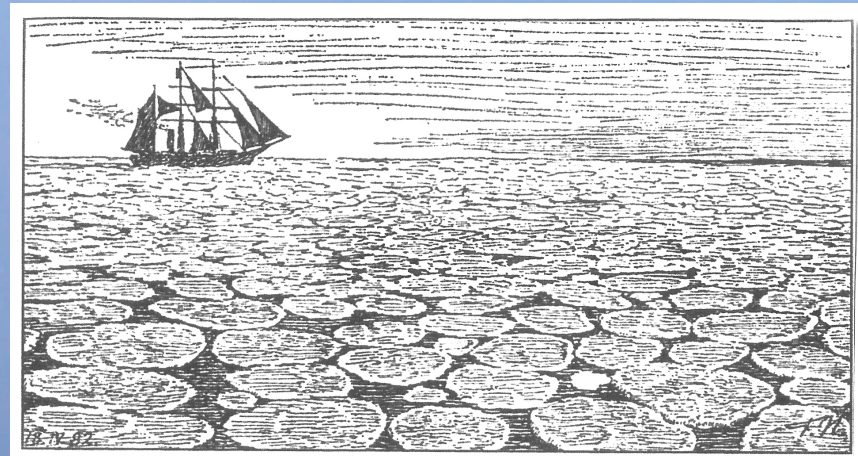


Syntheses of Sea-Ice, Climate and Human Systems in the Arctic and Subarctic (SYNICE)

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Sketch by Fridtjof Nansen, 1882



Funded by National Science Foundation (USA) in 2006

SYNICE AIMS

- To elucidate and clarify linkages, interactions and feedbacks among Arctic sea-ice, climate, and human systems.
- To synthesize a number of climate and sea-ice data sets together with data drawn from the social sciences and from traditional ecological knowledge (TEK).
- To document and understand the systems governing the variability of the ice-edge location in the North Atlantic, associated changes in the production of North Atlantic deep water and the thermohaline circulation.
- To evaluate impacts of changes in sea-ice cover on human systems in the Arctic and Subarctic, specifically in the regions of Iceland and Labrador/Nunatsiavut.

SEA ICE RECORDS FROM ICELAND

- **BASED ON A WIDE VARIETY OF HISTORICAL RECORDS**
- **Medieval Annals**
- **Certain Sagas**
- **Geographical Treatises**
- **Later Annals**
- **Travellers' Accounts**
- **Diaries**
- **Official Reports and Letters**
- **Early Newspapers**



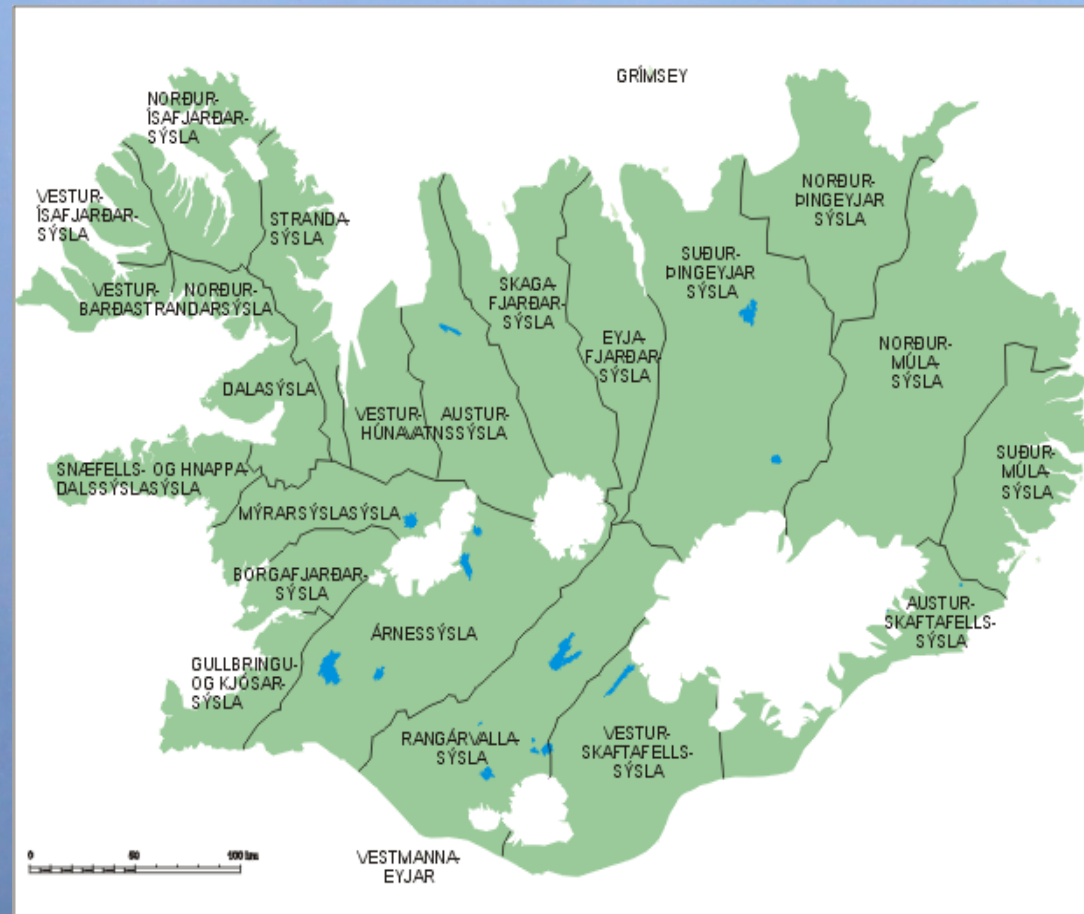
OFFICIAL REPORTS

c. 1700-1900

Reports in the form of letters were written from all the 23 districts of Iceland by officials called Sheriffs.

These were sent annually or more frequently to the Danish government.

They contain information on climate, weather, hay harvest, fisheries etc. as well as on SEA-ICE conditions.



Project funded by RANNÍS (Icelandic Centre for Research)

Letter from District Governor, Bergur Ólafsson Thorberg, dated 31 August 1866, Stykkishólmur, Snæfellsnessýsla

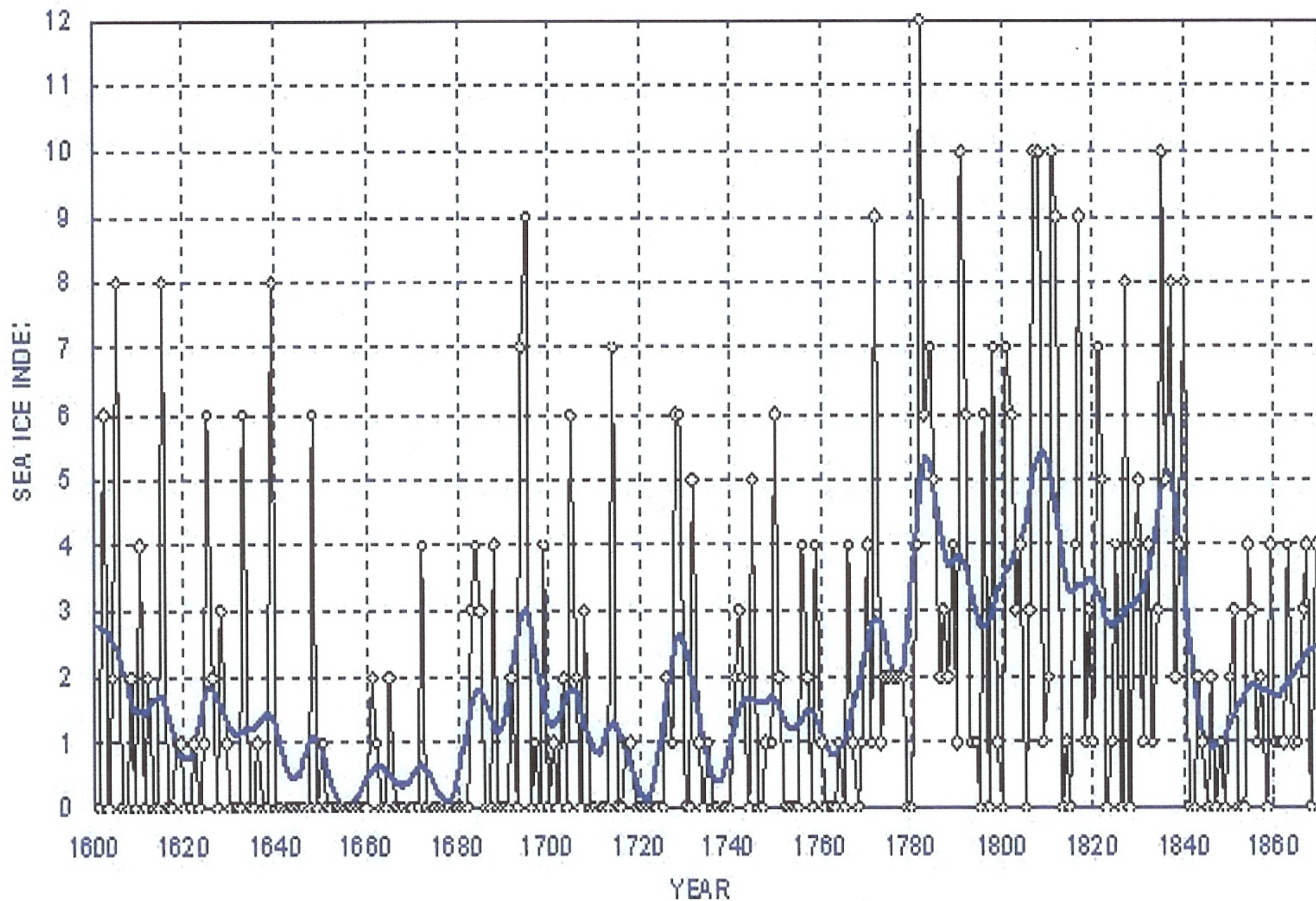
- Immediately after New Year, the inconstant and changeable weather which had prevailed for the last 2 months of the previous year was supplanted by a quite severe frost, partly caused by strong northeasterly storms and heavy snowfalls. This weather lasted, not just to the end of the month (January) but continued almost unchanged for the next 2 months, February and March. Although the wind occasionally changed to a southerly or southwesterly direction, this did not last for more than 1 to 2 days at a time before it began to blow again from the north with increased strength. Both the frost and the snow were much more severe than they usually are, even at this time of year. However, it was the snow that was much more than usual as in most places the ground was covered by such amounts of snow that all transport by horse was impossible and even people on foot had difficulty. Communication by sea also ceased completely on account of the ice which filled up all bays and fjords. As a consequence, for all this time, all livestock needed to be kept in and given fodder, as not even horses were able to seek their food outside.

IMPACTS OF SEA ICE ON POPULATION OF ICELAND IN THE PAST

- Lowering of temperatures leading to failure of grass crop, loss of livestock and human starvation.
- Blocking of trading vessels.
- Prevention of fishing.
- Could also bring useful products such as marine mammals and driftwood.



ICELANDIC SEA ICE



SEA-ICE RECORD FROM THE BARENTS SEA

Compiled by Torgny Vinje

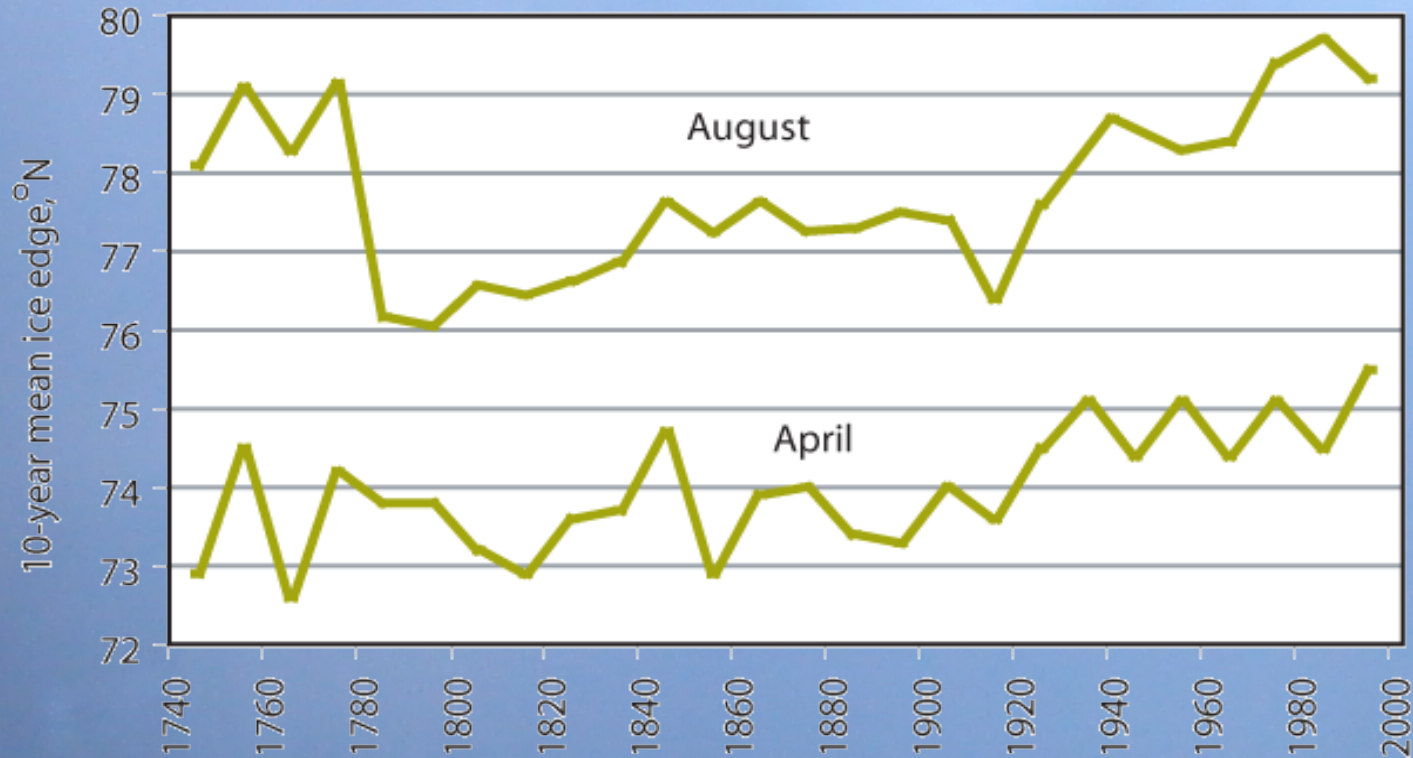


BARENTS SEA RECORD

Vessels sailing to the Arctic to explore or to hunt whales and seals made early sea-ice observations. Over the centuries, technological advances and commercial opportunities in the Arctic led to more frequent and regular sea-ice observations, with associated increasing accuracy. The ACSYS Historical Ice Chart Archive presents historical sea-ice observations in the Arctic region between 30°W and 70°E in the form of digitized maps, stored as shape files. The earliest chart dates from 1553, and the most recent from December 2002.

SEA-ICE RECORD FROM THE BARENTS SEA

Changes in the ice edge for April and August in the Western Barents Sea.



NEWFOUNDLAND and LABRADOR

- The coast of Labrador and the east coast of the island of Newfoundland are exposed to the cold Labrador Current. This distributes sea ice and icebergs across the Grand Banks of Newfoundland and into the North Atlantic Ocean. Ice appears through local formation and drift from further north off the Labrador coast in late autumn.

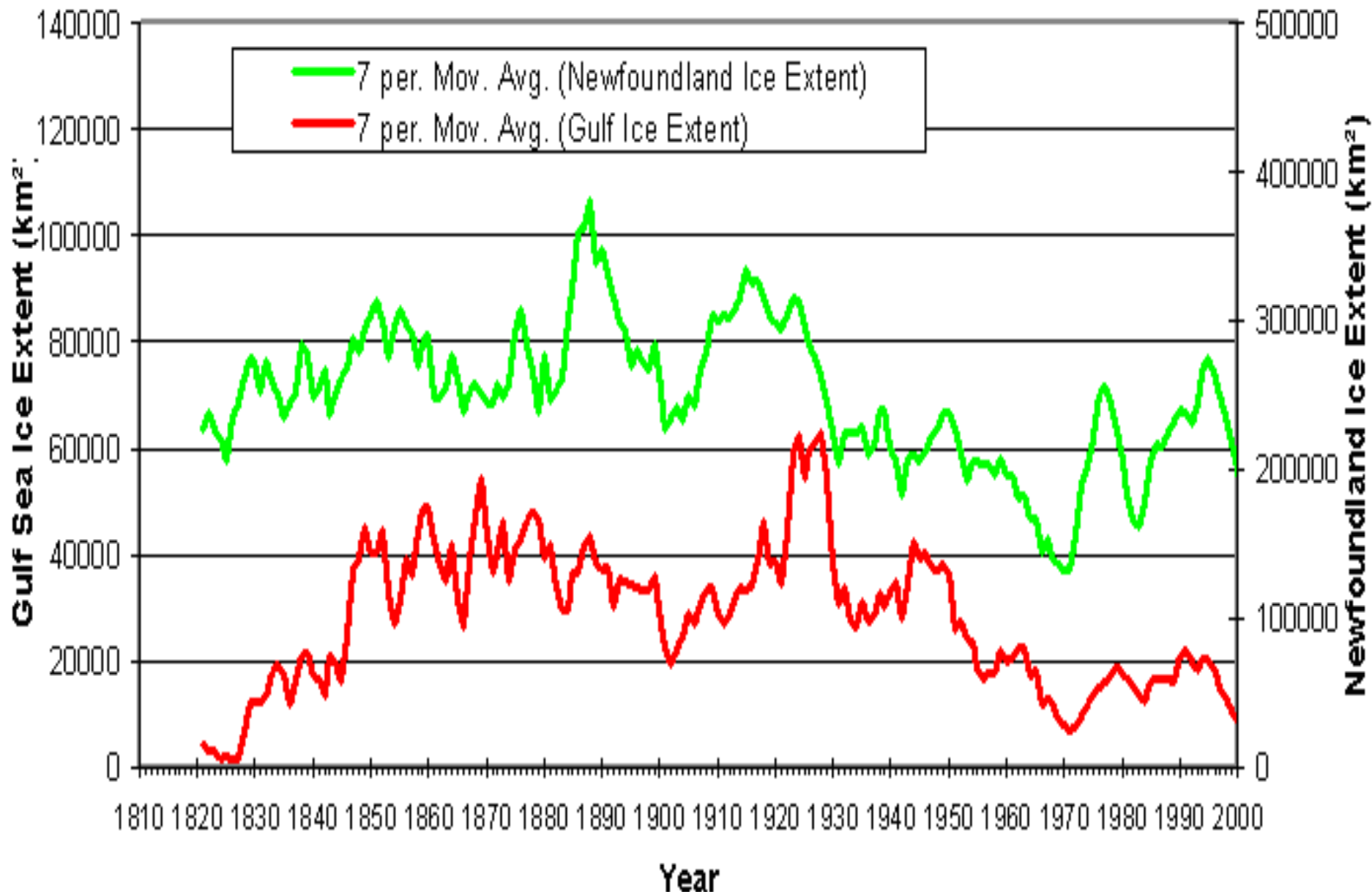


LABRADOR and NEWFOUNDLAND SEA-ICE RECORD

compiled by Brian Hill

- The data set for the period 1810–1958 was compiled by Brian Hill for sea-ice extent during January-April. For early years the Hill data set was compiled from ice sightings reported in shipping journals, gazettes and newspapers, and later, by the International Ice Patrol which commenced activity in 1914.

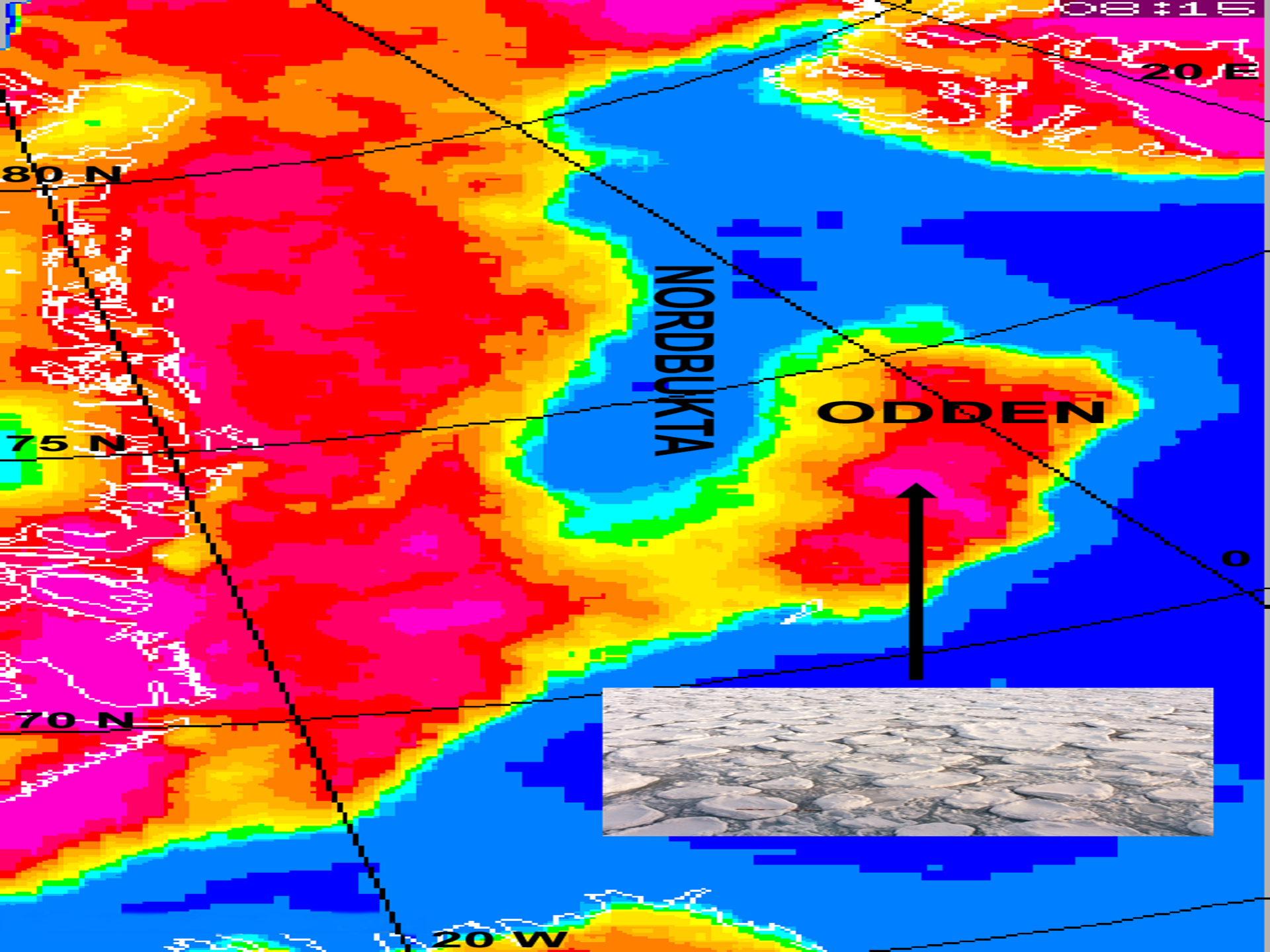
GULF and NEWFOUNDLAND ICE EXTENTS



THE ODDEN AREA

- A long sea-ice record has not yet been produced for the Odden region.
- Records exist, primarily sealer's accounts, which would make it possible to compile such a record.





ODDEN SEA-ICE RECORD

Peter Wadhams and Maxine Von Eye

- From the early seventeenth century, information on sea ice began to be periodically collected in connection with the hunting of bowhead whales, *Balaena mysticetus*, and continued in the eighteenth century when another “fishery” was initiated in the Greenland Sea. This involved the Greenland or harp seal *Phoca groenlandica*.

ODDEN SEA-ICE RECORD

Peter Wadhams and Maxine Von Eye

- The seals gathered to whelp on the sea ice in immense numbers at nearly the same time each winter in a relatively small area known as the “west ice” or Odden. The present project will acquire additional data from sealers’ logbooks held in the National Maritime Museum, London, and the Norwegian Polar Institute, Tromsø.

PRESENT-DAY IMPACTS OF DIMINISHING SEA ICE IN THE LABRADOR REGION



THE MORAVIAN MISSIONARIES AT THE LABRADOR COASTS

- The recording of meteorological data, comprising both instrumental and qualitative meteorological observations, began in August 1771, when the *Unitas Fratrum* or Unity of the Brethren, established its first mission among the Inuit on the Labrador coast.

Research on these data is being done by Gaston Demarée,
Royal Meteorological Office, Belgium

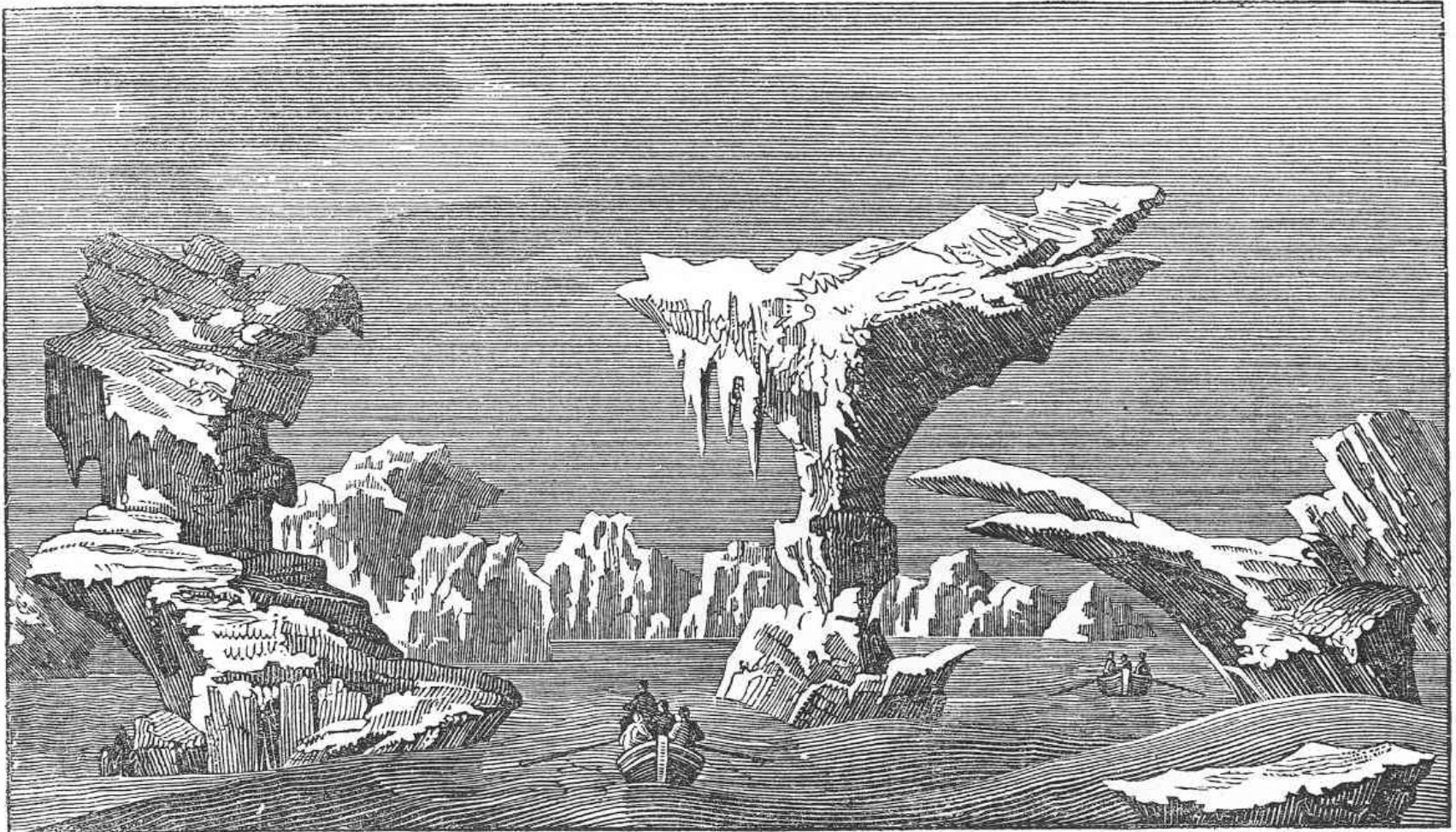
Calwer Missions-Blatt.

Nro. 25.

3. Dezember

1842.

Botschaft aus dem kalten Norden.



...schiffen ein, besondern Aufmerksam sein auf die ...
... wir heilen und von den Mittheilungen, die uns dastelhe

SUMMARY

- The sea-ice record from Iceland is near completion.
- The sea-ice record from the Barents Sea area is completed and published.
- The record of historical ice conditions around Newfoundland and on the Grand Banks, and in the Gulf of St. Lawrence and the Scotian Shelf, both from AD 1810 to the present is completed and published.
- Research on the Odden region of the central Greenland Sea has begun but needs further data acquisition and analysis.
- A climate and sea-ice record based on Moravian missionary accounts from Labrador has begun but needs further data acquisition and analysis.
- *The completion of the records will fill a knowledge gap and enable a more complete synthesis of climate and sea-ice data for the North Atlantic/Arctic.*

ACKNOWLEDGEMENTS

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