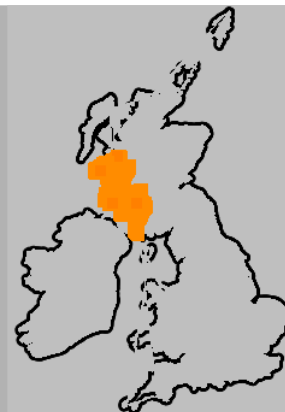


STORM EVENT

— 27th–28th February 1967 —

“Extensive” and “grievous” floods affect the Scottish coast; reportedly the worst in 30 years



Severity Ranking



Social	<u>Loss of life</u>	Flood related deaths not known of – although it was suggested that there may have been casualties if flooding had occurred unexpectedly at night
	<u>Residential property</u>	Residential and non-residential properties were affected in many [at 11 from available reports] villages and towns, some flooded to depths of 5 ft. [1.5 m]
	<u>Evacuation & Rescue</u>	*
Economic	<u>Cost</u>	Damages likely totalled several hundreds of thousands
	<u>Ports</u>	*
	<u>Transport</u>	Local roads inundated in many places, including one which was described as ‘a battlefield’.
	<u>Energy</u>	Energy supply disrupted by flood water in some areas
	<u>Public services</u>	Recreational sports facilities were among affected public services
	<u>Water & wastewater</u>	*
	<u>Livestock</u>	114 sheep drowned at Mersehead
Environmental	<u>Agricultural land</u>	Inundation and damage to several hundreds of acres of agricultural land
	<u>Coastal erosion</u>	“Miles” of shore and river banking was severely damaged
	<u>Natural environment</u>	*
	<u>Cultural heritage</u>	*
	<u>Coastal defences</u>	Damage to harbours and sea defences in numerous locations

*No known sources of information available

Source	<p>The storm developed along the eastern US seaboard on 23rd February 1967, and moved northeast towards Nova Scotia, Canada, before following an easterly to north-easterly track towards the UK (heading between Iceland and Scotland). On the afternoon of 28th February, the storm centred about 600 km north of Scotland with a central pressure below 945 mbar, generating strong south-westerly winds.</p> <p>The sea levels were described as “exceptionally” high (Hansard, 1967). The storm generated a skew surge of greater than 0.75 m at 6 sites from northern Scotland to the southern North Sea (including a skew surge at Lowestoft of over 1 m). Sea levels exceeded the 1 in 5 year return level at 2 sites in Scotland. The highest return period sea level was at Aberdeen and was 10 years. The next largest sea level return period of 1 in 6 years was at Ullapool.</p> <p>We are unaware of any sources describing the wave conditions during this event.</p>
Pathway	<p>This event saw defences overtop, outflank, overflow and breach over long stretches of coastline in estuaries around the Solway Firth in southwest Scotland. Concerns were raised about the state and maintenance of defences that may have led to the severity of this event – for example a culvert “choked” with the flood and caused the loss of 40 sheep (Hansard, 1967).</p>
Receptor & Consequence	<p>Properties were affected in many locations including Carsethorn, Southernness, Rockcliffe, Kirkcudbright, Creetown, Carseluth, Garlieston, Isle of Whithorn, Port William, Drummore and Port Patrick (Hansard, 1967; Hickey, 1997). This extensive list would suggest that hundreds of properties were impacted, although the number is not clearly stated anywhere and may be many more. In addition, there was extensive damage to farms, businesses and roads, with the cost likely to have totalled several hundreds of thousands (Hansard, 1967). At Mersehead, 200 acres of arable land (out of about 500 acres) were still under salt water two days later. River and sea banks were destroyed at other farms. At Grange of Cree and neighbouring farms over 500 acres was lost in this and previous flooding. There was also damage to salmon farming sites on the east coast.</p> <p>This event was serious enough to be debated in the Scottish House of Commons (Hansard, 1967). The MP for Galloway, John Brewis stated that the damage on this occasion was “extensive and grievous” all along the coast. MP for Dumfries Hector Monro lamented the number of elderly affected, and loss of business for farms (Hansard, 1967). He also stated: “[this event was] a very tragic example of how this sort of flood very often hits the people who have the least facilities to repair their houses, furniture, carpets and other possessions”.</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	27/02/67 07:00	<1	5.97	5.9	0.08
Milford Haven	27/02/67 08:00	3	7.86	7.72	0.14
Fishguard	27/02/67 09:00	2	5.46	5.36	0.1
Holyhead	27/02/67 12:00	1	6.33	6.12	0.21
Heysham	28/02/67 14:00	<1	10.54	10.15	0.39
Ullapool	28/02/67 09:00	6	6.1	5.47	0.62
Lerwick	28/02/67 13:00	2	2.77	2.37	0.4
Wick	28/02/67 14:00	5	4.21	3.79	0.42
Aberdeen	28/02/67 16:00	10	5.1	4.61	0.49
North Shields	28/02/67 06:00	4	5.86	5.17	0.69
Immingham	28/02/67 21:00	1	8.02	7.44	0.58
Lowestoft	28/02/67 12:00	<1	3.05	2.38	0.67
Harwich	28/02/67 14:00	<1	4.54	4.11	0.43
Sheerness	28/02/67 15:00	1	6.44	5.87	0.57
Dover	28/02/67 14:00	<1	7.1	6.73	0.37

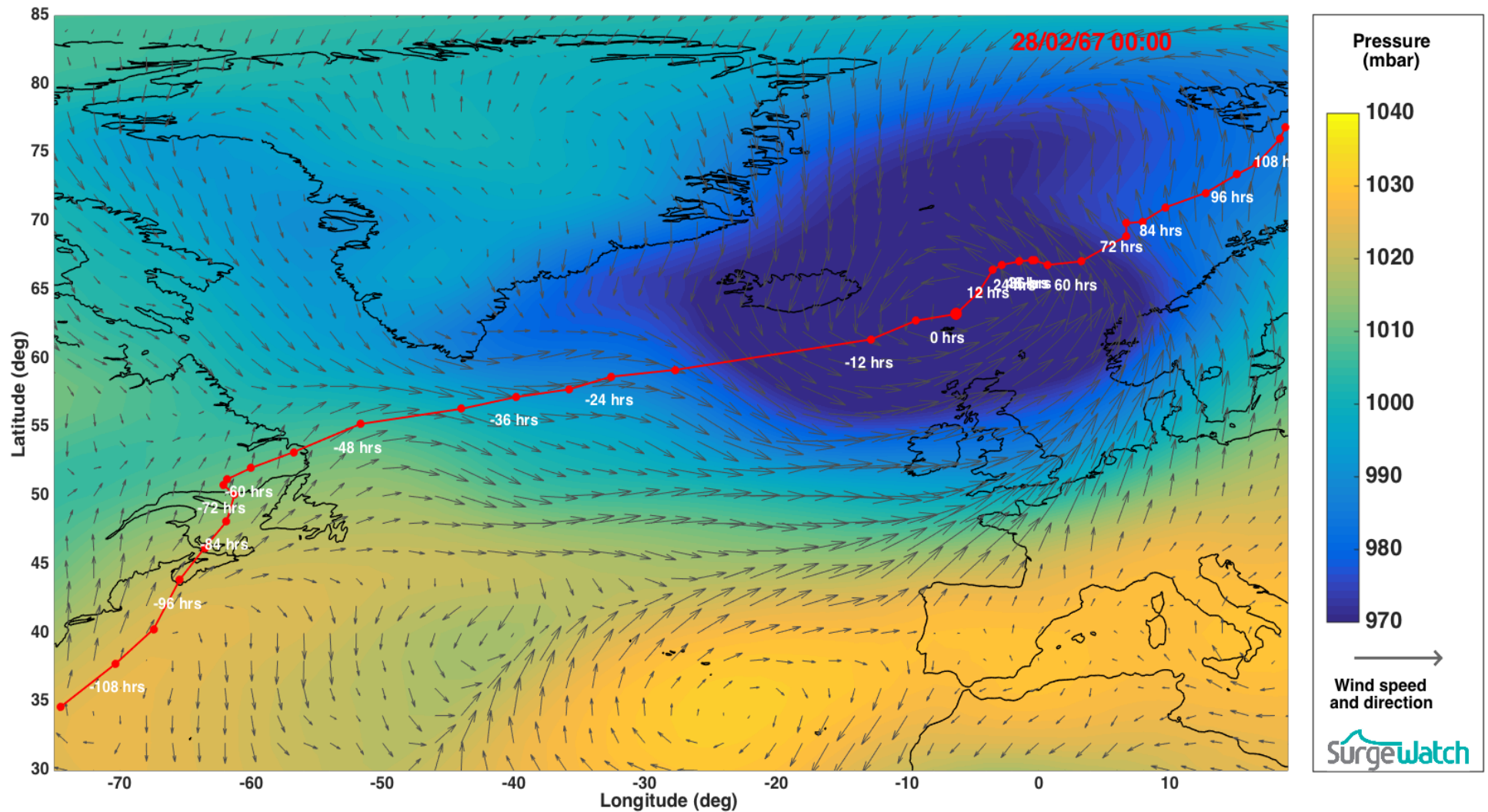


Figure 1: Meteorological conditions at time of maximum water level overlaid by the storm track

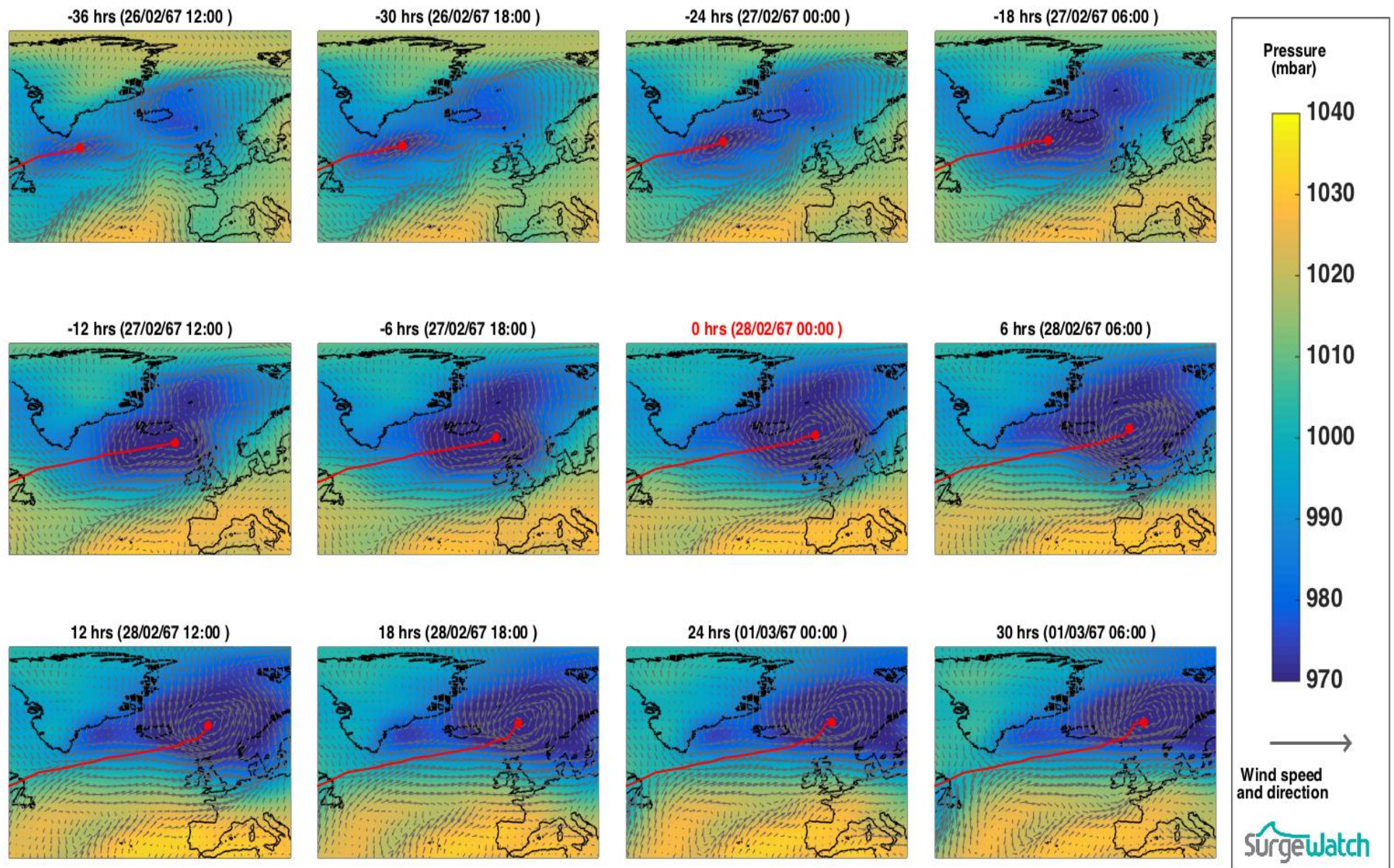


Figure 2: Meteorological conditions during event

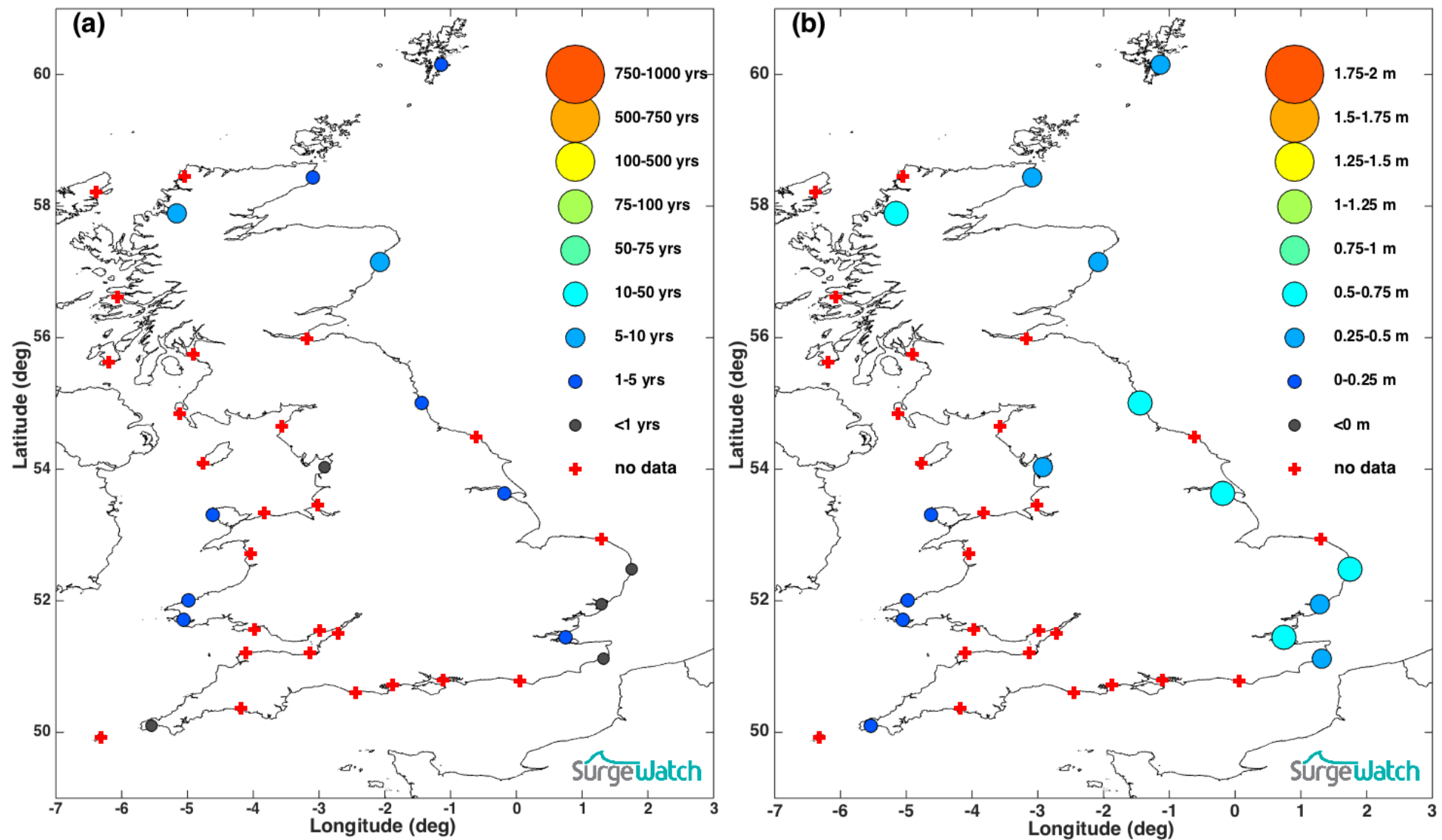


Figure 3: (a) Water level return period; (b) Skew surge levels

References

- Haigh, I.D. et al., 2015. A user-friendly database of coastal flooding in the United Kingdom from 1915–2014. *Scientific Data*, 2, p.150021. Available at: <http://www.nature.com/articles/sdata201521>.
- Hansard, 1967. *Scotland (Flood Damage)*, Available at: <http://hansard.millbanksystems.com/commons/1967/mar/23/scotland-flood-damage> [Accessed September 13, 2015].
- Hickey, K.R., 1997. *Documentary records of coastal storms in Scotland, 1500-1991 A.D.* Coventry University. Available at: <https://curve.coventry.ac.uk/open/items/aa6dfd04-d53f-4741-1bb7-bdf99fb153be/1/>.

Additional sources of information

- Windwick, S., 2007. High tide at Kirkwall Pier on the 28th February, 1967. *Orkney Communities*. Available at: <http://www.orkneycommunities.co.uk/imagelibrary/picture/number3507.asp> [Accessed September 13, 2015].