

### The icing of the sea - Winter 1939/40



Icing along the Danish, German and Finnish coasts started early and sea ice conditions lasted longer than in dozens of previous years. This proves that the sea water along all coasts was too cold for that time of the year.

**Denmark-Sweden:** First signs of ice were reported around mid-December and they increased soon in the inner, closed waters. A maximum of 115 ice days was reported. While 34 stations reported more than 100 days, 99 stations reported 75-100 days. Last ice was reported in the Sounds on the 19<sup>th</sup> of April 1940. Because of the early start of the winter, it remained known as the

severest ice conditions on sea for many decades.

**North Sea - Helgoland Bight:** Icing and ice floats emerged on river Elbe on the 16<sup>th</sup> of December 1939. In Hamburg, about 100 kilometres of river upstream from Helgoland Bight, at a mere 80 km distance from the Baltic Sea, there had been constant temperatures of sub-zero degrees Celsius since the 8<sup>th</sup> of December. Icing intensified massively since the 26<sup>th</sup> of December and extreme ice conditions maintained for 90 days, until mid-March 1940.

First ice arrived in Helgoland Bight, on the 17<sup>th</sup> of December 1939, and lasted until early March.

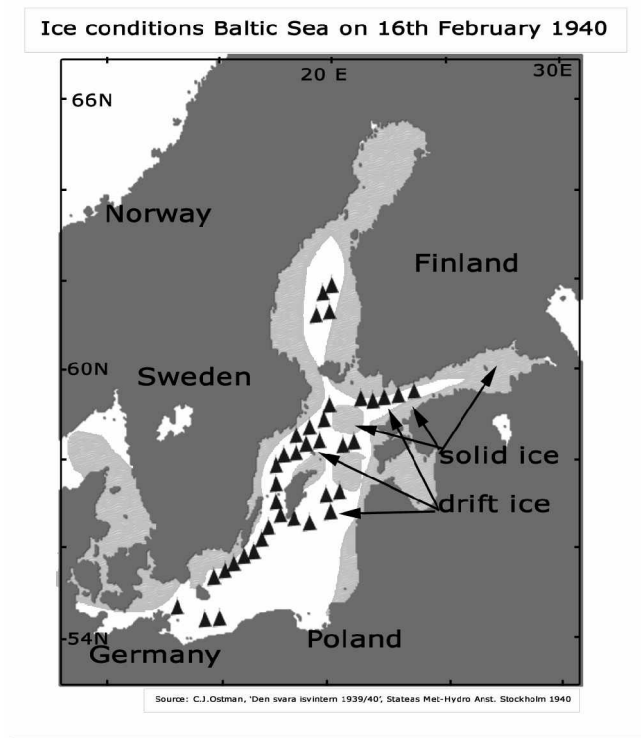
Southern Baltic Sea: Conditions for building up the ice differed in three ways from the average of previous years.

1. Ice formation started first in the southern Baltic Sea in mid-December 1939, and
2. Full icing in the Gulf of Finland started only with the cold wave on the 14<sup>th</sup>-24<sup>th</sup> of January 1940.

These events should not come as a surprise if one takes into consideration the German naval activities of the Kriegsmarine in the southern Baltic Sea: the ambush of Polish coastal defence, the laying of extensive sea minefields, the patrolling and the training of the crews.

In the South, at Greifswald Bodden (an open bight in the SE of the Rügen island), icing started on the 18<sup>th</sup> of December 1939. Solid ice remained intact in place until the 4<sup>th</sup> of April 1940. Last ice disappeared on the 11<sup>th</sup> of April 1940.

**Northern Baltic Sea:** The waters around Finland had never seen so much ice as during the war winter 1939/40 since 1883. And since the 30<sup>th</sup> of November, the region was especially affected by the most devastating war winter ever seen under the Arctic Circle where the sun never shines for many weeks. On land, the Russian Red Army attacked with more than 300,000 men on a front of one thousand kilometres length. At sea, the Russian Baltic Fleet attacked Finnish shore batteries on islands and coastal points with big shells. Submarines operated in the Gulf of Finland and in the Gulf of Bothnia, and laid many thousands of sea mines. Finish Navy was small but still operational. Because of the intense naval activities, the picture of the icing seems to be unclear at the first sight, which is not the case. It actually confirms that naval activities influenced substantially the sea-icing process.



Not to forget that the formation of sea ice started first in the southern Baltic Sea, along the coastline of Germany. In Hanko/Finland (at the west entrance in the Gulf of Finland), icing started on the 27<sup>th</sup> of December 1939; solid ice formed on the 4<sup>th</sup> of January 1940; the end of ice came on the 7<sup>th</sup> of May 1940, at almost the same time as in Helsinki. However, on the 15<sup>th</sup> of January 1940, the Gulf of Finland was still open as far as Pellinki. The Gulf of Bothnia was also open in most of its parts. Ice then formed rapidly. Although the Gulf of Bothnia is far in the North and its depths measure more than 200 metres - in the Baltic Sea area - it is the deepest water, holding considerable heat for considerable time even during cold winters. An 'ice-bridge' between Turku and the island of Åland (a depth of maximum 30 m) formed on the 6<sup>th</sup>-7<sup>th</sup> of January 1940, about 2½ weeks earlier than usual.

There is no other valid explanation for the temperature deviation and for the ice formation other than the war activities at sea. Most of the relevant factors for the Baltic Sea climatic conditions are the long open sea areas in the Gulf of Finland, a clear indication that, due to military activities, a high mixing of water took place, thus delaying ice formation.

## **Chapter summary**

While the previous chapter described the severity of war winter 1939/40 on one hand, and the naval activities during four pre-war months on the other, this chapter attempted to link anthropogenic causes with corresponding reactions in regional environment. As navies churned huge sea areas about, the evaporation of the seas increased and eventually changed the prevailing winds, declined the movement of the Atlantic depression on common routes and caused record deviations of the sea water temperatures. At least in one case, the build-up of sea ice conditions in the North and Baltic Seas demonstrates several aspects of the naval war and of its implication in environmental issues.

The events presented above are not mere incidents. Why were North and Central Europe affected and why Hamburg became a 'cold air plug'? This city is closely placed between two seas that were most heavily churned during the pre-winter months. Why Southern Europe, Switzerland and the Mediterranean region were not dragged into cold sphere? Why excessive rain occurred along a busy war front between France and Germany while the regions with heavy naval activities only four hundred kilometres further north, from Helgoland to Königsberg, saw less rain than usual? Why sea-icing started more powerfully in the coastal waters of Germany than in an area 1,000 km farther north in Finish waters? All questions could be convincingly explained as being the result of sudden naval activities at sea.