

## **UPDATES ARCTIC HYDROGRAPHY NORWAY**

### **Executive Summery**

This report gives an update of the activities that have taken place within the Norwegian Hydrographic Service since the autumn 2010. Reference is made to the National Report for ARHC1.

### **1. Hydrographic Office**

No significant change in the organizational structure.

A strategy plan up to 2016 has recently been presented.

The organizational development program for continuous improvement based on the LEAN tools continues. A project manager was recruited in September 2011.

Total budget for 2011 is NOK 217 mill., included expected annual sales revenue of NOK 59 mill..

### **2. Hydrographic Surveys**

#### **2.1. Internal conducted surveying 2010/2011**

##### **Svalbard**

Two survey launches equipped with EM 3002D have been operating for 15 weeks in Svalbard in the period mid June- late September 2011. R/V Hydrograf, with the EM 710, has also been used in the deeper parts. The efficiency has been very good as the operation partly been 24 hour per day. A total of about 1500 km<sup>2</sup> has been surveyed along the coast of Svalbard. The green areas in Figure 1 are the coverage of multibeam surveys, blue areas are single beam.

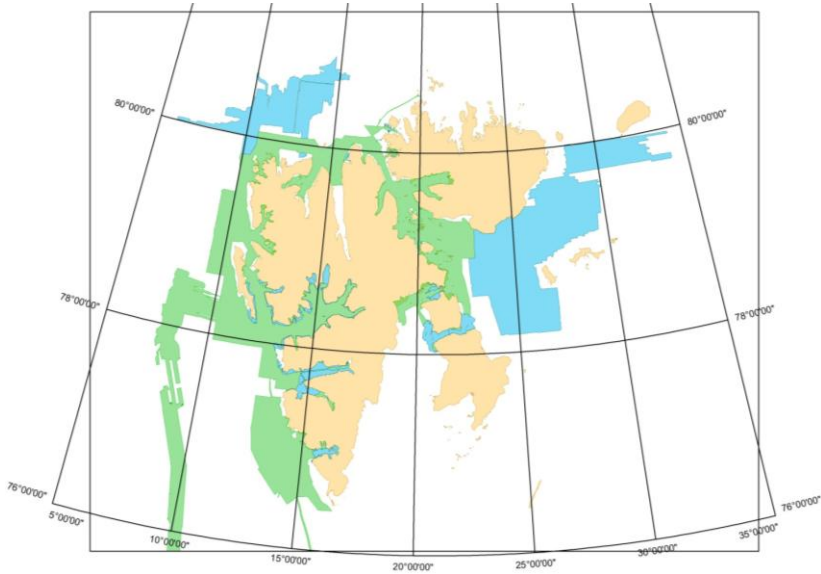


Figure 1: Status of modern surveying along Svalbard

**Norwegian coast**

Two survey launches, equipped with EM 3002D, have been operating on a 12-hour daily operation when not involved in the other activities mentioned above. R/V Hydrograf has contributed with the EM710. The main survey areas are in southern Norway and outside the Arctic area.

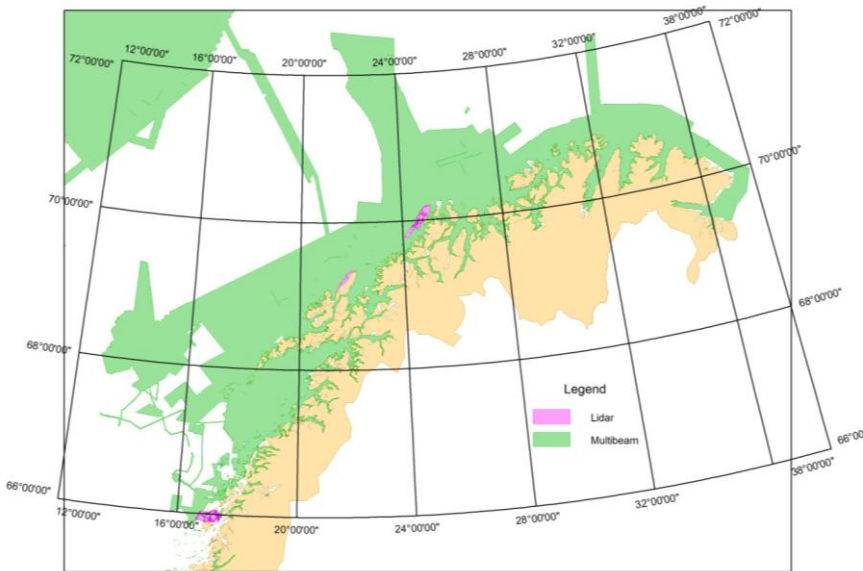


Figure 2: Status of modern surveying along the coast of northern Norway

## 2.2. Planned surveying along Svalbard

Based on inputs from the main stakeholders a long term survey plan for the territorial waters of Svalbard has been developed.

The guidance for the plan is that the whole Svalbard area shall be covered by adequate ENC/navigational charts, except for a few areas that are seldom visited

The surveying takes place at the western side in the beginning of the season as the eastern part is normally covered with ice until July/August. The routes for the cruise traffic will be prioritized in the west and north. On the east side safe navigation is some main passages will govern the priority of surveying.

## 3. New charts and updates

A chart plan comprising both surveying and ENC/chart production for the Norwegian coast and the Svalbard area for the period 2011 – 2015 was published September 2010. The plan will be reviewed in 2012.

### 3.1. ENC production

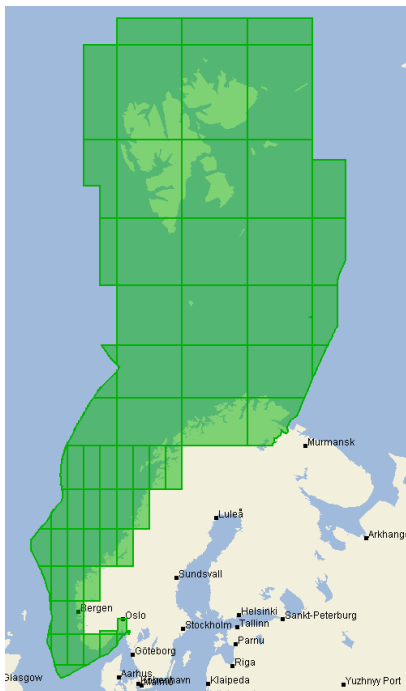


Figure 3: ENC coverage for the Norwegian coastal waters, (ENCs in User Band 2).

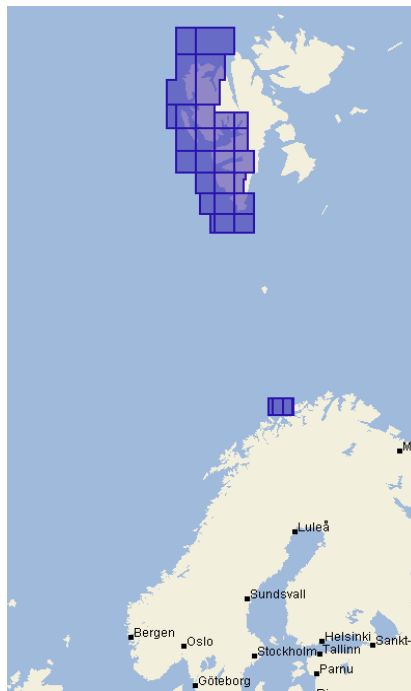


Figure 4: ENC coverage in the Svalbard area, (User Band 3)

In 2010 the ENC coverage in the Svalbard area has been extended with 17 new General ENCs, see Figure 3. Existing Overview ENC has expanded coverage in North (INT 174 and 175), see Figure 5. In addition 24 pilot sketches have been produced as ENCs. The total number of ENCs is currently 1032.



Figure 5. NO1A3000 “Norskehavet”

Updating via ER profiles has been issued in accordance with the Notices to Mariners and distributed through PRIMAR. In the past 12 months a total of 1145 ER files and 75 NE were issued as part of the continuous maintenance of the ENCs.

In connection with the transfer of ENCs to the new chart production system, a review of all ENCs are currently being undertaken in order to improve the quality of the data. New Editions of 159 ENCs were published in 2010 as a result of this task. In 2011 we expect about 150 new editions to be published.

#### Planned activities in 2012:

The NHS will continue the work of upgrading the Coastal chart series in scale 1:350.000. At the same time ENCs in user band Coastal (NO3) will be produced in compilation scale 1:180.000 and ENCs in the user band General (NO2) will be produced in compilation scale 1:350.000.

The Main chart series at Svalbard is in scale 1:100.000, see Figure 7. In 2011 all charts were issued as new edition. This was done after updating a general warning of not navigation in unsurveyed areas. Up to now 14 charts out of the planned 26 are published.

In 2011 new edition of the coastal and general charts in the Svalbard areas were issued. The charts were issued as INT-charts and ENC's were made for the same areas.

The production of new harbour ENC's and new editions of existing harbour and approach ENC's will continue.

### **3.2. Technology**

#### **Print On Demand (POD)**

The NHS initiated in 2007 a project with the objective of establishing a Print on Demand (POD) service. In January 2011 we offered the Main Chart Series (143 charts) as POD charts. The Harbour Charts will be included in the POD service in autumn 2011.

New files are created every 14 days, based on a continuous day to day update routine of the production data base. The available files in pdf format can be downloaded by the actual distributor and printed locally. The total amount of distributors is 5-10.

### **4. Nautical Publications**

A new edition of the "Norwegian Pilot", volume 7, Svalbard, was printed in august 2011.

A new version of the Norwegian INT-1 will be issued in 2011.

#### **Notices to Mariners**

Totally 24 editions are published every year. 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/>.

Feltkode endret

### **5. MSI**

The Norwegian Coastal Administration is the national authority responsible for MSI in Norway.

### **6. C-55**

Update of C-55 was sent to IHB in November 2010.

### **7. Capacity building**

Norway has participated in the annual meeting in the IHO Capacity Building Sub-Committee.

## 8. Oceanographic activities

One oceanographer at NHS has completed a PhD in numerical tidal/tidal current models.

The project on establishing a model of the MSL for coastal/inshore waters has been ongoing since last meeting.

## 9. Other activities

### 9.1. The BLAST project – Bringing Land and Sea Together

More information about the BLAST project can be found at the project website

[www.blast-project.eu](http://www.blast-project.eu)

Feltkode endret

We just want to highlight the results related to The ENC Harmonisation Checker (ENC-HC). The ENC-HC is a tool that automatically compares adjacent Electronic Navigational Charts (ENCs) and identifies geometric inconsistencies and inconsistent use of attributes.

Prior to the development of the ENC-HC, finding inconsistencies between adjacent ENCs from different producers was a manual, labour intensive process, prone to errors. The ENC-HC negates the need for manual inspection and delivers the results of the analysis as ENC overlay files in S57 format supported by an XML formatted report.

### 9.2. The MAREANO Program

*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 has been The Management plan for the Barents Sea (see figure 6 below). The aim of the program is to bridge the knowledge gap in poorly mapped but very sensitive areas. High quality multibeam bathymetry is regarded as a premise for further geological and biological investigations. The Norwegian Mapping Authority 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 program is the web-based geodata distribution, and distributed data management as part of a National Spatial Geodata Infrastructure (NSDI)

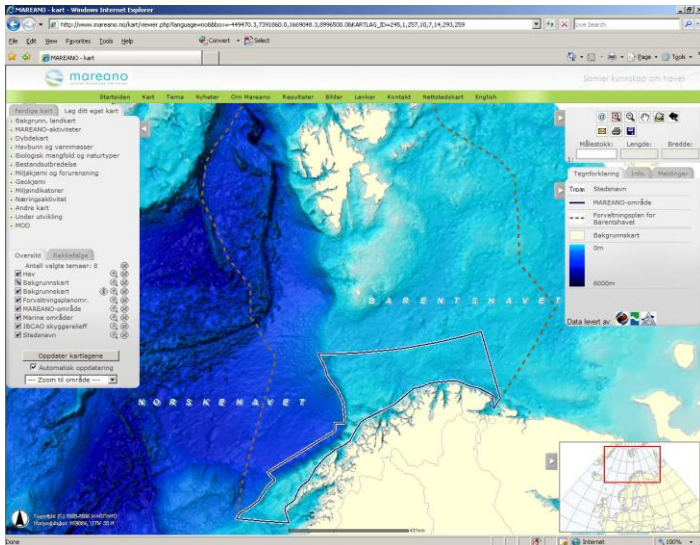


Figure 6. The solid lines indicate the original *Mareano* program area. The stippled lines encircle the area for *The Management plan for the Barents Sea*

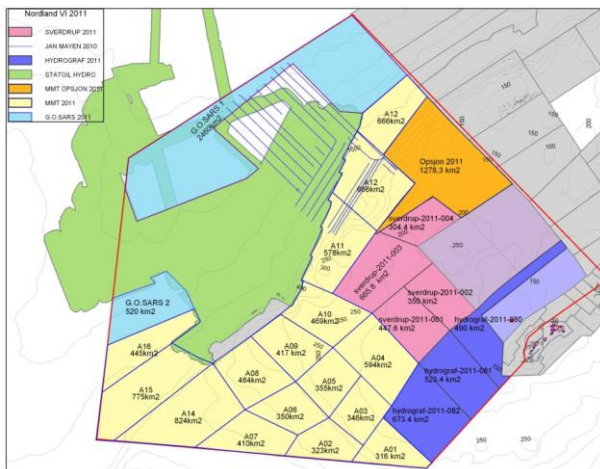


Figure 7. The surveyed areas within the Nordland VI block

*Results 2011:* In 2011 the program received NOK 96.4 mill in total through earmarked funding to Mareano through the National budget with a focus in area outside Lofoten (Nordland VI) and the previously disputed zone in the Barents Sea. NHS received NOK 51.6 mill. In 2011 15 600 km<sup>2</sup> has been surveyed in Nordland VI and 8 100 km<sup>2</sup> will be surveyed in previously disputed zone in

the Barents Sea. A new contract has been signed for further 12 600 km<sup>2</sup> to be surveyed in this new area, but this survey will not start before 2012.

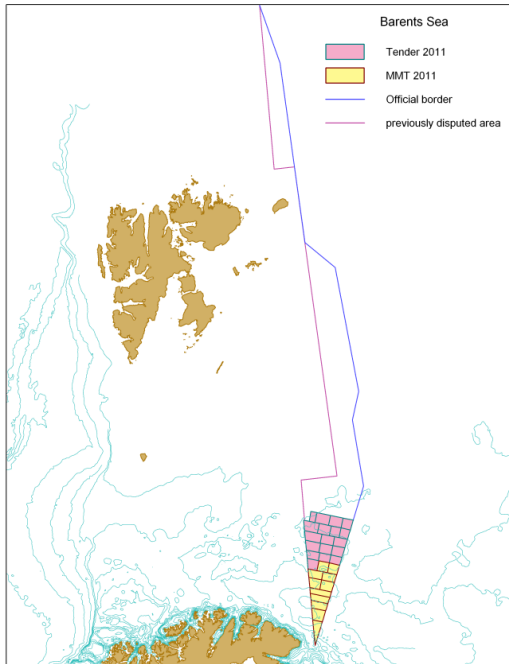


Figure 8. Overview of the surveying close to the Norwegian-Russian border.

### 9.3. The Pleco project

The NHS initiated in 2010 a project for procuring a new post-processing system of Multi-beam Echo-sounder Data. The NHS needs a new software system due to the fact that Kongsberg Maritime no longer wishes to provide support and maintenance for our current system. We started with a feasibility study to get acquainted with the existing solutions on the market. After that a significant work has been done to gather complete, correct, and communicable requirements for the software system we want to use in the future.

The main goals of the project are

- to be able to manage the high volumes of data produced by modern multi-beam echo-sounders systems
- to be able to efficiently visualize the data in 3D
- to have efficient statistical algorithms for data cleaning
- to report shoals, based on the cleaned dataset in an efficient way



- to get a system that allows for recreation of the final result from its raw data based on the corresponding recorded cleaning steps
- to get a system that can be used for quality control and validation of depth data in the field and in the office
- to get a system that absolutely minimize the number of manual operations and mouse movements (with occupational health and safety in mind).

On 21<sup>st</sup> of June 2011 an invitation to tender was announced on Doffin/TED. Deadline for submission of the tenders is 15<sup>th</sup> of September 2011. We expect to select a supplier within the 28<sup>th</sup> of October and implement the new system in 2012.