

STORM EVENT

—— 11th January 1978 ——

East Coast floods – in some areas water levels higher than 1953 but impacts lessened by the relatively fast disappearance of the storm, stronger sea walls and the wind being largely parallel to the coast



Severity Ranking



Social	<u>Loss of life</u>	A 70-year old woman drowned in her own home
	<u>Residential property</u>	Various reports indicate flooding affected a total of around 1,400 properties
	<u>Evacuation & rescue</u>	Thousands of people from Humberside to the English Channel were evacuated
Economic	<u>Cost</u>	*
	<u>Ports</u>	*
	<u>Transport</u>	Grimsby-Cleethorpes railway “seriously” displaced and services disrupted for eight days
	<u>Energy</u>	*
	<u>Public services</u>	*
	<u>Water & wastewater</u>	*
	<u>Livestock</u>	*
	<u>Agricultural land</u>	*
Environmental	<u>Coastal erosion</u>	Dunes at Scolt Head Island were eroded by up to 20 m north; dunes were cut back up to 7 m in Norfolk; the shingle bank of Salthouse was lowered by ~1 m; the Dunwich cliffs (Suffolk) were also eroded
	<u>Natural environment</u>	*
	<u>Cultural heritage</u>	Several piers were badly damaged: at Skegness the pier was split in two and put beyond repair; at Hunstanton the pier was “mostly” swept away; and in Margate the 150-year pier was “demolished”
	<u>Coastal defences</u>	Multiple defence breaches along the east coast

*No known sources of information available

Source

The storm developed from a low pressure system situated off southwest Greenland, and started to move eastwards from southeast Greenland on 9th January 1978, and passed south of Iceland and southeast towards Scotland on 10th January 1978. At approximately 18:00 10th January 1978, whilst located northwest of Scotland, the storm veered in a southwest direction and passed over the Wash in Lincolnshire at 06:00 11th January 1978. By midnight, it reached Hamburg, then moved eastwards and had largely dissipated by noon on 12 January. The minimum pressure reached was 976 mbar, and north to north-easterly winds reached 45 knots [23 m/s] with gusts of up to 70 knots [30 m/s] (Steers et al., 1979). Eden (2008) reports gusts of 77 knots [40 m/s] and 72 knots [37 m/s] in central London and Manston (Kent), respectively.

The storm generated a 0.98 m skew surge at Immingham and a 1.18 m skew surge at Lowestoft (these are the only two North Sea sites from our database that were recording data at the time). A sea level return period of 1 in 27 years was recorded at Immingham and 1 in 7 years at Lowestoft. Other reports indicate that on parts of the UK coast (Lincolnshire and Humber regions), the high water was higher than in 1953, for example a high water height of 5.92 m (above Ordnance Datum Newlyn) was recorded in Kings Lynn compared with 5.65 m in 1953 (Steers et al 1979). Conditions in the Wash (Lincolnshire) were worse than in 1953; since the wind and surge were locally magnified by this feature (Steers et al., 1979).

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

Pathway

There was widespread damage to defences along the east coast during this event, and the main flood pathways was overtopping and breaching.

Receptor & Consequence

Most coastal damage was on the east coast of England, mainly in Lincolnshire and East Anglia during 11th January. In King's Lynn, around 400 residential properties were flooded, and 22 children were evacuated from a hospital (*The Times*, 1978a). In Cleethorpes, about 1,000 houses were seriously flooded over a 5 km² area (Grimsby Telegraph, 2010). About 1,000 people were evacuated in Wisbech when the Nene overflowed its banks, with flood water reaching 5 ft. [1.5 m] deep (*The Times*, 1978a). A 70-year-old woman here was found dead in her home (*The Times*, 1978; Lamb, 1991). The railway between Grimsby and Cleethorpes was closed for 8 days when 100's tons of ballast were washed onto the coast (Steers et al. 1979). Workshops at Grimsby's Royal Dock were damaged (Grimsby Telegraph, 2010) and 28 houses and 8 business premises were flooded in Sandilands and Mablethorpe; as well as chalets and caravan sites at Trusthorpe and Ingoldmells. There was considerable coastal erosion in many locations (Steers et al., 1979). This event also impacted several Scottish towns (Hickey, 1997). In Buckie, many residential properties were inundated, and overtopping of defences along a stretch of 50 m carried debris to 5 m inland. There are reports of flooding for several other areas, including locations along the Grampian coastline where defences failed. Serious coastal erosion was reported in Findhorn and Burghead Bay, in places up to 12 m. Along the south coast, there was flooding in Sandgate, and in the Solent (*The Times*, 1978b; Zong and Tooley, 2003; Ruocco et al. 2011). The conditions at Bembridge were the worst in living memory. London came within 0.5 m of flooding, and the flood gates installed at London Docks in 1972 were closed for the first time (Met Office, 2014).

Northumberland County Council (2015) report that in January 1978 (unspecified date) that there was flooding in coastal areas of Northumberland – this is most probably the event of 11th January (since there were no other large storm surges recorded in the tide gauge data that month). Local roads and properties were inundated, and parts of the Quayside in Blyth was flooded by a depth of upto 1 ft. [0.3 m]. Other locations listed as impacted were Alnmouth, Amble Harbour, Berwick-upon-Tweed, and Blyth.

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)
Milford Haven	10/01/78 19:00	<1	7.55	7.4	0.15
Fishguard	10/01/78 08:00	<1	5.25	5.19	0.06
Heysham	10/01/78 12:00	<1	10.46	10.23	0.23
Portpatrick	10/01/78 12:00	<1	4.32	4.07	0.25
Millport	10/01/78 13:00	<1	3.83	3.57	0.26
Stornoway	10/01/78 07:00	<1	5.41	5.28	0.13
Lerwick	10/01/78 11:00	<1	2.62	2.33	0.29
Wick	10/01/78 12:00	<1	3.99	3.77	0.21
Immingham	11/01/78 20:00	27	8.51	7.52	0.98
Lowestoft	11/01/78 23:00	7	3.83	2.65	1.18

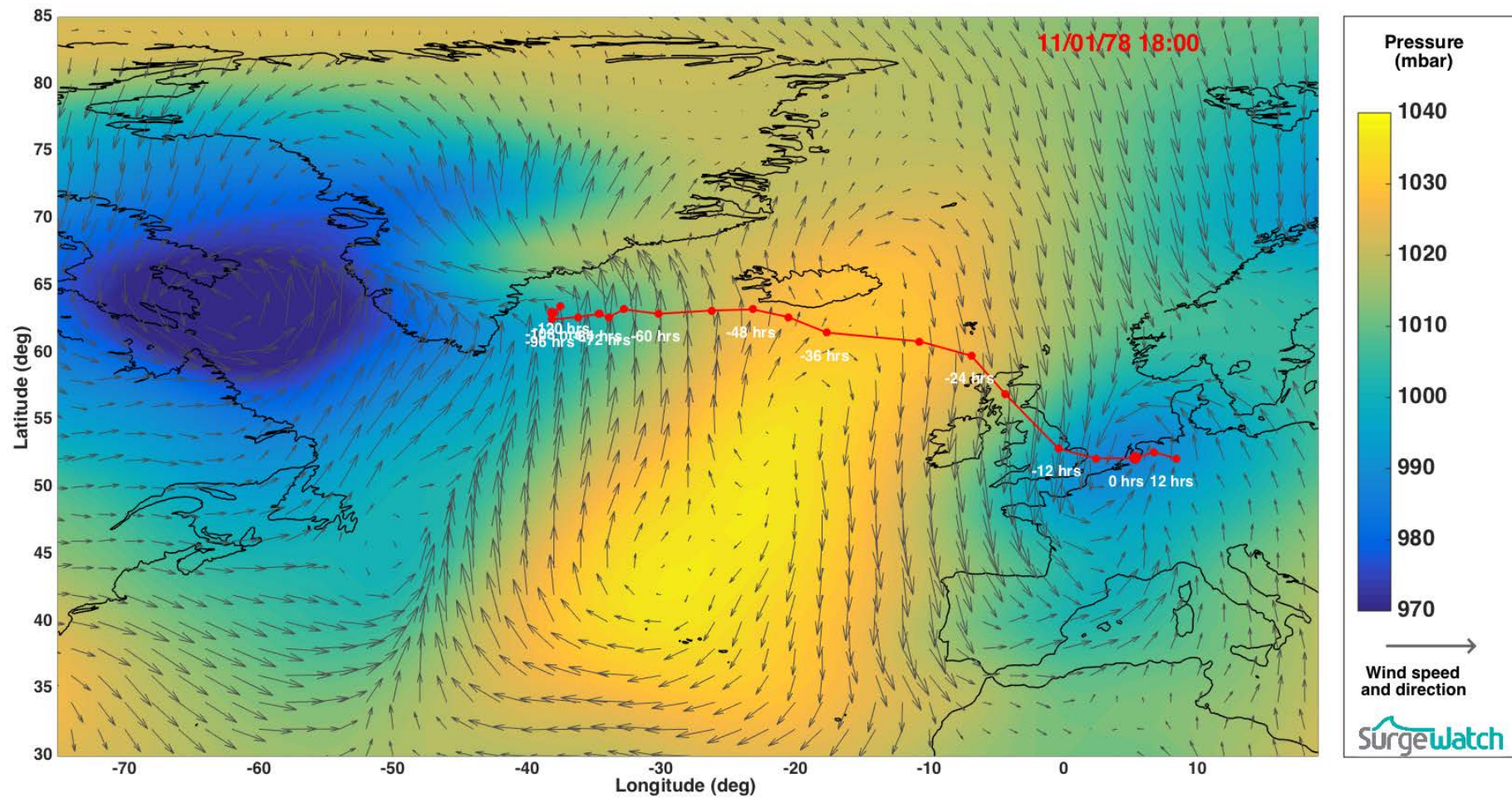


Figure 1: Meteorological conditions at time of maximum water level overlaid by the storm track

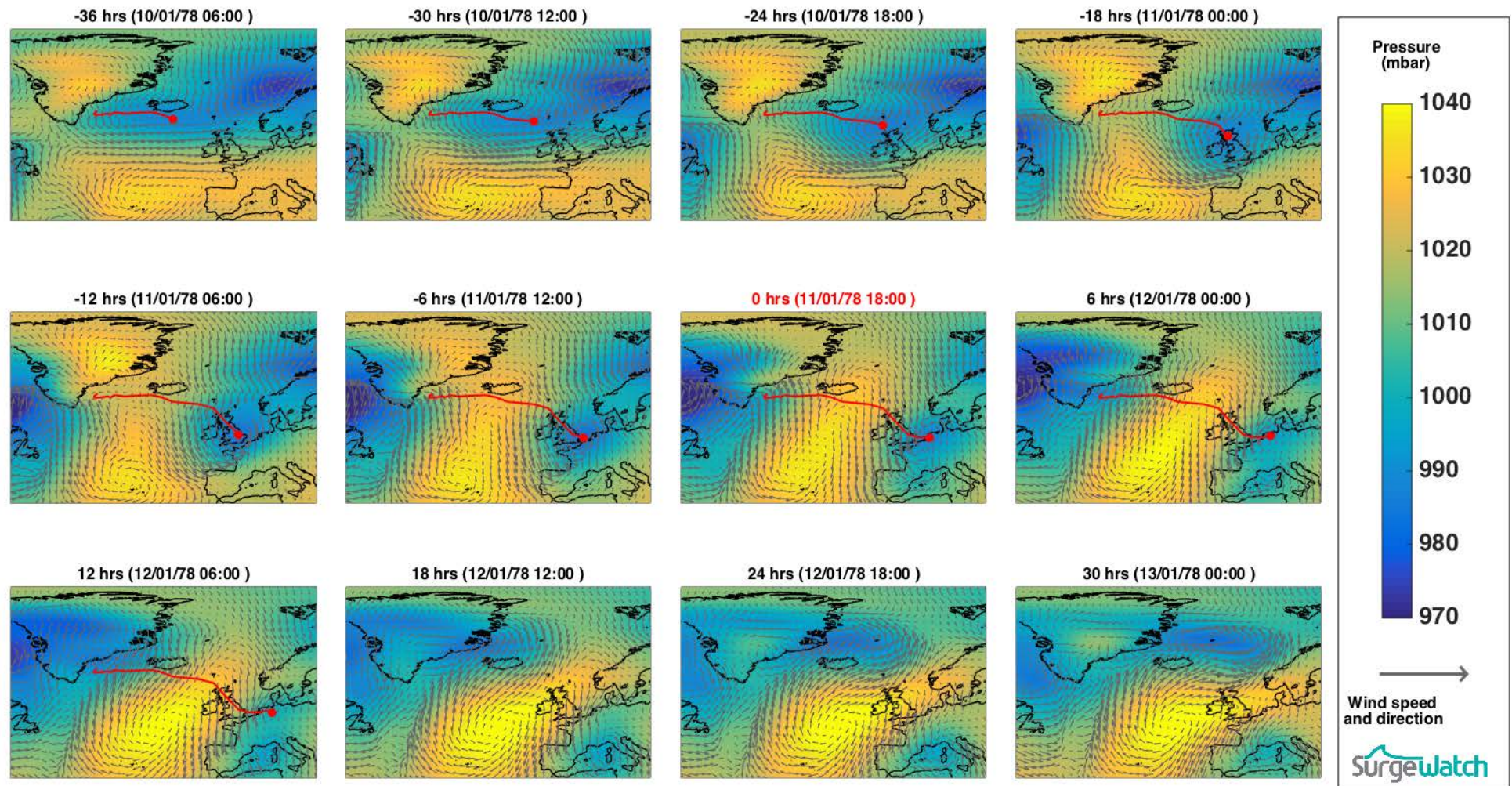


Figure 2: Meteorological conditions during event

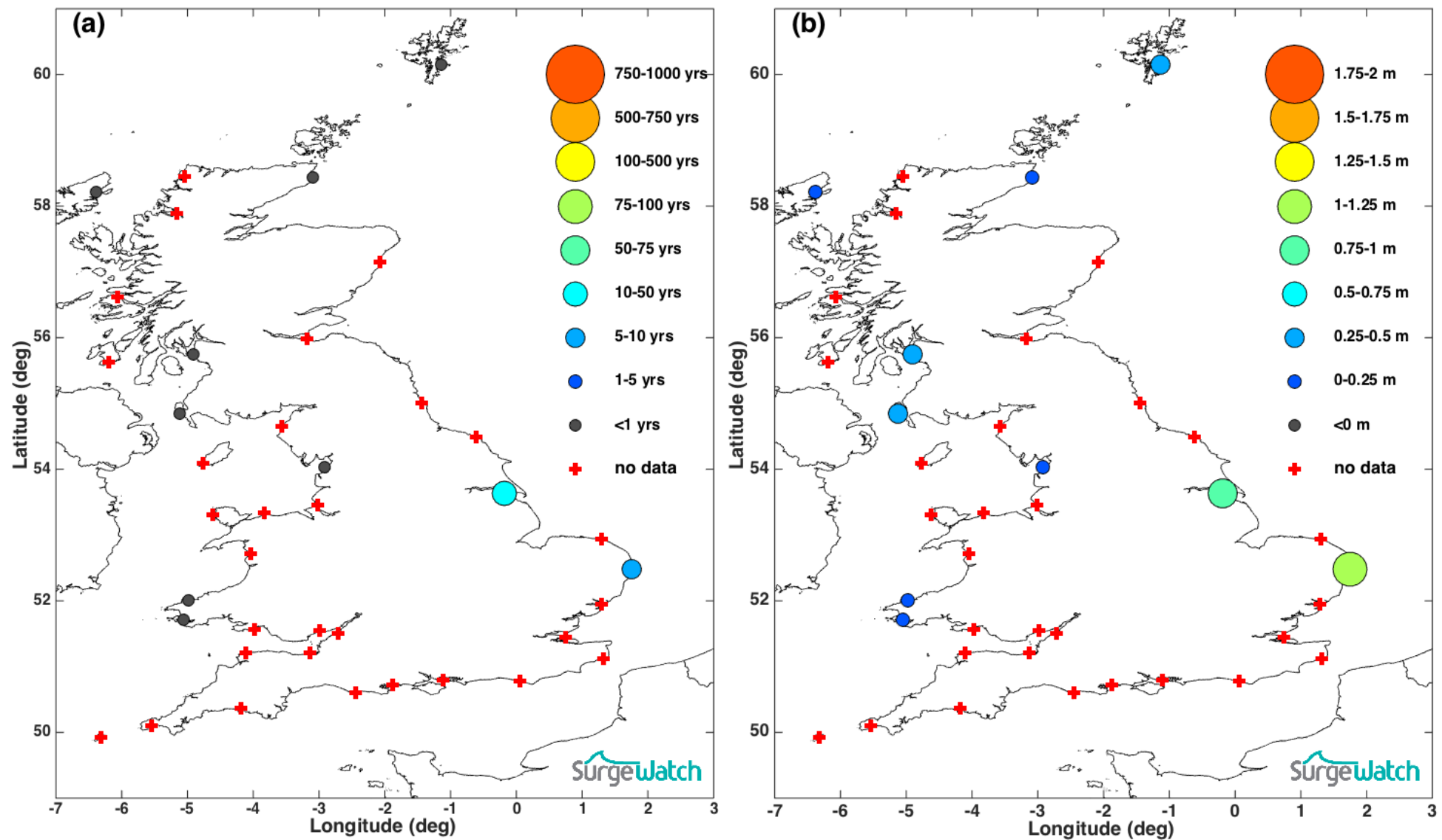


Figure 3: (a) Water level return period; (b) Skew surge levels

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Additional sources of information

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