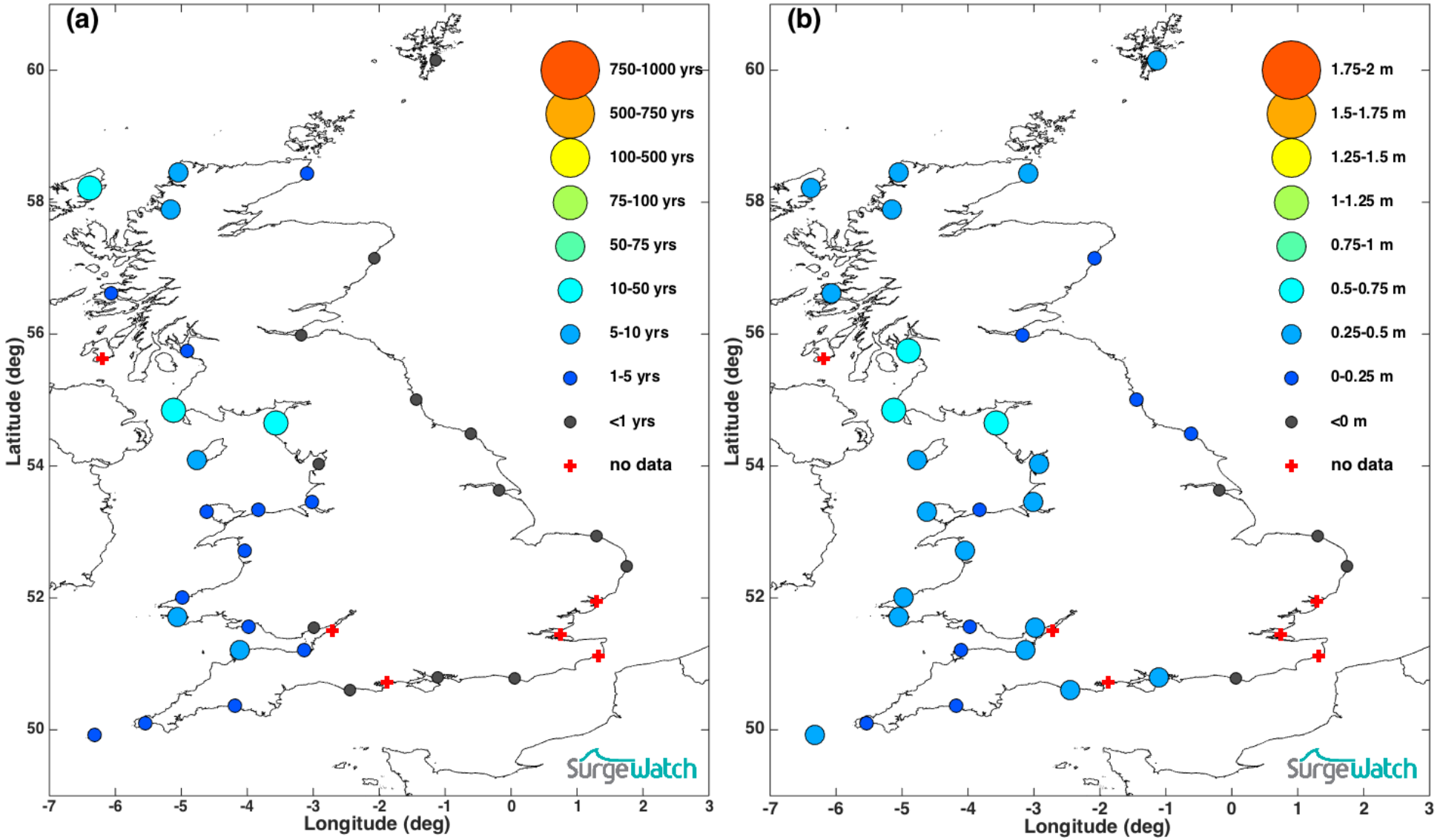

Figure 3: (a) Water level return period; (b) Skew surge levels

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Additional sources of information

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