

## **UPDATES ARCTIC HYDROGRAPHY NORWAY**

### **Executive Summary**

This report gives an update of the activities that have taken place within the Norwegian Hydrographic Service (NHS) since the autumn 2012. Some main issues are:

- *Several new recruitments in the top management team*
- *3 new survey launches ordered*
- *A multiyear contract with the Coastal Administration*
- *Continued high activity in the Mareano project*
- *Delivery of a new multibeam data processing software has started*
- *A project (Føniks) for a common sea and land database is launched*

### **1. Hydrographic Office**

As an outcome of an organizational development process the IT resources within the Mapping Authority is centralized, implying that our IT department is no longer a formal part of NHS. Several new persons in the top management are recruited as a consequence of retirements (Production manager, Quality manager, Director Primar and the Distribution Department).

The yearly audit related to the ISO certification has been accomplished with only a few minor deviations identified.

Total budget for 2013 is NOK 254 mill., included expected annual gross revenues of NOK 60 mill for the Distribution Department. A considerable part of budget (NOK 33 mill.) is related to additional grant for the MAREANO project.

### **2. Hydrographic Surveys**

#### **2.1. Surveying 2012/2013**

##### **Svalbard**

Two survey launches equipped with EM 3002D have been operating for 10 weeks in Svalbard in the period July-September 2013. The operation has been organized as 12 hours per day, 7 days a week. A total of about 500 km<sup>2</sup> has been surveyed close to the shore. The “spots” of dark green areas in Figure 1 constitute the 2013 surveying.

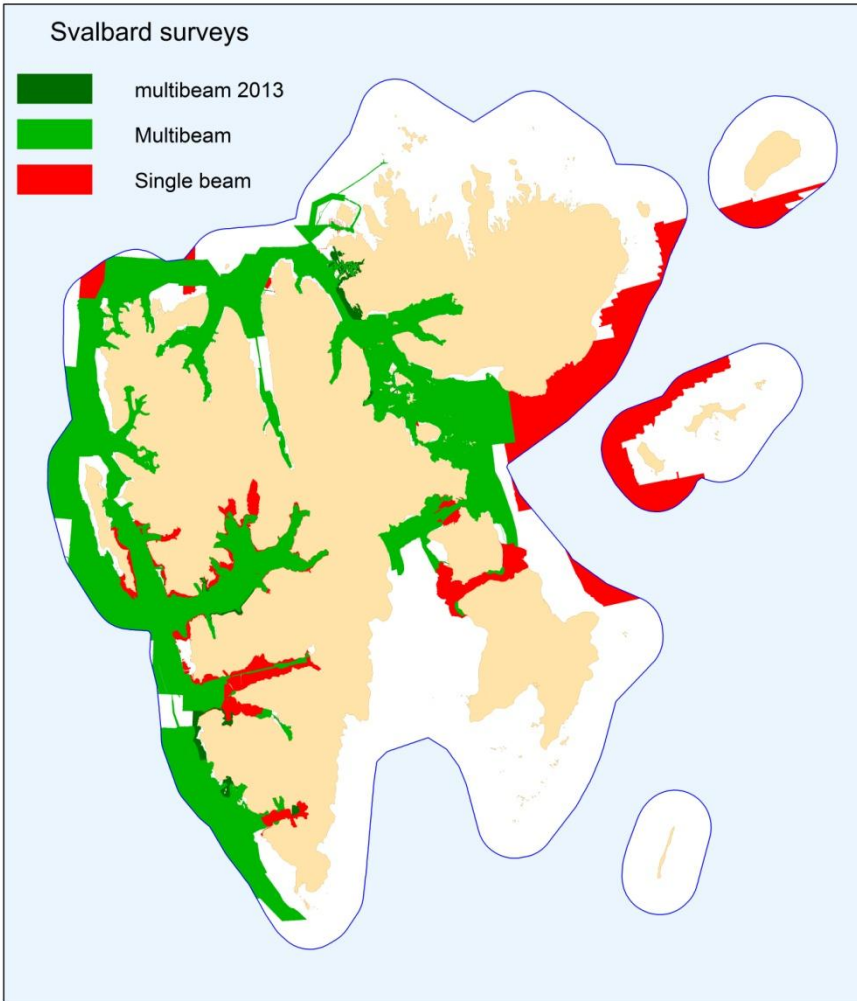


Figure 1. Surveyed areas around Svalbard

**Barents Sea**

As part of the Mareano project some surveying has taken place along the agreed delimitation line between Norway and the Russian Federation.

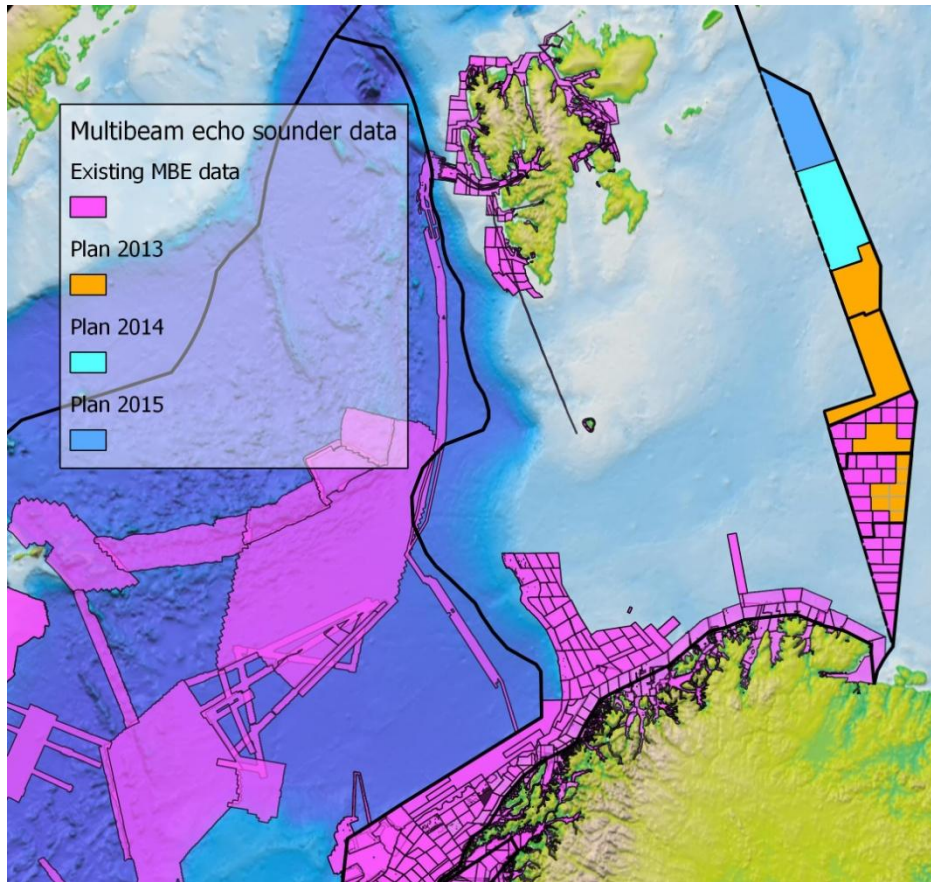


Fig. 2: An overview of the existing multibeam surveying in the Norwegian Arctic waters. The surveying for the Mareano project in 2013 and plans for 2014 and 2015 is included.

The main part of the surveying in the Mareano project took place to the south of the area shown in the figure above. The greater part of the surveying is done by contracted private companies.

### **Norwegian coast**

Two survey launches, equipped with EM 3002D, have been operating on a 12-hour daily when available. Our R/V Hydrograf has contributed with the EM710 in some fjords in addition to the surveying off the coast (Mareano project). All the surveyed coastal areas are outside the Arctic region.

### **2.2. New survey launches**

The NHS has started a procurement process to replace the two existing survey launches. In addition we include a third launch as part of the cooperation contract with the Coastal Administration. The Swedish company Swede Ship has been awarded the contract. The launches will be equipped with Em2040 multibeam echosounders, produced by Kongsberg Maritime. The launches will be made of aluminium, 11.15 meters long and a transit speed of 25 knots. The first launch will be delivered in December 2013 and the two others in early 2014.



Figure 3. Sketch of the new survey launches

### **2.3. New technologies**

The new multibeam Em2040 has been tested with very promising results. The data are much cleaner and the resolution far better than the multibeam we have been using up to now (Em3002D). With the new equipment we will start to also collect information from the water column.

## **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 2013 – 2017 was published April 2012.

### **3.1. Paper charts**

The Main chart series at Svalbard is in scale 1:100.000. In 2011 all charts were issued as new edition. This was done after updating a general warning of restrictions of navigation in non-surveyed areas. A new edition of chart 533 was published in 2013. In addition Bjørnøya (the Bear Island) in scale 1:100.000 was published

### **3.2. ENC**

For the Bear Island area the following ENCs are produced: NO3 Coastal, NO4 Approach and 2 NO5 Harbour

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

At present 194 charts are offered as POD.

143 charts from the Main chart series, 39 Harbour charts and 12 charts from the Main chart series of Svalbard.

#### **4. Nautical Publications**

A new edition of the “Norwegian Pilot”, volume 7, Svalbard, was printed in august 2011. This edition is now also available in an English version.

#### **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/>.

#### **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 March 2013.

#### **7. Capacity building**

Norway participated in the annual meeting in the IHO Capacity Building Sub-Committee in May 2013. Together with the Portuguese HO we conducted a Technical Visit to Mozambique on behalf of IHO in October 2012. The report is available on the IHO webpage.

The Norwegian Agency for Development Cooperation (Norad) some years ago launched a programme called *Oil for Development*. This programme aims to support developing countries in with resource, economy and environment management. NHS is represented in the programme, as subordinate of the Ministry of Environment. We were not involved in any practical implementation of any project so far in 2013.

In December 2013 we assisted Montenegro in acquiring software for conversion of paper charts into ENC's.

#### **8. Oceanographic activities**

New web-pages with tidal information were launched in 2012, <http://sehavniva.no>. Based on 23 permanent tide gauges and discrete tidal zoning the users can search for a location and get tidal predictions and water level from most of the Norwegian coast. A figure with different tidal levels relative to Chart Datum and levels with return periods up to 1000 years are also shown for each location.

In addition to observed water level and predicted tides we present a 5 days water level forecast from models run by the Norwegian Meteorological Institute (NMI). Near real time water level observations are transferred from NHS to NMI and are used to adjust the output from the model.

One big task has been to enhance the accuracy of short term water level observations, measured with pressure sensors. We are working on better procedures for calibration, installation of the equipment and processing of the data. These measurements are used for the reduction of soundings, better tidal-mapping of the coast and transferring land levelling datum to islands.

A new program, written in C++, for storing, processing, analysing and distributing water level data is developed at NHS. A rewritten program for harmonic analysis is integrated and it is now possible to analyse long data series in one operation.

## **9. Other activities**

### **9.1. The MAREANO Program**

More information about the Mareano program is available at [www.mareano.no](http://www.mareano.no).

In 2013 the program received NOK 90 mill in total through earmarked funding to Mareano through the National budget with a focus in selected offshore areas between 62°N-66°N and the previously disputed zone in the Barents Sea. NHS received NOK 38 mill.

The multibeam surveying is described in chapter 2.

A presentation of Mareano will be given at ARHC4

### **9.2. A Coast-MAREANO Project**

Together with some other governmental institutions we are in the process of preparing a project similar to the Mareano, but only for the Territorial waters. A prerequisite for any project is a change in the national policies on restricted access to high resolution bathymetric data.

A presentation of Coast-Mareano will be given at ARHC4

### **9.3. The PLECO Project**

The NHS is running a project to replace the existing multibeam data processing tool. NHS has chosen Caris as the vendor of the system, which will have its final delivery in early 2014. The first part of the delivery, based mainly on existing software, took place in January 2013.

### **9.4. The Føniks project**

Føniks is a project to make sure all data management of point clouds, grids and digital terrain models cohere to the same programmable interface across coastal boundaries and various horizontal and vertical reference systems. Scalable storage solutions and efficient processing and transformations will create unique land-sea integrations in the model domain for map production and data distribution, both at land and sea. The project is cooperation between the Sea (Hydrographic Service) and Land Divisions within the Norwegian Mapping Authority.

### **9.5. BarentsWatch**

The Norwegian Mapping Authority are participating in an intergovernmental cooperation on developing and establishing a general Information and surveillance system, covering the High North and the Norwegian coastal and sea areas. BarentsWatch aim to offer integrated knowledge and information services to the public, and will also support efficient coordination between governmental services through a common information picture. A core part of the system consists of map services, based on geographic information services from official sources. So far, the cooperation counts ( Ministries and 26 management Agencies and Research Institutes. Ref.: <http://www.barentswatch.no/en/om/>

### **9.5. International activities**

The NHS is involved in several Working Groups, Committees and Commissions related to IHO. Norway has representatives in the following Working Groups: TSMAD, CSPP, DIP, SNP, MSDI, DQ, TWL, IHO-EU Network and WEND. We have participated in the IRCC and the HSSC meetings in 2013. Norway is actively participating in 5 Hydrographic Commissions: ARHC, HCA, NHC, NSHC and SAIHC.

As operator of the PRIMAR RENC we participate in all related meetings.

During the last 2-3 years we have contributed with a substantial part of high resolution bathymetric data, obtained through the Mareano project, to GEBCO (and IBCAO) database.