SurgeWatch

STORM EVENT

1st March 1949

A major North Sea storm surge caused what was described as the worst flooding in 65 years. This was forewarning to the disaster that followed 4 years later

Severity Ranking

			4		

Social	Loss of life	*
	Residential property	Properties flooded in Ramsgate, Whitstable, King's Lynn (including St. Margaret's church) and Sheerness
	Evacuation & rescue	*
Economic	Cost	Total estimated damages in Norfolk was £500,000 (approximately £16 million in 2014 prices)
	Ports	*
	Transport	The railway station at Woodbridge, Suffolk flooded, causing delays
	Energy	*
	Public services	*
	Water & wastewater	*
	Livestock	*
	Agricultural land	*
Environmental	Coastal erosion	*
	Natural environment	*
	Cultural heritage	St. Margaret's Church in King's Lynn flooded
	Coastal defences	Considerable damage to coastal defences with extensive lengths of sea walls cracked, crests damaged, backing material washed out, and even some breaching

**No known sources of information available*

Source	The storm was initiated around 27th February 1949 southeast of Greenland and moved eastward. While centred over the North Sea, the storm maintained a central air pressure of around 980 mbar. Although not particularly intense, the Met Office reported a deep depression with a steep northerly gradient over Denmark during 1st March, moving eastwards and generating northerly gales over the North Sea. A wind field of such orientation is particularly favourable for generating a storm surge in the relatively shallow North Sea basin. There were "exceptionally" high tides in the Thames Estuary (Met Office, 1949). Within the national tide gauge network, only the three tide gauges (Newlyn, Aberdeen and North Shields) were operational at the time. At these sites the return periods were less than 1 year. At North Shields the maximum skew surge was 0.81 m. The event occurred at peak spring tides. We are unaware of any sources of information describing the wave conditions during this event.
Pathway	There was "considerable" damage to defences along the east coast during this event, although information concerning specific flood pathways is limited.
Receptor & Consequence	A North Sea storm surge was associated with serious flooding in many locations in southeast England, including London, Sheerness, Margate, Ramsgate, Southend, Whitstable, Sheerness, Boston and King's Lynn (The Times, 1949; Zong and Tooley, 2003). This event was described as the worst flooding in 65 years, and tellingly described as the missed wake-up call prior to the catastrophic event of 1953 (Baxter, 2005), The total estimated cost of damages in the county of Norfolk alone was £500,000, which is equivalent to about £16 million today (Cairns Post, 1949). There was considerable damage to coastal defences with extensive lengths of sea walls cracked, crests damaged, backing material washed out, and even some breaching (Summers, 1978). The Thames estuary was also affected, with a photograph showing evidence of flooding close to Buckingham Palace as defences in central London were overtopped. Properties were flooded in Ramsgate, Whitstable, King's Lynn (including St. Margaret's church) and Sheerness (The Times, 1949). At Cley-next-the-sea (Norfolk) the flood water reached a depth of 2.1 m and the main coastal road between Cromer and Wells was impassable (The Times, 1949). The railway station at Woodbridge was also flooded and held up traffic for some time. Beach chalets were washed away at Frinton and Walton-on-the-Naze (The Times, 1949). In Frankfurt, Germany at least 20 persons were killed and 38 severely injured as gales blew down weakened post-war structures (News, 1949). The strong gales and heavy seas also caused considerable trouble at sea, and scores of crew members were rescued from three vessels, including one which sank (News, 1949).

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	28/02/49 05:00	<1	5.18	5.13	0.05
Aberdeen	27/02/49 13:00	<1	4.33	4.03	0.3
North Shields	01/03/49 04:00	<1	5.37	4.56	0.81

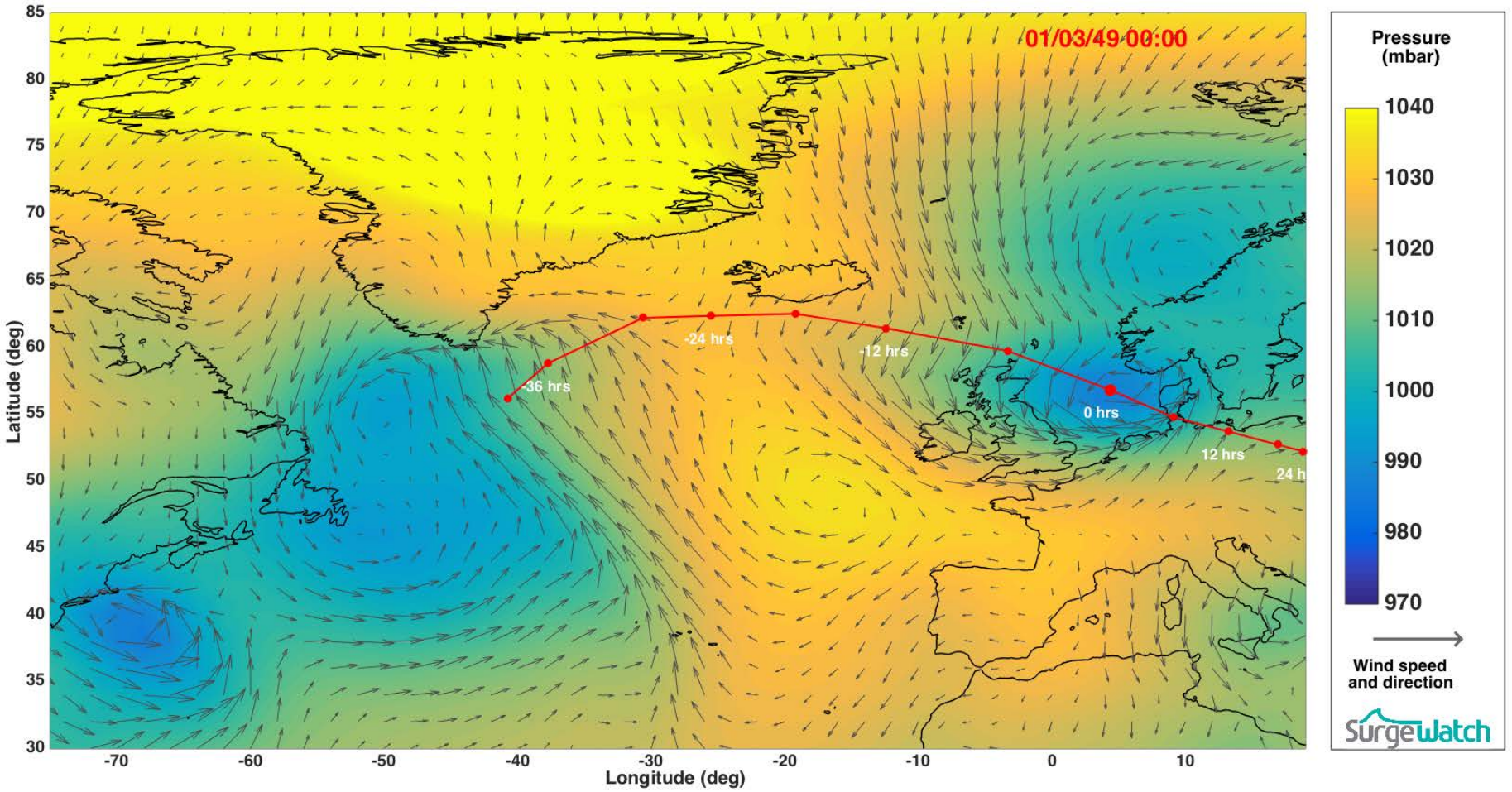

Figure 1: Meteorological conditions at time of maximum water level overlaid by the storm track

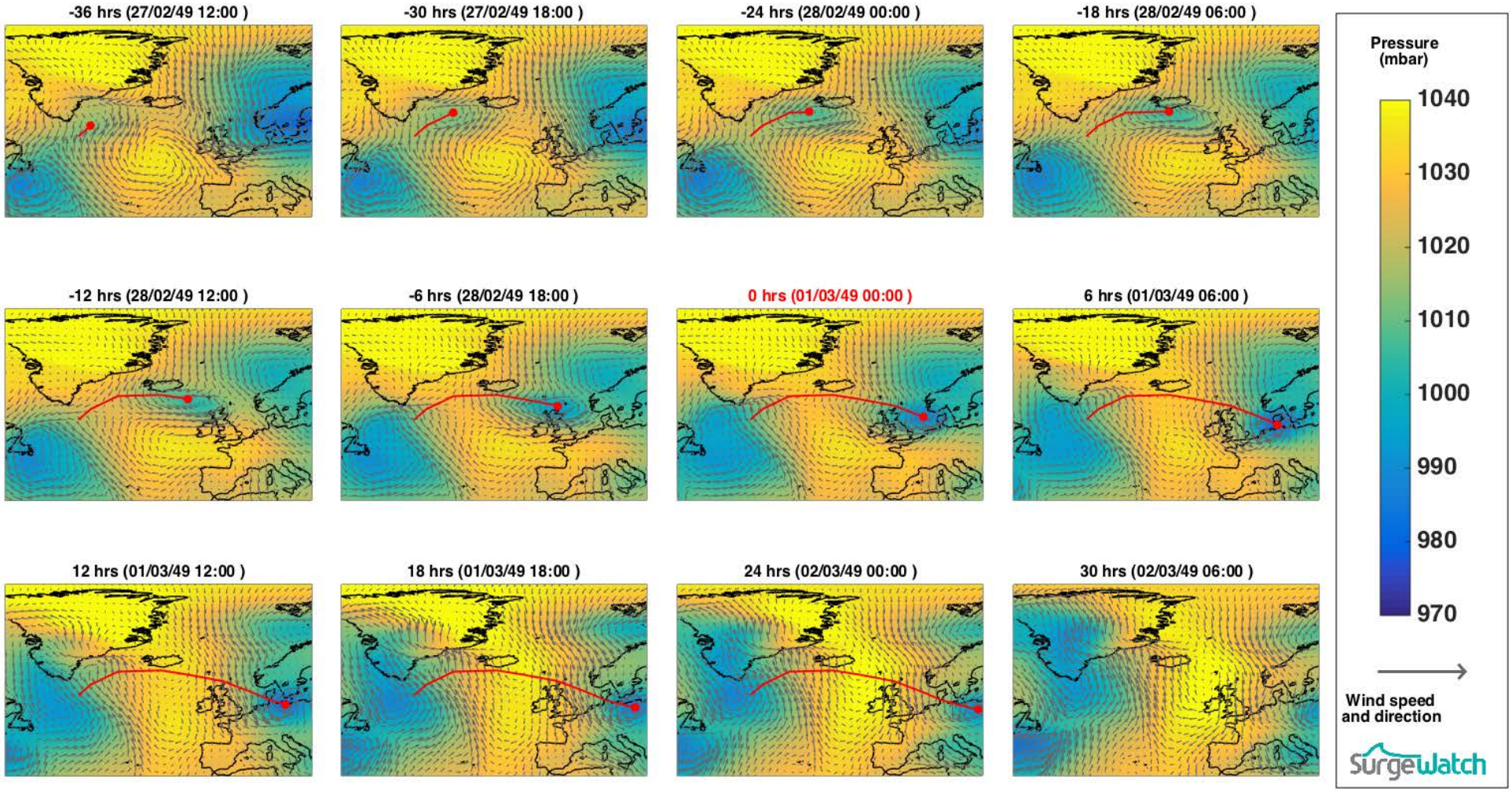

Figure 2: Meteorological conditions during event

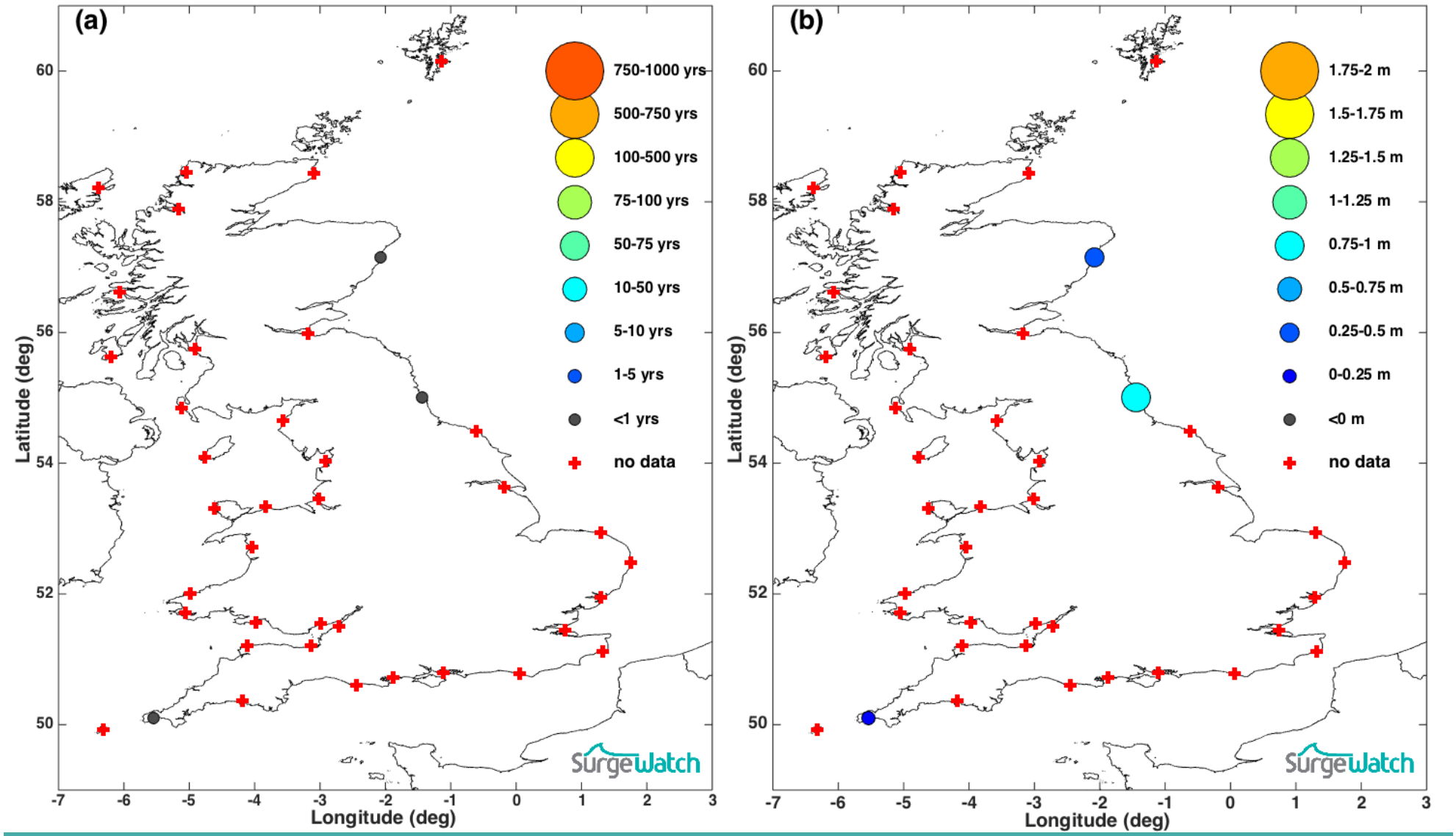

Figure 3: (a) Water level return period; (b) Skew surge levels

References

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Additional sources of information

Wikipedia, 2016. Storm tides of the North Sea. Available at: https://en.wikipedia.org/wiki/Storm_tides_of_the_North_Sea [Accessed: 19/09/2014].