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)

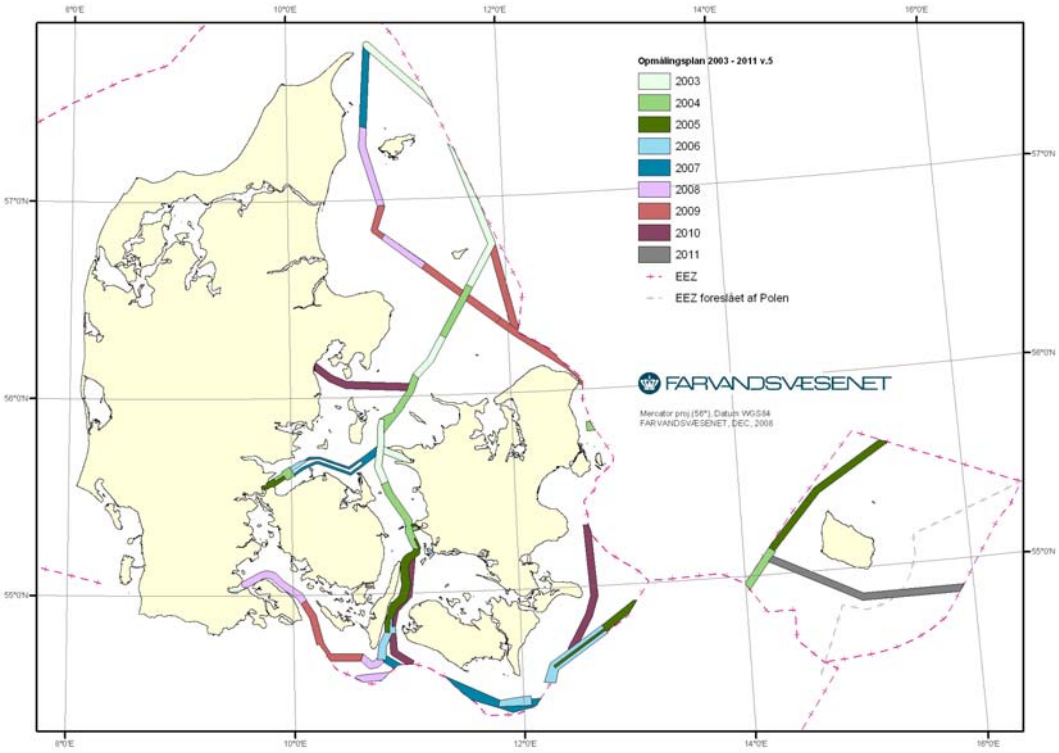


Figure 1. Survey plan 2003-2011

All surveys were carried out with multibeam echo sounder systems.

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 ENCs) 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.

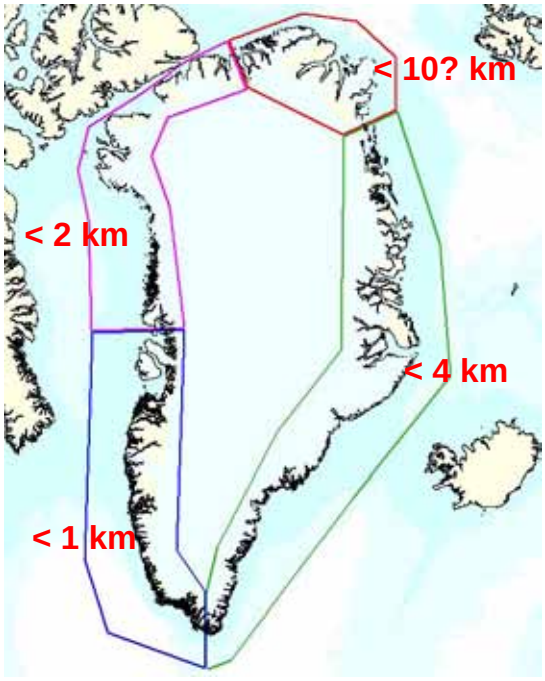
The chart index showing the Danish waters is available on this internet site:
http://www.danskehavnelods.dk/indexkort/danskesoekort.html

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

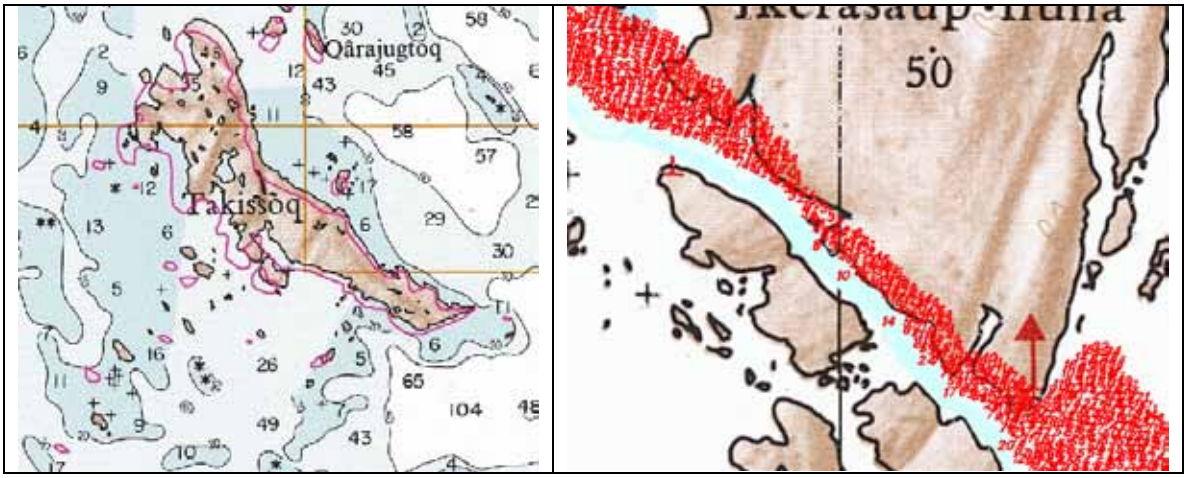
Since the last report was given, KMS has published 16 new editions and 2 updated reprints.

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. Orthopho-tos have been made from the same aerial photos.

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/Soekortognavigation/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)

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 Kadetrende 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

- 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/

National Report of Finland

[7 April 2009]

Executive Summary

This Report gives an overview of the main activities of the Finnish Hydrographic Office since the last NHC 52th Meeting. The main issues are:

- Traffic administrations will be re-organised in Finland by 1st January in 2010.
- There are also plans for de-centralising some of the offices.
- Hydrographic surveys will be moved to a state owned company by 1st January 2010.
- The Hydrographic Office has participated actively on the IHO and PRIMAR work.

1. Hydrographic Department

Administrative and Organisational Status

The FMA internal production including hydrographic surveys and fairway maintenance will be moved to a state owned company in 2010.

The printing and distribution agreement for paper charts has been renewed (with a Print on Demand option) in 2008 with J*ohn Nurminen Marine Ltd* (previous *Troil Marine Ltd*).

Hydrographic Department:

- The Director and Staff (5)
- Hydrographic Surveys Division (4)
- Charts Division (29)
- Hydrographic Information Division (24)

Internal Production Services includes

- **Survey Production Division** (12 + 26 survey officers on board vessels). In addition 40 + 42 persons were contracted from VG Shipping Oy.

The annual budget of all these units is roughly 10 - 12 Million €.

Fig. 1. ***The organisation of Finish Maritime Administration in 2009.***

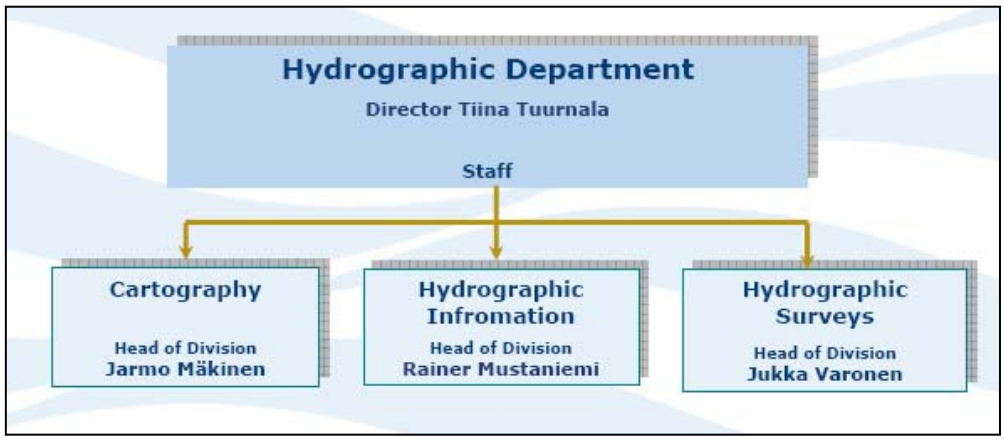


Fig. 2. ***The organisation of Hydrographic Department in 2009.***

Future organisational plans

The Finnish Government has decided that the current road, railway and maritime administrations in Finland will be reorganised by 1st January 2010. The draft Government proposal calls for acts to be adopted on *Transport Infrastructure Agency* and a new *Transport Safety Agency*. The draft proposal is also linked with another Government proposal for amending about 60 acts.

Under that proposal, the Finnish Rail Administration, the Finnish Road Administration's central administrative functions as well as the Finnish Maritime Administration's functions which are not being transferred to the Transport Safety Agency or to the undertaking to be set up with

responsibility for internal production would be merged into the Transport Infrastructure Agency.

The Transport Infrastructure Agency would also be responsible for transport guidance for the Regional Centres for Transport Services, Environment and Industry. Correspondingly, the Finnish Maritime Administration's maritime safety function, official vessel traffic management and pilotage duties and vessel register maintenance, the Finnish Civil Aviation Authority, the Finnish Rail Agency and the Finnish Vehicle Administration would be merged into the Transport Safety Agency.

The Transport Infrastructure Agency will include Road, Railway and Maritime Departments. The Maritime unit includes Hydrographic, Maritime Traffic and Fairway Divisions.

The new main offices will be located on Helsinki area, but there are evaluations going on for de-centralising some 200 - 400 persons. Decisions are expected during 2009.

Strategic Plans

The Hydrographic Programme was updated for years 2008 - 2018.

The implementation of the **Navi Programme** is going on almost as planned. Insufficient resources have slowed down some activities.

The Process Management System (including **Quality Management and Environmental Program**): is operational. The focus in 2008 was to make sure that the Process Management System is in use in all core and support processes and operation is evaluated and improved by the owners of processes regularly. Implementing performance indicators is currently going on.

2. Hydrographic surveys

Survey results in total in 2008 (own production): included 330 km^2 single beam echo soundings and 2000 km^2 surveyed with multi-beam method.

The operational costs for hydrographic surveys were 7 million €
(Hydrographic Surveys Division in Helsinki included).

Survey vessels of FMA Hydrographic Department

Vessel	Type / length	Multi-beam launch	Other survey launches	Crew during season	Operation area
Saaristo	Depot ship / 43 m	M640 M620	3	33	*Coast of Finland*
Sesta	Depot ship / 19 m	-	3	9	Lake *Saimaa*
Airisto	Survey ship/ 28 m	MBES: Reson SB7125		12	Gulf of Finland, Northern Baltic
Suunta	Survey ship/ 36 m	MBES: *SeaBat* 8111		14	Coast & open sea
Kaiku	Survey ship/ 22 m	MBES: *SeaBat* 8101, also a small launch with SBES		5	Lake *Saimaa*

The two multibeam launches of depot ship **Saaristo** are similar 15 m type launches equipped with *SeaBat* 8101 multibeam. S/v **Kaiku**, continued her effective work on the shallower fairways of the *Lake Saimaa*.

The geodetic survey team belongs to **Saaristo**, but works independently on all areas of Finland. The main tasks of the team (9 persons) is the survey of control points for the new EUREF-FIN coordinate frame and the survey of fixed aids for navigation.

S/v **Airisto** modernization project with Reson SB7125 dual frequency MBES system was completed and production started in June 2008.

The continuation of the re-survey of all sea fairway areas is the main objective of surveys (Navi Programme). This task is enlarged now to the surveys of open sea lanes (HELCOM survey plan). General surveys for chart renewals were continued by depot ship **Saaristo** and her launches in eastern part of Gulf of Finland. On inland lakes, the depot ship **Sesta** with her launches, and s/v **Kaiku** also, continued the project for renewing the charts of north-eastern *Saimaa* (*Oravi – Joensuu* area).

The BSHC/HELCOM Coordinated Hydrographic Re-Survey Plan has been updated with the survey results of the season.

Fig 3. ***Status of modern hydrographic survey data at end of 2007.***
Dark Blue: Multibeam
Light blue: Single beam

Fig 4. ***Status of processing of modern hydrographic survey data at end of 2007.***
Blue: Processed
Grey: Not processed

Hydrographic data processing and management

Survey data validation and quality checking against surrounding data as well as registration into bathymetric databases takes place in the FHO in Helsinki. The soundings are stored as original soundings in the Sounding Database System (*SYRE*). At the end of the year 2008 SYRE did contain about 22 billion soundings covering ~24.000 square km coastal waters and inland lakes. Geographic information of controlled areas and metadata of all survey projects are stored and maintained in the Controlled Area Database System (*VARE*). Data processing systems and databases are developed further and maintained by the FMA.

The FMA has one centralised hydrographic information management system integrated with both the ENC and printed chart production lines. The data management system (*KATISKA*), based on *Oracle10/ArcSDE9* and *ArcMap9* include databases and tools for processing and maintaining hydrographic data and export functions for ENC production. Some additional tools for data processing are developed further, for example tool for creating certain CATCOG areas automatically.

Printed charts are produced using the *nSector* system via automated update management interface. The goal is to produce both digital and paper products from a single source and so to avoid discrepancies between the different products.

All incoming correcting data is updated on-line to hydrographic database. At year 2008 FMA started the project to develop management of updates. The goal of this project is to handle chart updates in controlled and efficient way through the whole hydrographic process.

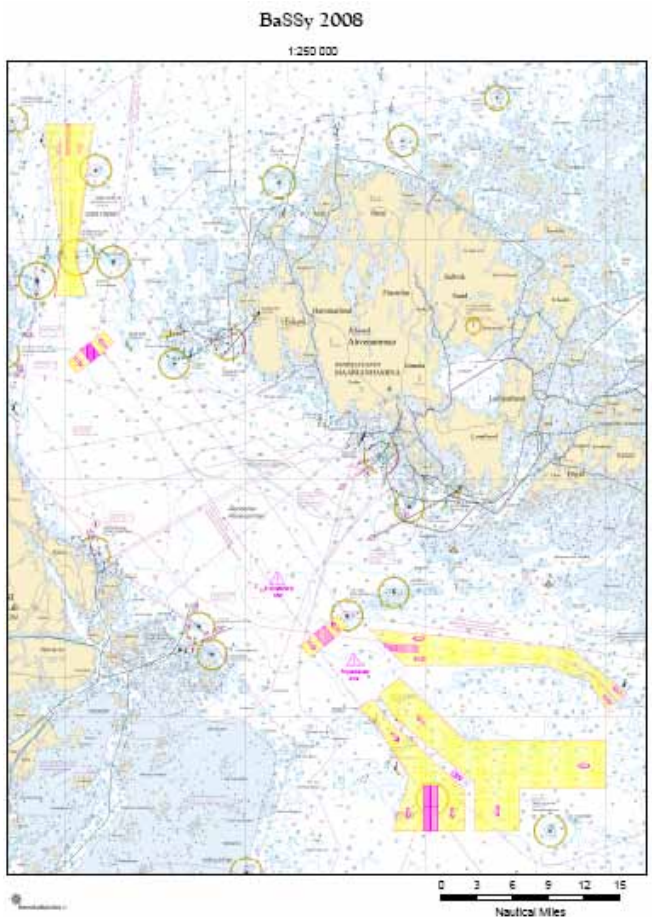


Fig 5. ***Proposed new TSS on South-West to Archipelago Sea***

3. Nautical Charts

Cartography

The chart modernisation from traditional Finnish nautical charts into as INT charts was continued, but somewhat slowly than planned. So far all coastal charts, all existing harbour charts (except one), 6 general charts and about 65% of the yachting charts series have been renewed. The revision of the whole chart portfolio will be completed by the end of 2009 for charts of sea areas and for inland SOLAS traffic charts in 2010.

During 2007 the Nordic Working Group on Paper Chart Harmonization developed overall recommendations to improve the method of updating the chart information of neighbouring countries areas and to harmonize the charts according to IHO's publication M-4 Chart Specifications of the IHO and Regulations of the IHO for International (INT) Charts. FMA has implemented the terms *New Chart, New Edition* and *Reprint* from September 1st 2008. Other issues listed in the final report of Nordic Working Group on Harmonizing Paper Chart Regimes are still under consideration.

There are 97 nautical charts and 17 chart series for small crafts. Each includes from 15 to 25 charts) for public sale on both sea areas around Finnish coast and on main inland lakes. The amounts of sold copies were in 2008 about 9.500 charts and 17.000 chart series.

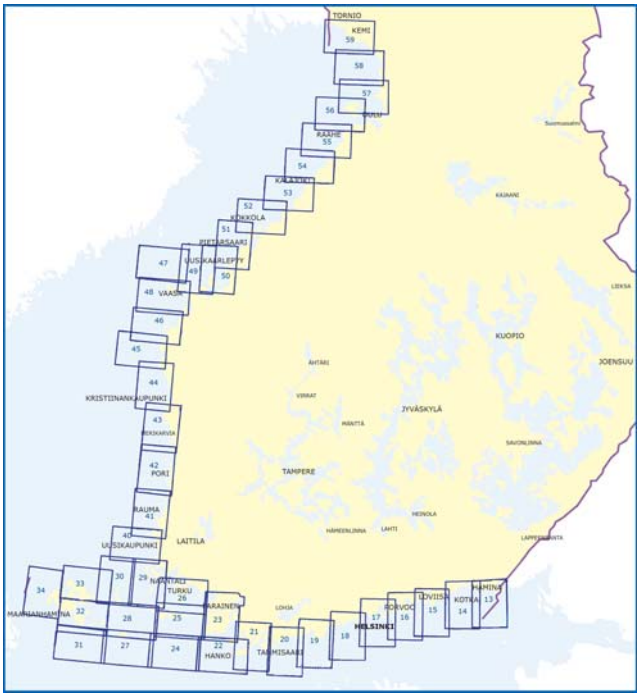


Fig 6. ***Renewed Finnish coastal charts***

ENC production and distribution

Currently there are 150 Finnish ENC cells on the market. These cells cover main fairways in Gulf of Finland, Archipelago Sea and Gulf of Bothnia. Target for adequate ENC coverage in navigational purpose approach is mid 2010.

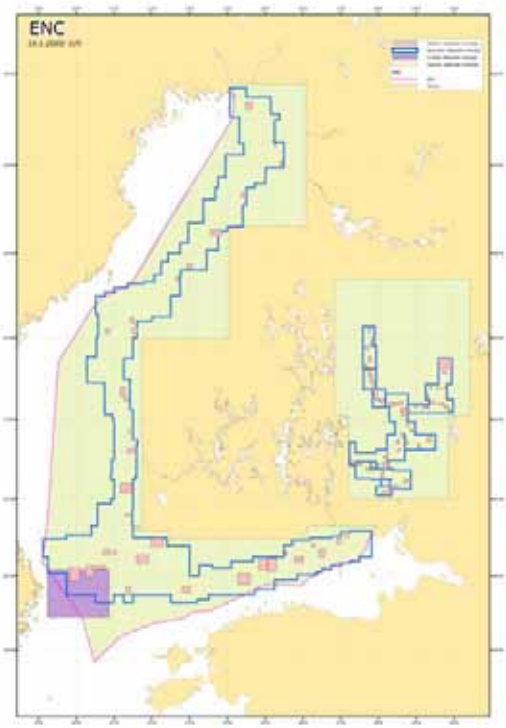


Fig 7. ***Target coverage for Finnish ENC data.***

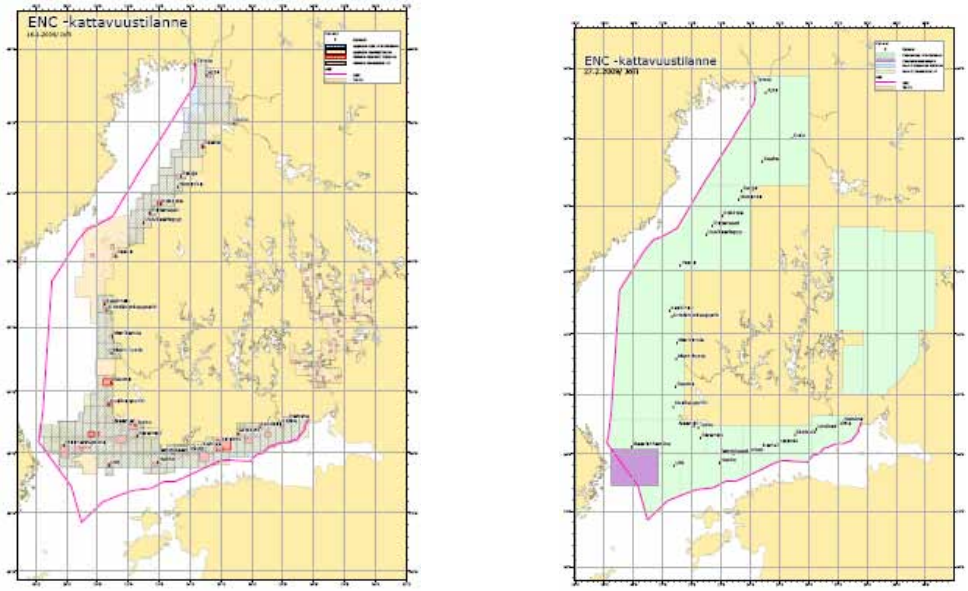


Fig 7b. ***Current ENC coverage for approach and harbour and for general usage bands (end March 2009)***

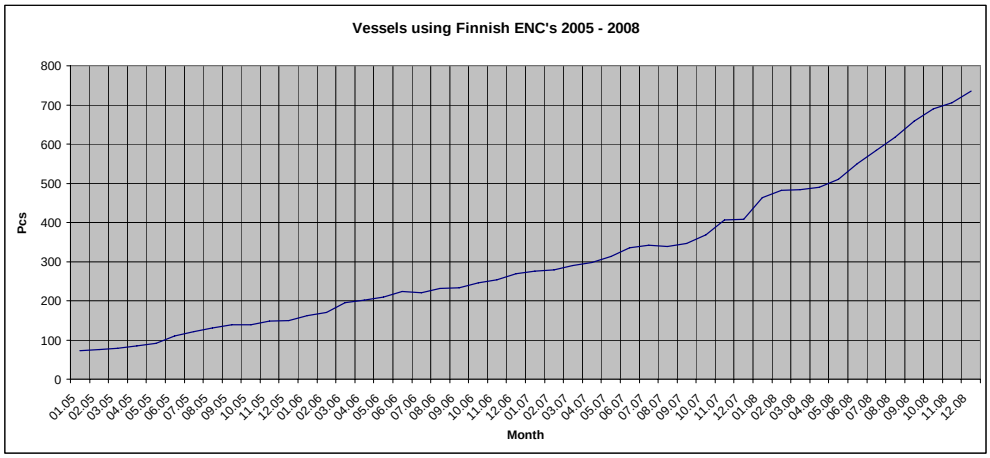


Fig 8. ***The number of ships using Finnish ENCs in 2005 - 2008.***

ENC base cells are produced using tailor-made KATISKA software. ENC updates are produced using both KATISKA and *SevenC*'s tools (*ENC Manager* and *ENC Designer)*. Tools for validation of ENCs are *dKart Inspector* from *Jeppesen* and *ENC Analyzer* made by *SevenC*'s.

The distribution of the ENCs is done via *PRIMAR*. The FHO has used the VPN service as a main data transfer tool. Also other services and tools (VRC, S57 Advisor, discussion group etc.) provided by *PRIMAR* are used. The experiences of services have been very positive.

Currently there are about 250 customers and about 870 vessels using Finnish ENCs. The total number of active subscriptions is approximately 34000.

4. Nautical publications 2008

Notices to Mariners are published every tenth day and are available also on the Internet. ENC charts are updated once a week based on the NtM material. Notices to Yachtsmen, which are compiled on the basis of the NtM, are published five times a year. Notices to Mariners have been published also in English language since June 2008.

The next edition of the List of Lights on the Finnish Coast will be published in Autumn 2009. General information is given in Finnish, Swedish and English, but the actual list of lights is only in Finnish and Swedish. The database will be updated continuously. The coordinates of all lights are given both in the Finnish national and WGS-84 (EUREF-FIN) coordinate systems. The book contains a complete list of lights and general information about the piloting, DGPS and rescue services.

A latest edition of the Catalogue of Finnish Nautical Charts was published in April 2005. The new sales Catalogue of Finnish Nautical Charts was published in February 2009**.**

A new edition of Chart 1 will be published in 2009.

5. MSI

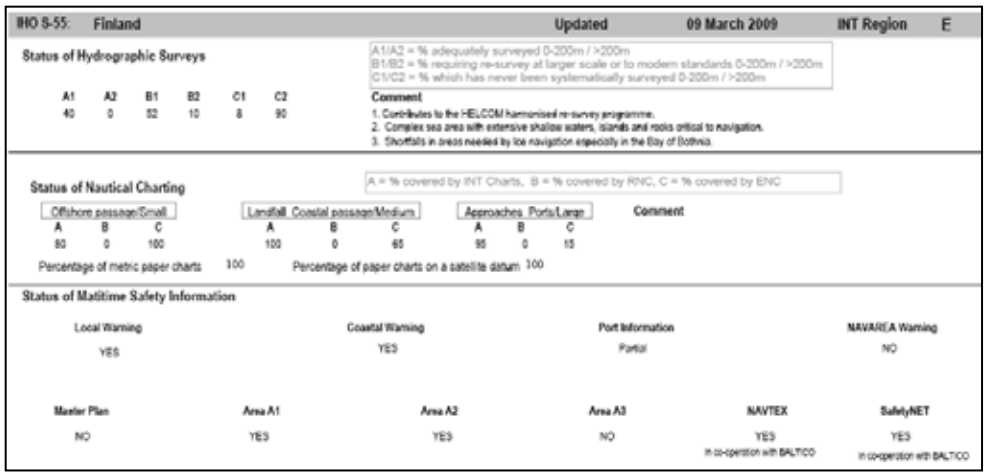
Navigational Warnings. The FHO (Helsinki Co-ordinator), *Turku Radio* and the designated persons in the Maritime Districts maintain an up-to-date file for navigational warnings. *Turku Radio* (24h service) is sending the Finnish navigational warnings based on this. Navtex warnings will be sent to *Baltico* in Sweden and transmitted by Stockholm Radio.

The system is supervised and co-ordinated by The Hydrographer and Helsinki Co-ordinator, whereby the Finnish navigational warning practice constitutes a part of the international navigational warning system.

From 1st January 2010 there will be technical changes in the Finnish MSI network. This will cause some changes in the Finnish Coastal and Local warning practices. These changes will be arranged in co-operation with Baltico and informed in the Notices to Mariners.

6. S-55

The S-55 database has been updated March 2009 (only minor changes).



IHO S-55: Finland — Updated: 09 March 2009 — INT Region: E

Status of Hydrographic Surveys

A1/A2 = % adequately surveyed 0-200m / >200m
B1/B2 = % requiring re-survey at larger scale or to modern standards 0-200m / >200m
C1/C2 = % which has never been systematically surveyed 0-200m / >200m

A1	A2	B1	B2	C1	C2
40	0	52	10	8	90

Comment
1. Contributes to the HELCOM harmonised re-survey programme.
2. Complex sea area with extensive shallow waters, islands and rocks critical to navigation.
3. Shortfalls in areas needed by ice navigation especially in the Bay of Bothnia.

Status of Nautical Charting

A = % covered by INT Charts, B = % covered by RNC, C = % covered by ENC

Offshore passage/Small			Landfall, Coastal passage/Medium			Approaches, Ports/Large			Comment
A	B	C	A	B	C	A	B	C	
80	0	100	100	0	65	90	0	10	

Percentage of metric paper charts: 100
Percentage of paper charts on a satellite datum: 100

Status of Maritime Safety Information

Local Warning	Coastal Warning	Port Information	NAVAREA Warning
YES	YES	Partial	NO

Master Plan	Area A1	Area A2	Area A3	NAVTEX	SafetyNET
NO	YES	YES	NO	YES in co-operation with BALTICO	YES in co-operation with BALTICO

7. Capacity building

Nothing to report.

8. Oceanographic activities

The FMA has an action plan to take a new vertical reference datum in use. This new datum will be based on the European Height reference system. However there is no fixed time schedule for this transition. In Finland also the land mapping authorities have decided to move on the same vertical reference datum. The BSHC countries are looking for a common vertical reference on the Baltic Sea.

The Hydrographic Department has a close co-operation with the Finnish Marine Research Institute for which is responsible for sea level

observations. There are common development plans for enhancing the methods and procedures for distributing actual sea level data and its interpolations and estimations. Finland has been active on promoting the non-tidal water level issues to be included into the TORs of the HSSC TWLWG.

9. Other activities

Bilateral Arrangements

The Nordic Countries negotiations with UKHO was finalised and a new Bilateral Arrangement including chart adoption concept was signed. At the same time a new commercial agreement covering ARCS was signed. The same concept has been introduced to Russia as well.

Spatial Data Infrastructure and Services

The non-navigational use of hydrographic data is increasing all the time and the INSPIRE directive demands new activities from HOs. The directive will be implemented in Finland with a separate legislation which is now in Parliament process. FMA has participated actively on the work of National Geo Data Portal. The Primar Web Chart Service has been linked to the portal and it is in trial use.

International activities

The Hydrographic Office has participated actively on the IHO work. Finland has representatives in the WEND and CHRIS Committees, and in various working groups e.g. TSMADWG, CSPCWG (Vice-chair), HICWWG (Vice-chair) and MSDIWG, DQWG. Also Finland has represented both the NHC and BSHC in the ISPWG.

Finland has been active within the BSHC on ENC harmonisation (BSEHWG), harmonisation of vertical datums (Chairing ChartDatumWG) and on Coordinated Hydrographic Re-Survey Plan (Chairing BSHC/HELCOM MWG) and Chairing BSICC. Within NHC Finland has been active on Data Quality issues (establishing and chairing of Nordic DQSubWG), and enhancing paper chart production (PCPWG) and hydrographic data transfer (IDEWG). Finland has participated to the work of all the working groups of PRIMAR.

Printing On Demand

The FMA has worked with the Technical Research Centre of Finland (VTT) on the issue of Printing On Demand. The pre-study for FMA has been made. During this spring several tests will be made in order to make a recommendation of acceptable printing solutions.

10. Conclusions

This report highlights the main activities of the Hydrographic Department since the last NHC 52th Meeting.

———————————————

NHC/53/4.4A

53rd NHC Meeting
Hesinki 22-23 April 2009

NATIONAL REPORT
NORWAY

Executive Summery

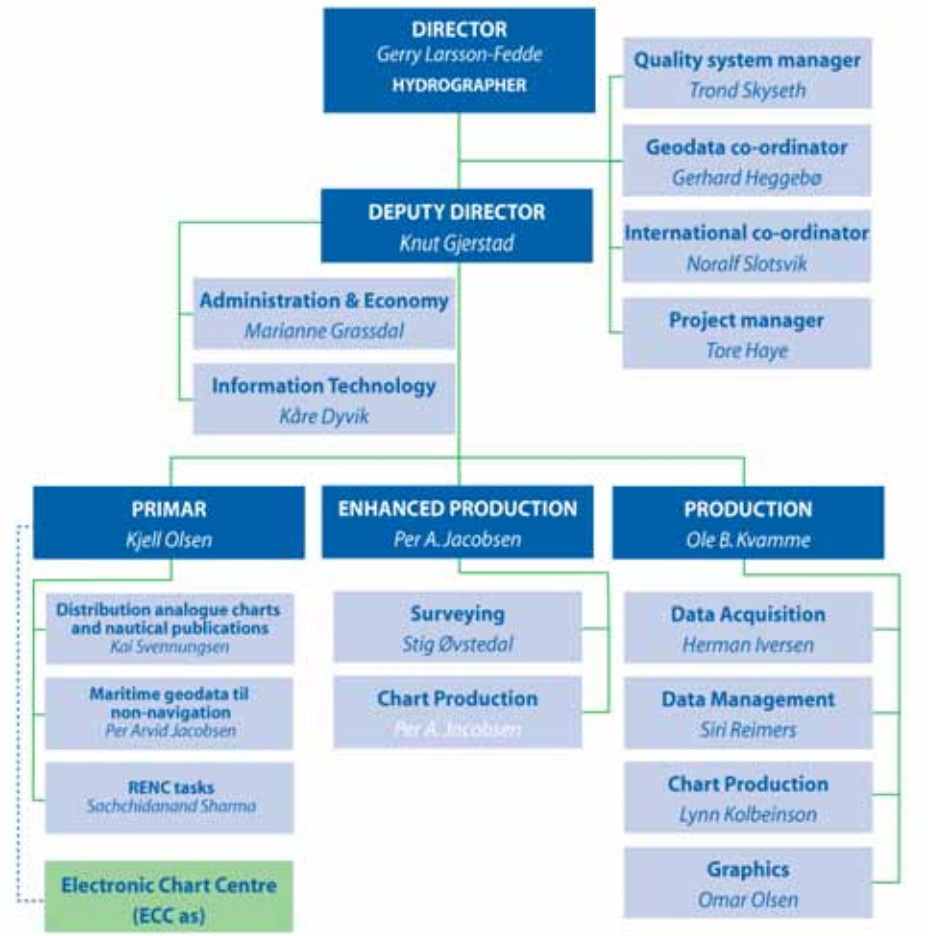
This report gives the summary of the activities that has taken place within the Norwegian Hydrographic Service since the last report given at the NHC/52 meeting in Norrkøping, May 2008.

1. Hydrographic Office

The IHO Yearbook was updated March 2009.

Administrative information:

The organisation structure by the end of 2008 was as follows:



The Enhanced Production project (see figure above) ended in December and was by January 1, 2009 no longer a part of NHS. An Organisation Development (OD) process took place during 2008 and several changes are expected to be implemented first half of 2009. An evaluation study on how to manage our survey resources was also conducted. Decision related to implementation of any changes will be done during 2009. One proposed solution is to outsource the management of crew and technical operation of our survey vessel to the Institute of Marine Research.

Total budget for 2009 is NOK 194 mill., included expected annual sales revenue of NOK 55 mill.

2. Hydrographic Surveys

2.1. Internal surveying 2008

Svalbard
Two survey launches equipped with EM 3002D and have been operating on a 12-hour daily operation for 12 weeks in Svalbard. The efficiency has been very good and a total of 750 km^2 has been surveyed along the Svalbard coast, mostly in areas with water depths less than 20 meters.

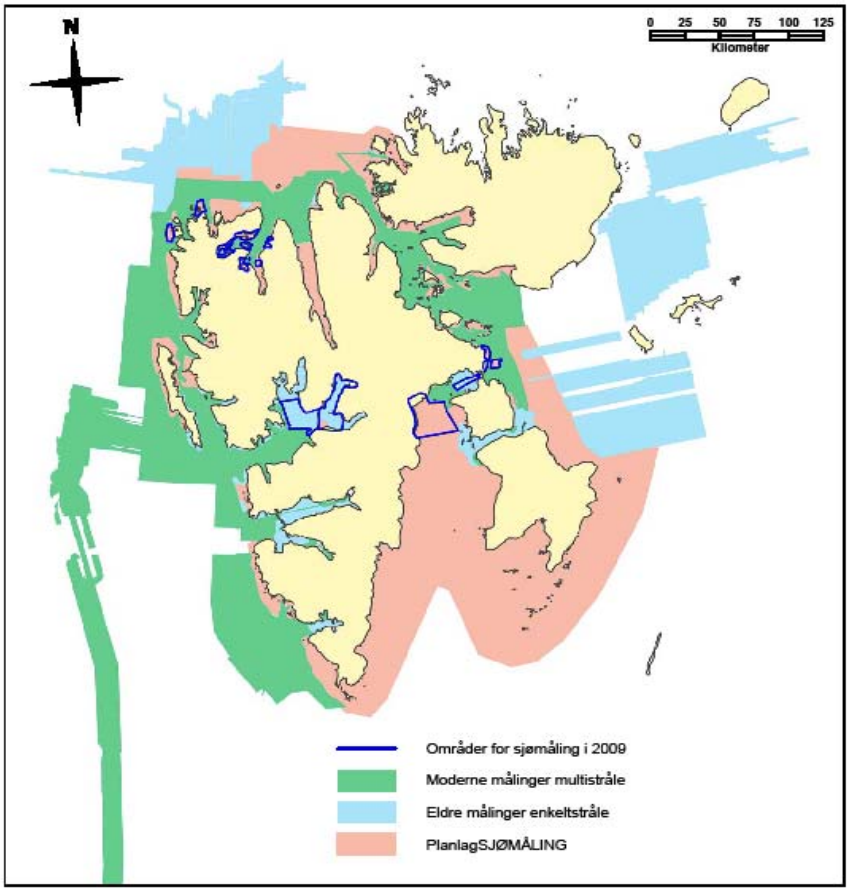


Fig. Planned surveying and surveyed area at Svalbard

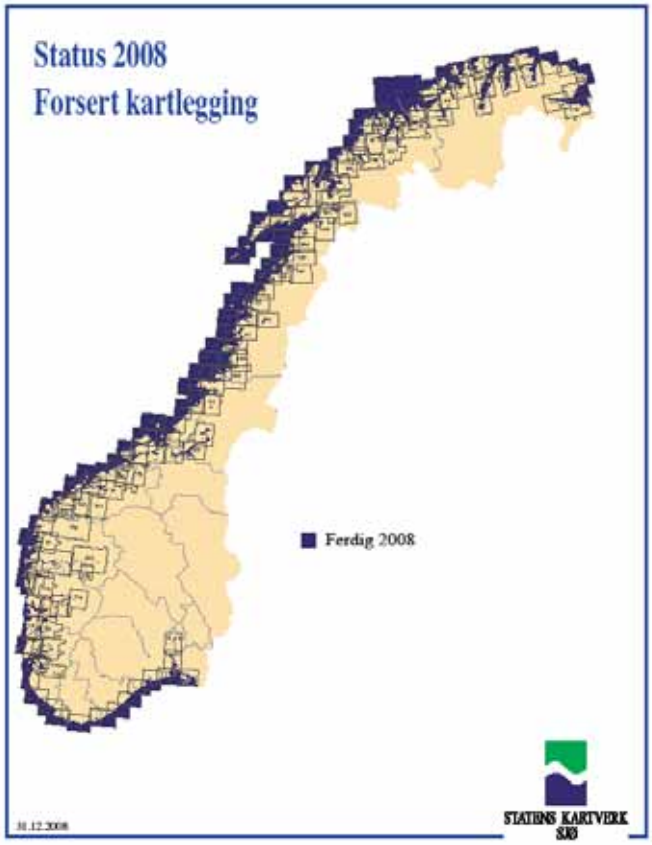


Fig. The status of the surveying of coastal area of the Norwegian coast. Most of the coast has been re-surveyed after 1960.

Norwegian coast

Two survey launches, equipped with EM 3002D, have been operating on a 12-hour daily operation in 9,5 months in 2008 (before and after Svalbard survey campaign). The efficiency has been reasonable good and a total of 345 km^2 has been surveyed along the Norwegian coast, mostly in areas with water depths less than 20 meters. For a few surveys along the coast we utilised EM710, covering totally 248 km^2. The same equipment has also been used in the Mareano project, collecting 5633 km^2.

Plans 2009

NHS will in March 2009 reinstall EM 710 in an elevator mechanism on our main vessel, m/s *Hydrograf*. The EM710 will continue to be used in the Mareano project and will also be used in fjord surveys on Svalbard.
There will be an autonomous survey campaign along Norwegian coast with our newest surveying launch while *Hydrograf* is surveying deep water for the Mareano project.

In the period June-September the survey vessels will be used in coastal area along Svalbard. Expected area to be covered is 850 km^2.

Surveying of coastal area along the mainland of Norway is planned for January to mid March, and after Svalbard expedition for the rest of the year. Expected area to be covered is 400 km^2.

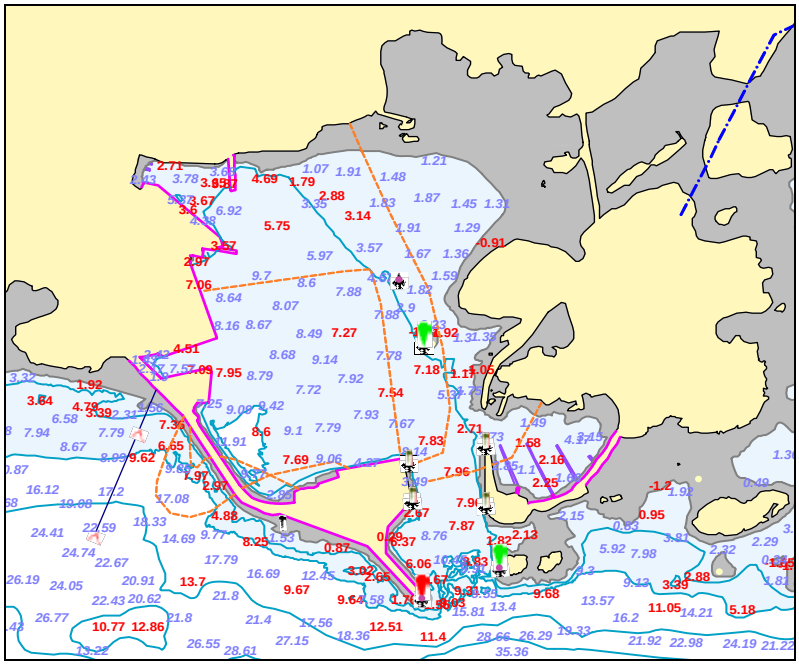
2.2. External sea surveying 2008

Status
External partners, mainly Fugro-OSAE, have surveyed a total of 24623 km^2. Most of the surveying has been related to the Mareano project (see Chap. 9)

Plans 2009
Marin Mätteknik, Sweden, has been awarded a contract and will survey in the Mareano project, using Em710, at Tromsøflaket and Eggakanten off Northern Norway

3. Nautical Charts

3.1. Primary Database
The primary data base consists of selected bathymetry, coastline, shoreline constructions, pontoons, lights and navaids, submarine cables and pipelines, overheads cables, anchor berthing, marine farms, wrecks and obstructions, restrictions, precautionary area, traffic separation zones etc. A main goal was achieved in April 2008 with the full coverage of digital data for the Norwegian coast and western parts of Svalbard. Some minor areas are still based on rather old and insufficient survey information.



Example of information extracted from the Primary Database (From Chart 76: Melbu harbour) Scale M1:5000

The information is organized in an Oracle database and formatted according to S57. The topology is also established according to the S57-format. The data is continuously updated with information from internal and external sources. The production of Notices to Mariners (Etterretninger for sjøfarende) is based on the information from the Primary Database.

The bathymetry, the coastline and shoreline constructions are also available for downloading from the national geospatial infrastructure *Norge Digital.*
www.geonorge.no

3.2. Chart production

In July 2008 the goal to reach full ENC coverage for the Norwegian Coast was completed, followed by the completion of modernised paper charts for the same areas in September.The production has been carried out by an extensive use of private industry. Quality controls and final approval of external production was accomplished in-house by NHS.

3.3. ENC production

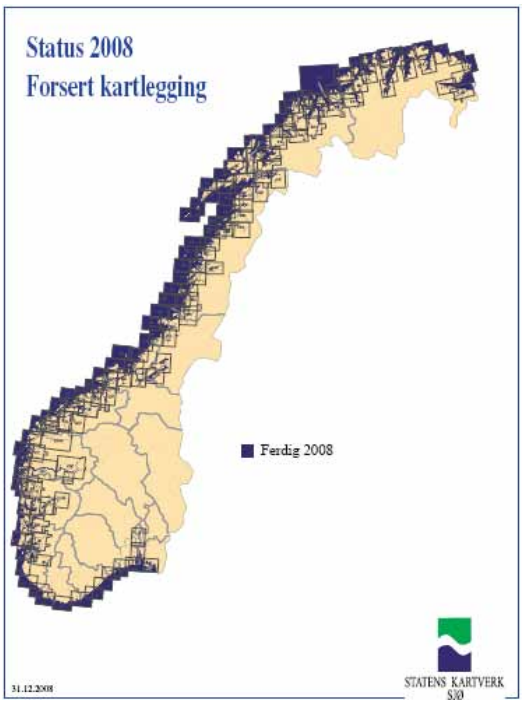


Figure 1

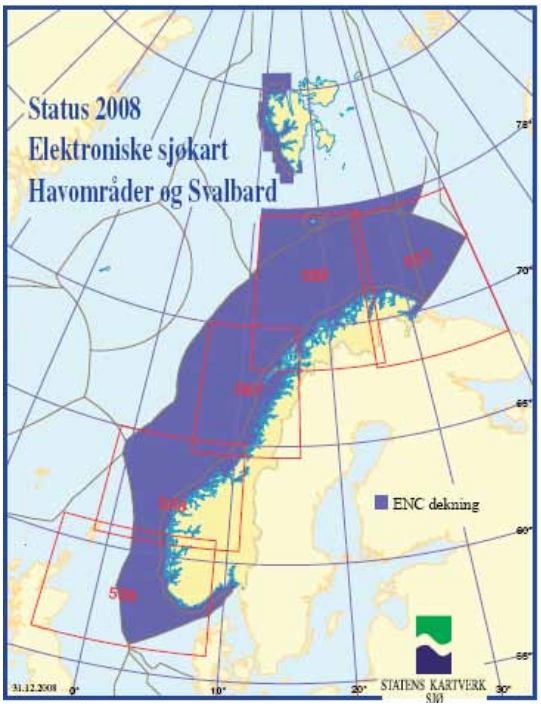


Figure 2

Figure 1: Shows ENC coverage for Norwegian internal coastal waters (ENCs in Approach User Band).
Figure 2: Shows ENC coverage in General- and Coastal User Band inside the Norwegian Economic Zone**,** also including the Svalbard area. (Blue colour indicates ENC coverage).

.
In 2008 ENCs equal to 28 D-cells (30' x 30') in the Approach and Harbour User Band were produced. In addition 9 ENCs covering the west coast of Svalbard were published. As reported previously all new ENCs are compiled from source data (Primary Data). The total number of ENCs was by the end of the year 930.

	Usage Band	Compilation scale	No of ENCs
1	Overview	<1:1 499 999	1
2	General	1:350 000 – 1:1 499 999	50
3	Coastal	1:90 000 – 1:349 999	27
4	Approach	1:22 000 – 1:89 999	732
5	Harbour	1:4 000 – 1:21 999	117
6	Berthing	>1: 4 000	3

Figure 3 – Number of ENCs in each usage band

Updating via ER profiles were issued in accordance with the Notices to Mariners and distributed through PRIMAR. A total of 817 ER files and 162 NE were issued as part of the continuous maintenance of the ENCs.

Planned activities in 2009:
The ENC production for 2009 will focus on production of new harbour ENCs and new editions of existing harbour and approach ENCs where areas with older survey data will be replaced with new survey data. In addition 14 ENCs covering parts of the west coast of Svalbard and 2 overview ENCs covering INT 10, INT 100, INT 101, INT 113 and INT 140 are planned. Some of the production will be outsourced.

3.4. Paper chart production

In 2008 a total number of 14 new charts in 1:50 000, 3 new harbour charts, 2 new charts on Svalbard and 1 new INT chart were published (see listing below).

New charts published 2008:

Chart No.	Title	Scale
88	Lyngøya – Nordkvaløya	1: 50 000
81	Nordmela - Andenes – Dverberg	1: 50 000
89	Sørfugløya - Kvaløya – Torsvåg	1: 50 000
102	Reinøysundet - Rolvsøya – Måsøya	1: 50 000
105	Porsangen. Repvåg – Kistrand	1: 50 000

104	Nordkapp - Lille-Tamsøya – Sværholt	1: 50 000
103	Måsøya - Nordkapp – Honningsvåg	1: 50 000
75	Eggum - Gimsøy - Gaukværøya - Stokmarknes	1: 50 000
115	Vadsø - Varangerbotn	1: 50 000
71	Værøy - Lofotodden	1: 50 000
73	Ure - Gimsøystraumen - Svolvær	1: 50 000
70	Røst - Værøy	1: 50 000
72	Lofotodden - Stamsund	1: 50 000
74	Fuglehuk - Ramberg - Eggum	1: 50 000
493	Kollsnes	1: 5000
494	Nyhamna (Harbour chart)	1: 10 000
474	Porsgrunn – Skien (Harbour chart)	1:20 000
526	Svalbard	1:100 000
527	Svalbard	1:100 000
315	Grønlandshavet (New INT chart adopted from BSH)	1: 3 500 000

Reconstructions[1] (published as New Editions) 2008:

Chart No.	Title	Scale
131	Trondheimsfjorden, Levanger - Steinkjer	1:50 000
36	Kristiansund - Tyrhaug	1: 50 000
80	Harstad - Sjøvegan - Dyrøya	1: 50 000
128	Kristiansund - Sunndalsøra	1: 50 000
126	Storfjorden. Ytre del med Hjørundfjorden	1: 50 000
129	Halsafjorden - Surnadalsøra	1: 50 000
35	Hustadvika	1: 50 000
34	Romsdalsfjorden. Molde - Åndalsnes	1: 50 000
32	Steinshamn - Hustadvika	1: 50 000
30	Haugsholmen - Ålesund	1: 50 000
31	Breidsundet - Fjørtoft	1: 50 000
33	Harøyfjorden - Molde	1: 50 000
125	Haugsholmen - Volda	1: 50 000

1. Reconstruction: Reconstruct a chart from Primary Data Base

Remarks:
- All charts are referred to WGS 84
- The charts are printed in 4 colours (CMYK)

Revised Reprints published in 2008:
65 charts were revised and reprinted (out of these 51 were updated through our Digital Production Line based on changes in the Primary Database).

Reconstruction of charts:
13 main charts were taken into the digital production line, reconstructed, transformed to WGS 84 datum and published as New Editions.

Planned activities in 2009

The chart production for 2009 will be focused on production of new 5 new harbour charts and one large inset and 2 charts on Svalbard. We also plan to issue new editions of 5 charts where areas with older survey data will be replaced with new survey data. In addition 11 charts will be reconstructed.

A 5 year chart plan was decided in 2008. The work of reconstructing charts on ED 50 or Norwegian Datum to WGS 84, and implement these into the Digital Production Line will be given priority. The objective is to complete this work within a period of four years. The revision of the chart plan has recently started and will also include plans for Svalbard.

3.5. Technology

The MINTEC-project:

NHS entered in 2005 into an agreement with HydroService (now Jeppesen) regarding development of a new technology for production and maintenance of ENCs and paper charts, based on dKart Office software (the MINTEC project). The project was formally approved and completed in the autumn 2008.

The new technology was implemented late 2007, nevertheless, also in 2008 much effort and resources was put into training of the staff and development of new processes with the new system. A major task has also been to transfer paper charts and ENCs from Intergraph MGE to dKart Office. For the paper charts, most of the work has been carried out externally and we expect to complete this task during the spring 2009. For the ENCs, the work is being carried out internally. Due to a major upgrade and improvement of the data, it is not expected that it will be completed in 2009.

Print On Demand (POD):

The NHS initiated in 2007 a project with the objective of establishing a Print on Demand service, and with technical solutions based on the dKart Office technology. The project continued in 2008 and will be intensified in 2009, with an objective to have in place an operational prototype, tested and approved, by the end of 2009. The intention is further to establish the POD service in 2010.

Tracings

A project making us capable to produce tracings was set up in 2008. The aim is to deliver this improved updating service to the users of our paper charts within the end of 2009.

4. Nautical Publications

New editions of the “Norwegian Pilot”, Volume 4 and 6, has been published in 2008

Notices to Mariners (Etteretning for sjøfarende)
Totally 24 editions were published in 2008. The publication is available both as printed version and in PDF-format for distribution by e-mail. Notice to Mariners is also published on http://www.statkart.no/efs/

5. MSI
The Norwegian Maritime Directorate is the responsible body for MSI in Norway.

6. S-55
We intend to update S-55 with some minor changes on surveyed areas and ENC coverage during April 2009

7. Capacity building
We have participated in the annual meeting in the IHO Capacity Building Committee. In June we conducted, together with Portugal, an Advisory visit to Angola on behalf of the CBC.

The Norwegian Agency for Development Cooperation (Norad) has launched a programme called *Oil for development.* NHS is represented in the programme, as subordinate of the Ministry of Environment, but we have so far not got involved in any specific project or country. Assisting in capacity building related to hydrography might be relevant.

8. Oceanographic activities
One oceanographer at NHS is taking a PhD in numerical tidal/tidal current models. Norway has a lot of narrow straights with strong tidal currents, and we have the intention to be involved in modeling these areas.

The Norwegian Meteorological Institute is working on a tidal model for the North Sea, the Norwegian Sea and the Barents Sea. We will use the results to calculate harmonic tidal constants in a 4 km grid and find the LAT surface relative to the MSL surface (from the Danish National Space Center).

We have started a project to establish a model of the MSL for coastal/inshore waters. For this purpose we bought 20 pressure gauges and plan to collect one-month observation series at a lot of closely spaced locations. With the help of GPS measurements at each site we aim at finding the difference between the MSL and ellipsoid. In addition we utilize the information from the permanent gauges.

Data from our 23 tide gauges are transferred to the office once an hour. We collect one-minute data, and after an automatic quality control we publish ten-minute values on the Internet. The GPRS system is used for the data transfer from the different locations. For 2008 we obtained a data acquisition rate of approximately 99%.

9. Other activities

9.1. The NMDB Project (Norwegian Bathymetric Database)

The Norwegian Hydrographic Service has contracted the Dutch company Atlis B.V to provide a new management and distribution system for high resolution depth data, called the Norwegian Bathymetric Database. Currently an early release of the system is being tested by the NHS. Final delivery is scheduled for May 2009.

For details related to the functionality etc of the NMBD please refer to the National report for 2008.

9.2. The MAREANO Project:

Background: Mareano is a multidisciplinary marine mapping and documentation programme aiming at providing the foundation for ecosystem based sustainable management of the Norwegian coastal and sea areas. The primary focus is The Management plan for the Barents Sea. The aim is to bridge the knowledge gap in poorly mapped but very sensitive areas. Especially the ocean areas have received little attention and coverage from modern surveys. High quality multibeam bathymetry is regarded as a premise for further geological and biological investigations. The Norwegian Hydrographic Service (NHS) is responsible for bathymetry data acquisition, and effective data management and distribution of survey data, derived products and services. An important facet of the programme will be web-based geodata distribution, and distributed data management as part of a National Spatial Geodata Infrastructure (NSDI)

Organization and financing: The NHS is a programme partner with the Institute of Marine Research (IMR, programme management) and the Geological Survey of Norway (NGU). The phase 1 of the Mareano programme, runs from 2006-2010, and covers 162 000 km^2 from Lofoten to South Barents Sea with a typical depth around 250-300m. The plans include a total budget exceeding NOK 250 mill., in which an excess of NOK 100 mill is estimated to cover the NHS' responsibility for bathymetry surveying and data management.

Results 2008: In 2008 the Mareano programme received NOK 32.6 mill in total through earmarked funding to Mareano through the National budget with a focus in the southern Barents Sea. The NHS part was to survey 24 000 km^2 in the area of Nordland VI and Troms II, outside of Andøya, and start surveying on Eggakanten further north. By the end of the year 24 316 km^2 was finished, but the operation continues in 2009.

The surveys spans from 100m depth to about 2700m where the Kongsberg Simrad Echo sounder EM710 was used down to about 1000m and EM300 in deeper waters. Fugro OSAE finished their contract with NHS by the end of the year, and a new international invitation to tender was published 23.12.08. The NHS m/s *Hydrograf* surveyed 5633 km^2, mainly on Eggakanten.

Difficult weather- conditions is again a major challenge. The results, however, show detailed and high quality EM710 data, providing the ample resolution for the follow up

studies by the biologists and geologists. Even the EM300 data revealed spectacular results from the shelf edge showing submarine canyons and major slide scars.

Data distribution: All the multibeam data in the NHS north of Lofoten has been modelled in grids of various resolutions, and visualized through shaded relief maps as a Web Map Service included in the map services on the Mareano webpage. Further overview bathymetry map services have been produced, also showing the coverage of all surveys in the NHS' data management system. Further information and results will be available on www.mareno.no. This website will be a portal for knowledge dissemination mainly through effective map services and documentation aimed at both government decision-makers and the general public. This will be a joint effort among the programme partners, but the project management is led by the Institute of Marine Research.

NSDI: According to the Mareano data policy all geodata from the Mareano programme will be published in the Norwegian spatial data infrastructure; *Norge Digitalt*. The NHS results were published already by the end of 2008 except classified data with finer resolution than 50m within Norwegian territorial waters (12 nm).

Mareano will be a major undertaking for the NHS in the years to come, and is mainly aimed at non-navigational purposes. Planning for using the Mareano concept also for the Management Plan for the Norwegian Sea started in 2008, but this will probably be part of the 2010 budget.

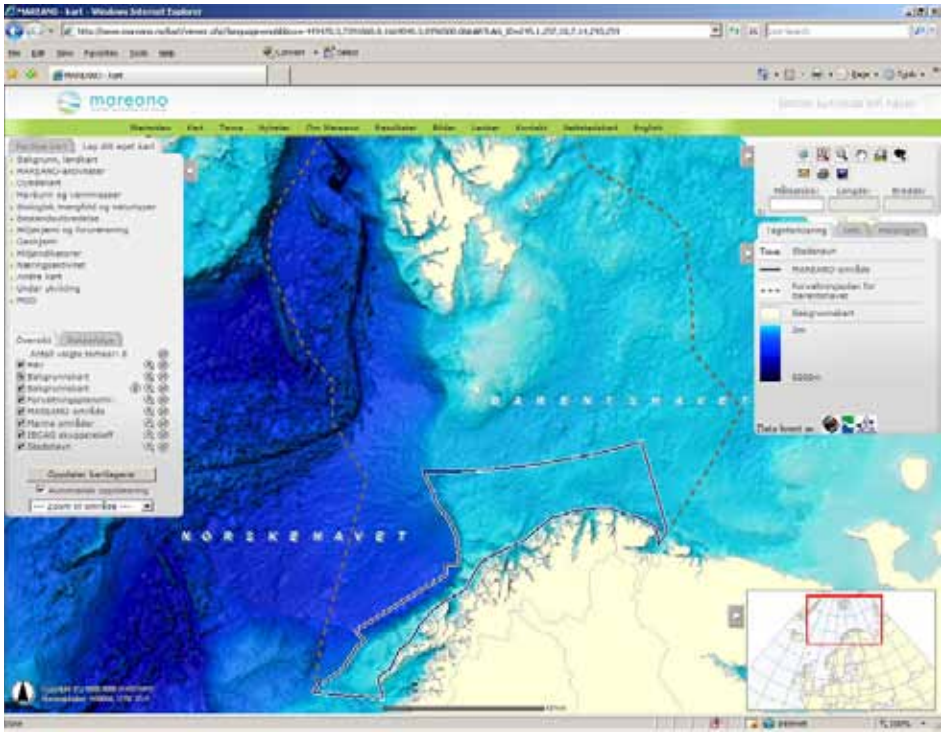


Fig. The solid lines indicate the *Mareano* project area. The stippled lines encircle the area for *The Management plan for the Barents Sea*

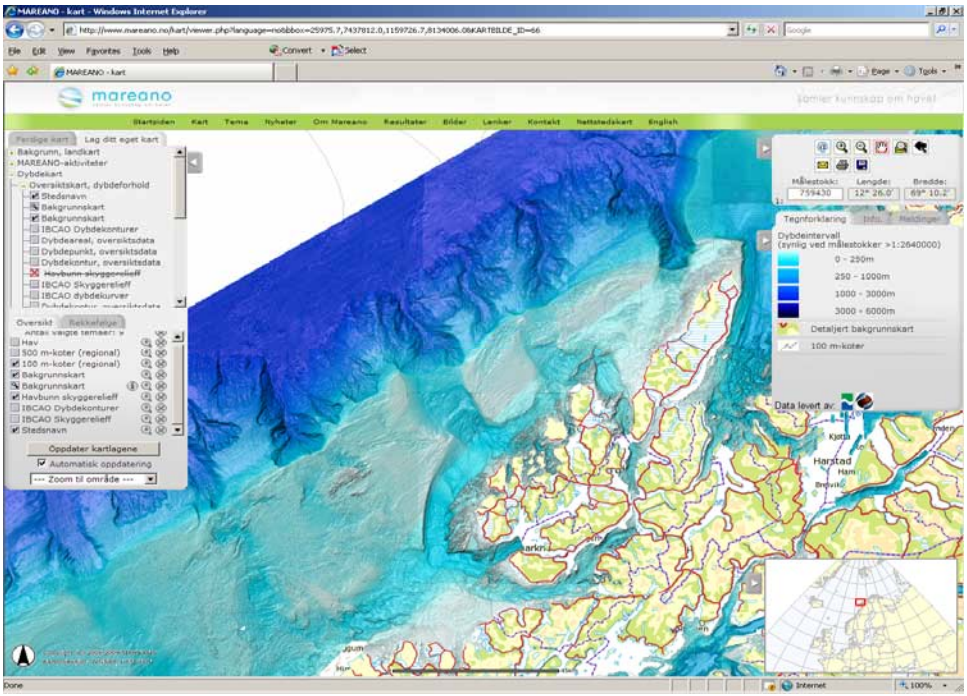


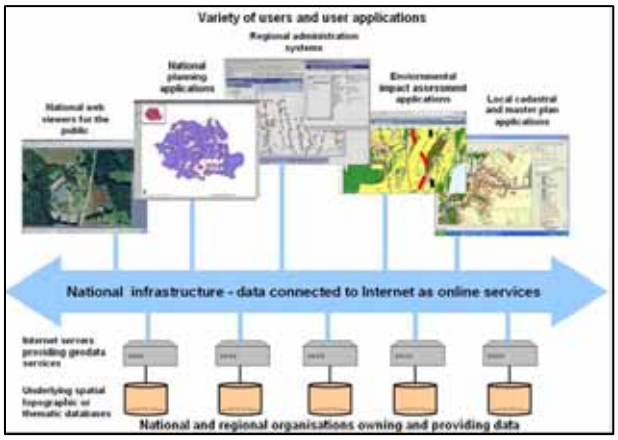
Fig. An example from the WMS shadow relief map service showing spectacular submarine canyons and slide scars on the edge of the most narrow part of the Norwegian shelf north of Lofoten and west of Andøya (screendump from map service on www.Mareano.no)

9.3. Integrated Maritime Services

The NHS and the Norwegian Coastal Administration are preparing a new production line for exchanging geospatial information between the two organisations. The main focus until the summer 2009 will be to implement a solution that can be used to exchange updated navigational objects from the Norwegian Coastal Administration to the NHS in digital form.

9.4. Norway digital

Norway digital is the Norwegian government's initiative to build the National GeoSpatial Data Infrastructure. It is already a very successful co-operation with over 600 collaborating partners and a comprehensive infrastructure with basic reference data and thematic data available through more than 100 operational web map services, a national portal and other supporting network based services. Norway digital is an existing implementation of the infrastructure described by the European INSPIRE-directive. The dissemination of information is based on new technologies for Internet distribution. There is a rapidly growing interest among the partners to disseminate data as web map services (WMS). Downloadable data are available on standard formats. Metadata is delivered together with the geodata sets. A national portal (www.geonorge.no) is giving information about the present status of the available data and web map services. The technologies used are based on international standards (ISO and OGC).



The Norwegian Hydrographic Service has released several new web map services (WMS) through the national geospatial infrastructure *Norway digital*. Among these new services are the bathymetric shadow relief pictures, based on a 50mx50m digital terrain model. This service has also a corresponding ftp-based download service of the underlying grid-data.

The figure shows the coverage area of the WMS based bathymetric shadow relief service.

Another topical web map service is the seamless raster charts which is served with updated information from the main chart series (1:50000). The latest addition to Norway digital is the PRIMAR Web Map Service, which is a WMS-based service that uses updated electronic navigational chart (ENC) as source for online delivery of chart images on the Internet. The services offered through Norway digital is not to be used for navigational purposes.

53rd NHC Meeting
21-23 April 2009
Helsinki

NHC/53/4.5A

NATIONAL REPORT OF SWEDEN

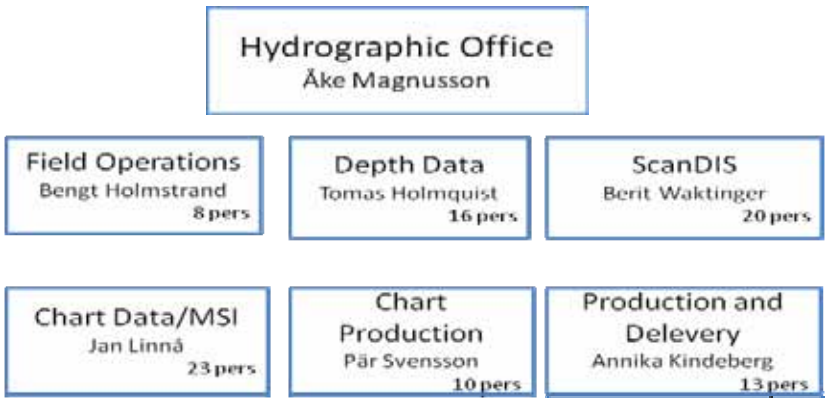
Executive summary

This report gives a summary of the main activities within the Swedish Hydrographic Office since the last NHC meeting .The main issues are:

- Some minor changes to the organization of the Hydrographic Office have been performed
- Surveys during 2008 were to a great extent conducted by external operators
- Old hydrographic survey data is converted and included in digital soundings data base
- New charts produced
- Production of preliminary and temporary (P/T) notices for ENC in operation
- The sale of ENCs has increased

1. Hydrographic Office

The Hydrographic Office employs nearly 100 people, crews on survey ships not included. The operations are certified by Lloyd´s register quality assurance in accordance with ISO 9001:2008. Yearly quality audits are conducted by Lloyds and internal auditors. Since last a meeting some minor changes to the organization has been done and the organization are now as follows:

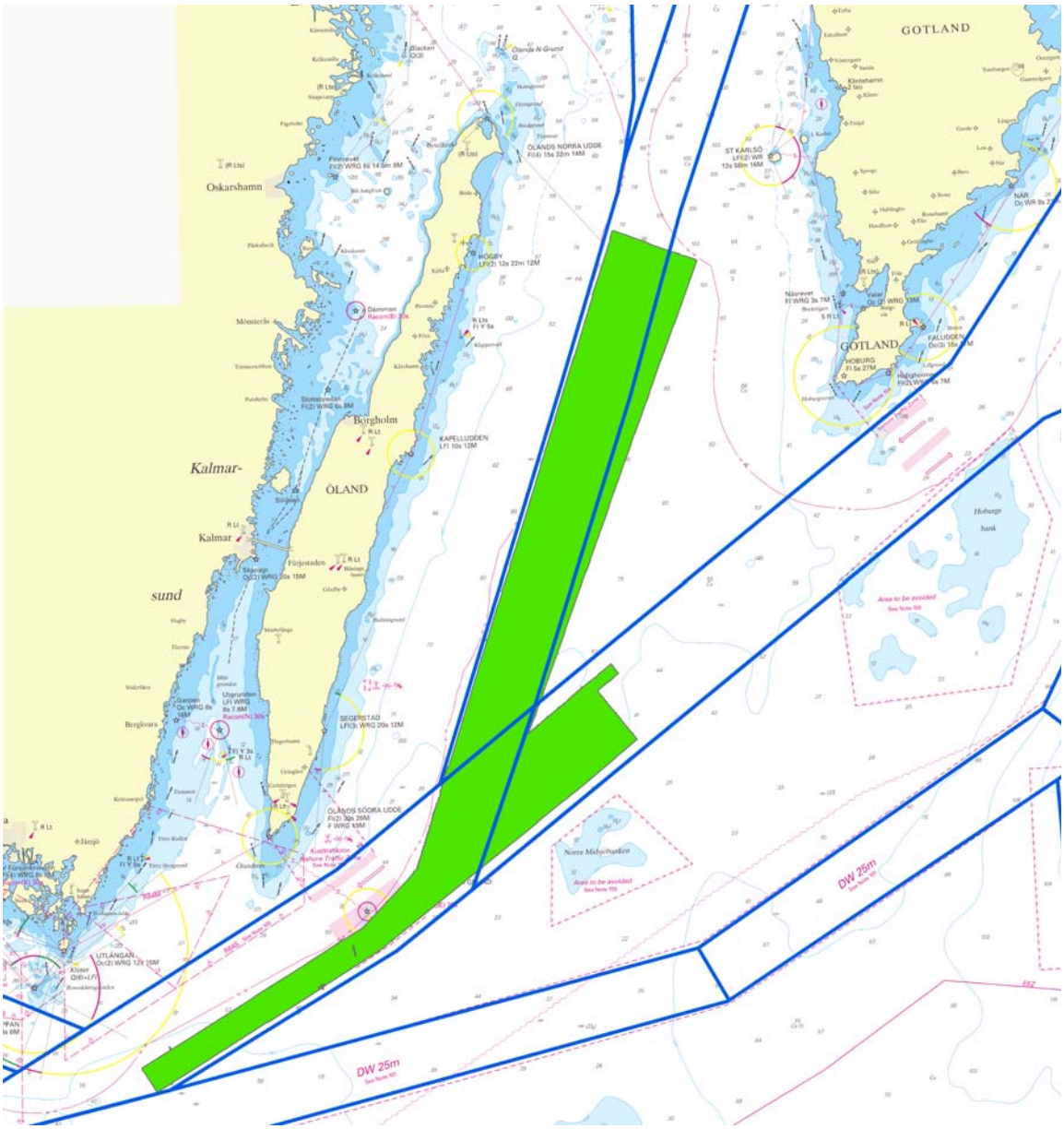


Total budget(costs) for 2009 is 85 million SEK and the annual sales for 2008 were 30,8 million SEK.

2. Surveys

All Swedish waters are surveyed and most of the areas, especially fairway areas, to a high standard. The long term objective is that all Swedish waters should be surveyed in accordance with the international standard, S-44. Surveys and resurveys now and in the coming years are focused to fairway areas in our SMA Safe Seaways concept (Säkra sjövägar). This concept encompasses over 70 000 km^2 out of totally 150 000 km^2 within the Swedish EEZ.

The surveying fleet consists of two vessels JACOB HÄGG and NILS STRÖMCRONA. Both vessels are equipped with multi-beam echo sounders and Nils Strömcrona has also bar-sweeping equipment. During 2008 a total of 500 km^2 were surveyed by these vessels. These surveys were mainly conducted in very shallow and consequently time-consuming areas.



Figur 1 Area of survey by external contractor Marin Mätteknik AB during 2008

Within the concept ”Säkra Sjövägar” and priority fairways surveys during 2008 have been conducted in fairways to Luleå, Iggesund and Hargshamn as well as in a fairway area in the southern part of Sea of Åland (Svenska Björn) where draught is secured up to 15.3 meters.

Within an internal periodic resurvey program fairways to Gothenburg, Södertälje, Luleå and Göta älv have been surveyed. The aim is to control the fairway depth, other fairway dimensions and the need for dredging.

In addition 2300 km^2 were surveyed in open sea, south and east of Öland island in Central Baltic Sea. These surveys were conducted in accordance with the BSHC/HELCOM resurvey plan and by an external contractor.

The total area of surveys during 2008 then amounts to 2848 km^2.

3. New charts and updates

ENCs and paper charts are produced from a common database. This database is continuously updated.

Swedish waters are completely covered by ENCs and the total number of cells are 531 (*2009-03-31*). The increase in usage of Swedish ENC cells distributed by PRIMAR continues.

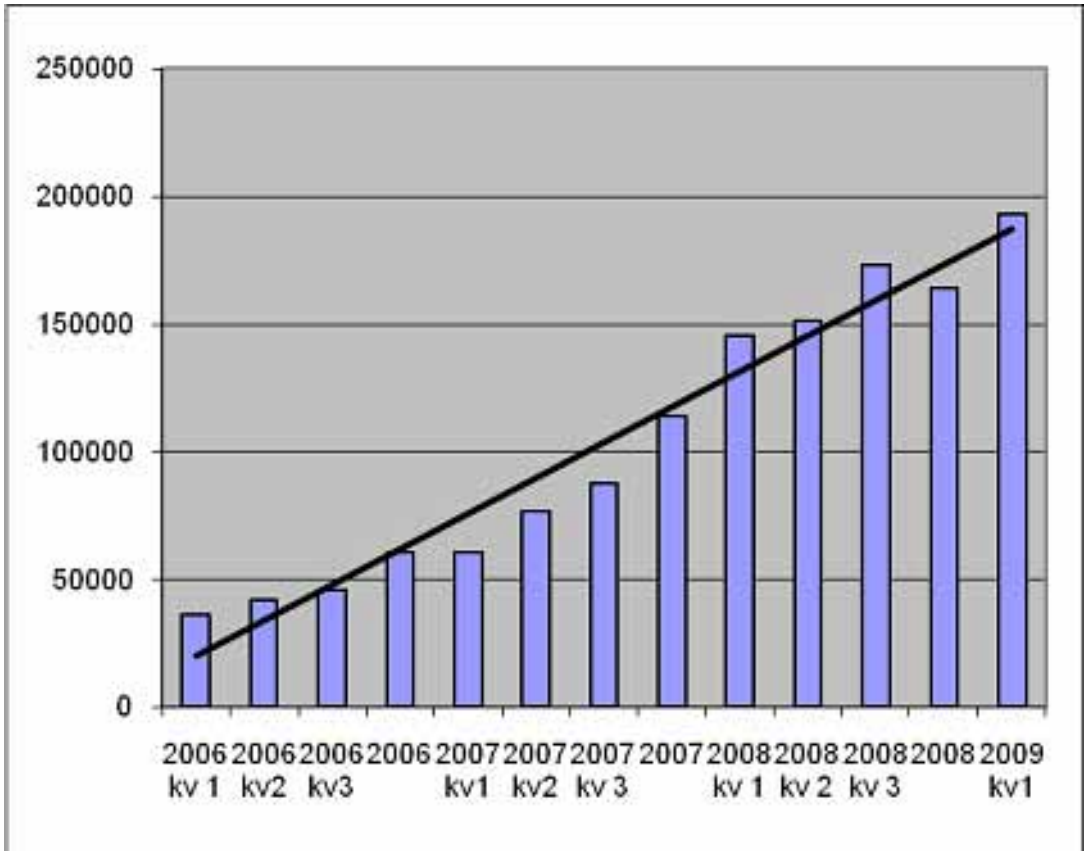


Table: Total number of Swedish cells in use by Primar customers

In late 2008 an improved production environment for ENC was developed. This facilitates the delivery of changes/updates to ENC that are of temporary or preliminary nature and corresponding to P/T notices in NtM. During 2009 this service will gradually be taken into full operation.

The Swedish paper chart portfolio consists of approximately 120 charts and 12 series of charts for small craft. Another 3 series of small craft charts covering Bay of Bothnia have been decided for production and release 2009 and 2010. Special charts, tailored to the customer, such as “print on demand” charts are also available as well as a service to provide chart images to mobile phones and PDA’s.

During 2008 the following new (or totally renewed) charts were issued:

General	Chart 2	1:1 600 000		Östersjön, Baltic Sea
	Chart 7	1:500 000		Östersjön, södra delen
Coastal	Chart 74	1:250 000		Östersjön, Helsingborg-Ölands södra udde
Special	Chart 1133	1:12 500		Aggarösundet, Hjulstafjärden (Mälaren)
	Chart 1352	1:12 500		Göta älv – Trollhätte kanal, Södra
	Chart 1353	1:12 500		Göta älv – Trollhätte kanal, Norra

4. New publications and updates

The Swedish List of Lights as well as sailing directions have not been reprinted for many years. A working group is however presently studying how the additional information, which traditionally has been published in sailing directions, best shall be compiled and presented to the mariners.

I can be noted that the area of digitally publishing the information corresponding to sailing directions etc is problematic. The topic is not yet mature and the lack of guiding IHO documents or standards is obvious.

Notices to Mariners (NtM) are published daily on the Internet via an on-line database. On a weekly basis a printed version of NtM is issued as well as a PDF-version on the Internet.

5. MSI

Sweden is Baltic Sea Sub-area Coordinator within the international Navigational Warning Service as well as NAVTEX co-ordinator within the Baltic Sea area. The table below shows the number of handled navigational warnings during 2008.

Originating country	Number of warnings received	Number of warnings transmitted on Navtex	% of received warnings transmitted on Navtex
2008			
Sweden	484	97	20
Finland	15	13	87
Russia, Petersb.	19	16	84
Russia, Kaliningr.	32	32	100
Estonia	9	5	56
Latvia	23	22	96
Lithuania	44	34	77
Poland	87	72	83
Germany	103	71	69
Denmark	314	105	33
TOTAL	1130	467	41

6. S-55

The information concerning Sweden in S-55 has recently been updated although the changes are small.

Hydrographic Surveying

	A	B	C
Depths < 200m	16	83	1
Depths > 200m	100	0	0

Comments:

- Contributes to the HELCOM harmonised re-survey programme
- 50% of the area encompassed in column B is surveyed at close to S-44 standard
- Only a very limited area of Swedish waters is deeper than 200 m.

Nautical Charting

Purpose/Scale	A	B	C
Offshore passage/Small	100		100
Landfall and Coastal passage/Medium	100		100
Approaches and Ports/Large	100		100
Percentage of Group A showing depths in metres	100		
Percentage of Group A referenced to a satellite datum	100		

7. Capacity building

Sweden has not been active in the area of capacity building during the period.

8. Oceanographic activities

Oceanographic activities within the Swedish Maritime Administration (SMA) are very limited. Other institutions like the Swedish Meteorological and Hydrological Institute (SMHI), Swedish Geological Survey (SGU) and universities are more involved in oceanography. SMA contributes in monitoring of water levels etc.

9. Other activities

Converting fair sheet archive (ScanDIS)

The hydrographic office has for some years been running a project named ScanDIS with the objective to digitise soundings from fair sheets and similar maps in our archive. This operation is financially supported by the government as a part of a special Baltic Sea programme. Since this will continue for still some years the operation is made more permanent in our organisation. We cooperate with the Swedish Enviromental Protection Agency (Naturvårdsverket) in planning and prioritising of the work.

The overall aim is to create national coverage in the soundings database and for the Hydrographic Office specifically thus enable new and more efficient production of chart information. Metadata and quality information is essential for future use.

INSPIRE and related activities

On the national level SMA is involved in ongoing activities to improve the spatial data infrastructure in order to meet requirements in the INSPIRE directive. A project to establish a national geodata portal has started, lead by the National Land Survey, and the project is scheduled until 2010. An SMA internal project to start the implantation of INSPIRE has started and personnel from the Hydrographic Office are involved.

The national Geodata Advisory Board, where SMA has a delegate, has been operating since 2006 and produces a national geodata strategy which is updated yearly.