Cold Pole over Skagerrak Winter 1940/41.

Occupation of Norway contribute to extreme winter.

By Dr. Arnd Bernaerts
October 2013
- changes reserved -

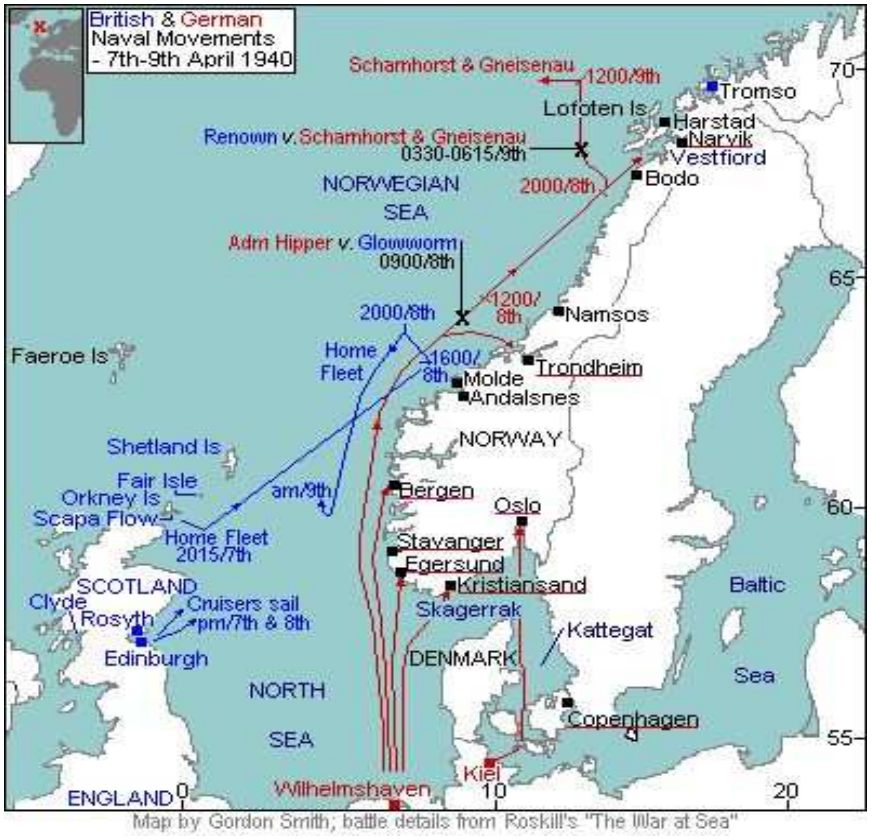
„Norwegian Campaign"

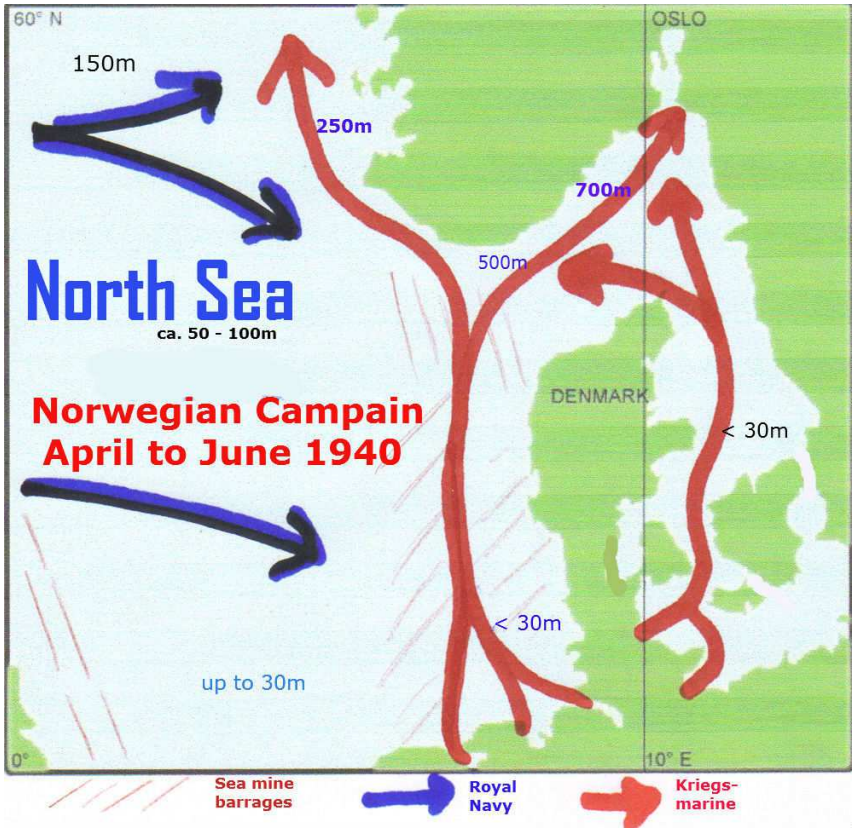
German denotation: „*Unternehmen Weserübung*"

On April 9th,1940 Germany attacked Norway, which defended the country (with Allied help) until surrender on June 10. Naval war continued from the North Sea to the North Cape.

__Until June the Campaign cost the Kriegsmarine about 1/3 of its assets. The air force lost about 250 planes.

__total loss was 34 naval vessels with 500,000 tons including 9 submarines, 19 destroyers or bigger ships, which were sunk or damaged. The loss of naval vessels was equal on both sides.





Utsira Fyr – Norway

Utsira Fyr 59.3 N 4.9 E , °C
Winter Temperatures 1880 - 1955
December/January/February
Source: GISTEMP – Monthly data as text
At: http://data.giss.nasa.gov

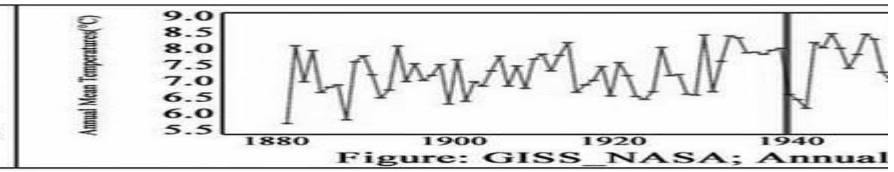
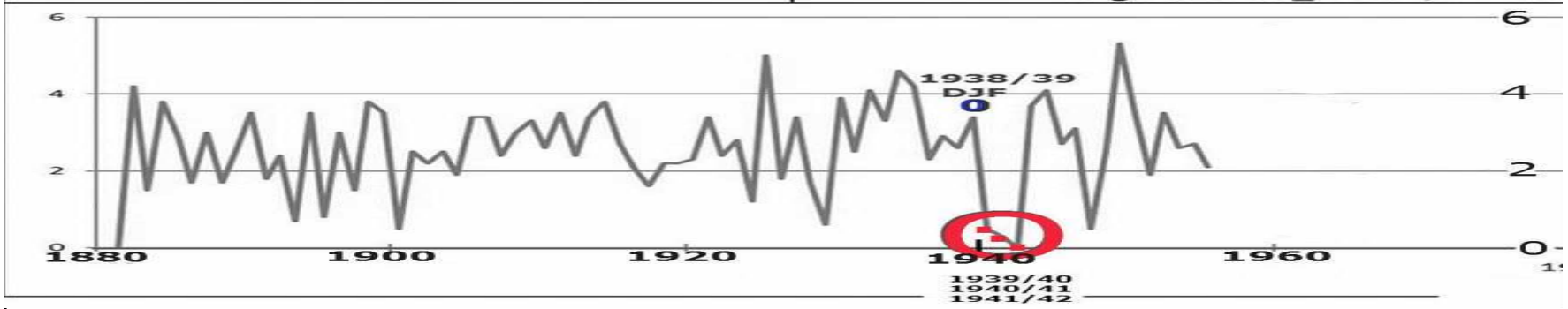
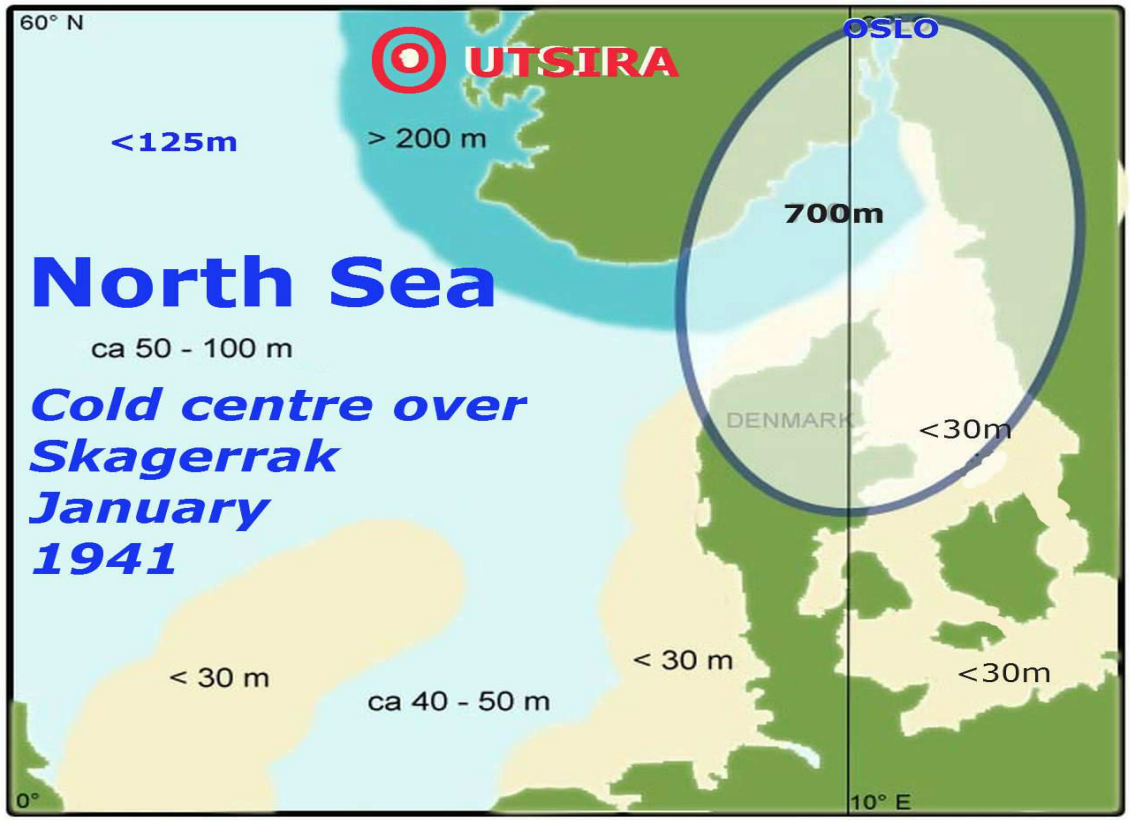


Figure: GISS_NASA; Annual





Kobenhavn – Denmark

Kobenhavn, 55.7 N 12.6 E, °C

Winter Temperatures 1880 – 2009

December/January/Febraury

Source: GISTEMP – Monthly data as text

At: http://data.giss.nasa.gov

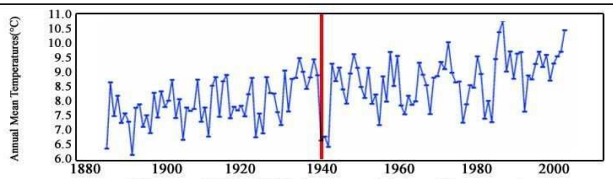
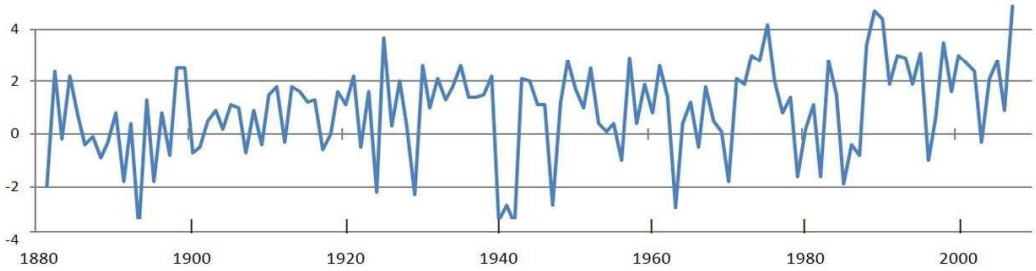
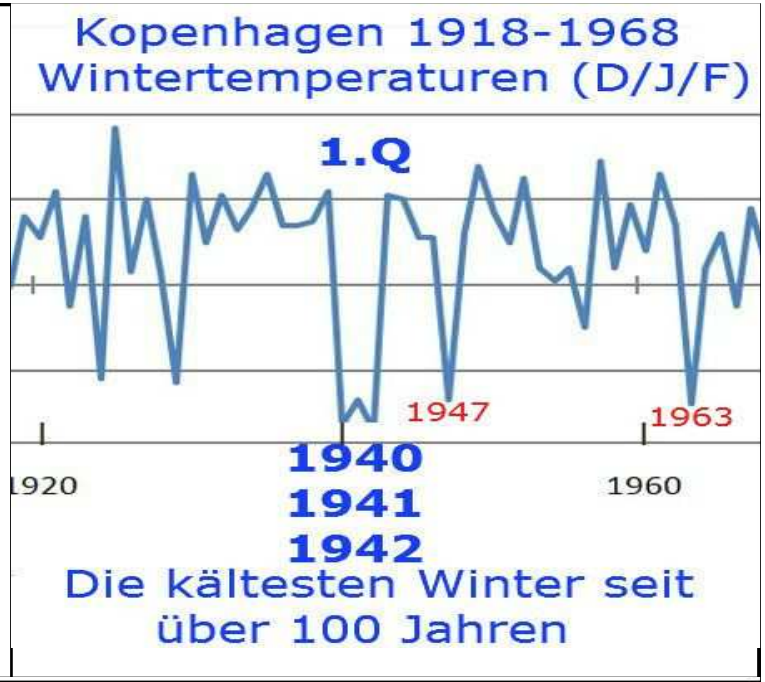
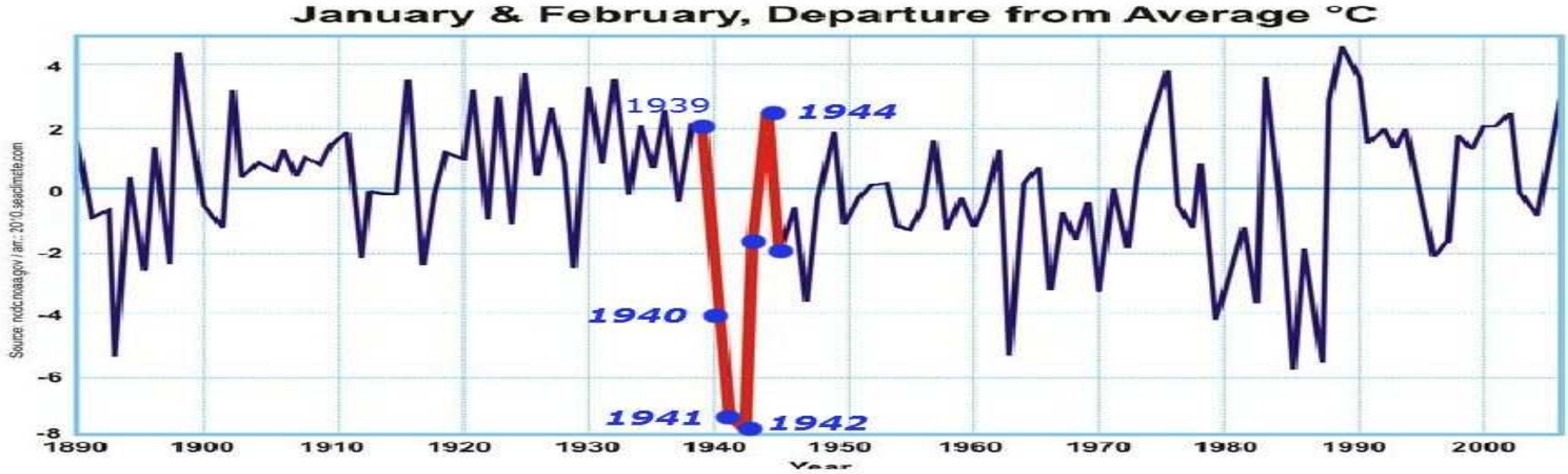


Figure: GISS_NASA; Annual Mean Temperatures;



Arranged: 2009/www.seaclimate.com



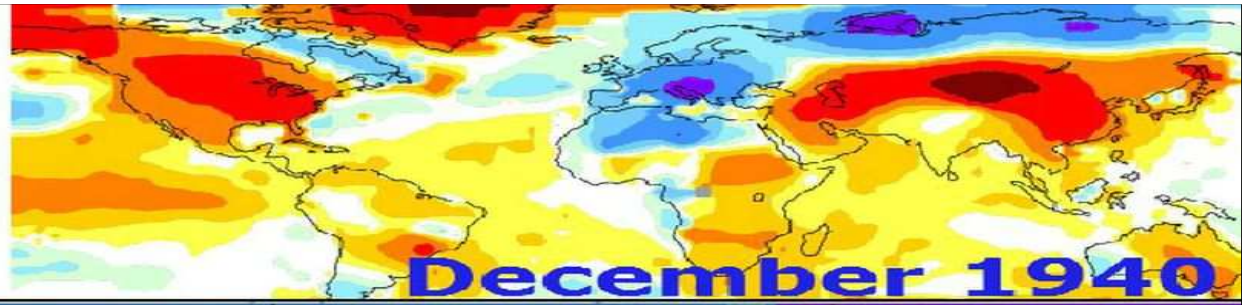


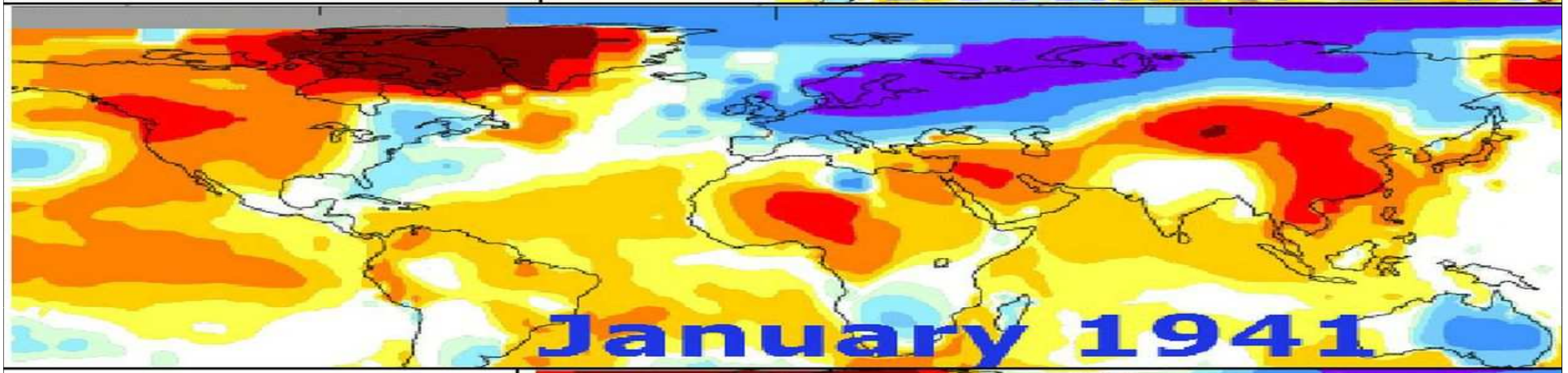
Denmark - January & February - T°C

Source: NASA-GISS, (below). Arranged by 2010/www.seaclimate.com (above)

Winter 1940/41

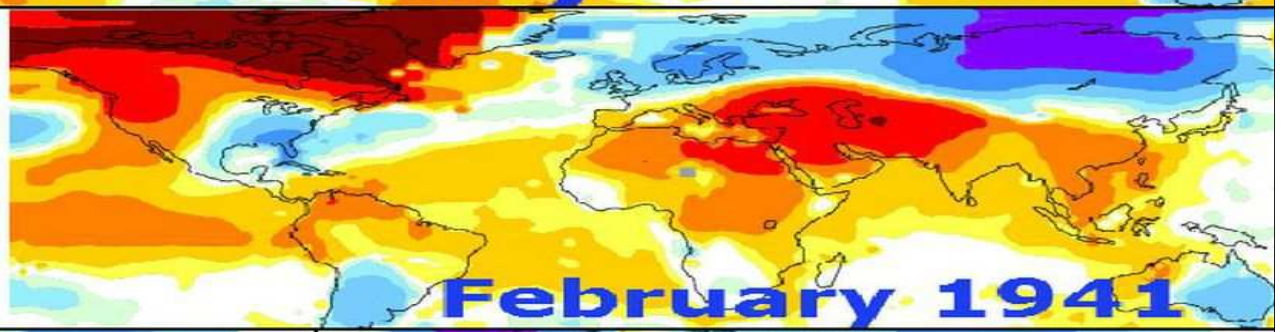
T°C Anomalie

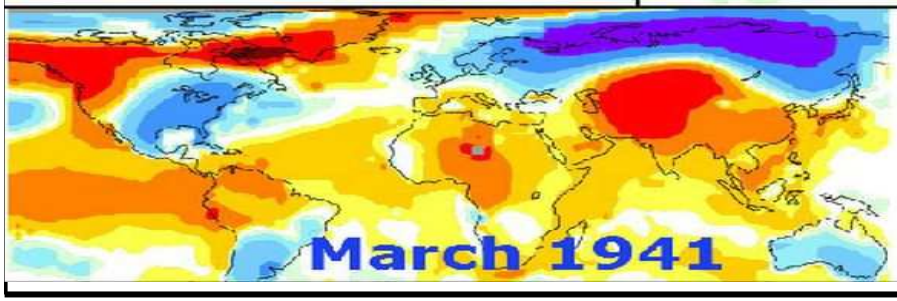


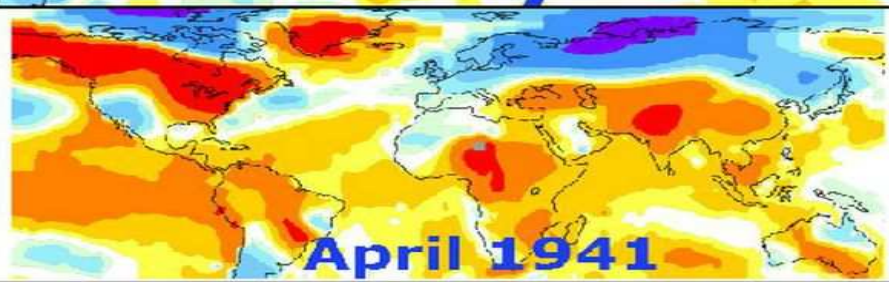


T°C Anomalie

März & April 1941







The Norwegian meteorologists Hesselberg and Birkeland [1],

had been working on climate variations in Norway, with a concluding supplement for the years 1940-1950 (Hesselberg, 1956). There are only a few pages on the war winters 1940, 1941 and 1942, and one table on temperatures in January 1941, from which two experts are quoted, as a prelude, and more details will be given later (below: sec. b-dd):

· "6. The Three Cold Winters 1940-42.

After rapidly rising winter temperatures in the 1930-years the three cold winters 1940-42 initiated a period with somewhat lower temperatures. It therefore may be of interest to look a little closer at meteorological conditions during these years. As they were approximately the same for the whole period, these three years can meteorologically be treated together by studying the mean values during the years 1940-42".

Concerning January 1941 the authors say:

· "As an illustration of the cold winter we give a table over the lowest minimum observed in January 1941 (Table C). The coordinates of the stations are found in the Norwegian Meteorological Year-books. The coldest periods were January 1.-3. 16.-20. Some of the minimum temperatures in January 1941 are the coldest ones ever observed at the station. The cold temperatures in January and February caused

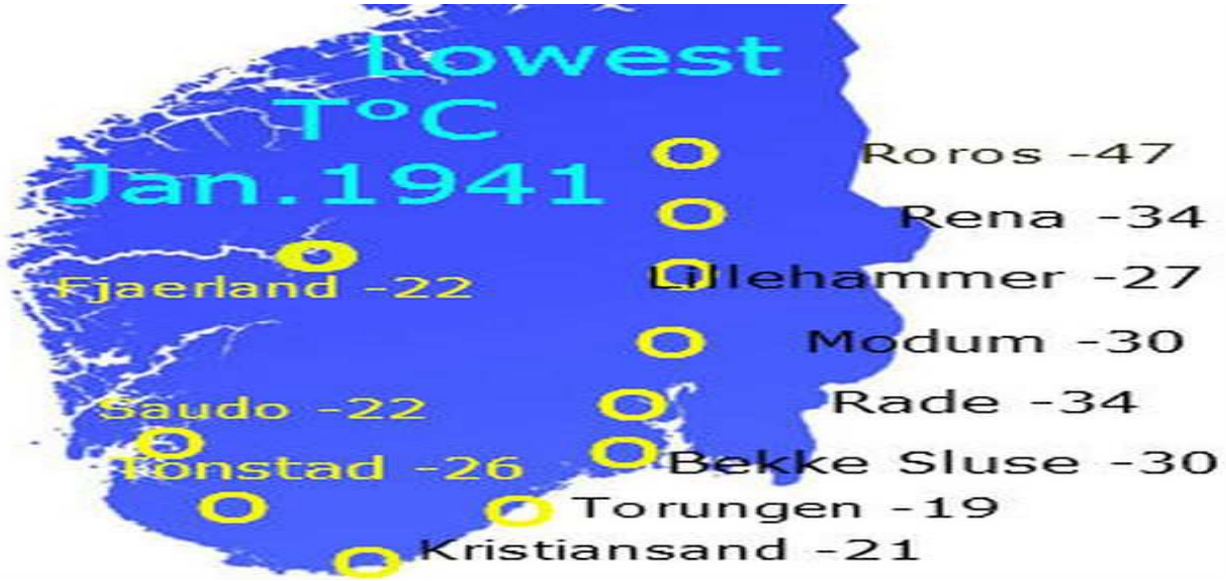
[1] Hesselberg, T.H., and Birkeland, B.J. (1956); "The continuation of the secular variations of the climate of Norway 1940-50", in: Geofysiske Publikasjoner Vol. XV. No. 5. , Bergen 194456; p.14, Table C.

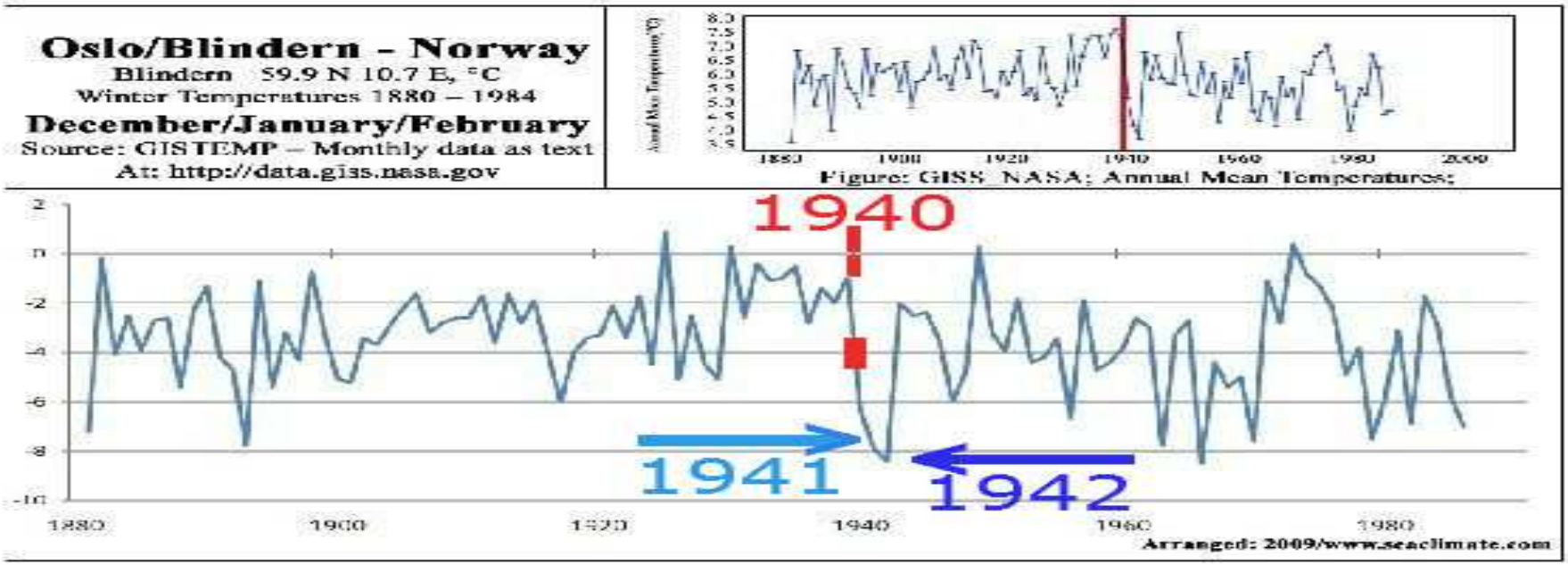
Table C. **The Lowest Temperatures in January 1941 (C°).**

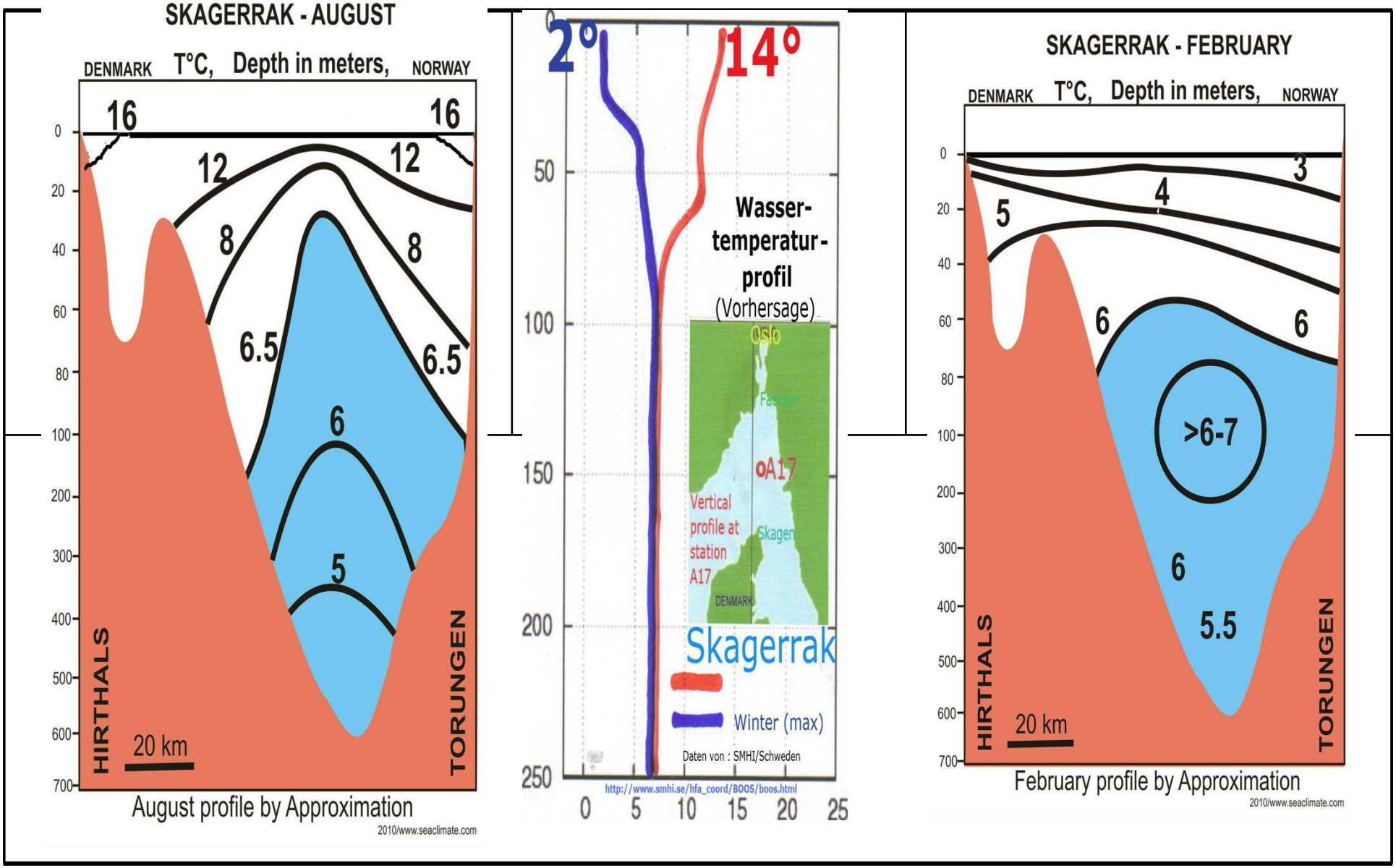
Excerpt from Hesselberg & Birkeland

Station	Min. temp.	Station	Min. temp.
Røros	—47.5	Torungen	—19.0
Alvdal	—42.8	Grimstad	—19.0
Engerdal	—37.0	Byglandsfjord	—30.0
Ytre Rendal	—33.0	Kristiansand	—21.5
Dombås	—36.3	Oksøy	—14.3
Vinstra	—32.6	Mandal	—19.4
Vollen i Slidre	—31.8	Lista	—13.1
Åbjørsbråten	—30.0	Tonstad	—26.6
Lillehammer	—27.1	Obrestad	—14.9
Rena	—36.2	Sauda	—22.4
Vang i Hedmark	—31.8	Skudenes	—12.8
Østre Toten	—29.1	Utsira	— 9.1
Kutjern	—31.8	Svandalsflona	—23.0
Flisa	—36.3	Ullensvang	—13.4
Bygdøy i Oslo	—25.8	Fjærland	—22.3
Blindern i Oslo	—26.0	Fortun	—22.7
Asker	—25.9	Sunndal	—24.8
Modum	—30.4	Tingvoll	—20.0
Nesbyen	—32.9	Selbu	—24.8
Haugastøl	—32.5	Meråker	—26.5
Dagali	—27.2	Sulstua	—32.4
Svene	—35.0	Ytterøy	—16.8
Kongsberg	—30.9	Kjevli i Snåsa	—36.2
Gaustatoppen	—26.5	Nordli	—36.0
Horten	—20.8	Majavatn	—27.0
Eidsberg	—29.0	Leka	—17.7
Råde	—34.6	Bjørnfjell	—32.0
Brekke Sluse	—29.8	Narvik	—18.9
Ferder	—14.5	Dividalen	—29.1
Gvarv	—36.1	Karpbukt	—33.9
Dalen	—23.6	Karasjok	—46.0
Jomfruland	—23.4	Kautokeino	—38.0
Lyngør	—18.6	Siccajavre	—40.5

T.H. Hesselberg and B.J. Birkeland (1944-1956);
"The continuation of the secular variations of the climate of Norway 1940-50";
Geofysike Publikasjoner, Vol.15, no.5, p.3-40


Lowest
T°C
Jan.1941
Roros -47
Rena -34
Lillehammer -27
Modum -30
Rade -34
Bekke Sluse -30
Torungen -19
Kristiansand -21
Fjaerland -22
Saudo -22
Tonstad -26


Oslo/Blindern - Norway
Blindern 59.9 N 10.7 E, °C
Winter Temperatures 1880 – 1984
December/January/February
Source: GISTEMP – Monthly data as text
At: http://data.giss.nasa.gov
Figure: GISS_NASA; Annual Mean Temperatures;
1940
1941
1942
2
0
-2
-4
-6
-8
-10
1880
1900
1920
1940
1960
1980
Arranged: 2009/www.seaclimate.com


SKAGERRAK - AUGUST
DENMARK T°C, Depth in meters, NORWAY
16
16
12
12
8
8
6.5
6.5
6
5
HIRTHALS
TORUNGEN
20 km
August profile by Approximation
2010/www.seaclimate.com
2°
14°
Wasser-
temperatur-
profil
(Vorhersage)
Oslo
oA17
Vertical
profile at
station
A17
Skagen
DENMARK
Skagerrak
Winter (max)
Daten von : SMHI/Schweden
http://www.smhi.se/hfa_coord/BOOS/boos.html
SKAGERRAK - FEBRUARY
DENMARK T°C, Depth in meters, NORWAY
3
4
5
6
6
>6-7
6
5.5
HIRTHALS
TORUNGEN
20 km
February profile by Approximation
2010/www.seaclimate.com

Bundesamt für Schifffahrt und Hydrograpie, Hamburg

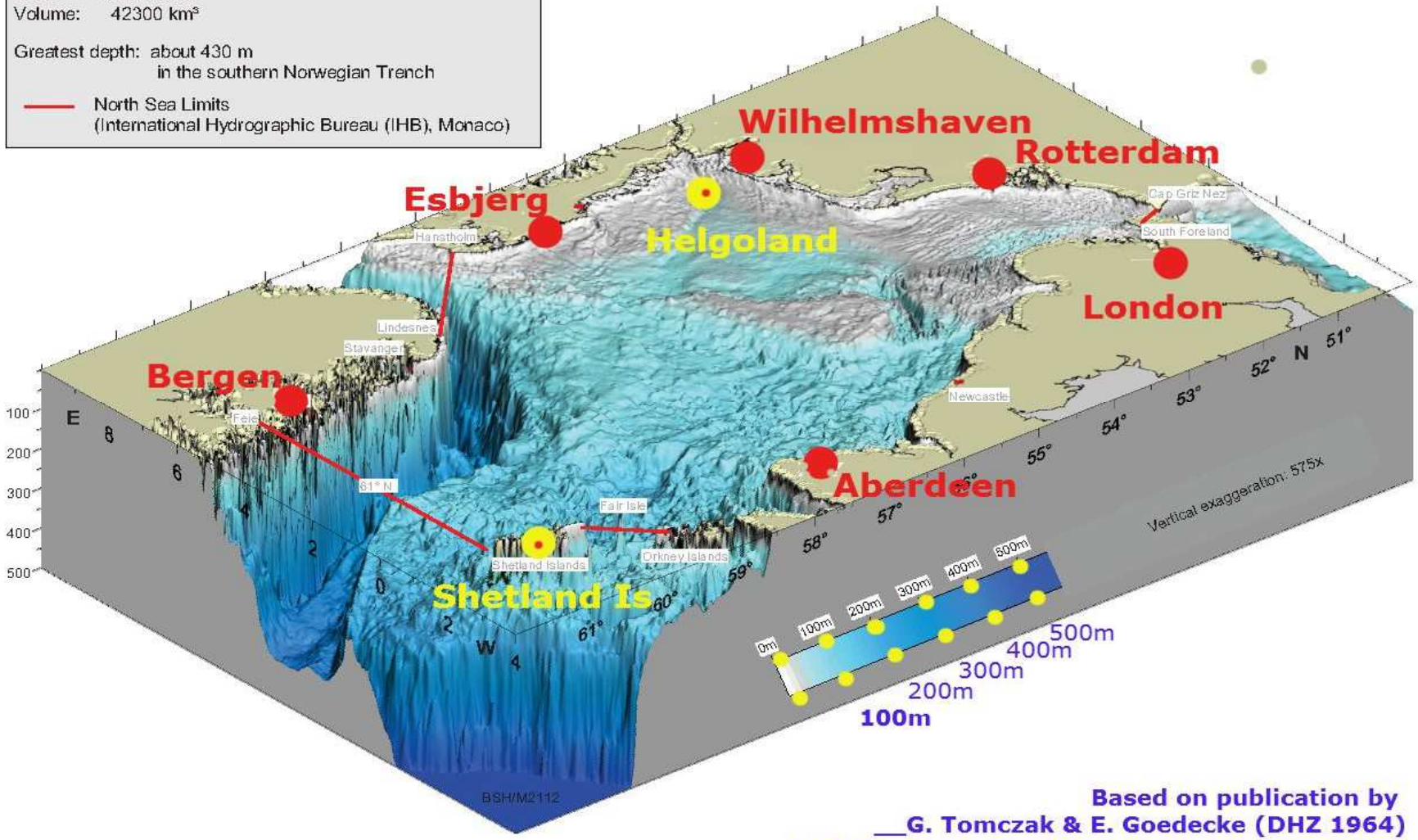
North Sea Atlas 2009

The North Sea is an adjacent sea to the North Atlantic Ocean and part of the European continental shelf

Area: 525000 km²
Volume: 42300 km³

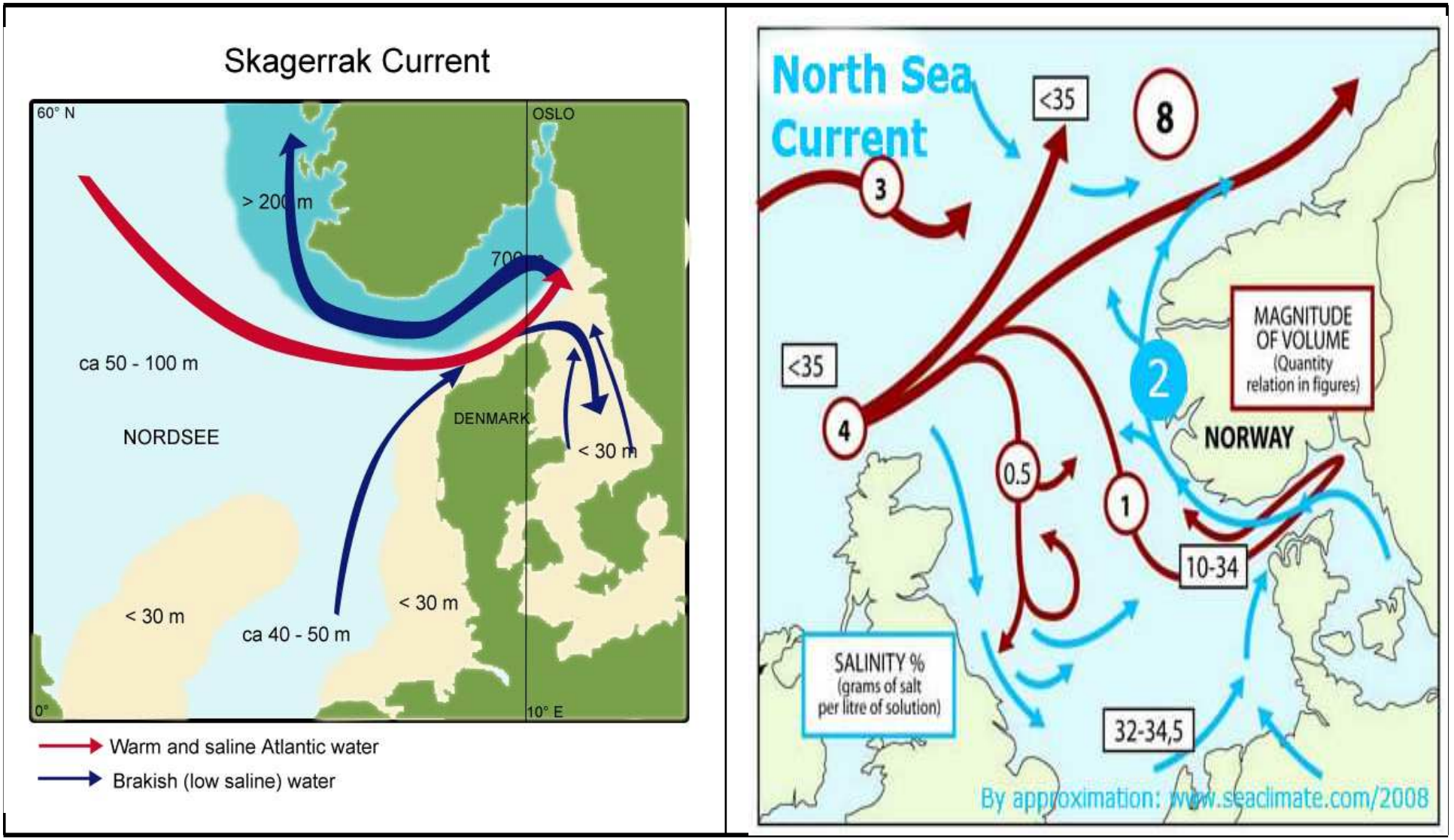
Greatest depth: about 430 m
in the southern Norwegian Trench

North Sea Limits
(International Hydrographic Bureau (IHB), Monaco)



Based on publication by
__G. Tomczak & E. Goedecke (DHZ 1964)
__E. Goedecke, J. Smed & G. Tomczak (DHZ 1967)

Download: http://www.bsh.de/de/Produkte/Buecher/Sonstige_Publikationen/Nordsee_Atlas/North_Sea_Atlas.pdf - May2011


Skagerrak Current
60° N
OSLO
> 200 m
ca 50 - 100 m
NORDSEE
DENMARK
< 30 m
< 30 m
< 30 m
ca 40 - 50 m
0°
10° E
Warm and saline Atlantic water
Brakish (low saline) water
North Sea Current
<35
8
3
<35
4
2
MAGNITUDE OF VOLUME (Quantity relation in figures)
NORWAY
0.5
1
10-34
SALINITY % (grams of salt per litre of solution)
32-34,5
By approximation: www.seaclimate.com/2008

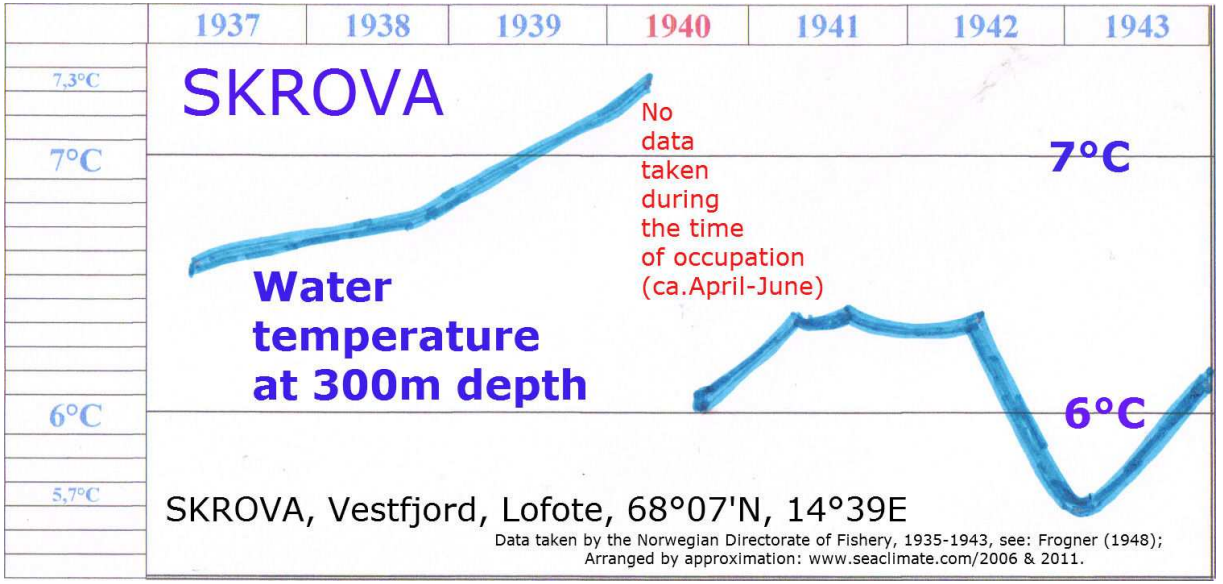
Deviation of Sea Surface Temperature at Ferder & Torungen / South Norway during the German occupation of Norway from May to December 1940

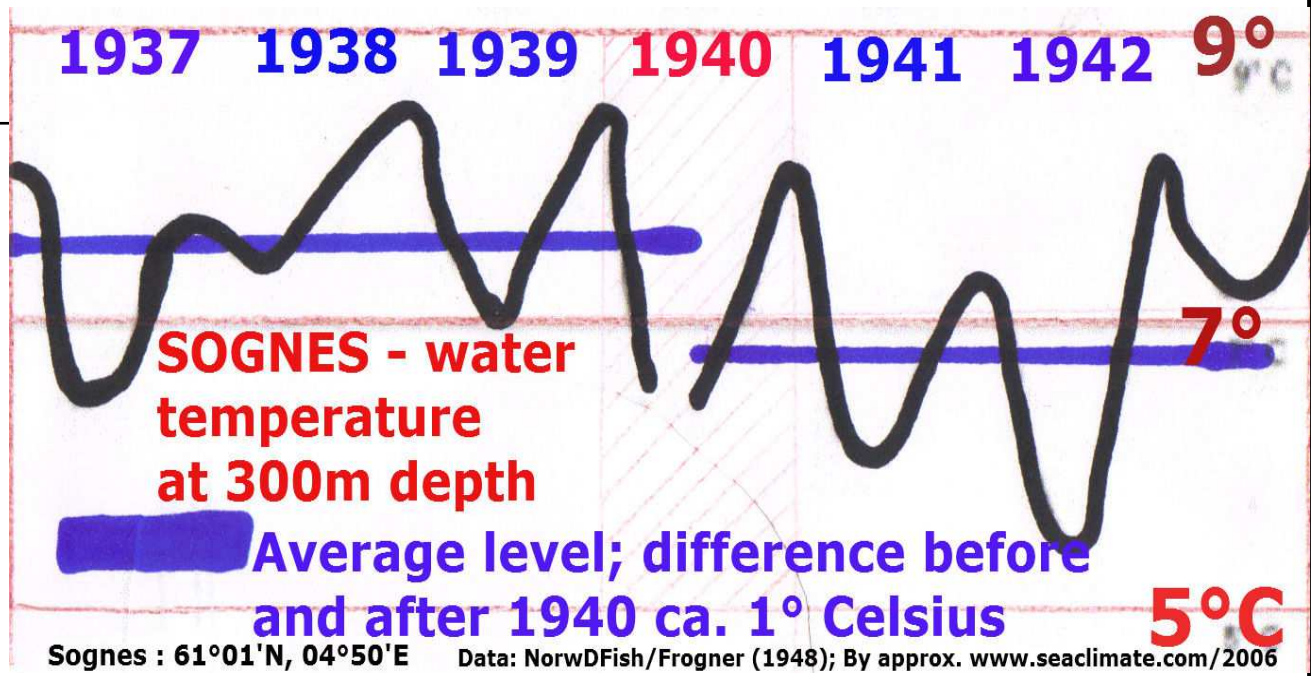
Station	May	June	July	Aug	Sept	Oct	Nov	Dec
Ferder								
Means *)	9.3	14.4	17.1	17.0	14.4	10.6	7.0	3.9
1937-39	10.4	14.2	17.7	19.6	16.3	11.6	8.1	3.7
1940	10.0	17.1	18.2	16.9	13.2	9.9	6.3	4.0
Torungen								
Means *)	8.2	12.7	15.4	15.7	13.7	10.5	7.1	4.4
1937-1939	9.0	12.4	15.9	18.2	15.3	11.3	8.2	4.3
1940	8.7	14.9	15.8	15.5	12.3	9.7	6.3	4.9
	normal	warmer	normal	colder	colder	colder	colder	normal

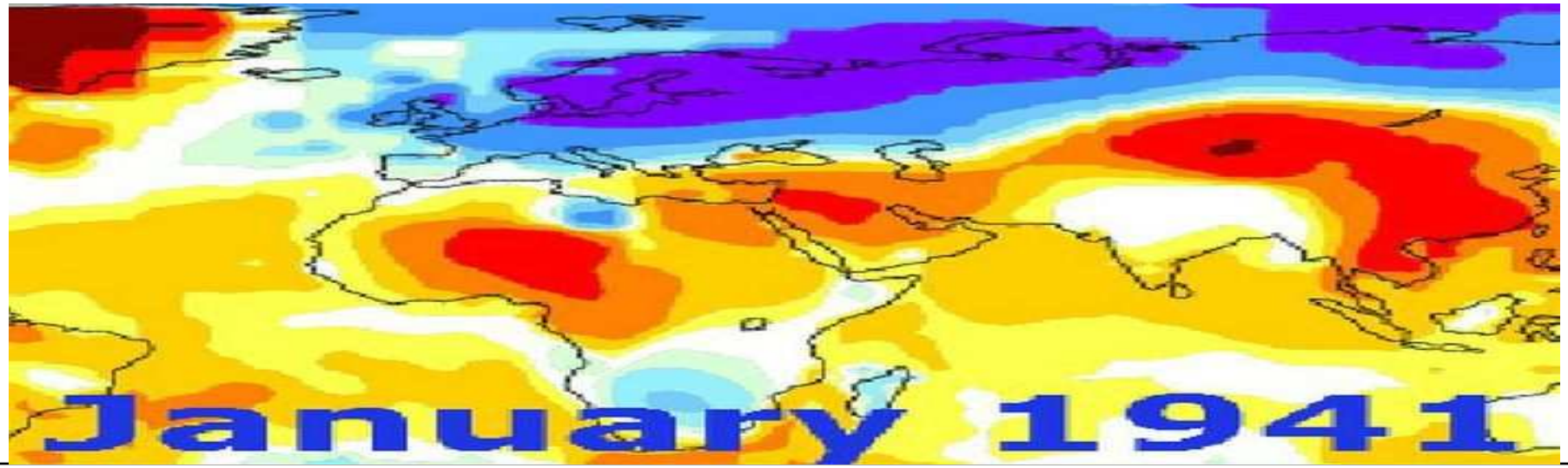
*) Mean temperature 1871-30; Source: Frogner (1948)

Arranged by: www.seaclimate.com/2006

Severe impact on sea temperature structure at 300 meters depth during intensive naval activities in summer 1940

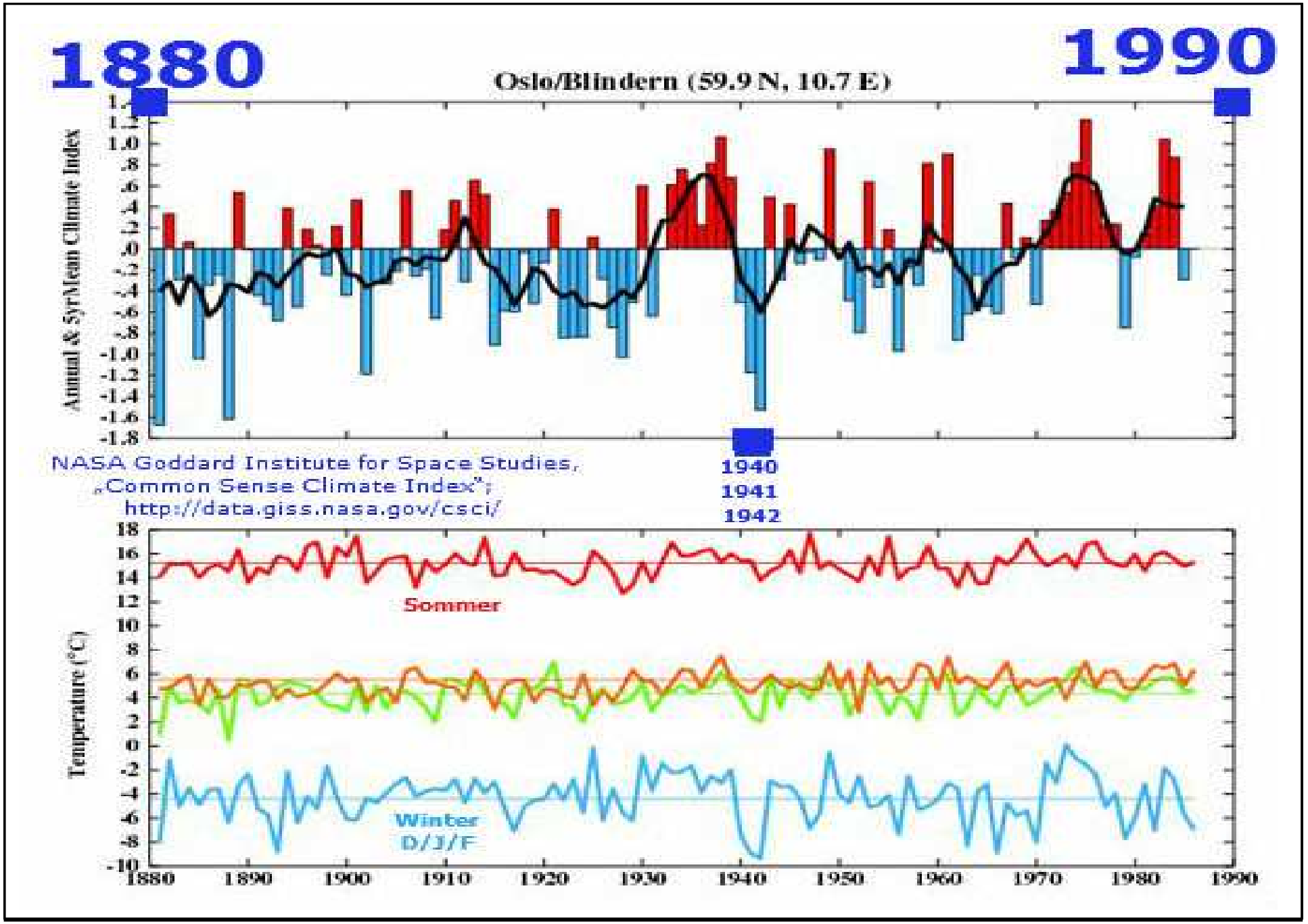






SCAPA FLOW's low temperatures in January 1941 proves the impact of naval war!

Searching for details matter!!


1880
1990
Oslo/Blindern (59.9 N, 10.7 E)
Annual & 5yrMean Climate Index
1.2
1.0
.8
.6
.4
.2
0
-.2
-.4
-.6
-.8
-1.0
-1.2
-1.4
-1.6
-1.8
NASA Goddard Institute for Space Studies,
„Common Sense Climate Index";
http://data.giss.nasa.gov/csci/
1940
1941
1942
Temperature (°C)
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
Sommer
Winter
D/J/F
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990

Evidence from the fact that the Baltic did not serve as a naval battle ground in winter 1940/41, but 1939/40 & 1941/42!

1939/40 = Highest naval activities (since Sept.):
German Bight, Southern Baltic,
and since Dec.39 Gulf of Finland

Berlin-Germany
Tempel, Berlin 52.5 N 13.4 E, °C
Winter Temperatures, 1880 – 2009
December/January/February
Source: GISTEMP – Monthly data as text
At: http://data.giss.nasa.gov

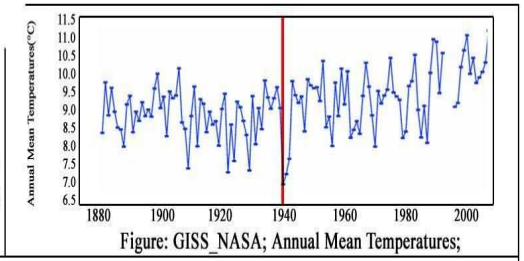
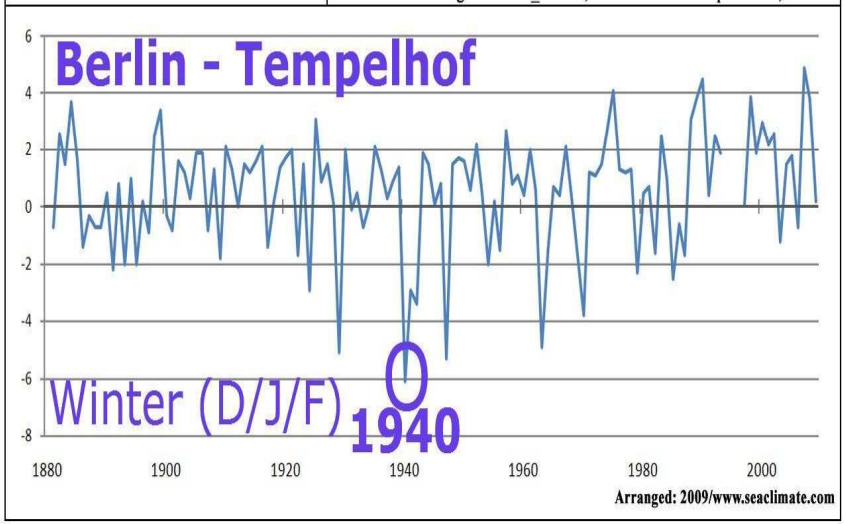


Figure: GISS_NASA; Annual Mean Temperatures;



1941/42 = Higest naval acctivities (since June):
Eastern Baltic (from Gdansk to St. Petersburg

Helsinki – Finland
Helsinki/Seutula 60.3 N 25.0 E, °C
Winter Temperatures 1880 – 2009
December/January/February
Source: GISTEMP – Monthly data as text
At: http://data.giss.nasa.gov

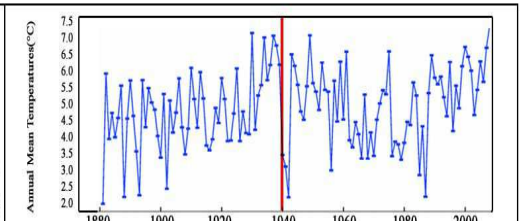
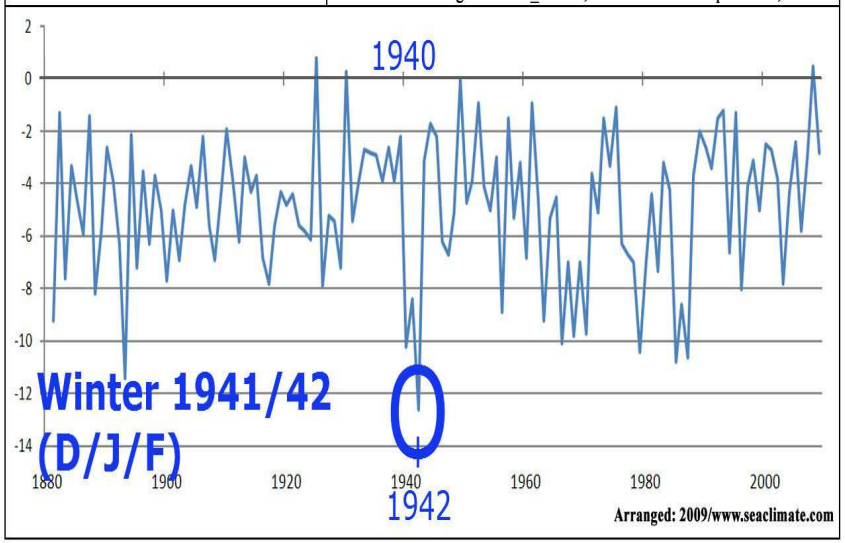


Figure: GISS_NASA; Annual Mean Temperatures;



The three winters 1940, 1041 & 1942 combined showed exceptional deviation as Hesselberg and Birkeland (1944-1955) observed:

Southern Norway seasonal deviation during the years 1940, 1941, and 1942.

Mean value for the period 1901-30	Winter	Spring	Summer	Autumn
Atmospheric pressure	+6 mb	+3 mbar	+0,5 mbar	+0,5 mbar
Air temperature	-4°C	-1°C	+0,3°C	+0,2°C
Amount of precipitation	- 12%	- 8%	+2%	+3%
Wind from the north	+24%	+8%	+4%	+7%
Wind from the east	-5%	0	0	-2%
Wind from the south	-17%	-10%	-6%	-9%
Wind from the west	-1%	+2%	+2%	+4%

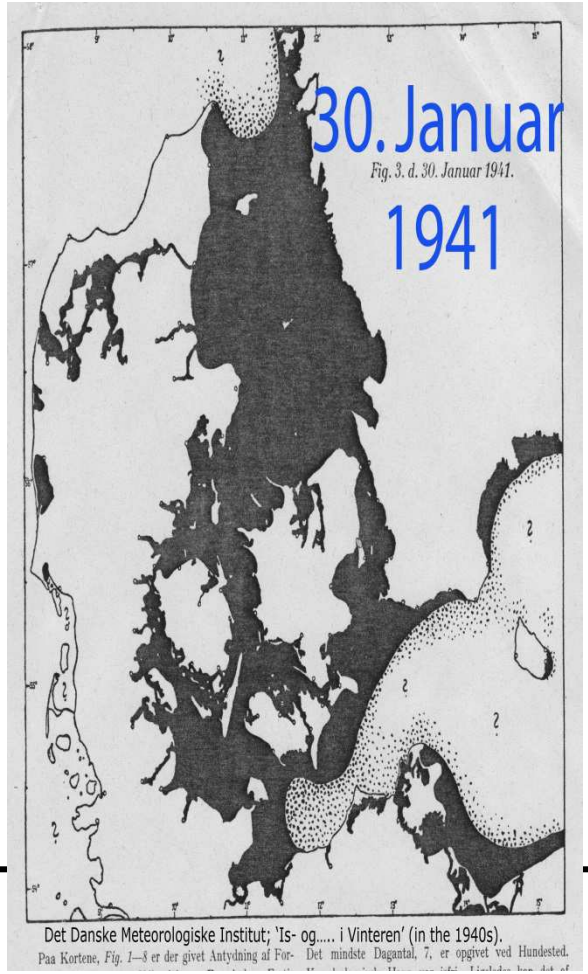
Data source: Hesselberg & Birkeland, 1944-50; Arranged by approximation: www.seaclimate.com/2005

Less naval activities before and during winter 1940/41 produced less sea ice, which was nevertheless one of the severest since the late 19th Century ;

__Fourth severest since 1883 in the Baltic.

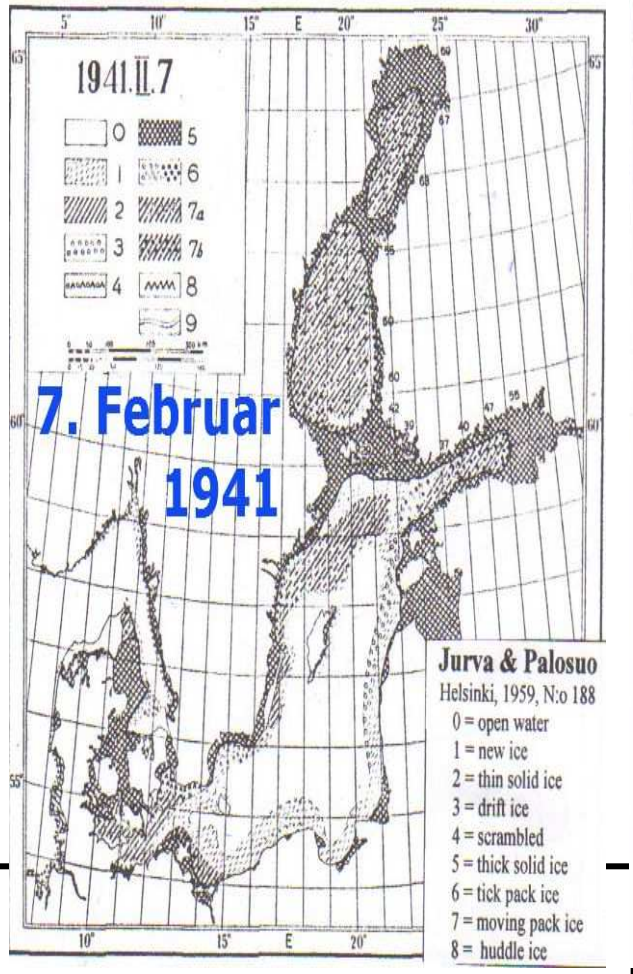
__Fifth severest since 1900 along German coast.

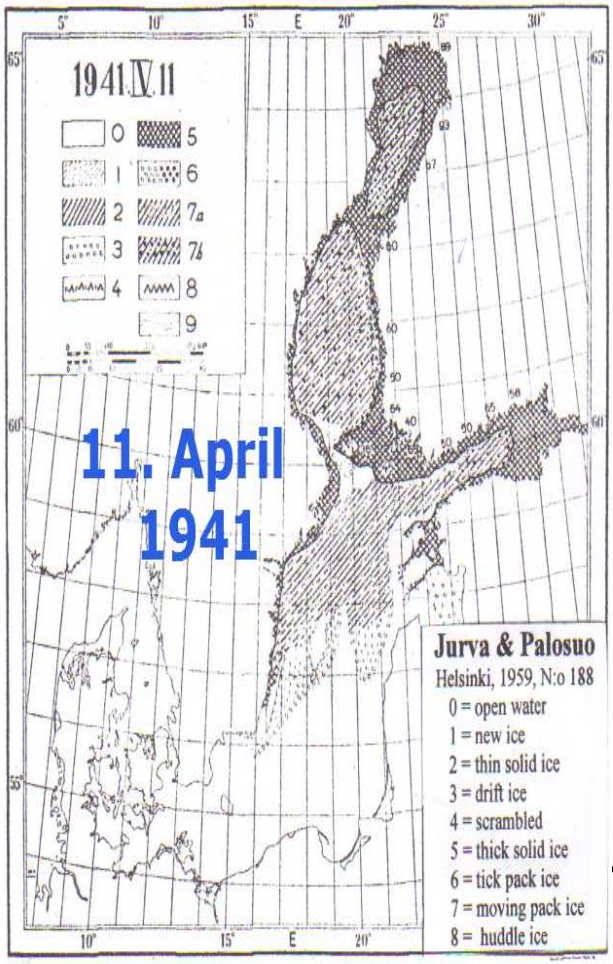
- ***In the German Bight earlier (~ 2 weeks) than German East coast***



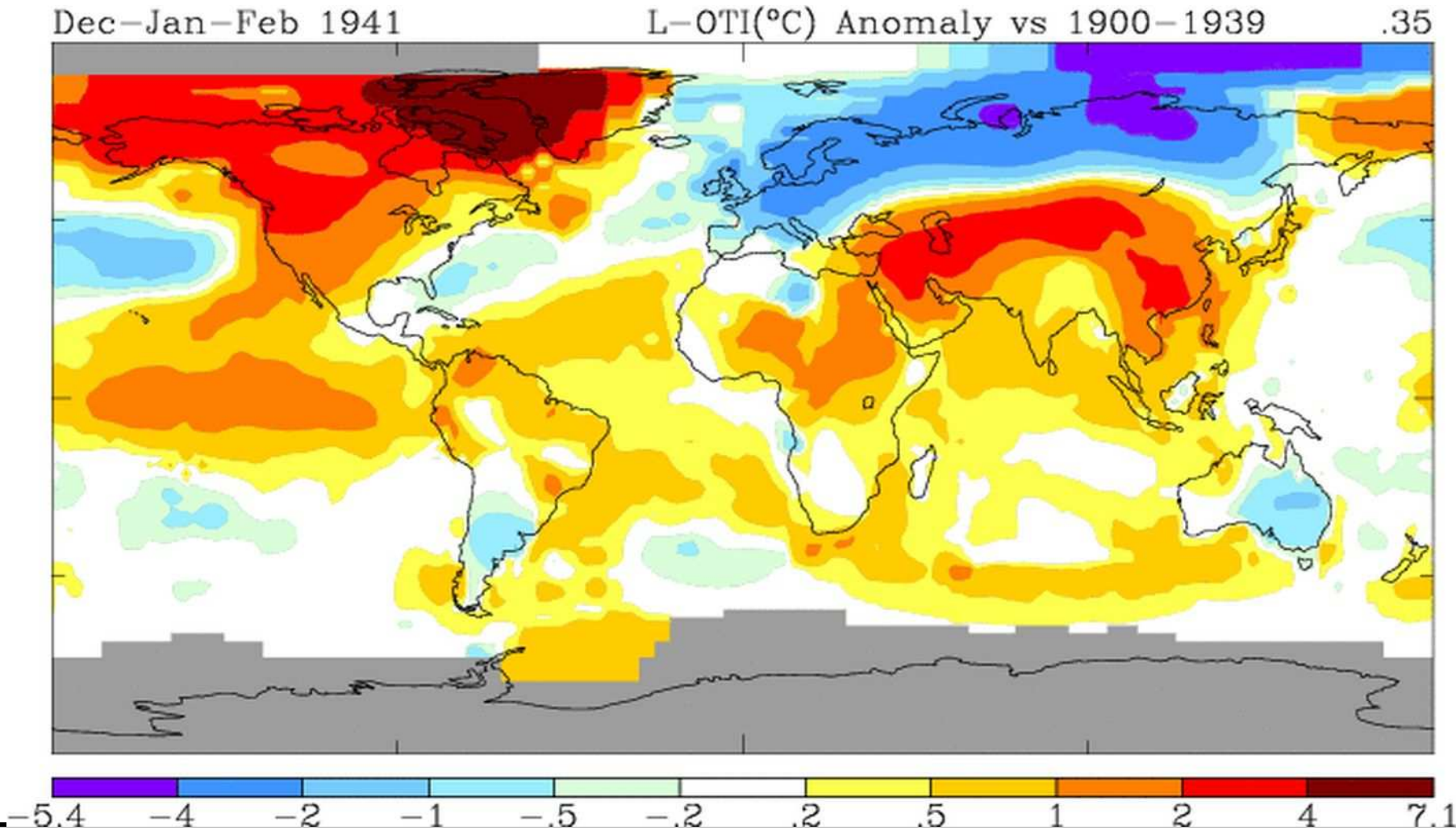
Det Danske Meteorologiske Institut; 'Is- og..... i Vinteren' (in the 1940s).

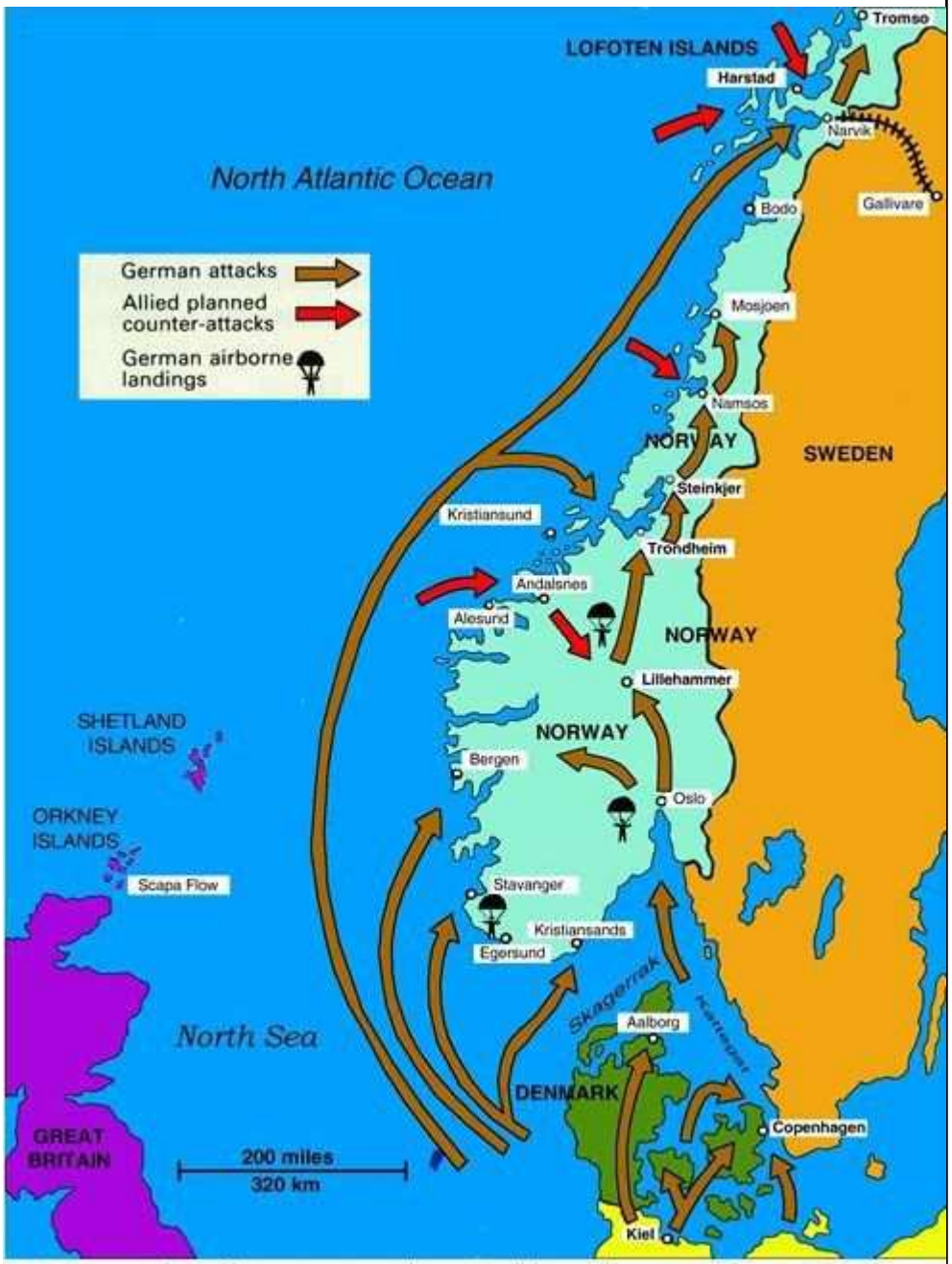
Paa Kortene, *Fig. 1—8* er der givet Antydning af For- Det mindste Dagantal, 7, er opgivet ved Hundested.





The cold winter 1940/41, with the centre over the Baltic, proves to be a European affair, which was caused by naval war along it sea shores.





Source: http://www.war-experience.org/history/keyaspects/norway1940/

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Summary

(1)Winter 1940/41 is one of the coldest since the end of Little Ice Age.

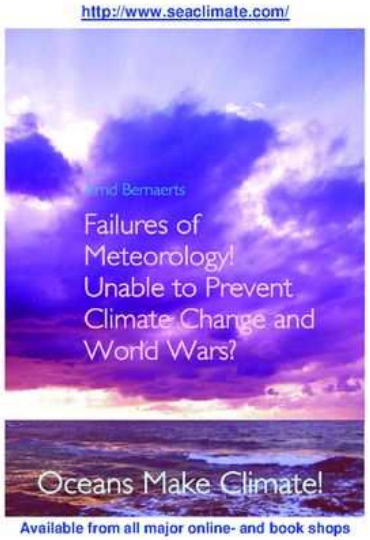
(2) The second war winter is slightly milder and showed up with less sea ice as 1st and 3rd war winter, because naval activities had been much lower, without fighting at sea.

(3) Record cold around Skagerrak can be linked to high naval warfare in this region and along the Norwegian coast.

CONCLUSION:

Even though North Sea physical structure and processes are highly complex, causal connections between low temperatures and naval war can be detected and they are numerous.

Many thanks for your kind interest!



The lecture is based on the book:

Failures of Meteorology! Unable to Prevent Climate Change and World Wars?
Oceans Make Climate!

Pages: 232, about 200 figures and images, 14 color pages.Book on Demand/BoD; ISBN 978-3-8448-1284-8
And in online-book shops, e.g. http://www.amazon.co.uk

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