SurgeWatch

STORM EVENT

24th December 1999

One of a series of storms during the Christmas period and a big coastal flood event in parts of the UK

Severity Ranking

		3			

Social	Loss of life	*
	Residential property	Properties flooded in Totton and Lymington (Hampshire)
	Evacuation & rescue	*
Economic	Cost	*
	Ports	*
	Transport	Brockenhurst-Bournemouth railway line flooded at Sway (although likely source was rainfall flooding)
	Energy	*
	Public services	*
	Water & wastewater	*
	Livestock	*
	Agricultural land	*
Environmental	Coastal erosion	*
	Natural environment	*
	Cultural heritage	*
	Coastal defences	Breach in defences at Selsey, Sussex

**No known sources of information available*

Source	The storm developed over Canada on 21st December 1999 and moved northeast deepening to a central pressure of approximately 957 mbar by midnight on 24th December (Le Blancq & Searson, 2000). The storm continued to deepen reaching 927 mbar while situated northwest of Scotland (Met Office, 2014). Wind gusts of 60 – 70 knots [31 – 36 m/s] were recorded throughout Scotland; and up to 80 knots [41 m/s] in southern England (Met Office, 2014). The storm generated a skew surge of 0.7 m at Kinlochbervie (Scotland) and skew surges values of 0.5 m on much of the west and north UK coast (with similar values also recorded at Plymouth and Portsmouth on the south English coast, and Immingham on the east English coast). Water levels exceeded the 1 in 5 year return level at 4 sites (three in Scotland, one in north Wales). The highest return period water level was at Kinlochbervie and was 1 in 23 years. The next largest return period of 1 in 19 years was at Wick (on the northeast coast of Scotland). The high water on Christmas Eve was a large event at Sefton (Liverpool Bay) with peak offshore wave conditions comprising a significant wave height of 5.39 m (Brown et al., 2010).
Pathway	There was a breach in defences at Selsey, Sussex. We are unaware of any further specific information concerning the flood pathways during this event.
Receptor & Consequence	This event was associated with flooding along the English Channel and Bristol Channel over several days during Christmas 1999, impacting Dorset, Hampshire, Surrey, and Kent (Eden, 2008; Ruocco *et al*., 2011; Haigh *et al*., 2015). One newspaper article reported that a favourable change in wind conditions spared "thousands" of homes from flooding. A dozen residential properties were inundated in Totton to over 1 ft. [0.3 m] in depth, and properties in Lymington were also reported flooded. In Selsey, a breach in the defences led to some flooding, while in some areas pumping was required to remove the flood water (Ruocco *et al*., 2011). Flooding was also reported on the south coast of Jersey on 24th – the worst event on the island since November 1984. The Brockenhurst-Bournemouth railway line was flooded at Sway New Forest although this lies outside of the tidal floodplain.

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)
Portsmouth	25/12/99 00:15	5	5.44	4.83	0.61
Bournemouth	24/12/99 22:30	1	2.79	2.32	0.47
Weymouth	22/12/99 18:30	<1	2.27	2.3	-0.03
Devonport	24/12/99 19:15	<1	6.14	5.64	0.5
Newlyn	25/12/99 06:00	<1	5.97	5.78	0.18
St. Mary's	24/12/99 18:00	<1	6.09	5.86	0.23
Hinkley Point	24/12/99 20:00	1	13	12.29	0.72
Newport	24/12/99 20:15	5	13.55	12.58	0.97
Mumbles	24/12/99 19:15	<1	10.37	9.98	0.39
Milford Haven	24/12/99 19:30	<1	7.79	7.36	0.43
Fishguard	23/12/99 19:30	<1	5.39	5.1	0.29
Barmouth	23/12/99 20:45	3	6.05	5.47	0.58
Holyhead	23/12/99 22:45	7	6.6	5.95	0.65
Llandudno	23/12/99 23:15	5	8.75	8.15	0.6
Liverpool	23/12/99 23:30	2	10.5	9.84	0.66
Heysham	23/12/99 23:45	3	10.95	10.26	0.69
Workington	24/12/99 00:00	3	9.44	8.89	0.55
Port Erin	23/12/99 23:45	2	6.2	5.57	0.63
Millport	25/12/99 01:45	4	4.5	3.63	0.88
Port Ellen	24/12/99 05:45	1	1.72	0.99	0.73
Tobermory	24/12/99 06:30	5	5.61	4.99	0.62
Stornoway	23/12/99 07:00	<1	5.3	5.19	0.11
Ullapool	24/12/99 07:30	18	6.3	5.66	0.64
Kinlochbervie	24/12/99 08:00	23	6.11	5.4	0.7
Lerwick	25/12/99 00:45	4	2.84	2.46	0.38
Wick	25/12/99 00:45	19	4.38	3.84	0.55
North Shields	24/12/99 16:30	<1	5.73	5.38	0.35
Whitby	24/12/99 17:00	<1	6.2	5.82	0.38
Immingham	24/12/99 19:15	<1	8.02	7.47	0.55
Cromer	24/12/99 19:30	<1	5.22	5.08	0.15
Lowestoft	25/12/99 11:15	<1	2.85	2.58	0.27
Sheerness	23/12/99 12:30	<1	6.08	5.97	0.11
Dover	23/12/99 11:00	<1	6.82	6.94	-0.12

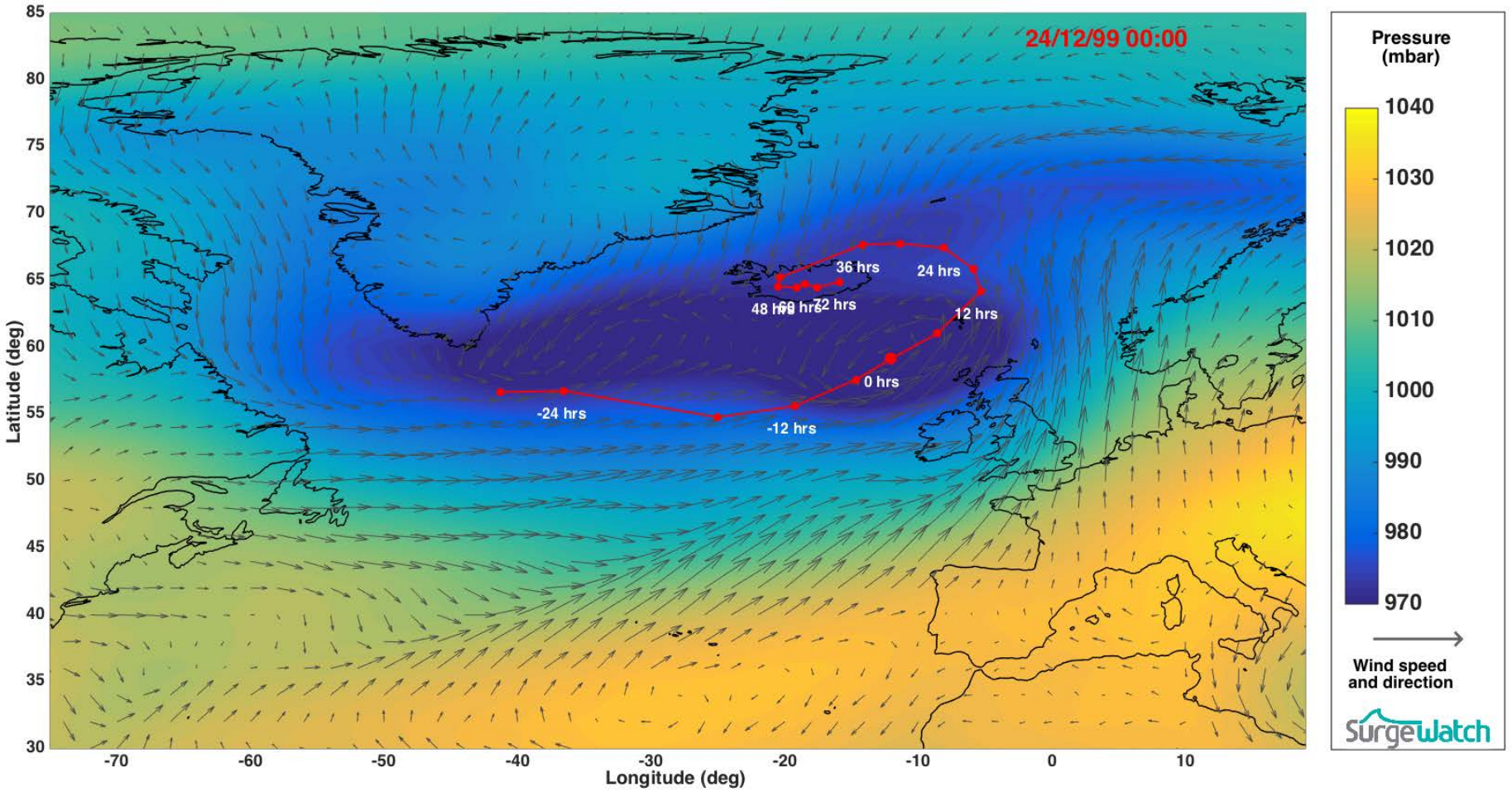

Figure 1: Meteorological conditions at time of maximum water level overlaid by the storm track

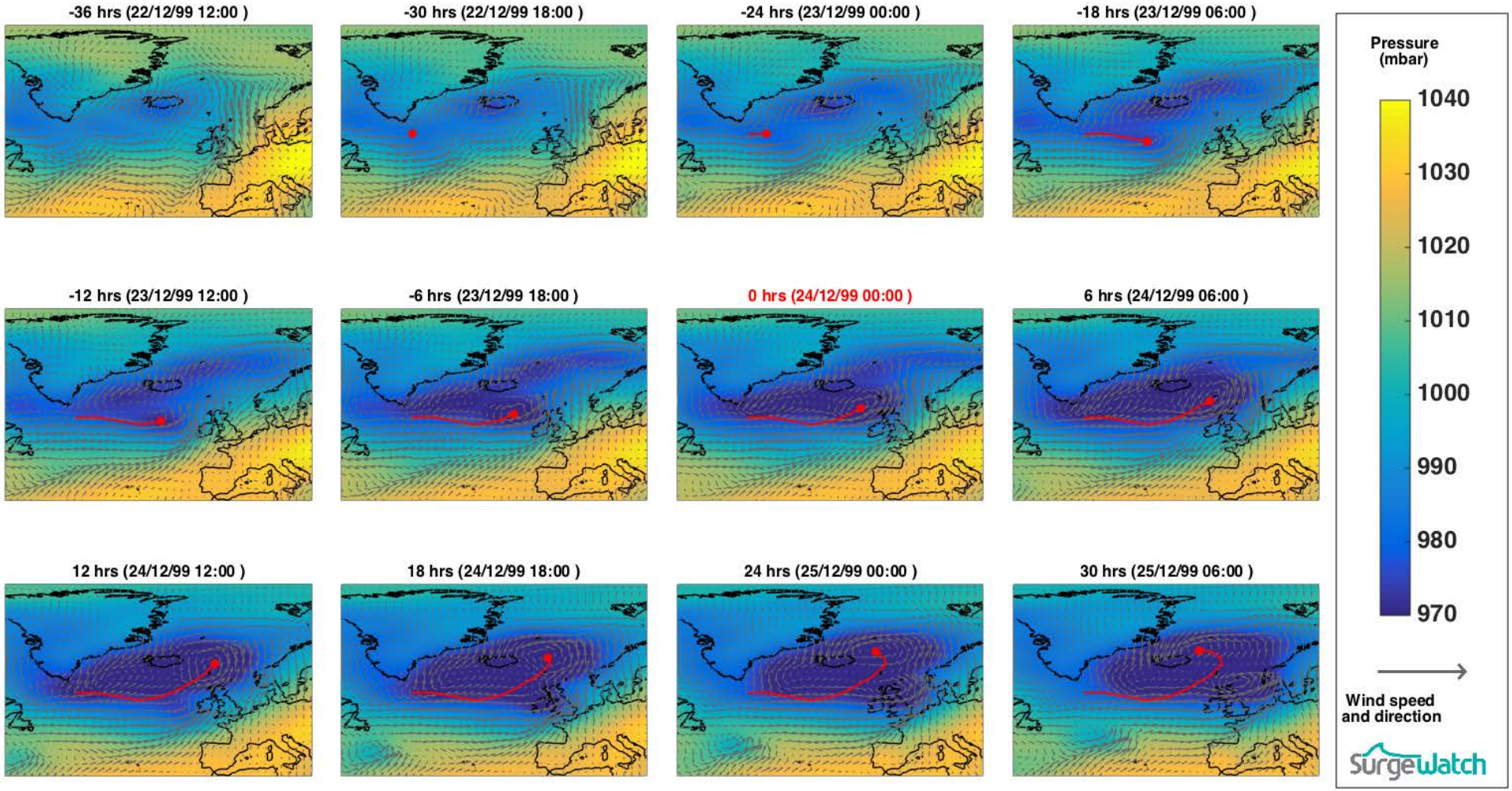

Figure 2: Meteorological conditions during event

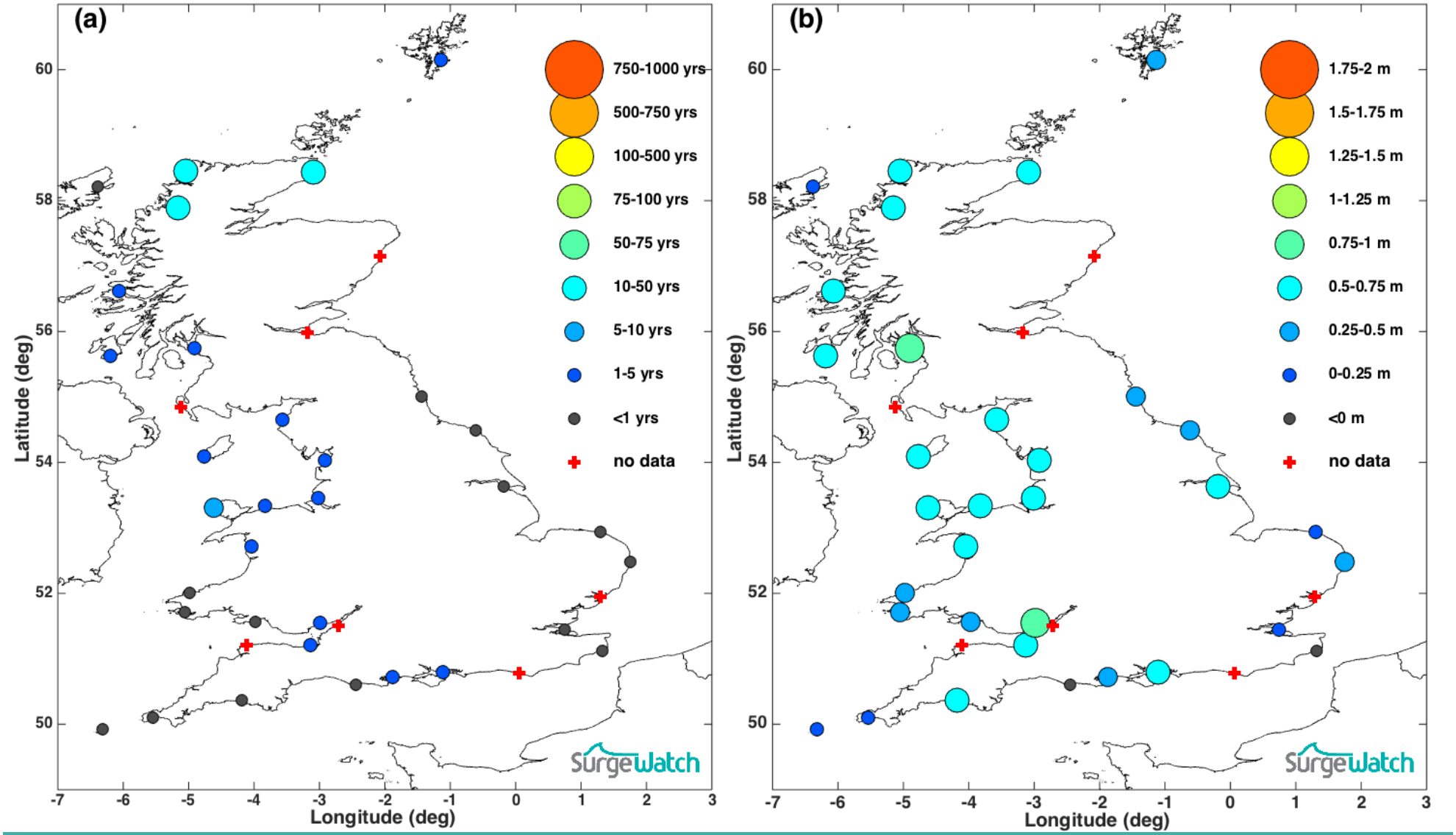

Figure 3: (a) Water level return period; (b) Skew surge levels

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Additional sources of information

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