



Ice service for ship traffic and oil exploration in ice covered areas

Head of Ocean and Ice, Operation department

Nicolai Kliem

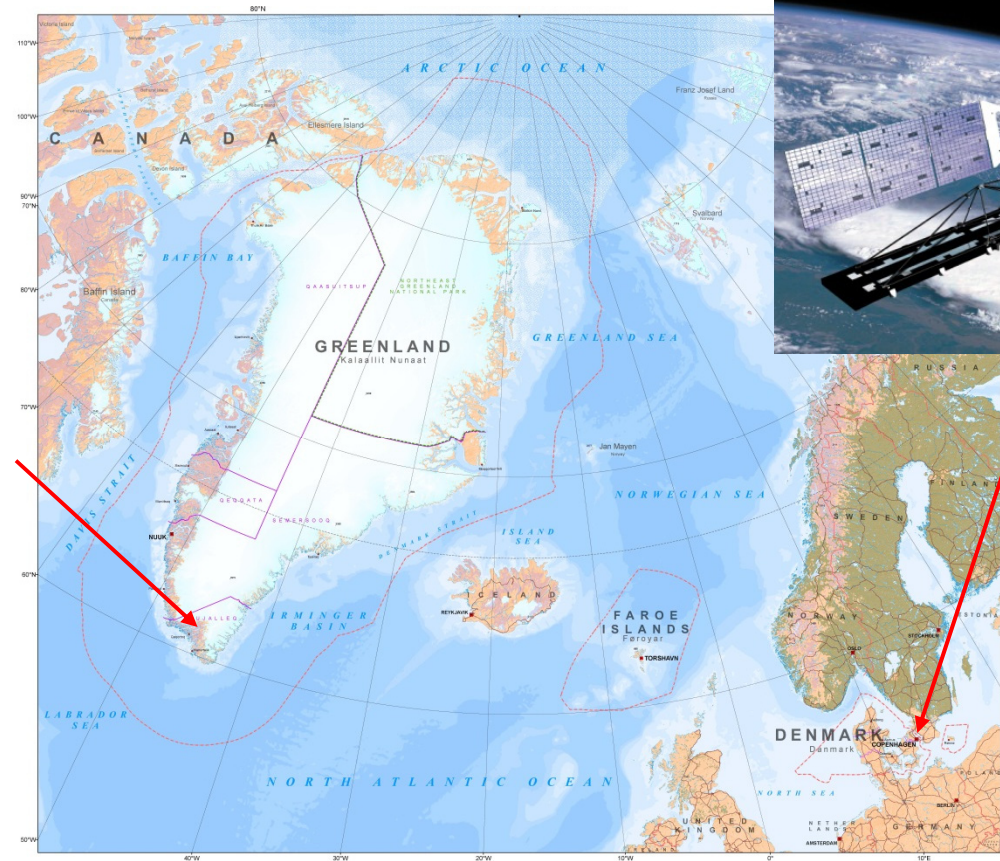
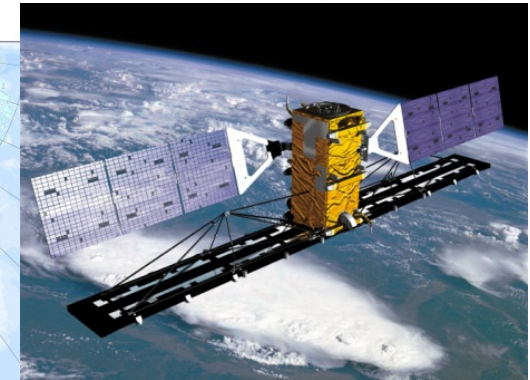
nk@dmu.dk

DMI Greenland Ice Service

Ice patrol in Narsarsuaq
Helicopter ice observations
and ship guiding.



DMI Copenhagen
Satellite based ice mapping



Foundation of the Greenland Ice Service



M/S Hans Hedtoft
Sinks 30 January 1959
off Cape Farwell
95 casualties

The Ice Patrol in Narsarsuaq is established



DMI Greenland Ice Service Users

Royal Arctic Line (RAL)
Cargo



Arctic Command, JRCC, and the Navy
Inspection



Arctic Umiag Line
Passengers



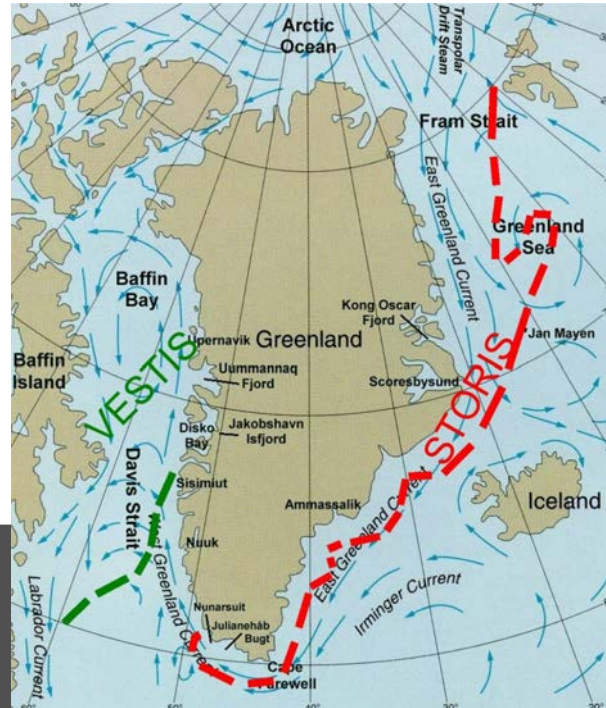
Trawlers



Other users
Research ships
Oil exploration
Cruise ships
Sirius dog sledge



Sea ice extent

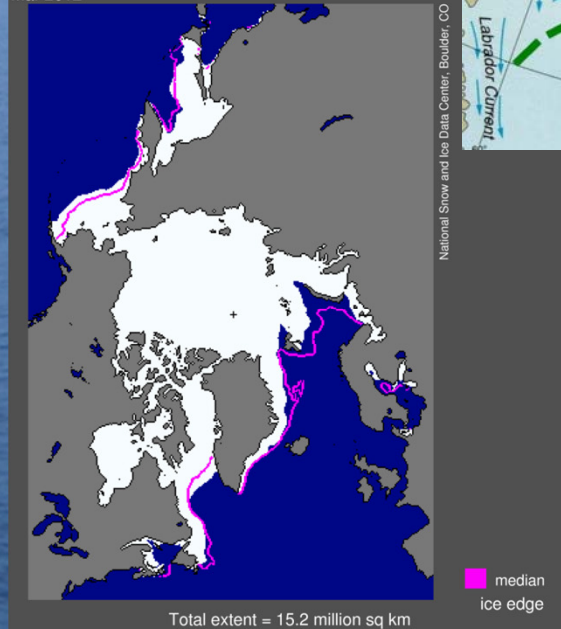


Forekomst af polaris i Kap Farvel området

Måned	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dato	1-8 9-16 17-24 25-31	1-7 8-14 15-21 22-28	1-8 9-16 17-24 25-31	1-8 9-16 17-24 25-31	1-7 8-15 16-23 24-30	1-7 8-15 16-23 24-30	1-8 9-16 17-24 25-31	1-8 9-16 17-24 25-31	1-7 8-15 16-23 24-30	1-7 8-15 16-23 24-30	1-8 9-16 17-24 25-31	1-8 9-16 17-24 25-31
År	2008 2006 2004 2002 2000 1998 1996 1994 1992 1990 1988 1986 1984 1982 1980 1978 1976 1974 1972 1970 1968 1966 1964 1962 1960											

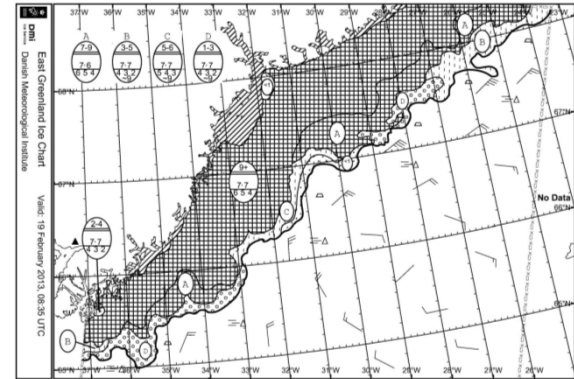
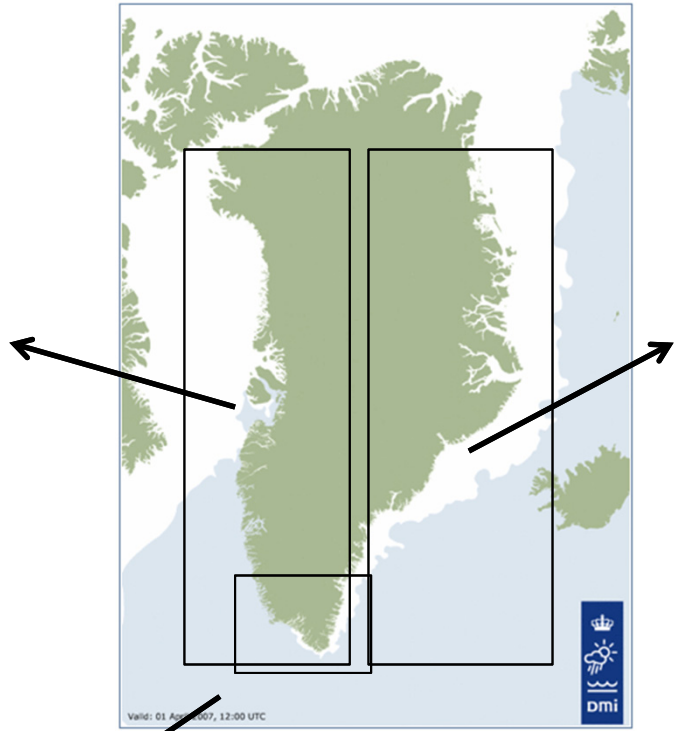
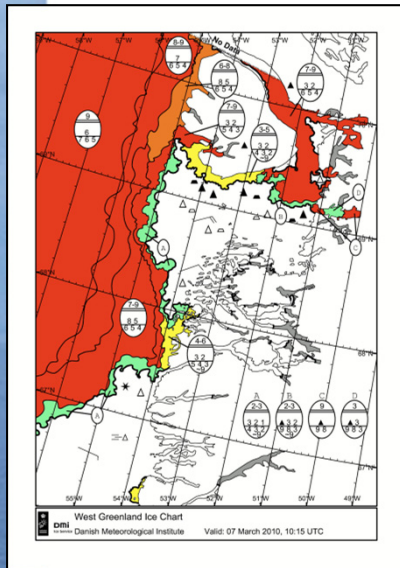
■ Polaris vest for Kap Farvel
■ Polaris fylder Julianehåbsbugten til vest for Nunarsuit
■ Åbent vand (isbjerge, skosser forekommer)

Sea Ice Extent
Mar 2012



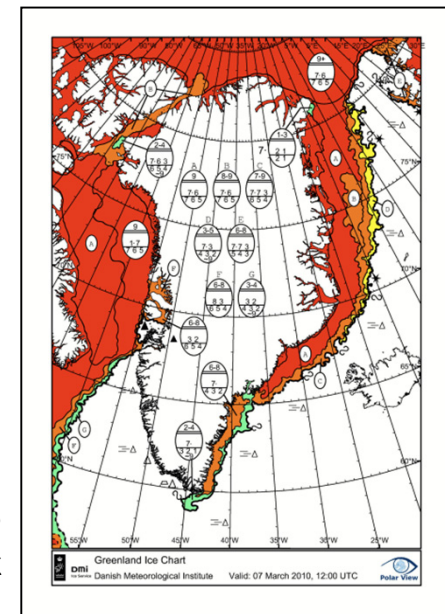
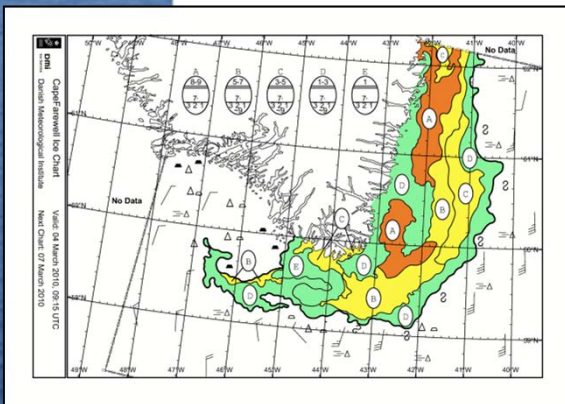
Standard Ice Charts

Regional charts



Cape Farewell
~190 charts per year

Overview charts
2 times per week



DMI's Ice Patrol in Narsarsuaq

Full tidme chartered helicopter. 2+2 navigators from Royal Arctic Line (5-weeks rotation). In-fjord ice-observations 2-4 times a week. Distribution of ice information in Greenland, and ship guidance.

Photos on drobox



Ice report on dmi.dk in Greenlandic and Danish



Om DMI Cool

Dmi
Vejr, klima og hav




Vejr Hav Klima **Grønland** Færøerne Lær om Nyheder Erhverv

Vejret
Byvejr
Vejrkort
Vind
Metar og Taf

Hav
Farvandsudsigter
Udsigt for Nunap Isua
Iskort
Ismelding
Sikunik nalunaarut
SST - Havoverflade-temperatur
Tidevandstabeller Grønland
Is-leksikon

Målinger
Vejret lige nu
Satellit
Indlandsisens massebalance
Ozonlaget over Grønland
UV-indeks

Arktis
Havisareal
Havisens bevægelse og koncentration
Havis-minimum
Arktisk vejr
Middeltemperaturer

Ismelding   

Iscentralen Ismelding
Narsarsuaq

Billeder fra Isrekognosceringer kan modtages i DropBox.
Skriv venligst til Iscentralen icepatrol@dmi.dk for invitation.

www.dmi.dk

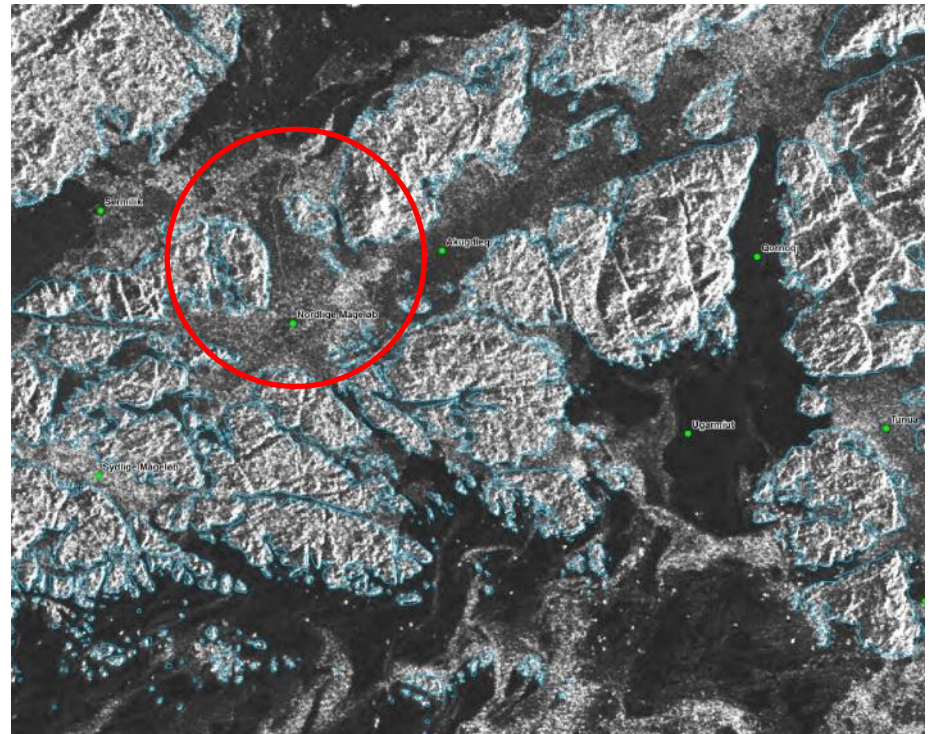
På indenskærs isrekognoscering den mellem Narsarsuaq, Narsaq, Mato løb Qaqortoq, Hollænderløbet, Qarmat, Mågeløbene, Sermilik, her afbrudt grundet dårligt vejr, og Breddefjord blev følgende observeret:

14. I Sermilik: Enkelte skosser. Ved munden spredte isfælde og skosser.
16. I Nordlige Mågeløb: Enkelte isfælde og skosser.
17. I Sydlige Mågeløb: Enkelte isfælde og skosser. Kan passeres med forsigtighed.
18. I området vest for Ugarmut: Enkelte isfælde og skosser.
19. I Qornoq: Enkelte skosser.
20. I Tunua: Enkelte skosser.
21. I Ikerasak: Enkelte isfælde og skosser
22. I Kuanit sava: Enkelte isfælde og skosser.
23. I Breddefjord: Mange isfælde og skosser, revler med bræt/storis. I den sydlige del Spredte isfælde og skosser.

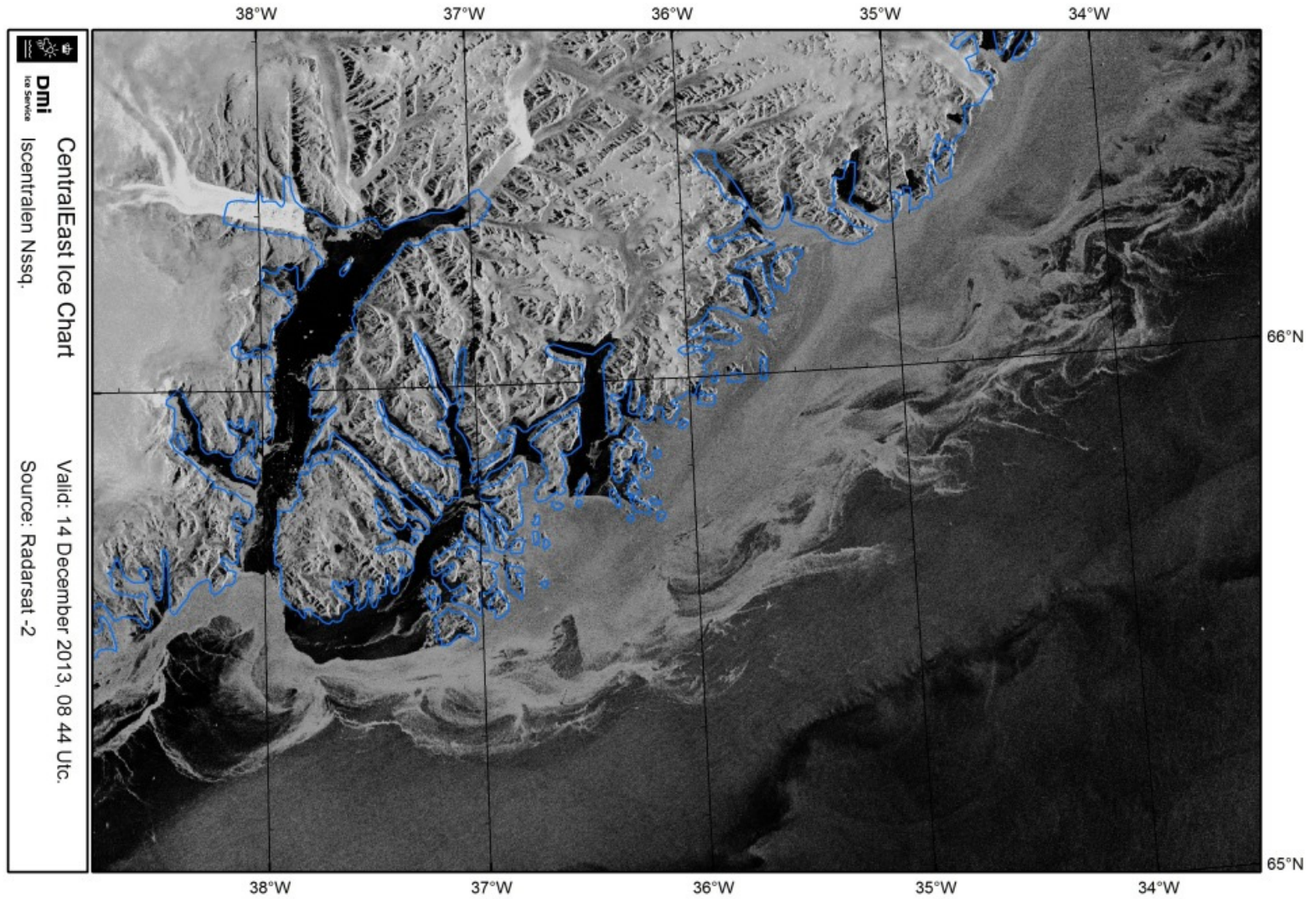
**Nordlige
Mågeløb_20150217_0945_Wide_HH**

**Note: Sejlrende i isen i det Nordlige
Mågeløb kan ses på Radarsat-2 billedet**

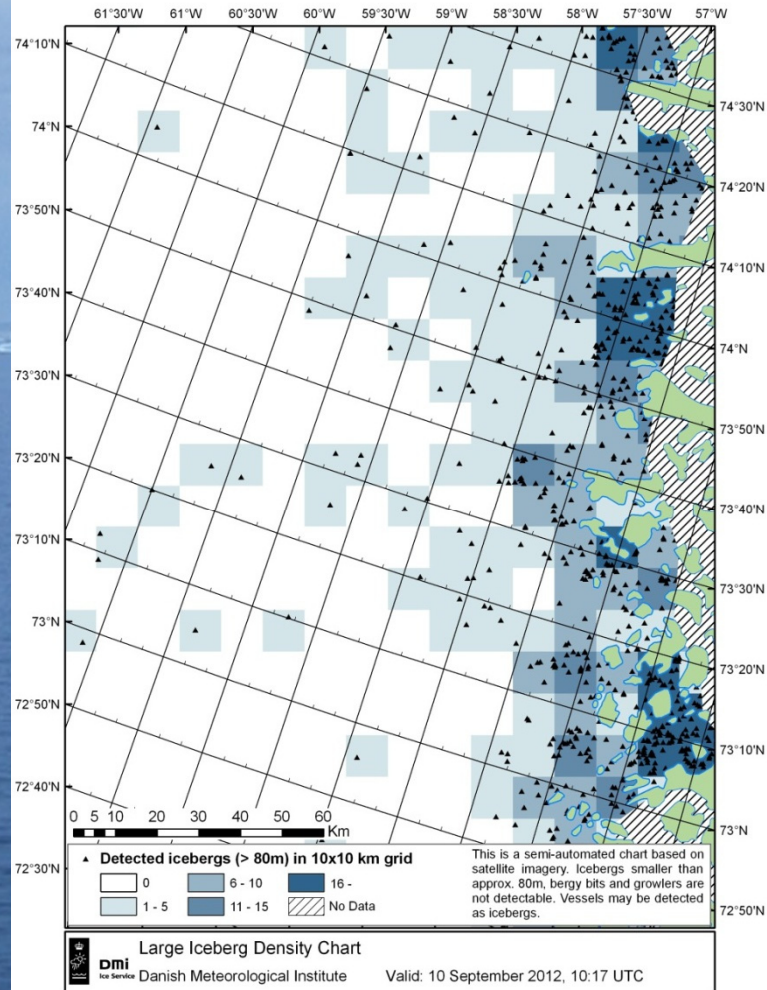
**Isrecco 16. februar 2015: 16. Nordlige
Mågeløb**



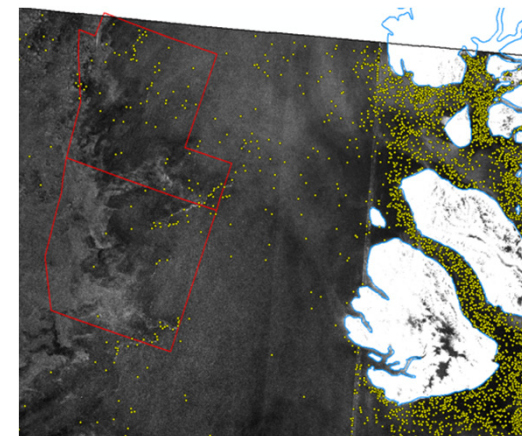
Other operational sea ice products



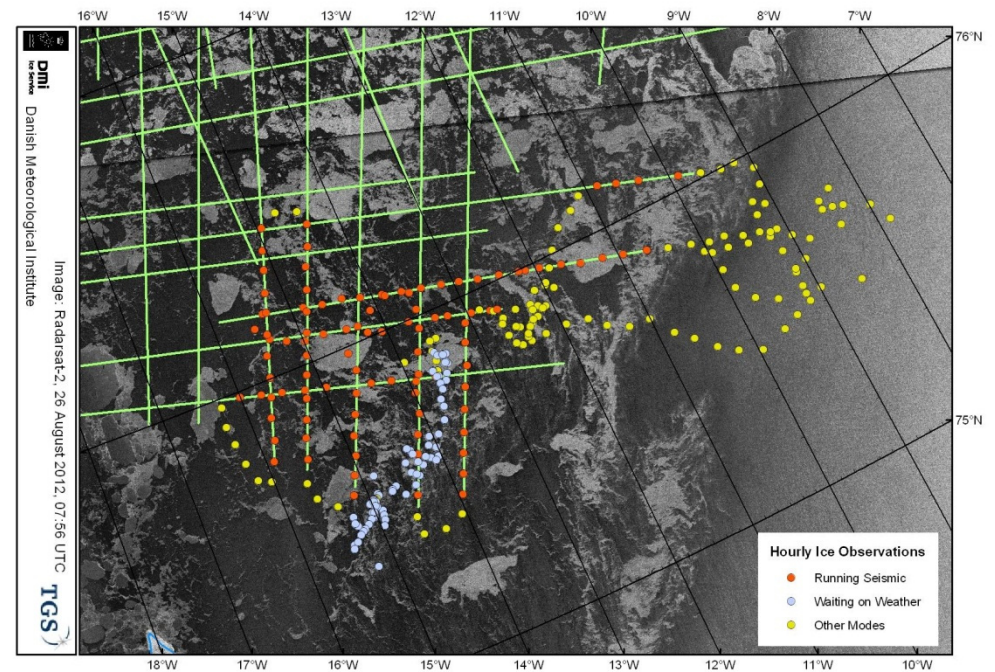
Operational iceberg density maps



Charts based on satellite images

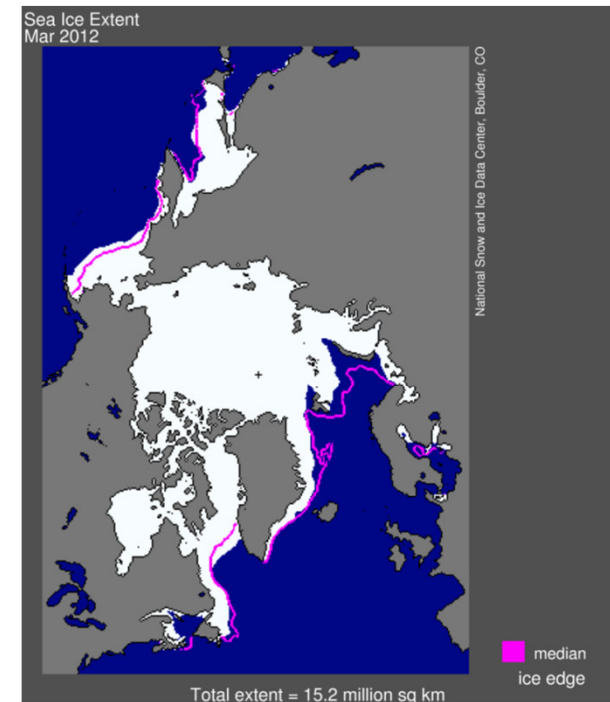
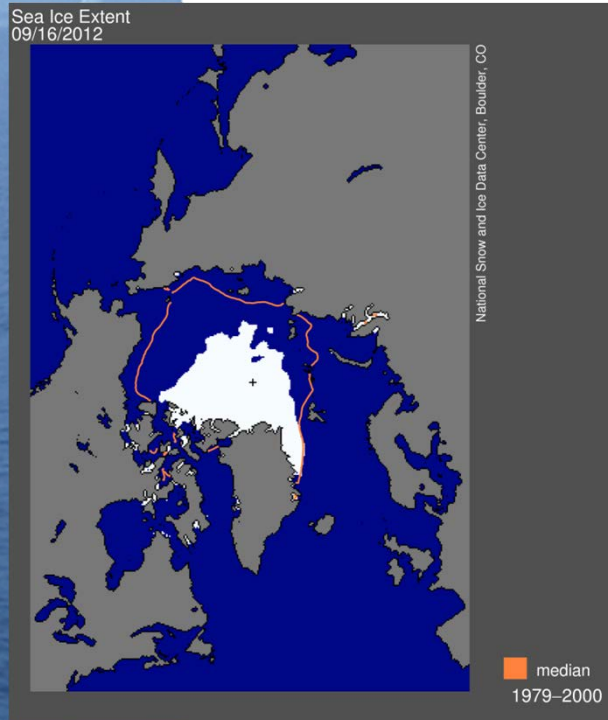
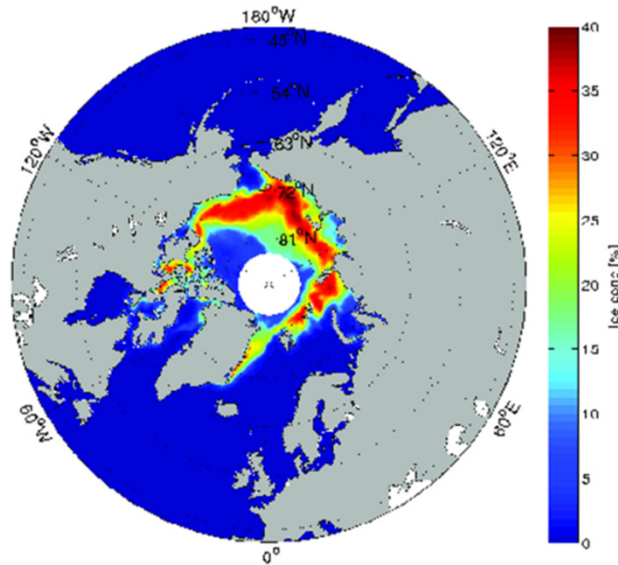
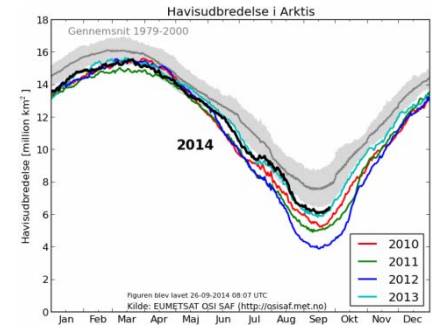
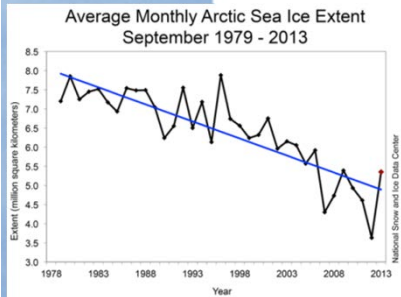


On-board ice advising

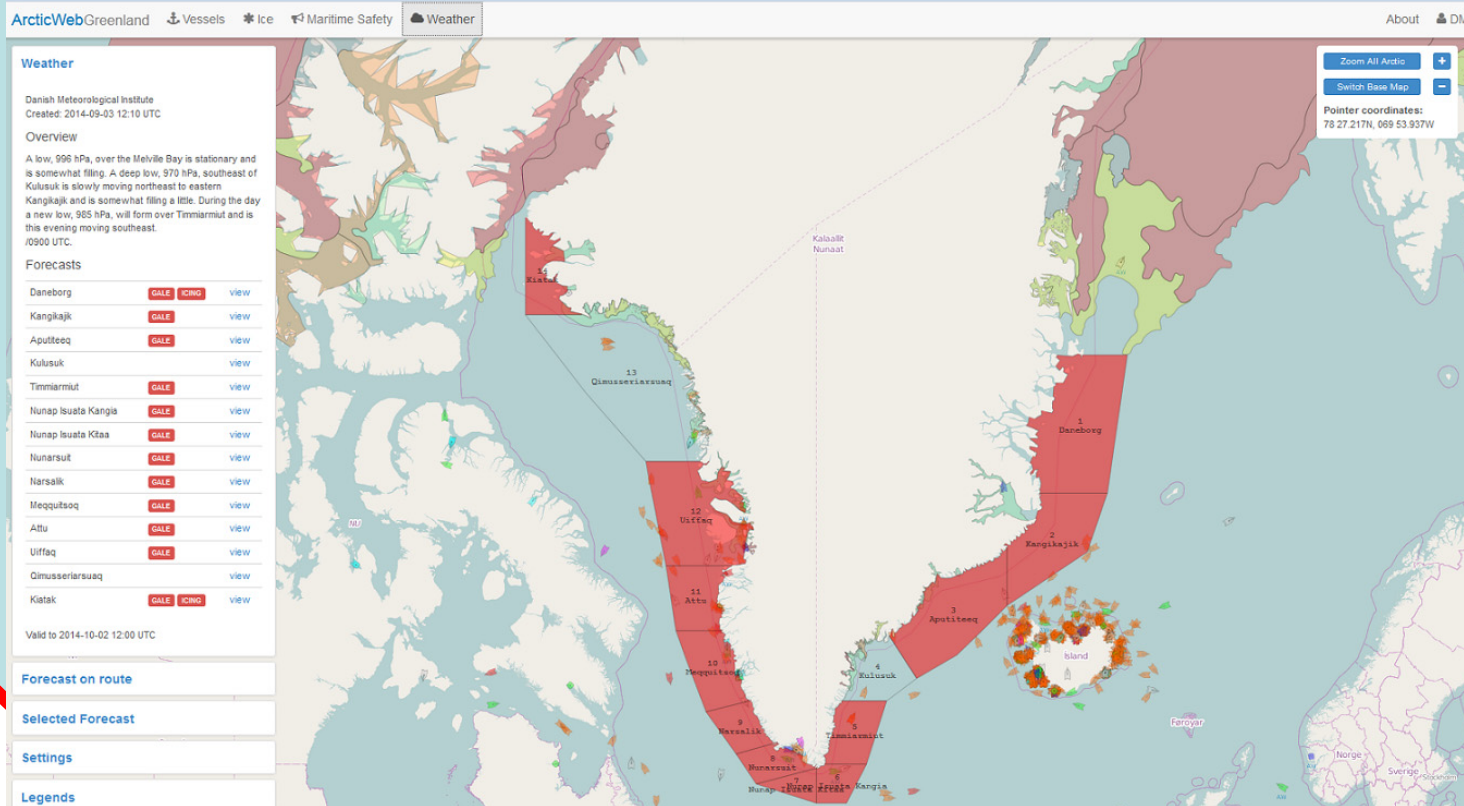


Changed conditions

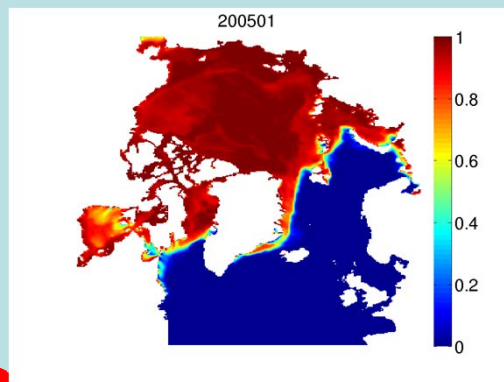
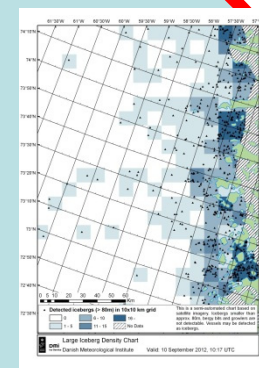
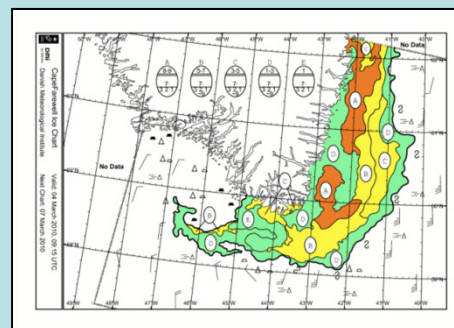
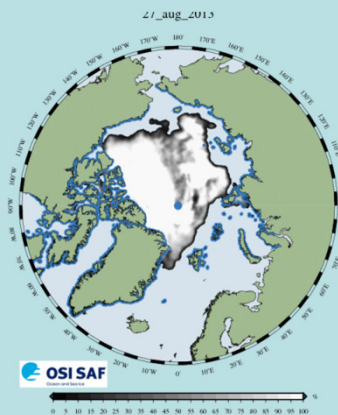
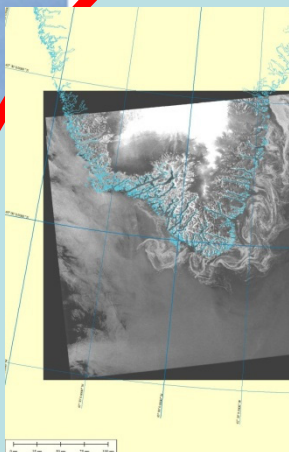
Decrease in sea ice cover



Integrated service



Integrated service





PolarView



Dmi
Centre for Ocean and Ice

Satellite Images
Satellite Images from the coasts of Greenland

[Home](#)

[Forecasts and observations](#)

[Research and development](#)

[Commerce](#)

[Contact](#)

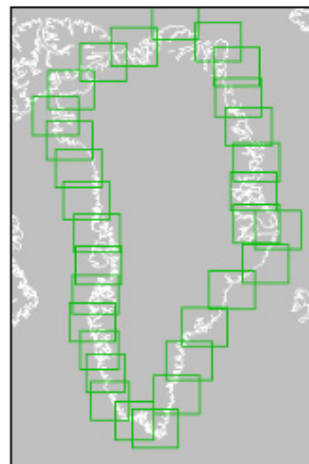
Modis Satellite Images

Modis satellite images from areas along the coasts of Greenland. The images are updated several times a day.

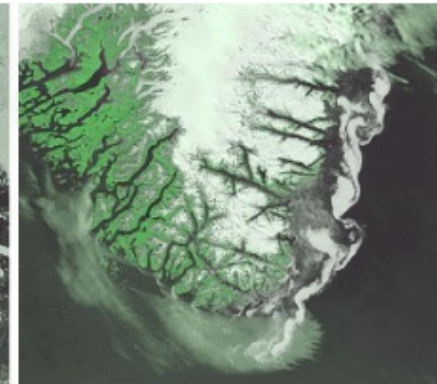
The Modis images are delivered by the the University of Dundee, Scotland (the green images) and by NASA's Goddard Space Flight Center. The NOAA images are infrared images from DMI's own receiving stations. The ASAR images are radarimages from ESA's ENVISAT satellite.



Click on the outlined fields on the map below to select the region of your choice.



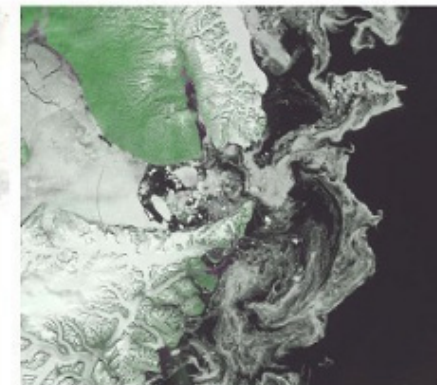
Station Nord



Kap Farvel



Disko



Ittoqqortoormiit

Distribution of satellite images as a supplement to icecharts

Ocean and sea ice modeling

Hydrodynamic modelling – Hycom-Cice

New setup at DMI:

10 km. resolution

Runs every 12 hours

6 days forecast

Data input:

Weather forecast (DMI Hirlam – ECMWF)

Ice concentration (satellite & ice charts)

SeaSurfaceTemperature (satellite)

Local data: Currents, ice conditions

Data output:

Sea ice concentration

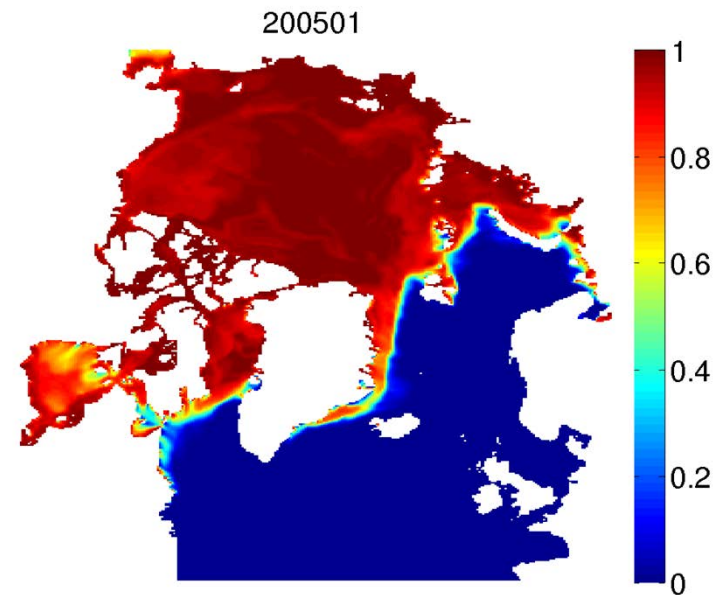
Sea ice thickness

Sea ice compression

Surface and 3D current (incl. tides)

Oil spill tracing (also offline on demand)

Monthly mean ice concentration



Sea ice statistics

Break-up and freeze-up forecasts.

Minimize your prior standby period. Optimizing your operating window.

Bring in the right ship for the right purpose. No need to bring in an icebreaker if there is no ice.

Seasonal statistics:

Statistical studies. Multiple year data.

Area specific statistics on day/week basis.

Form basis for the forecasts.

Long range strategic forecasts:

Monitoring of the development of all parameters.

Issuing a weekly forecast for 2-3 month.

General overview.

Short range tactical forecasts:

10 days tendency.

2 days specific forecast combined with model.

Week of	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
April 02	9	9+	9	9	9+	9+	9+	9	9	9	9	9+	9
April 09	9	9+	9	9	9+	9+	9+	9	9	9	9	9+	9
April 16	9+	9+	9	9	9+	9	9+	9	9	9	9	9+	9
April 23	9+	9+	9	9	9	9	9+	9	9	9	9	9+	9
April 30	9+	9+	9	9	9	9	9+	9	9	9	9	9+	9+
May 07	9+	9+	9	9	9	9+	9+	9	9	9	9	9+	9
May 14	9	9	9	9	9	9+	9+	9	9	9	9	9	9
May 21	8	9	9	9	9	9	9+	9	9	9	9	9	9
May 28	8	9	9	9+	9+	9	9+	9	9	6	9	9	9
June 04	8	9	9	9	8	9	9+	9	7	9	9	9	9
June 11	8	9	9+	9	9	9	9+	9	9	7	9	9	9
June 18	8	9	9	9	8	9	0	9	0	0	0	9	0
June 25	5	9	8	3	5	9	0	6	8	0	0	9	6
July 02	0	9+	0	0	0	9	0	0	9	0	0	9	9
July 09	0	9	2	2	0	9	0	0	0	0	0	9	9
July 16	0	6	0	0	0	9	0	0	0	0	0	5	0
July 23	0	9	0	0	0	0	0	0	0	0	0	0	0
July 30	0	5	0	0	0	0	0	0	0	0	0	0	0
Aug 06	0	0	0	0	0	0	0	0	0	0	0	0	0
Aug 13	0	0	0	0	0	0	0	0	0	0	0	0	0
Aug 20	0	0	0	0	0	0	0	0	0	0	0	0	0
Aug 27	0	0	0	0	0	0	0	0	0	0	0	0	0
Sep 03	0	0	0	0	0	0	0	0	0	0	0	0	0
Sep 10	0	0	0	0	0	0	0	0	0	0	0	0	0
Sep 17	0	0	0	0	0	0	0	0	0	0	0	0	0
Sep 24	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 01	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 08	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 15	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 22	0	0	0	0	0	0	0	0	0	8	0	9	9
Oct 29	8	8	0	0	0	7	0	0	0	8	0	9	9
Nov 05	8	9	0	6	9	7	0	0	6	9	2	9	9
Nov 12	6	6	0	9	9+	8	0	9	9	9	8	9	9
Nov 19	7	8	0	9	8	8	9	9	9	9	8	9	9
Nov 26	9	8	8	9	9	9	9	9	9	9	9	9	9
Dec 03	9	9+	8	9	9	9+	9	9	9	9	7	9	9
Dec 10	9	8	9+	8	9	7	9	9	9	9	9	9	9
Dec 17	9	8	9+	9	9	8	9	9	9	9	9	9	9
Dec 24	9	9+	9+	9+	9	9+	9	9+	9	9	9	9	9