

STORM EVENT

13th December 1978

This event preceded the severe wave event at Chesil Beach in February 1979 – surge and percolation flooding



Severity Ranking



Social	<u>Loss of life</u>	*
	<u>Residential property</u>	Over 30 commercial and residential properties near Victoria Square flooded
	<u>Evacuation & rescue</u>	Residents near Victoria Square evacuated to emergency rest centres
Economic	<u>Cost</u>	*
	<u>Ports</u>	*
	<u>Transport</u>	Road adjoining the Isle of Portland to the mainland (A354) was flooded
	<u>Energy</u>	Electricity and gas mains in the causeway were broken
	<u>Public services</u>	Emergency services were committed for 5 days
	<u>Water & wastewater</u>	*
	<u>Livestock</u>	*
	<u>Agricultural land</u>	*
Environmental	<u>Coastal erosion</u>	Crest of Chesil Beach opposite the car park was lowered along a 40 m length and the leeward side eroded by seepage flooding and overtopping
	<u>Natural environment</u>	*
	<u>Cultural heritage</u>	*
	<u>Coastal defences</u>	Damage to beach and sea walls (by this and the event 3 months later)

**No known sources of information available*

Source	<p>The storm developed along the eastern US seaboard during 10th February 1978, following a north-westerly track before eventually combining with a larger depression over the central Atlantic. By 13th February, a large area of low pressure extended over the northern North Atlantic, deepening to below 960 mbar and producing south-westerly winds over the English Channel.</p> <p>There is no local sea level data available at the time of this event. This event occurred during spring tides.</p> <p>Wave heights exceeded 4.5 m at a period of around 12 seconds (Frampton, 1997). This type of combined wave and surge event was thought to have a return period of between 1 in 5 to 1 in 10 years (e.g. Frampton, 1997).</p>
Pathway	<p>Overtopping was the primary flood pathway during this event, most notably at Chesil Beach. At the junction of the sea wall and Chesil Beach there was overtopping was extreme, resulting in shingle overspill (Frampton, 1997). The beach ridge itself was not breached. In parts of Chiswell, the flood water reached a depth of 1.2 m.</p>
Receptor & Consequence	<p>This event was associated with coastal flooding along parts of the English Channel, most notably in Portland (Met Office, 1978; Zong and Tooley, 2003). According to West (2014) and references therein, the overtopping at Chesil Beach was the worst in several years. The road adjoining the main island was partly washed away, exposing underlying electricity and gas pipes. The damages here during this event (and subsequently the event to occur 3 months later in February 1979), resulted in over £5 million in investments to improve defences at Chesil.</p>

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)
Newlyn	14/12/78 04:00	<1	5.59	5.29	0.30
Milford Haven	12/12/78 17:00	<1	7.31	6.61	0.70
Fishguard	12/12/78 18:00	<1	5.03	4.51	0.52
Heysham	13/12/78 23:00	<1	9.43	9.00	0.43
Portpatrick	12/12/78 10:00	<1	4.32	3.63	0.68
Millport	12/12/78 11:00	<1	3.85	3.22	0.63
Stornoway	12/12/78 18:00	<1	5.00	4.55	0.46
Lerwick	12/12/78 09:00	<1	2.44	2.08	0.36
Wick	12/12/78 22:00	<1	3.83	3.36	0.47
North Shields	14/12/78 03:00	<1	5.19	4.92	0.27
Immingham	14/12/78 06:00	<1	7.21	6.87	0.34
Lowestoft	14/12/78 10:00	<1	2.77	2.40	0.37
Dover	14/12/78 11:00	<1	6.77	6.46	0.31

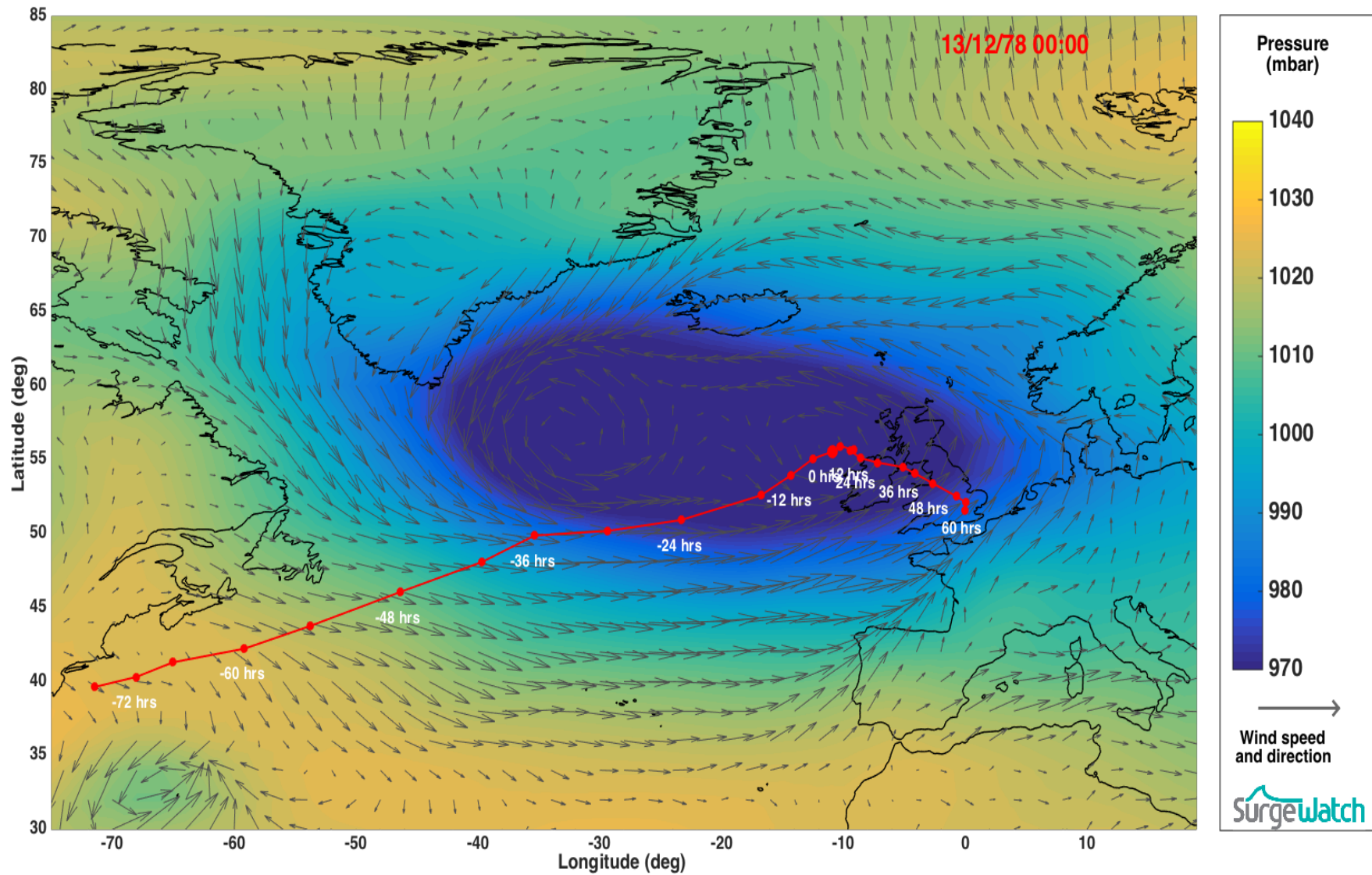


Figure 1: Meteorological conditions at time of maximum water level overlaid by the storm track

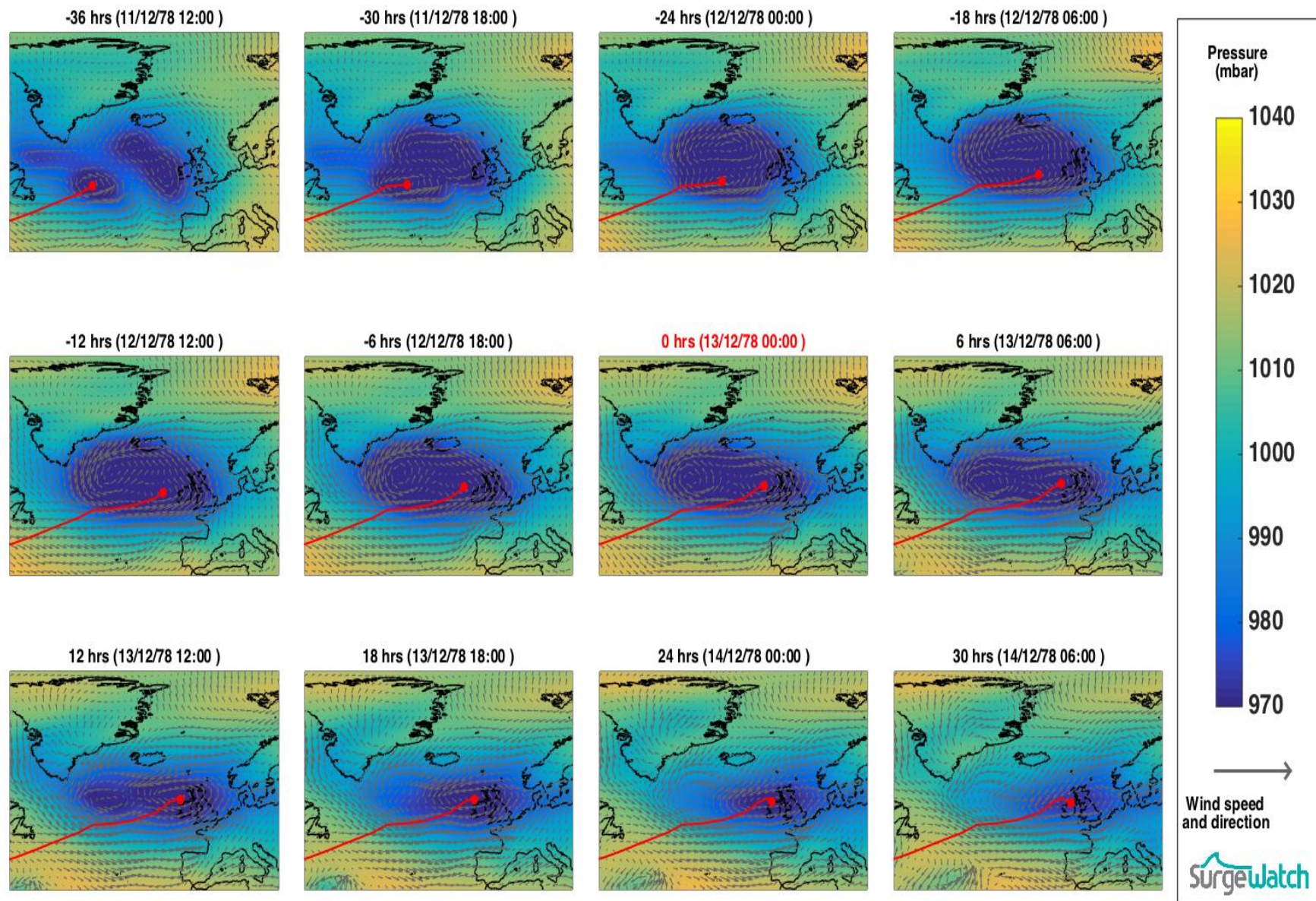


Figure 2: Meteorological conditions during event

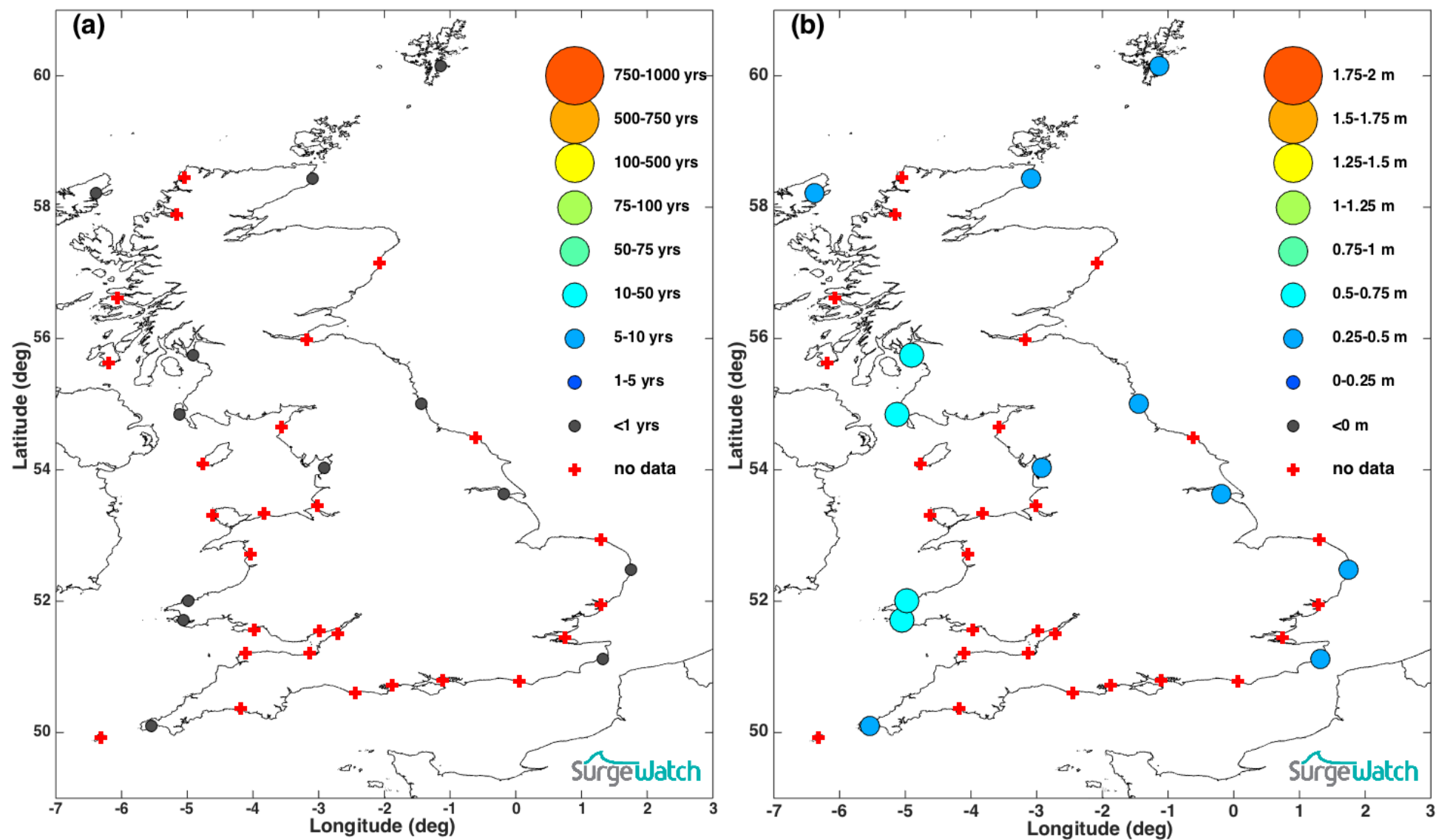


Figure 3: (a) Water level return period; (b) Skew surge levels

References

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Additional sources of information