

Hydrographic National Report of Denmark

March 2009

1. Hydrographic Office

The present report outlines and summaries the activities carried out in 2008 by The Danish Maritime Safety Administration, and The National Survey and Cadastre.

The Danish, Faroese and Greenlandic hydrographic obligations are managed by two governmental organisations:

- Farvandsvæsenet (FRV), the Danish Maritime Safety Administration (DaMSA)
- Kort & Matrikelstyrelsen (KMS), the National Survey and Cadastre, Hydrographic Office.

The Danish Maritime Safety Administration is responsible for e.g. hydrographic surveying, issuing of Notices to Mariners, List of Lights and Tide Tables.

Hydrographic Office in the National Survey and Cadastre is responsible for e.g. technical support for delimitating the maritime boundary of the Danish waters, charting, issuing of Chart Corrections and related nautical publications such as INT 1 and Pilots (sailing directions).

In both organisations there have been some changes with regard to organisation and staff.

Royal Danish Administration of Navigation and Hydrography (RDANH) has changed name to Danish Maritime Safety Administration (DAMSA) since 1st of April 2008. The Oceanographic Department has changed name to Department for Hydrography and Maritime Data (HMD).

During 2008, there has been a minor reorganization in KMS. The Hydrographic Office now has the responsibility for the sale and marketing of the nautical products, and also has the responsibility for coordinating all KMS' activities in the Faeroe Islands and Greenland.

2. Surveys

Coverage of new surveys

The hydrographic surveys are conducted by DaMSA and mainly carried out by the Royal Danish Navy but also by some private survey companies.

The Danish hydrographic survey operations have been carried out in the following areas:

1. Danish waters inside the Skaw.
2. The west coast of Greenland.
3. North and East of Greenland in connection with United Nations Convention on the Law of the Sea (UNCLOS) surveys.

Danish waters:

The hydrographic surveys inside the Skaw are re-surveys carried out in accordance with the HELCOM Copenhagen Declaration adopted on 10 September 2001 by the HELCOM Extraordinary Ministerial Meeting.

In accordance with the Declaration a coordinated survey plan has been made for the Baltic. Therefore, the main survey effort has been placed on the primary shipping routes through the Danish waters and entrances to major ports. The routes will be re-surveyed to meet the standards of "Special Order" or "Order 1" as set in the International Hydrographic Organization "Special Publication No 44".

The surveys in 2008 have been carried out as outlined in figure 1. (Purple areas)

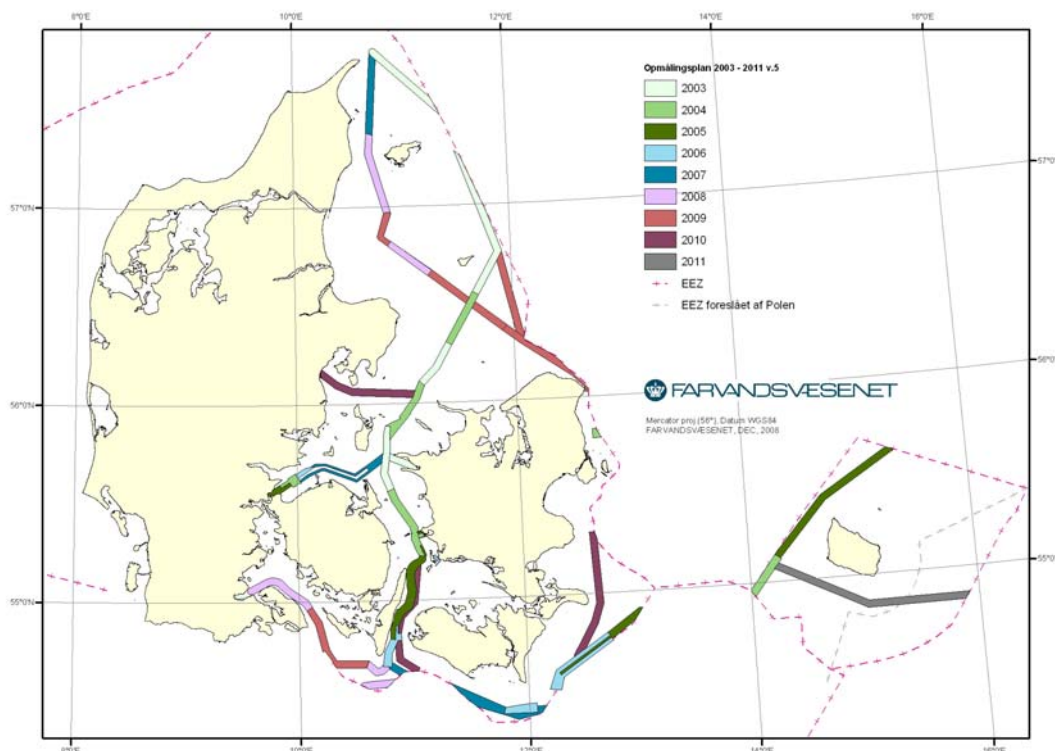


Figure 1. Survey plan 2003-2011

All surveys were carried out with multibeam echo sounder systems.

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Denmark is in the process of optimizing the shipping routes, based on AIS and statistical data. The new optimized routes will be submitted to IMO and HELCOM resurvey monitoring group. The Surveys in 2009 will be a continuation of the revised coordinated re-survey plan for the Baltic area.

Greenland waters:

The surveys on the West Coast of Greenland were carried out in the archipelago in unsurveyed waters in order to allow safe access to major ports and to locate sheltered coastal fairways.

All surveys were carried out with multibeam echo sounder systems.

The plan for the surveys in the Greenland waters in 2008 is a continuation of the re-surveying program of the entrances to the main ports and inshore routes between ports in Greenland. Some near shore areas have been surveyed for the safety of cruise ships operating on the west coast.

New ships

I/F Jens Sørensen, MSF MK1 BIRKHOLM and MSF MK1 FYRHOLM have operated in Danish waters in 2008. All the ships are equipped with modern multi beam survey instruments. I/F Jens Sørensen replaced HDMS GRIBBEN in 2008. The result for I/F Jens Sørensen in 2008 has exceeded the expectations.

DaMSA ship I/F Jens Sørensen surveyed in 2008 in Danish waters.



Problems encountered:

There have been minor problems with the implementation of the new survey fleet. Most have been solved during 2008.

3. New charts & updates

Charts (paper as well as ENC) covering the Danish, Faroese and Greenlandic waters are produced and updated by KMS.

ENC

The Danish waters have been covered with ENCs in various navigational bands since June 2000.

In The Greenlandic waters KMS has a major task in producing ENCs. During 2008 KMS produced 3 ENCs. In 2009 KMS intends to produce 12 ENCs covering a part of the Greenlandic waters.

The Faroese waters are not yet covered by ENCs. In 2009 KMS intends to produce 3 ENCs covering a part of the Faroese waters.

All the ENCs are updated on a weekly basis.

ENC Distribution method

All the Danish produced ENCs and updates are distributed through a network of Primar authorized distributors.

INT charts

4 new editions and 3 updated reprints have been published.

National paper charts

The chart portfolio of the Danish waters comprises 63 charts all produced according to international standards.

The chart index showing the Danish waters is available on this internet site:
<http://www.danskehavnelods.dk/indexkort/danskesoekort.html>

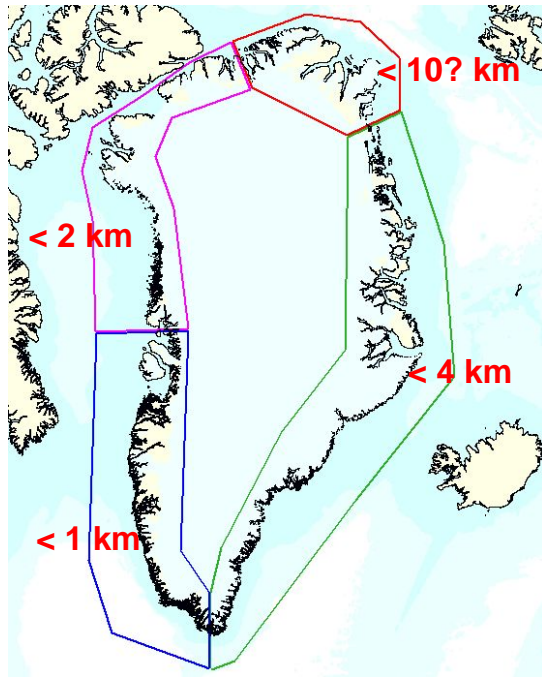
The chart index showing the Greenlandic waters is available on this internet site:
http://www.danskehavnelods.dk/indexkort_gronland/gronlandskesoekort.html

Since the last report was given, KMS has published 16 new editions and 2 updated reprints.

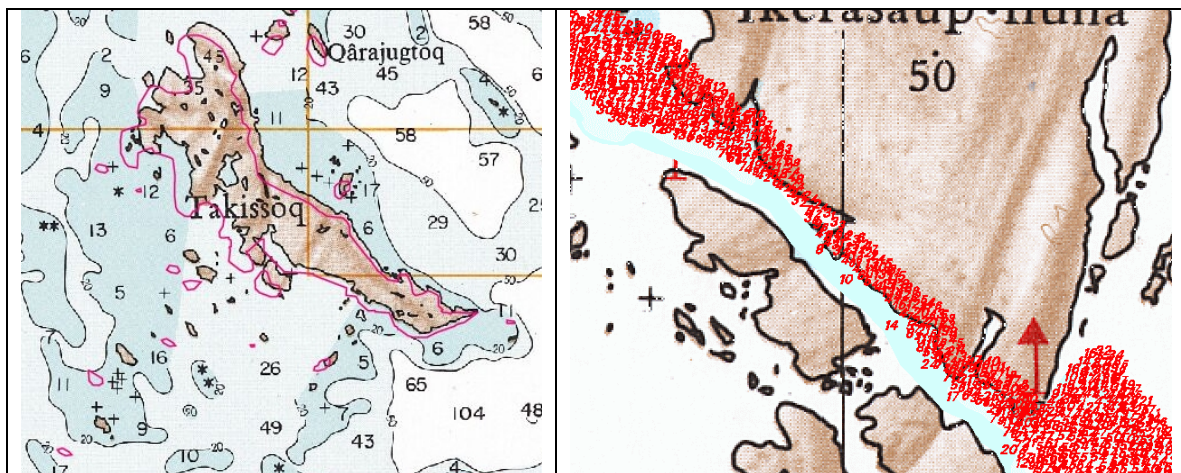
Geometric rectification of the Greenlandic charts

Only a very small number of the Greenlandic charts are produced in accordance with internationally agreed standards. The majority of the charts do not have an accuracy that allows for the use of GPS positioning, when sailing inshore or close to the islands.

The geometrical accuracy of the Greenlandic charts is varying and the errors are some places of a rather large extension up to 10 km. The errors are only partly systematic; they are very locally.



The above map of Greenland shows the variation of the geometrical accuracy in kilometre.



The left map illustrates an example of the difference between the coast line from V-map (a worldwide military map in 1:250.000) and chart 1212 (1:80.000). The right map shows a small section of the same chart and newly measured multi-beam data from DaMSA.

KMS has contracted with a Danish company, who helps KMS in the rectification process.

Aerial photos from 1980s in the scale of 1:150.000 have been used for a photo-grammetric measuring of the coastline, lakes, rivers and glaciers, 25 meter height contour lines and a 100 metre Digital Height Model (DHM) grid. Orthophotos have been made from the same aerial photos.

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The existing charts have been used for vectorising the depth contour, soundings, geographical names, rocks and the coastline.

The orthophoto has been used as reference in order to establish transformation points between the photogrammetric measured coastline and the chart, for the geometric rectification.

The photogrammetric objects and the vectorised objects have been merged together, and compiled to end up as new charts. The old charts are from the 1950ties and 1960ties, and in the newly compiled charts the symbolisation and colour have been changed to fulfil the international standards. The datum has also been changed from Qornoq 1927 to WGS1984.

The geometric rectification will be spot checked with newly measured multibeam data from DaMSA, supplied with on point measurement of the coastline from The Defence Command Greenland, The Greenland Police and The Geological Survey of Denmark and Greenland (GEUS).

The chosen method will be used for 65 Greenlandic charts covering the South western part of Greenland.

3 charts based solely on vector data were rectified and published 2008. 4 more charts are planned to be rectified and published in 2009.

4. New publications & updates

New publications

In 2008 KMS published important information on KMS' homepage in Danish only for mariners navigating the Greenlandic waters:

http://www.kms.dk/Soekortnavigation/Gronlandske_farvande/

A new edition of Den grønlandske Lods II (The Greenlandic Pilot) covering the east coast has been published in 2008. The publication is in Danish only.

Publications

The internet based publications:

Kort 1/INT 1 (bilingual)

Søkortrettelser/Chart Corrections (bilingual)

Bag om søkortet (in Danish) / Behind the nautical chart (in English)

Den danske Lods, generelle oplysninger (in Danish)

Den danske havnelods (in Danish)

The printed publications:

Kort 1/INT 1 (bilingual)

Søkortrettelser/Chart Corrections (bilingual)

Den grønlandske Lods I (in Danish)

Den grønlandske Lods II (in Danish)

Den grønlandske Havnelods (in Danish)

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Den færøske Lods (in Danish)
Havneoplysninger for Færøerne (in Danish)

5. Maritime Safety Information (MSI)

Information to mariners and oceanographic forecasts is available on:
<http://www.frv.dk/en/ifm/index.htm>

6. S-55

Status of hydrographic surveying and nautical charting worldwide

State of surveys updated March 2009

Area	A1	A2	B1	B2	C1	C2	Comment
Denmark south	95	100	5	0	0	0	Contributes to the HELCOM harmonised re-survey programme.
Denmark Faeroes	100	100	0	0	0	0	Revision of ports and resurveys are ongoing
Denmark Greenland	25	20	25	10	50	70	The coastline of Greenland is very complex and the total sea area of the EEZ is ca. 2.000.000 square kilometres. Due to permanent ice cover, the limit for navigable waters has been set to 75 degrees northern latitude. Thus the percentages are rough approximations. The East coast is sparsely populated and only surveyed near populated areas. A prioritised programme is in force to resurvey navigable routes to and between populated areas on the west coast of Greenland, to modern standards.

7. Capacity Building

Denmark has not been active in the area of Capacity Building during the period.

8. Oceanographic activities

Tide gauge network

DaMSA maintains 9 water level stations spread across Denmark. The data are used in several ways, primarily for navigation safety, but the data are also an integral part of the national storm surge monitoring and prediction system. The data are transferred by telephone from each site to the oceanographic database every ten minutes. DaMSA has not encountered serious problems with the new system.

In addition, DaMSA has in the past measured water levels in Greenland from 1990 until 2004 for the purpose of obtaining sufficient data to enable the prediction of tide levels for the coming many years. DaMSA also maintains three sta-

tions measuring temperature, salinity and currents within the water column. These three stations are located at Drogden and at two sites in Storebælt (the Great Belt). These data are also transferred to the database every 30 minutes. Online observations and forecasts are available in English on:
<http://www.frv.dk/en/ifm/index.htm>

The United Nations Convention on the Law of the Sea (UNCLOS)

Both DaMSA and KMS are actively involved in the work for UNCLOS in the waters around Greenland and the Faroe Islands.

DaMSA is responsible for the data quality assessment on existing bathymetric data and planning and technical specifications for new surveys. In 2009 DaMSA will conduct bathymetric work during an expedition to the east coast of Greenland. DaMSA is also conducting soundings through the ice cap north of Greenland in cooperation with Canada.

9. Other activities

Participation in IHO Working Groups

DaMSA is participating in the Nordic Data Quality sub Working Group (NDQsubWG)

KMS is actively involved in the work done by MSDIWG, CSPCWG, SNPWG, EUWG, TSMAD and HSSC.

New technologies and/or equipment

The Hydrographic Office in KMS is preparing an EU-tender for a new hydrographic production system.

The Hydrographic Office in KMS is implementing Lean in the Hydrographic Office.

From 1st February 2009 the distribution of the KMS' nautical charts and publications is handled by the company:

Iver C. Weilbach & Co. A/S,
Toldbodgade 35, DK-1253 København K,
E-mail nautical@weilbach.dk, www.weilbach.dk.

International

Bilateral cooperation between Denmark and Germany on survey of the Kade-trende has been completed in 2008.

KMS has together with the Hydrographic Offices in Norway, Sweden and Finland signed almost identical, but though individual contracts regarding new bilateral arrangements with the United Kingdom Hydrographic Office.

KMS has started the project "Bringing Land and Sea Together" (BLAST). The BLAST project is a co-operation between the countries around the North Sea. BLAST is applying for the EU Interreg programme for the North Sea. The main theme for the project is integrated coastal zone management and it consists of five work packages:

- Developing the marine and coastal reference base

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- Harmonisation of maritime information
- Regional monitoring, information, integration and distribution functionality
- Climate change and integrated coastal zone management
- Dissemination

The project is planned to start in the 2. half of 2009 and will end by the end of 2012.

DaMSA and KMS are both actively taken part in the work done by the IMO Correspondence Group on e-Navigation, the IALA e-Navigation Committee, and the HELCOM Monitoring Working Group.

Websites

Farvandsvæsenet, the Danish Maritime Safety Administration (DaMSA):
<http://www.frv.dk/en/index.php>

Kort & Matrikelstyrelsen, the National Survey and Cadastre (KMS):
<http://www.kms.dk/English/>

Søfartsstyrelsen, the Danish Maritime Authority (DMA):
<http://www.dma.dk/>