



## NATIONAL REPORT OF SWEDEN

### Executive summary

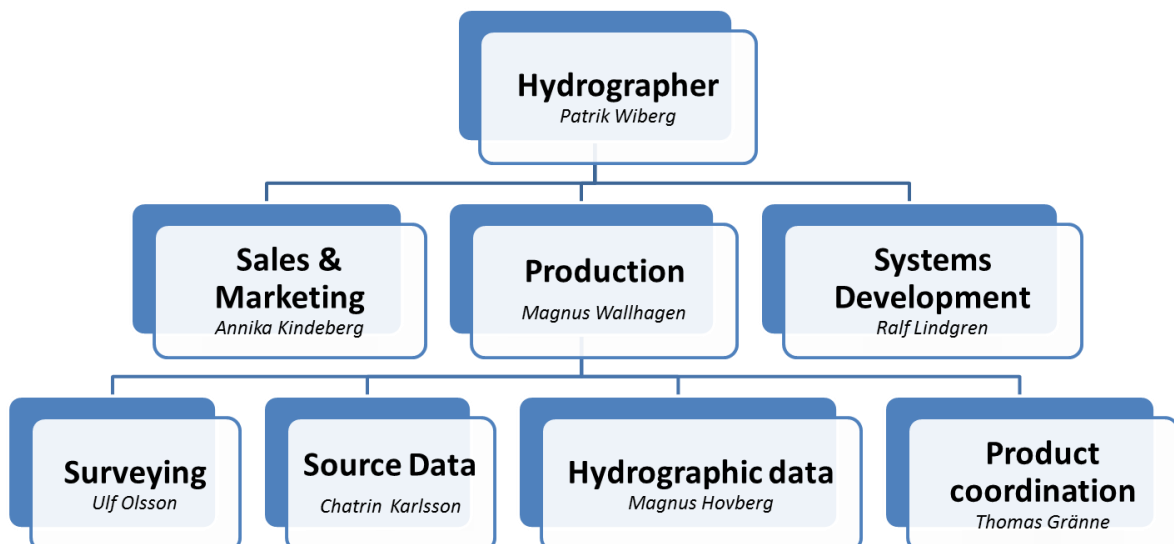
This report gives a summary of the main activities within the Swedish Hydrographic Office since the last report given at the 22<sup>nd</sup> BSHC meeting in Rostock September 2017.

### 1. Hydrographic Office

The Swedish Hydrographic Office is organized within the Swedish Maritime Administration (SMA). Apart from hydrography, SMA is also responsible for other maritime services, where the main are Pilotage, Fairway Service, Icebreaking, Search and Rescue (SAR) and Maritime Traffic Information.

At the time of compiling this report the Hydrographic Office, including the hydrographic survey personnel, employs 120 persons.

All operations are certified in accordance with ISO 9001 and the environmental standard ISO 14001. The quality management system covers all parts of the operations and supporting activities within the Swedish Maritime Administration.



## 2. Surveys

### 2.1 Overall status and surveys 2017 – 2018 (Q2)

Most Swedish waters are surveyed to some degree over the years, but the long term objective is that all Swedish waters should be surveyed in accordance with the IHO standard S-44. Sweden and Finland have implemented a common Finnish Swedish realisation of S-44; named FSIS-44. There are still areas used by SOLAS vessels that needs to be surveyed by modern methods.

Surveys and re-surveys now and until 2020 are focused on shipping routes as defined as HELCOM Cat I and II areas in the Hydrographic Re-Survey plan for the Baltic Sea. Cat I and II encompasses 118 000 km<sup>2</sup> out of totally 165 000 km<sup>2</sup> within Swedish waters. Sweden has targeted that the surveying of Cat I and II areas should be finalized 2020.

Since 2011 the Swedish HO, together with other Baltic Sea HOs, has received co-financing from the EU TEN-T and Connecting Europe Facility (CEF) programme for hydrographic surveying activities. The first phase of the global FAMOS project FAMOS Freja was finalized 2016, but FAMOS is continuing with the second phase FAMOS Odin 2016 – 2018. The HOs from Denmark, Estonia, Finland, Germany, Latvia Lithuania and Sweden is participating in FAMOS Odin. In addition to these HOs, there are also many other additional partners such as national authorities and institutes. Additional activities in this second phase are studies on route optimizing in the Baltic Sea in regards to bathymetry and squat. The project will also perform studies on better control of Under Keel Clearance, where the clearance is critical. See more in the SE FAMOS Project Status Report, document C6\_BSHC23\_SE.

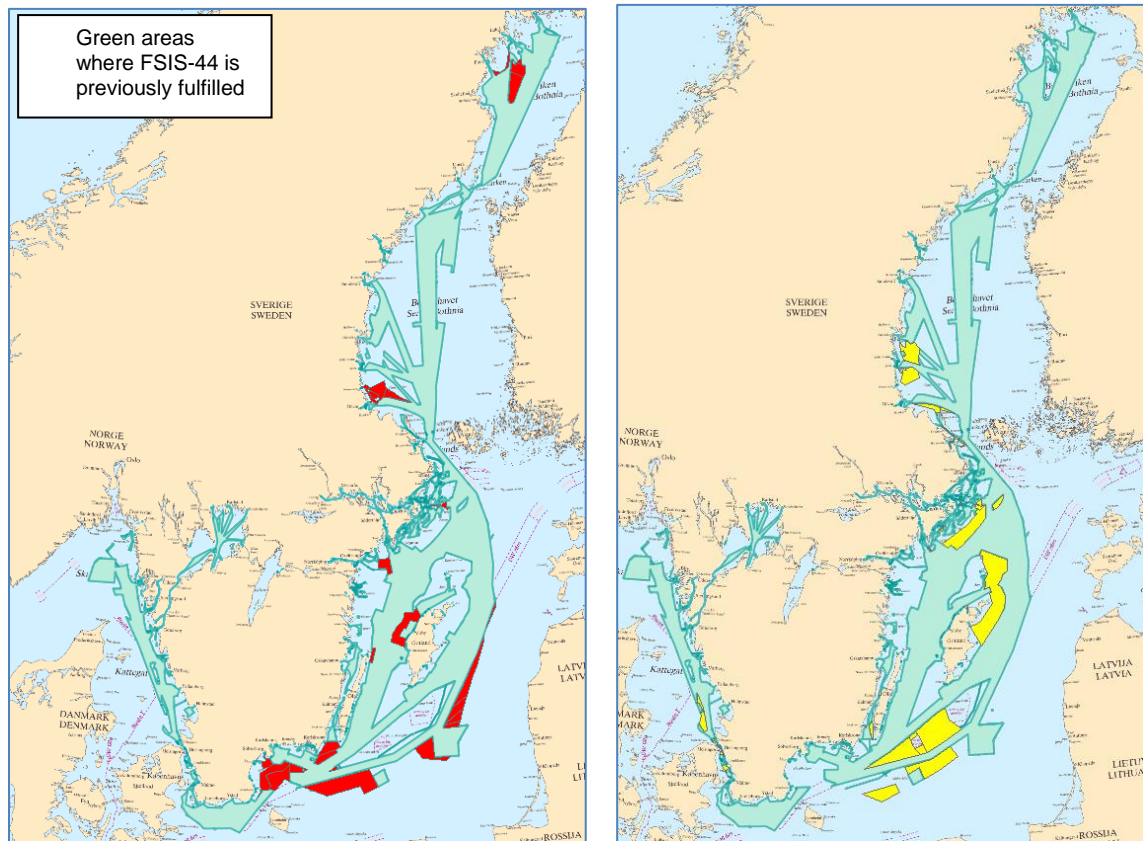


In 2017 a total amount of 10 514 km<sup>2</sup> were surveyed in Swedish waters by SMA vessels and through contracted companies and additionally 349 km<sup>2</sup> was survey by other actors. Approximately 3 200 km<sup>2</sup> was surveyed the first 6 months of 2018. The table below summarize the total amount of Swedish waters, surveyed in accordance with FSIS-44.

| Category of SE waters                                      | Area                    | FSIS-44 fulfilled      | Percentage FSIS-44 fulfilled |
|--|-------------------------|------------------------|------------------------------|
| Total area SE waters                                       | 165 000 km <sup>2</sup> | 98 200 km <sup>2</sup> | 60 %                         |
| Shipping routes<br>HELCOM Cat I and II +<br>inland waters* | 118 000 km <sup>2</sup> | 88 000 km <sup>2</sup> | 77 %                         |
| Other waters<br>HELCOM Cat III +<br>inland waters*         | 47 000 km <sup>2</sup>  | 7 000 km <sup>2</sup>  | 15 %                         |

\*The figures in this table differ slightly from the SE figures in the BSHC MWG Report since also areas in inland waters are

included here.



**Figure 1 Surveys performed 2017**

**Surveys planned 2018**

The FAMOS Odin project, with the co-finance from the EU CEF-program, has given SMA possibility to procure external resources for surveying. Framework agreements, regarding hydrographic surveys in Swedish areas 2017 – 2019 (with possible extension one year), have been awarded seven service providers. In July 2017 the first survey agreement was signed with Clinton. The survey area was 6 700 km<sup>2</sup>, but only 3 900 km<sup>2</sup> was reached by Clinton due to weather and usage of a small vessel (M/V Northern Wind). Since Clinton underachieved, another contract was signed with MeriTaito, to cover some of the areas Clinton should have surveyed. MeriTaito (MSV Pohjanmeri) surveyed all areas according to the signed contract. In total 4 600 km<sup>2</sup> was survey by Clinton and MeriTaito to a total cost of 7,7 million SEK (0,77 million €) in 2017.

Further procurements, of a total cost of 15,2 million SEK (1,52 million €), have been done in 2018. Figure 3 shows the areas planned to be surveyed by procurement of external resources. Clinton has been awarded a contract to survey an area of 2 700 km<sup>2</sup> (areas A – E in figure 3 below) and MMT (Marin Mätteknik) has been awarded another contract surveying an area of 2 000 km<sup>2</sup> (areas F – I in figure 3 below). The surveying is ongoing at the time of compiling this report.

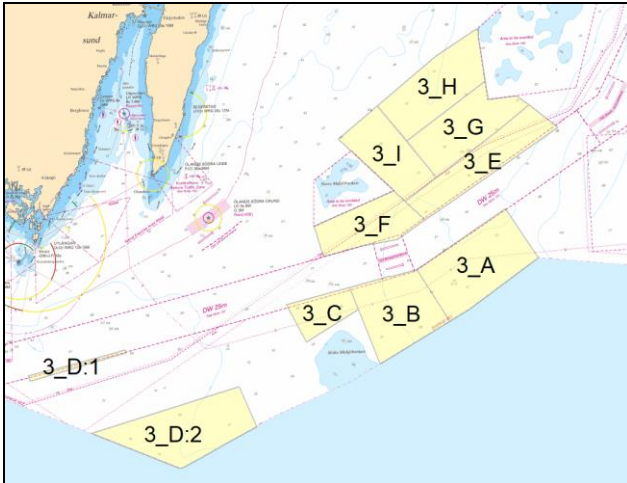


Figure 2 Areas to be surveyed by procurement of external resources.

## 2.2 Survey Vessels



Figure 3- SMA Survey vessels equipped with multibeam. To the left the two survey vessels Jacob Hägg and Baltica where surveying are performed 24 hours per day and 7 days per week, weather permitted. To the right the two survey boats Petter Gedda and Anders Bure.



Figure 4 Bar sweeping survey vessel Gustaf af Klint. The bar is transverse across the stern and is here submerged into the water.

## 2.3 Depth Database

The depth database DIS (Depth Information System) is managed in an ESRI-system with some specialized tools developed by a Swedish GIS company specialized on ESRI tools. Q1 2018 135 billion depths were stored in the depth database.

## 3. New charts and updates

### 3.1 New ENC and Paper Charts

The Swedish paper chart portfolio consists of 117 paper charts and 16 series of small craft charts. Special charts, tailored to the customer are also available as well as a service to provide S-57 or raster data to the end user service providers. For S-57 deliveries to the leisure craft market the PRIMAR service “GeoViewer” is used.

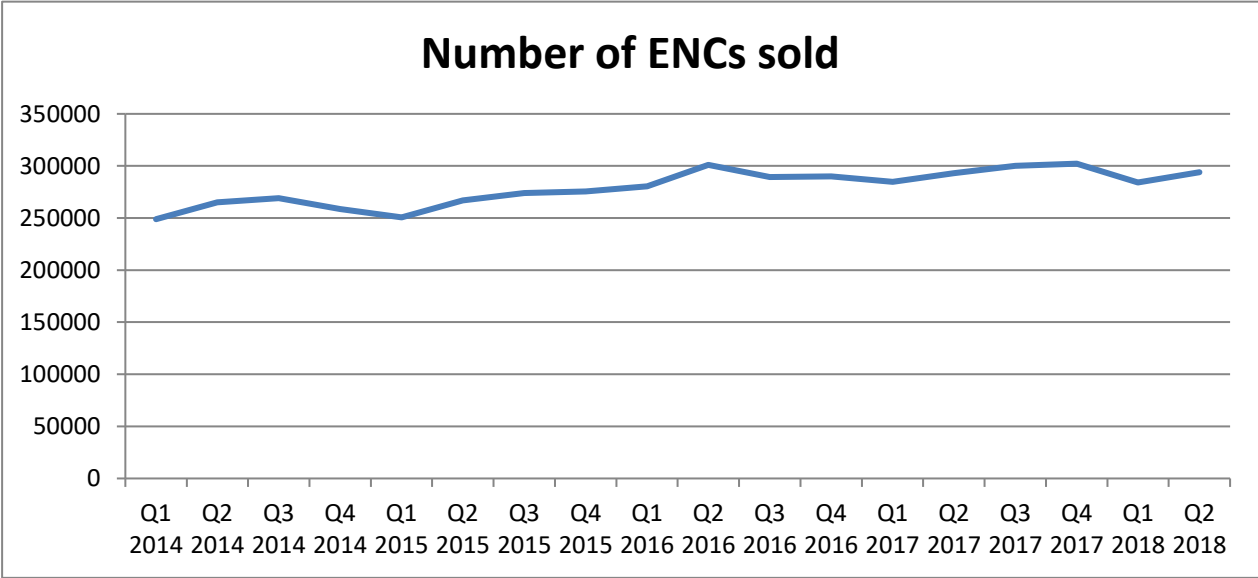
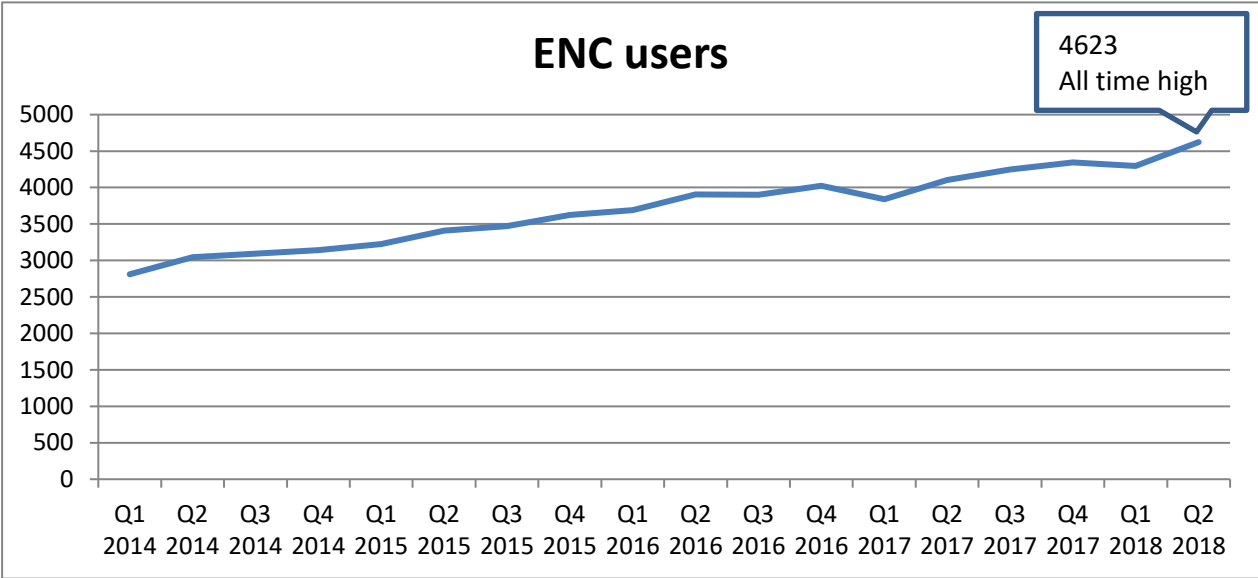
At the SMA website under the headline “Se på sjökort” a chart index showing Swedish charts is available at: <https://geokatalog.sjofartsverket.se/kartvisarefyren/>

Under the headline “Djupinformationens kvalitet” the quality of depth data is presented: <https://geokatalog.sjofartsverket.se/kartvisarefyren/>

4 New Editions of paper charts were published 2017 and another 24 New Editions have been published 2018 (Q1 and Q2). These paper charts were the first paper charts published after SMA changed chart production system to CARIS HPD. In 2018 also 6 New Editions of small craft charts was published covering Stockholm archipelago, Hanöbukten, Lake Vänern and Bay of Bothnia. Bay of Bothnia was the first small craft chart totally produced with Baltic Sea Chart Datum 2000. SMA has now produced all three basic chart products (ENC, paper charts and small craft charts), using the new CARIS system.

145 New Editions (EN) and 445 Revisions (ER) of ENCs have been produced so far 2018 (Q1 and Q2).

The sales of Swedish ENC's for the last five years are shown in the table below. The number of ENC users is increasing with approximately 15 % yearly and the number of ENC's sold is increasing with 13%.



| Usage Band | Compilation Scale       | No of SE ENC's                        |
|------------|-------------------------|---------------------------------------|
| 2 General  | 1:350 000 – 1:4 999 999 | 11                                    |
| 3 Coastal  | 1:90 000 – 1:349 999    | 81                                    |
| 4 Approach | 1:22 000 – 1:89 999     | 230                                   |
| 5 Harbour  | 1:4 000 – 1:21 999      | 153                                   |
| 6 Berthing | >1:4 000                | 105                                   |
|            |                         | <b>580</b> , total number of SE ENC's |

### 3.2 The Chart Improvement project – Sjökortsllyftet

Within the BSHC it has been agreed upon that all chart products within the Baltic Sea should be adjusted to a common vertical reference level; Baltic Sea Chart Datum 2000. As part of the commitment made in BSHC the SMA started the Chart Improvement project (Sjökortsllyftet) 2015 in order to adjust the chart products to this new reference level. Apart from amend existing depth contours and depth figures also some other quality improvements will be made at the same time such as:

- New surveyed coastline, from the Swedish land survey agency (Lantmäteriet), will be used.
- Navigational aids will be adjusted to geodetically survey positions
- 15 and 30 m depth contours will be included as standard depth contours

11 New Editions of paper charts has been published in March 2018 with equivalent 29 New Editions of ENCs as a consequence of the project. Also one New Edition of a Small Craft Chart series, covering the Swedish coast of Bay of Bothnia, was published in April 2018. The new vertical reference level will be implemented in all Swedish chart products (117 paper charts and 580 ENCs) early 2021.

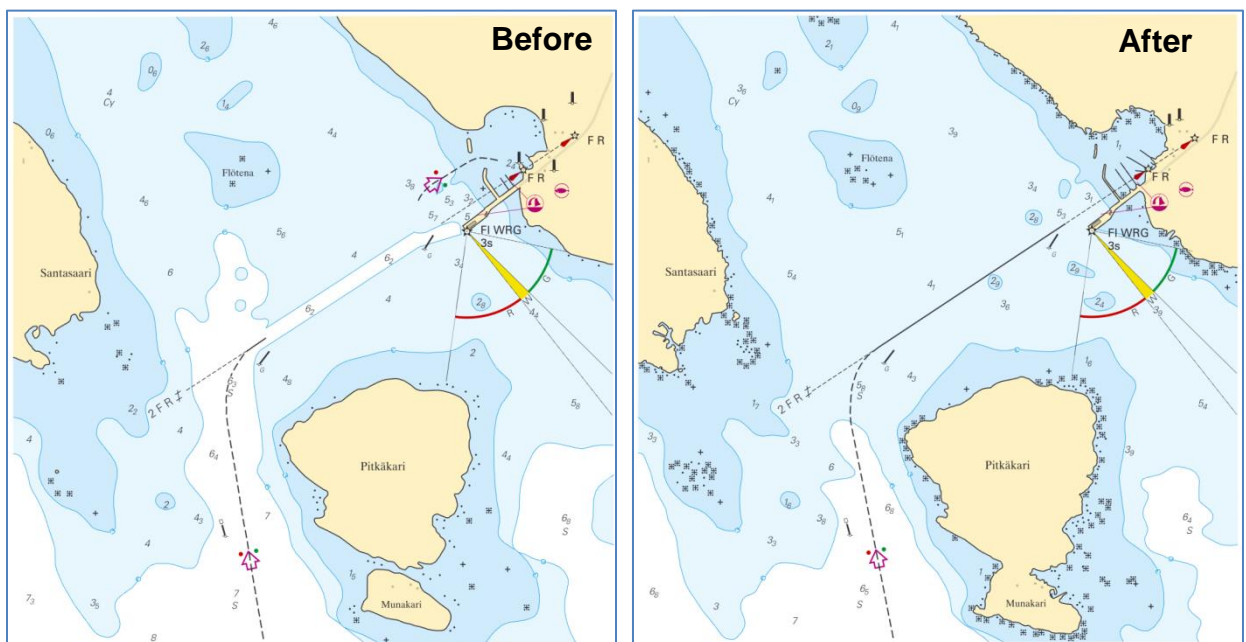


Figure 5 Changes after the Chart Improvement project in the Haparanda region, near the Finnish border.

### 3.3 Small Craft Charts

The sales of Swedish small craft charts are very important for the SMA net result. However since SMA has changed its production system for chart products late 2016 it was not possible to produce any new editions of small craft charts to the 2017 season. The production of small craft charts started again, in the new CARIS HPD system, in the second half of 2017 and as mentioned six small craft chart series has been published 2018.

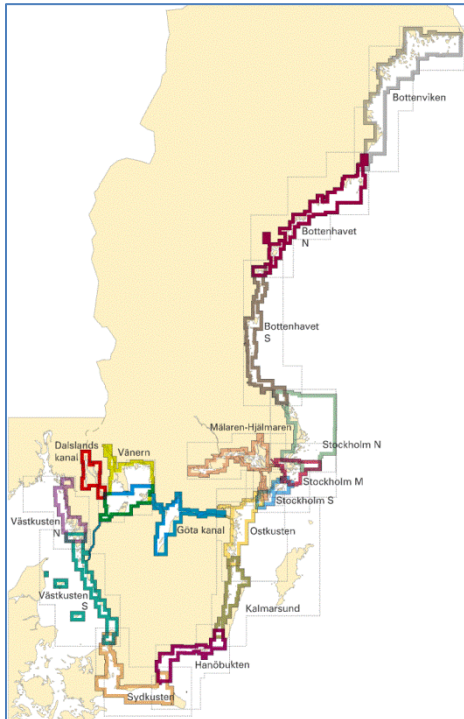


Figure 6 Small craft chart series in Sweden

## 4. New publications and updates

### 4.1 NtM and other publications

The Swedish Notices to Mariners (Ufs) are available on the SMA web site:

- A daily updated database in which NtM information can be searched in many different ways, e.g. all notices published for a certain given area and published during a given period time period.
- Each week one Swedish and one English PDF-file is published on the website [www.sjofartsverket.se/ufs](http://www.sjofartsverket.se/ufs) and [www.sjofartsverket.se/ntm](http://www.sjofartsverket.se/ntm) respectively.
- General nautical information (about MSI, regulations, ENC and paper charts, fairway information, etc.) needed for safe navigation in Swedish waters is available in Ufs A. This was previous a booklet, but from 2018 it is only published as a pdf version available both in Swedish and in English at the SMA website. The link to the English version is [http://www.sjofartsverket.se/upload/Ufs/Ufs%20A%202018%20English\\_HQ.PDF](http://www.sjofartsverket.se/upload/Ufs/Ufs%20A%202018%20English_HQ.PDF). It is easy to print the pdf version for the customers and having only a digital version will make it easier to keep the information updated.

The Swedish Chart Catalogue is published once per year.

### 4.2 Swedish Pilot

Swedish pilot books in paper format have not been available in several years. Critical nautical information, traditionally published in the pilot books, has instead been published at the respective SMA Pilot Area's website. To secure more harmonized nautical information and utilize for harbours to more easily contribute a portal called Svensk Lots/Swedish Pilot is



under development. This portal will be available at the SMA website and the two harbours Göteborg and Luleå will be the two first harbours planned to be published late 2018.

## **5. MSI**

All Swedish navigational warnings are drafted and broadcasted by the station **MSI SWEDEN**. This station also performs the NAVTEX broadcasting of MSI for the entire Baltic Sea with exception of area “U”, which is covered by Tallinn Radio.

The station is operated H24 all days of the year and may be contacted as follows:

Tel: +46 771 63 06 85

E-mail: [swedentraffic@sjofartsverket.se](mailto:swedentraffic@sjofartsverket.se)

The NtM department at the Hydrographic Office in Norrköping maintains the role “Baltic Sea Sub-area Coordinator”, with the responsibility of international coordinator of MSI in the Baltic Sea area.

## **6. C-55**

The latest update regarding Sweden in the C-55 database was delivered to the IHB in August 2017.

## **7. Capacity building**

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

## **8. Oceanographic activities**

The SMA is responsible for a number of water level stations but it is the Swedish Meteorological and Hydrological Institute (SMHI) that has the main responsibility for the Swedish oceanographic activities. The SMA and the SMHI have a close cooperation on water level information. Other actors are the Swedish Geological Survey, universities and research institutes.

## **9. Other activities**

### **9.1 Seabed 2030 – RDACC in Stockholm**

The GEBCO Seabed 2030 project will facilitate mapping of the ocean floor by the year 2030. The Nippon Foundation will contribute US\$ 18.5 million for the first ten years of the project. The aspiration is for Seabed 2030 to compile all available and newly collected bathymetric data into a high quality, high resolution digital model of the ocean floor and to promote international efforts to collect new data. The work will be done through the establishment of four Regional Data Assembly and Coordination Centres (RDACCs) and a Global Data Assembly and Coordination Centre (GDACC). One of four RDACCs will be the Department of Geological Sciences, Stockholm University, Sweden, responsible for the North Pacific and Arctic Ocean.

## 9.2 New legislation on maritime limits and boundaries

1 March 2018 a new legislation on the maritime limits and boundaries in Swedish waters became into force. A Contiguous Zone has been established as a new zone in Swedish waters. Under UNCLOS, the outer limits of this zone may not extend beyond 24 nautical miles measured from the territorial sea baselines. All Swedish maritime limits and boundaries are now available in a digital format at [www.geodata.se](http://www.geodata.se) and at <http://www.sjofartsverket.se/sv/Maritima-Tjanster/Havsgranser/>.

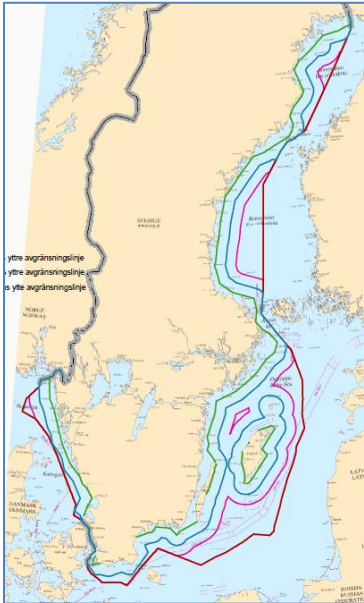


Figure 7 Maritime limits and boundaries in Swedish waters

## 9.3 Marine Spatial Data Infrastructure in Sweden

Marine data is used by many different stakeholders in Sweden. Apart from navigation it is crucial for many different purposes such as marine environmental mapping, flooding prediction and marine spatial planning. In Sweden there are no specific initiative to establish a geodata portal for only marine data. The Swedish land survey agency – Lantmäteriet – is coordinator for all geodata in Sweden including marine data. At [www.geodata.se](http://www.geodata.se) marine spatial data is available together with all other geodata.

The Swedish Agency for Marine and Water Management has an overall responsibility for Marine Spatial Planning in Sweden, but the coastal municipalities are responsible for their on waters 1 nautical mile outside the limit of baseline. For Marine Spatial Planning specifically the municipalities have expressed that the lack of marine data in the coastal region is problematic and hinder them to do solve their planning.

## 9.4 Category B Hydrographic Surveyors Program established in Sweden

The SMA has been involved in the establishment of a Category B Hydrographic Surveyors Program in Sweden. This Cat B program has been certified by the FIG/IHO/ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC). The University of Gothenburg is overall responsible for the program, but to be able to deliver the program a consortium of academia, industry and government organizations has

been established. This is the first certified Hydrographic Surveyors program established in any of the Nordic countries. As head of the program, the well-known hydrographic expert David Dodd has been recruited by the University of Gothenburg. Preparations is also ongoing for the establishment of a Hydrographic Surveyors Cat A program. The first Cat B course will start in Gothenburg 6 November 2018. The program welcomes of course participants from all of the BSHC member states and elsewhere as well.