

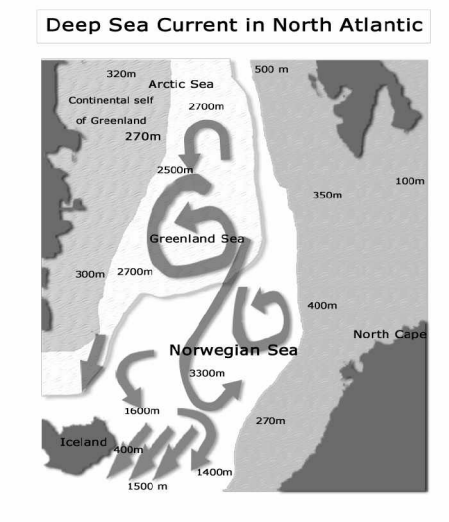
A possible cause for the sever warming: 1918-1939

Let's face the facts: WWI was the most destructive event the North-East of the North Atlantic had ever faced. Much of the North Atlantic water going North, and the whole North Sea was part of the naval battleground for four war years before moving northwards, towards Spitsbergen. Since 1918, the Arctic Ocean warmed twice: in 1938 and in 1980. Between slightly above the Arctic Circle and the pole, the warmest years on record in the Arctic Ocean were 1937 and 1938. War winter 1939/40 put an abrupt end to the Warming of Europe. The most convincing conclusion is that WWI has played a significant role in the warming of the climate since 1918, but how?

We started the chapter on Spitsbergen warming in 1918 by pointing out that two decades of sustained warming could only come from the Norwegian Sea, and/or from the northern arm of the Atlantic Gulf current.

The Norwegian Sea basin is a three thousand meter deep hole. The heat reservoir is enormous: enough to preserve the Northern Hemisphere from icing during the Nordic winters and to sustain regularly storms and winds. But water mass isn't the most important element. What matters even more is the very delicate balance of water temperatures and salinity at any depths.

We can't ignore the warm water inflow coming from the south. The inflow coming from the west of Scotland is the most significant and about 6-7° C warmer than water crossing the Iceland-Faroe Ridge. The inflow into the Norwegian Sea represents almost eight times the total outflow of all the world rivers (eight million tones per second), while the forwarded energy in terms of heat transport corresponds to an energy output of 100,000 major electricity power plants. In comparison to the 8×10^6 m³/sec warm water from the Gulf Current, the water transport in the Norwegian Coastal current on the southwest coast is of about 1 million cubic meter per second (1×10^6 m³/sec), increasing northwards with a speed between 30 and 100 cm/sec, or with 1 to 4 km per/h. It takes between 3 and 8 weeks for the water to reach Spitsbergen. It's a phenomenon of large proportions, so one can wonder if and how a nearby sea war can actually compete with such natural dimensions. But nature ways are intricate and physics offers thousands of variations and changes. The same way a very thin and still freshwater layer at the surface of vast sea areas would isolate almost completely the seawater body from the atmosphere during winter time, hundreds of other activities can change the structure of seawater layers. That



must have happened in 1918 and it was indeed a phenomenon with important consequences. A two decade warming does not come from nowhere. Scientists who speak about climatic changes as a matter of expertise have to answer this question first.

Providing reasonable explanation for the warming of Spitsbergen in 1918 might not be such a difficult task. One explanation could be based on the fact that naval war around Britain and in the North Sea caused the cooling down of the water from September until March, this way having a strong effect on about up to 20% of all water that formed the Norwegian Currents. Therefore, the water coming from the North Sea had significant lower salinity as compared to the high salinity of the Atlantic water. This colder water would go down faster than usually, forcing saltier water (from the inner Norwegian Basin) to the surface. Significant parts of the system were forced into higher motion, and, at the north of Spitsbergen, colder and saltier water flowed quicker into the Arctic Basin, which, at its turn, allowed more water to flow into the Norwegian Sea via the Scotland, Faroe, and Iceland ridges. The “experiment” ended with a larger amount of warm water at north of Scotland, after the end of WWI.

There might be other more convincing explanation and we are always interested in any good reasoning. But what we find difficult to accept is that the severe and lasting warming of Spitsbergen which took place almost one hundred years ago has not been explained yet. One century has passed since this sudden and severe warming first started, then materialized into a two decade phenomenon.