Excerpt from iUniverse book: "Booklet on Naval War changes Climate" by Arnd Bernaerts

CHAPTER C, The three years cold package & the war, page 45

The military occupation of Norway

In April 1940, seven months after the beginning of the WWII, Adolf Hitler sent the German Navy on attack missions to Norway. The well-prepared invasion plan known under the name of "Weserübung" was to take control in only one move. A minimum of six locations were targeted, Oslo and Kristiansand (Skagerrak), as well as Stavanger, Bergen, Trontheim, and Narvik, covering a distance of about 2,000 km, with numerous fjords, bights, islands and rocks.

During the campaign which lasted until June 1940, presumably 80 to 120 naval vessels and approx. 1,000 airplanes had been available in the service of the parties participating in the war. Although the Norwegian Navy was small, it was able to lay sea mines with their fleet made up of a dozen mine layers and to use the installed coastal batteries in an important number of locations. One of the first battles was fought in the vicinity of Narvik. On the 10th of April 1940, five Royal Navy destroyers entered the harbour of Narvik where five destroyers of the Kriegsmarine were seriously damaged, out of which two sank. Six other German ships were also sunk. British Navy lost two destroyers.

Material and ammunition needed by the German forces were to be transported to various locations with the help of about 50 vessels, with a total capacity of 250,000 tons. The loss of ships and tonnage during the campaign amounted to about 20% of the total ships/tonnage available, including two tank ships of 6,000 tons. The Campaign ended on the 10th of June. During the struggle that lasted four months, a total of 34 naval vessels of about 500,000 tons, including 9 submarines, 19 destroyers and bigger ships, were sunk or damaged. The loss of naval vessels was equal for both sides.

The struggle between the Allies and the German naval forces continued along the Norwegian coast throughout the remaining months of 1940. British, Dutch and Polish submarines permanently patrolled the area, searching and targeting German convoys and naval vessels.

Stirring Skagerrak

When evaluating any war at sea, we must be aware of the fact that the impact of stirring and churning the seawater body down to a depth of 60-80 meters is nothing compared to the situations which affects lower water masses. Due to a complex current system with quite different water masses coming from different sources, Skagerrak makes it even worse. This may certainly be interesting for the ocean science but not so relevant for our investigation. Fine tuned observation may not be needed if we are rather interested in brute force experiments. Carrying out war operations in the deep water areas of Skagerrak and along the Norwegian south-western coast is nothing more than a grand



climatic adventure. The already altered seawater structures will inevitably influence and finally change winter conditions.

Most of the Skagerrak sea area is below 200 meters deep, the deepest point 700 meters. measuring The temperature for the whole water body will be of roughly 6°C in March and at peak time, in August, with hardly more than 1-2 degrees warmer. Even if the temperature of the surface layer can exceed 16°C in August, at more than 40 meters deep temperatures never exceed 10°C. As surface vessels had draught of up to 10 meters, submarines submerged to 100 meters deep and depths charges were made to explode at any place between 5 and 150 meters deep, water structure at Skagerrak was easily stirred. Indeed, temperatures of the surface seawater at Freder and Torungen were lower between August and November 1940 than the long-term averages or the temperatures of the pervious years.

Taking into account that a forceful current system can fairly exchange Skagerrak waterⁱ, the occupation of Norway may be reflected in severe and early sea icing during the winter of 1940/41, which together with the pervious war winter of 1939/40 became the harshest ice winter in the north of Copenhagen in many decades.

i Water entering Skagernak via the Jutland Current in the southwest, proceeding along Denmark's coast urning anti dockwise at Sweden's coast to become off Oslo Fjord the Norwegian Coast Current flowing south-westward until leaving Skagernak and turning northweaths flowing along Norway's coast utril reaching Norwegian Sea. In opposite direction a deep counter current injects high salimity Atlantic water into the Skagernak deep.