SurgeWatch

STORM EVENT

27th October 2004

High winds, huge waves and flooding in Cornwall

Severity Ranking

		3			

Social	Loss of life	*
	Residential property	Around 200 properties were flooded in Cornwall
	Evacuation & rescue	In Looe, some were evacuated to a local church
Economic	Cost	*
	Ports	*
	Transport	Flooding of the railway at Penzance caused some delay to services. “Many” roads in Cornwall were also flooded
	Energy	*
	Public services	*
	Water & wastewater	*
	Livestock	*
	Agricultural land	*
Environmental	Coastal erosion	*
	Natural environment	*
	Cultural heritage	*
	Coastal defences	*

**No known sources of information available*

Source	The storm developed off the east coast of the US on 21st October 2004 and moved northeastwards towards the southeast of the UK. On 26th October the storm combined with, and was enhanced, by another low-pressure system located south of Iceland. The storm remained stationary for 24 hours southeast of Ireland, before moving south towards Portugal. At midday on 27th October, the central pressure dropped below 965 mbar about 300 km southwest of Ireland. At Penzance, the central pressure reduced to approximately 976 mbar during the early evening of 27th October (Easterling, 2004). The large pressure gradient generated severe south to southwesterly gales across Devon, Cornwall and south Wales (Met Office, 2004). At Brixham, wind gusts of 59 knots [30 m/s] were reported. The storm generated a skew surge of between 0.5 and 1 m at several sites in southwest England. Water levels exceeded the 1 in 5 year return level at 3 sites along the south coast. The highest return period water level was at Newlyn and was 37 years. The next largest return period of 17 years was at Weymouth. The highest skew surge was at Newlyn and was 0.78 m. The event occurred around the time of peak spring tides. Wave heights of up to 10 m were recorded off the UK southwest coast (Seaview Sensing, n.d.).
Pathway	Reports indicate serious failure of defences in Cornwall. We are unaware of any further specific information regarding the flood pathways for this event.
Receptor & Consequence	This event saw the worst coastal flooding in south Cornwall since 1962, owing to a combination of a storm surge driven by a southeasterly gale, a "massive" swell, and high spring tides (Eden, 2008). Impacts included closure of roads, delayed trains, fell trees and damaged coastal defences (BBC, 2004). There was also flooding in Dorset and Devon, along with parts of Northern Ireland (Met Office, 2004). In Penzance the combination of spring tides and gale force winds from the southeast sent huge breakers crashing over the Promenade - many properties in the surrounding streets were flooded (West, 2014). There was also 2 ft. [0.6 m] of water on the tracks at Penzance station. At Looe, waves crashing on the front and the rapidly rising tide led to road closures and people being evacuated from their homes into the church hall. The floods caused many roads to be closed to traffic and brought southern parts of the county almost to a standstill. Other affected areas included Fowey, Lamorna, Mousehole, Newlyn, Porthleven, Falmouth, Penryn, Mylor Bridge, Peranarworthal, Devoran and Point, St Mawes, Truro and Tresillian, Goran Haven, Portmellon, Mevagissey and Pentewan, Par, Lostwithiel, Polperro, Seaton and at Kingsand, Torpoint and Saltash. In Fowey 32 properties flooded, 50 flooded in Looe, 40 in Flushing, 40 in Penryn, and 25 in Penzance. At Mousehole, many boats in the harbour were damaged by the extreme waves (Easterling, 2004).

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	27/10/04 22:45	<1	6.95	6.72	0.23
Portsmouth	27/10/04 22:45	<1	5.13	4.59	0.54
Bournemouth	27/10/04 20:15	2	2.85	2.25	0.6
Weymouth	27/10/04 18:00	17	2.95	2.35	0.6
Devonport	27/10/04 17:15	8	6.35	5.68	0.67
Newlyn	27/10/04 16:15	37	6.42	5.65	0.78
St. Mary's	27/10/04 16:15	3	6.4	5.72	0.68
Ilfracombe	27/10/04 17:30	<1	9.83	9.44	0.39
Hinkley Point	28/10/04 18:45	<1	12.2	12.12	0.08
Avonmouth	28/10/04 19:15	<1	13.77	13.75	0.03
Newport	28/10/04 19:15	<1	12.54	12.6	-0.06
Mumbles	27/10/04 17:45	<1	10.07	9.66	0.41
Milford Haven	27/10/04 17:45	<1	7.65	7.14	0.5
Fishguard	27/10/04 18:45	2	5.57	5	0.58
Holyhead	27/10/04 21:45	<1	6.29	5.8	0.49
Llandudno	28/10/04 22:45	<1	8.15	7.76	0.39
Liverpool	28/10/04 23:00	<1	9.91	9.55	0.36
Heysham	28/10/04 23:15	<1	10.29	9.9	0.39
Workington	28/10/04 23:30	<1	8.78	8.37	0.4
Port Erin	27/10/04 22:45	<1	5.69	5.26	0.43
Portpatrick	27/10/04 23:00	<1	4.42	4.02	0.4
Port Ellen	28/10/04 18:00	<1	1.3	0.91	0.39
Stornoway	27/10/04 18:15	<1	5.16	5.01	0.14
Lerwick	28/10/04 23:00	<1	2.31	2.31	0
Wick	27/10/04 22:45	<1	3.76	3.67	0.09
Aberdeen	28/10/04 00:45	<1	4.57	4.45	0.12
North Shields	29/10/04 03:45	<1	5.42	5.25	0.17
Whitby	29/10/04 04:15	<1	5.82	5.73	0.1
Immingham	28/10/04 05:45	<1	7.39	7.36	0.03
Cromer	28/10/04 06:15	<1	5.11	5.21	-0.1
Lowestoft	26/10/04 07:15	<1	2.81	2.56	0.25
Harwich	28/10/04 23:45	<1	4.21	4.09	0.12
Sheerness	29/10/04 00:45	<1	5.97	5.89	0.08
Dover	26/10/04 09:30	<1	6.81	6.49	0.33

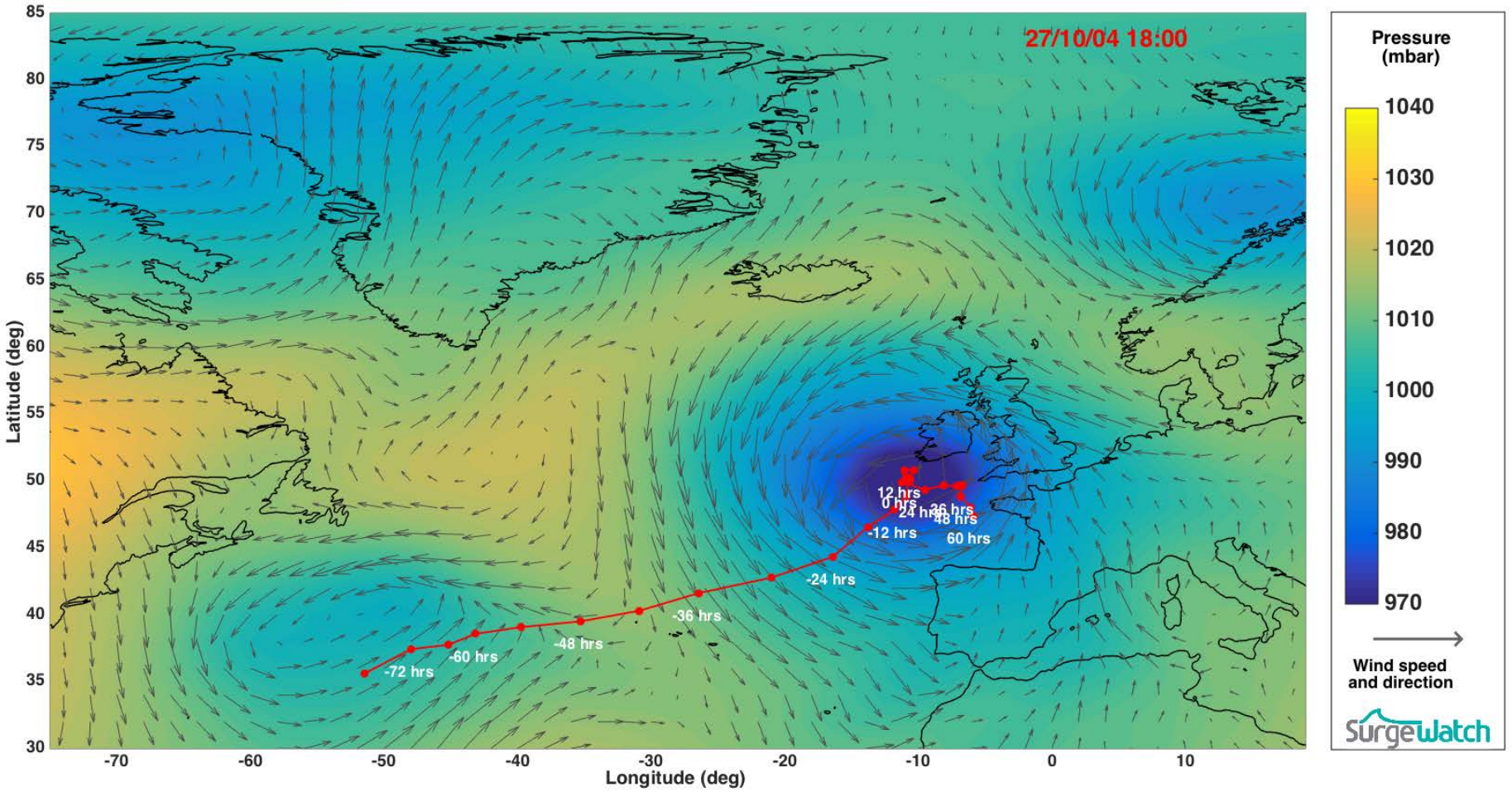

Figure 1: Meteorological conditions at time of maximum water level overlaid by the storm track

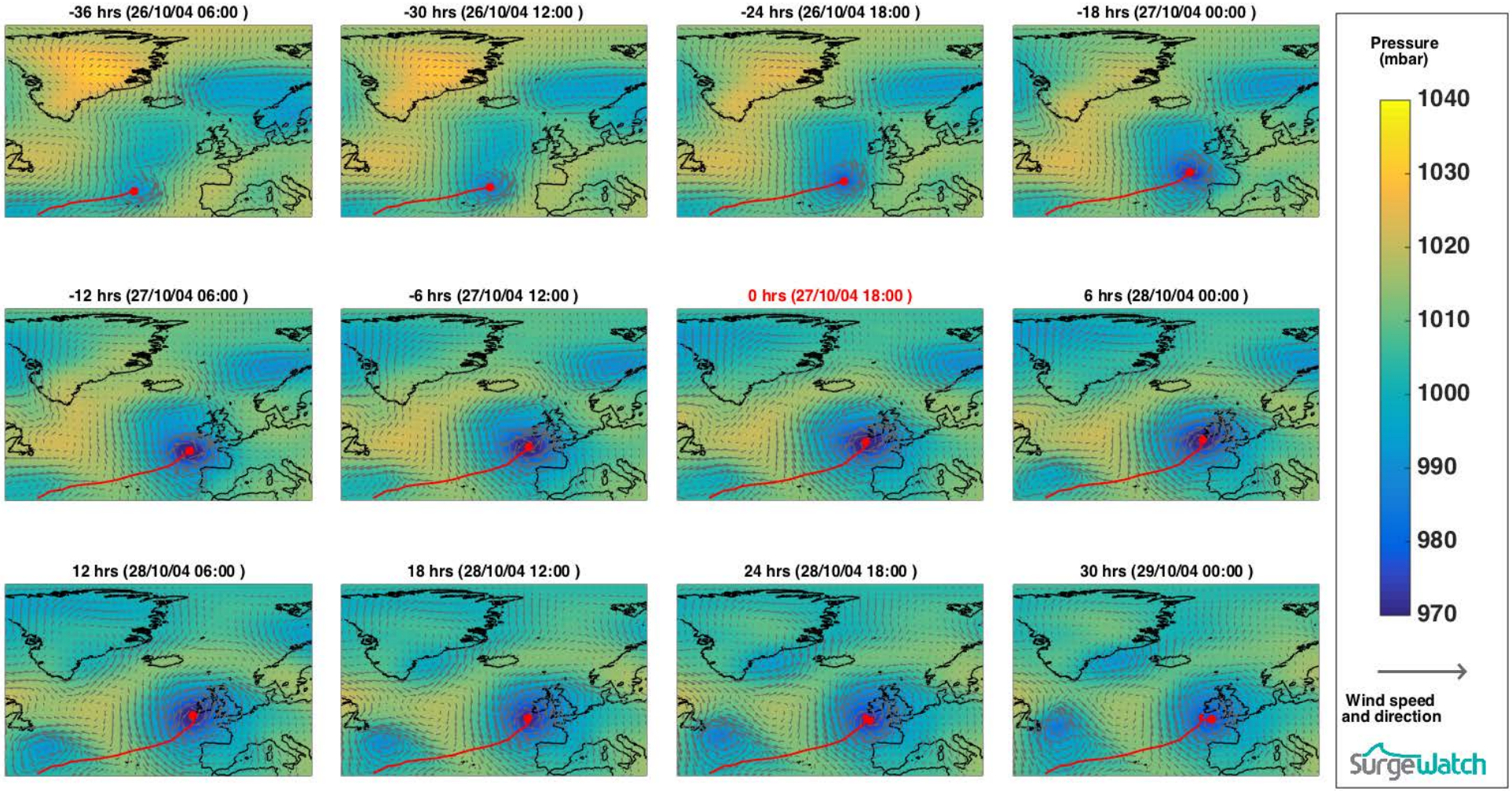

Figure 2: Meteorological conditions during event

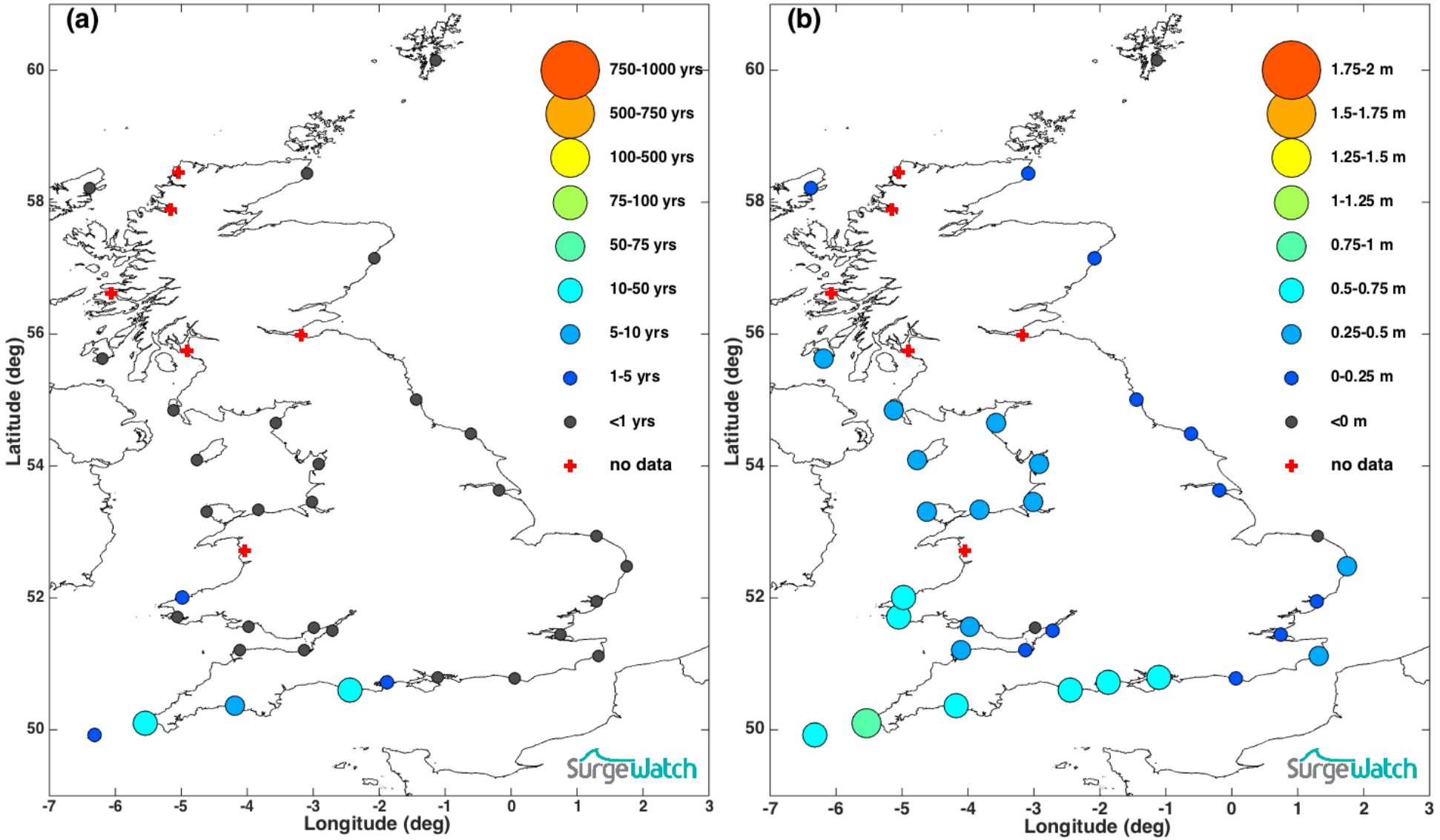

Figure 3: (a) Water level return period; (b) Skew surge levels

References

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Additional sources of information