

## NATIONAL REPORT OF SWEDEN

### Executive summary

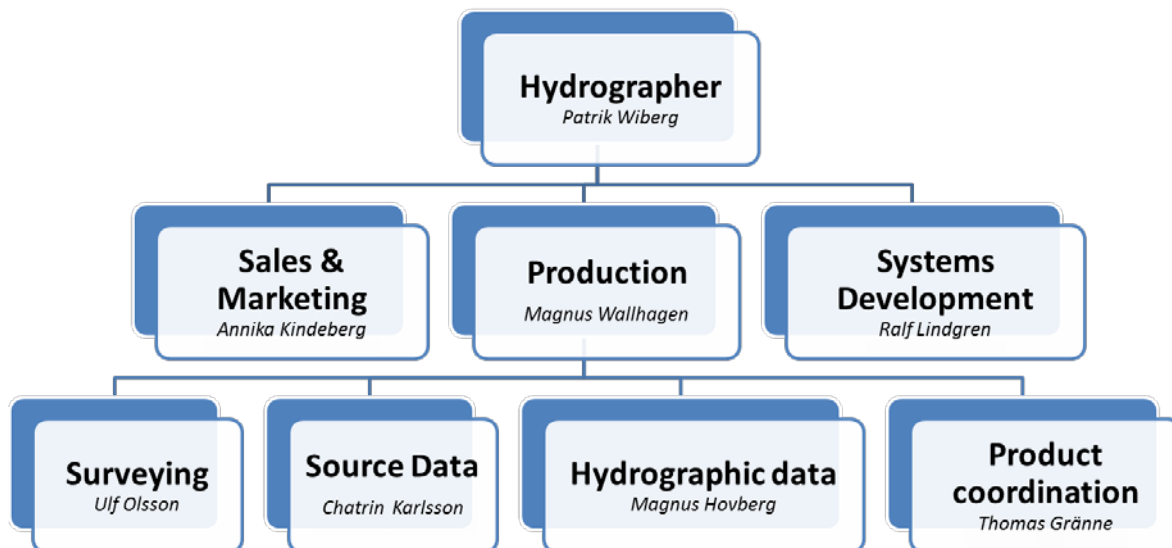
This report gives a summary of the main activities within the Swedish Hydrographic Office since the last report given at the 61<sup>st</sup> NHC meeting in Elsinore March 2017.

### 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 2016 – 2017 (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. This standard is achieved in the majority of areas used

by SOLAS vessels, but there are still areas used by SOLAS vessels that needs to be surveyed by modern methods.

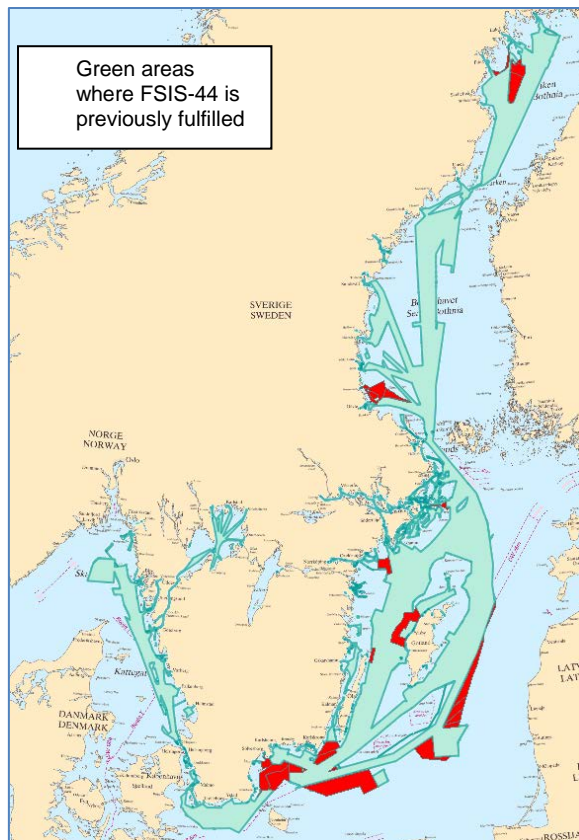
Surveys and re-surveys now and until 2020 are focused on shipping routes as defined as HELCOM Cat I and II areas in the Hydrographic Re-Survey plan for the Baltic Sea. Cat I and II encompasses 118 000 km<sup>2</sup> out of totally 165 000 km<sup>2</sup> within Swedish waters. Sweden has targeted that 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 E-navigation Report, document NHC62-D2.1.

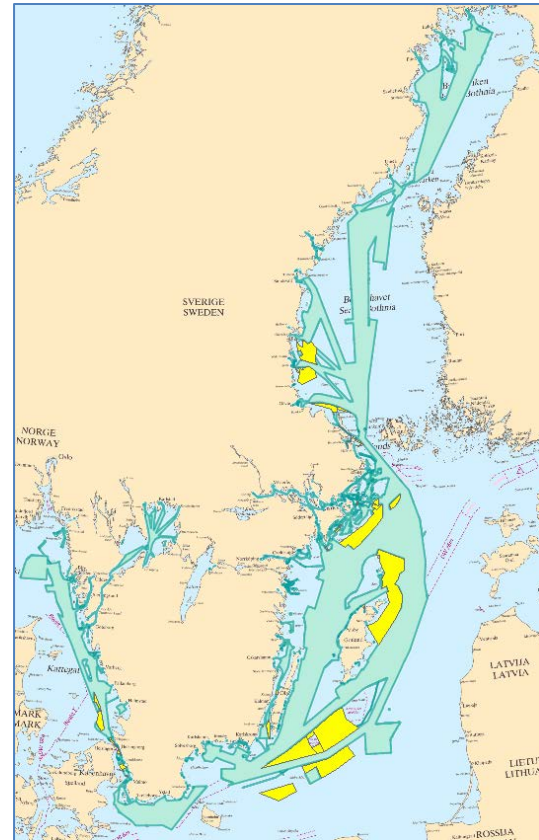


In 2017 a total amount of 10 514 km<sup>2</sup> were surveyed in Swedish waters by SMA vessels and additionally 349 km<sup>2</sup> was survey by external resources. The table below summarize the total amount of Swedish waters, surveyed in accordance with FSIS-44.

Category of SE waters	Area	FSIS-44 fulfilled	Percentage FSIS-44 fulfilled
Total area SE waters	165 000 km <sup>2</sup>	95 000 km <sup>2</sup>	58 %
Shipping routes HELCOM Cat I and II + inland waters*	118 000 km <sup>2</sup>	88 000 km <sup>2</sup>	75 %
Other waters HELCOM Cat III + 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.			

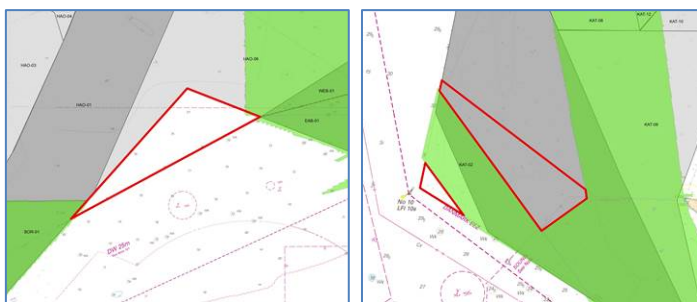


**Figure 1 Surveys performed 2017**



**Surveys planned 2017 (SMA vessels)**

At the 21<sup>st</sup> BSHC meeting 2016 it was identified that a small in area in Danish waters, north of the DW-route off Bornholm, was not included in the HELCOM Re-survey plan. Since Sweden had planned to do surveys in the adjacent area in Swedish waters, Sweden offered to also survey the small area in Danish waters. As a compensation then Denmark offered to survey an equivalent since of area in Kattegat in Swedish waters. The surveys was performed the first half of 2017 and the good cooperation between Denmark and Sweden led to efficient surveying of the areas. Bathymetry data has now been delivered to the respective HO.



**Figure 2 Sweden surveyed a Danish area north of Bornholm an Denmark surveyed two equivalent Swedish areas in Kattegat.**

The FAMOS Odin project, with the co-financing 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 €).

Further procurements, of a total cost of 15,2 million SEK (1,52 million €), will be done in 2018. Figure 3 shows the areas planned to be surveyed by procurement of external resources.

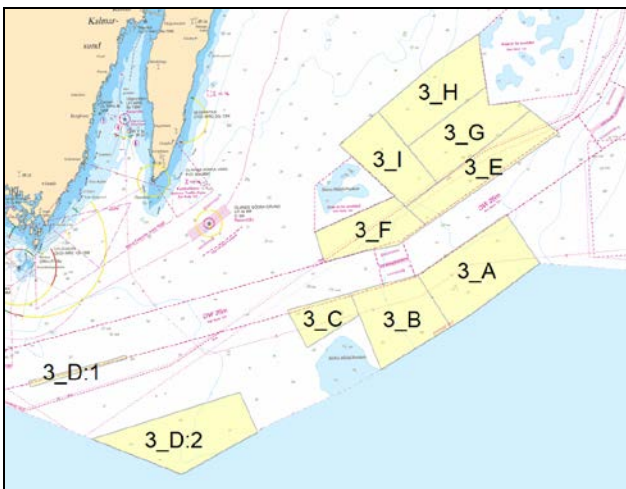


Figure 3 Areas to be surveyed by procurement of external resources.

## 2.2 Survey Vessels



Figure 4- 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 5** 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. At the time of writing this report, 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.

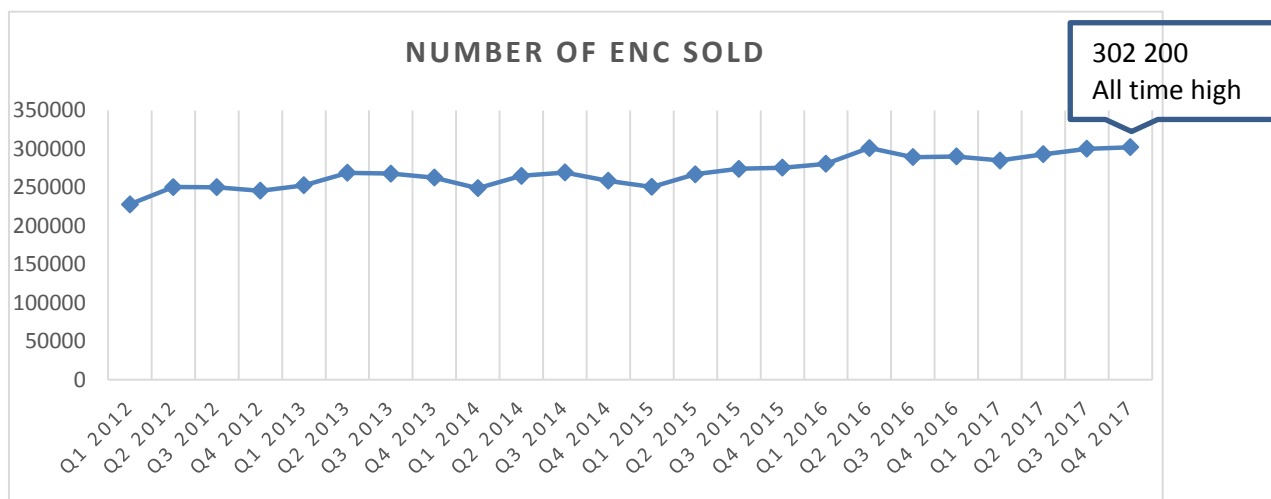
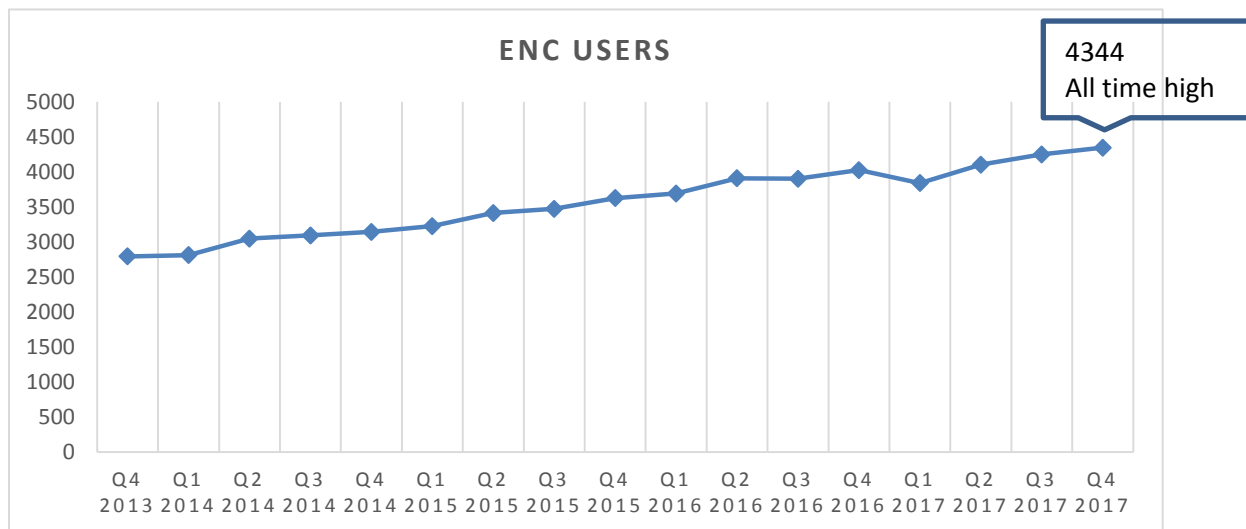
At the SMA website under the headline “Se på sjökort” a chart index showing Swedish charts is available at: <https://geokatalog.sjofartsverket.se/kartvisarefyren/>

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

4 New Editions of paper charts was published 2017. These paper charts were the first paper charts published after SMA changed chart production system to CARIS HPD. In the beginning of 2018 also 3 New Editions of small craft charts was published covering Stockholm archipelago. This means that all three base chart products (ENC, paper charts and small craft charts) have been produced using the new CARIS system.

As a consequence of data migration, when starting up the ENC production in the new CARIS HPD system, all 579 Swedish ENCs had to be published as New Editions, which was made the first quarter of 2017.

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 23 New Editions of ENC's as a consequence of the project. Also one New Edition of a Small Craft Chart series, covering the Swedish coast of Bay of Bothnia, will be published in April 2018. The new vertical reference level will be implemented in all Swedish chart products (117 paper charts and 580 ENC's) until 2021.

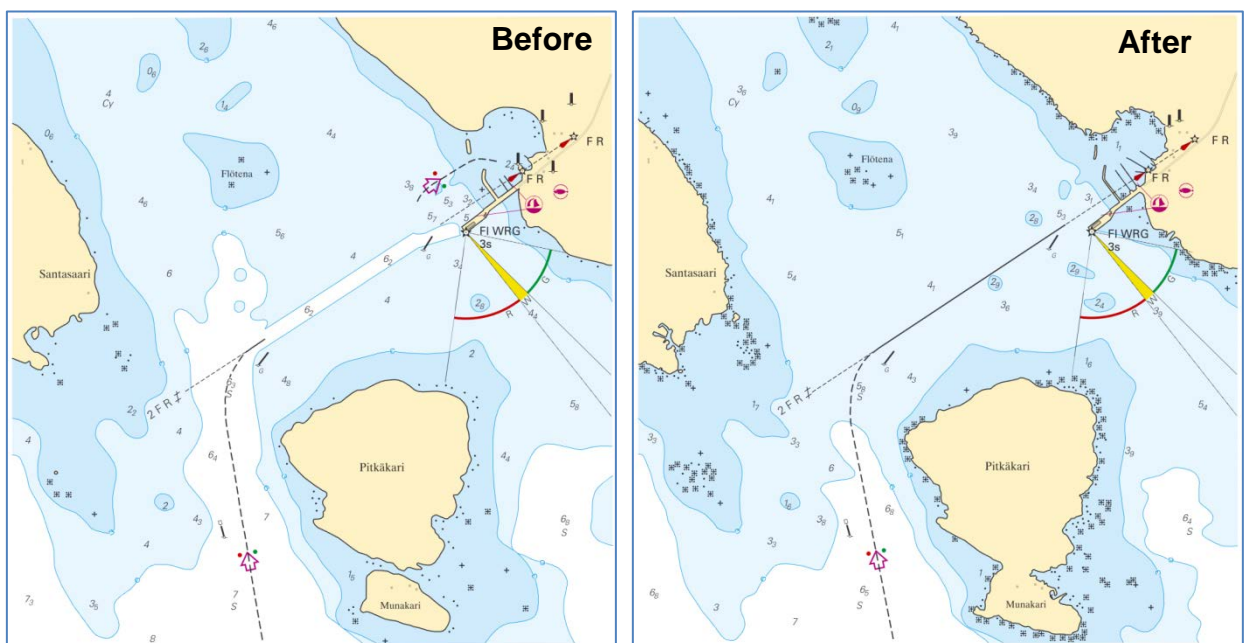
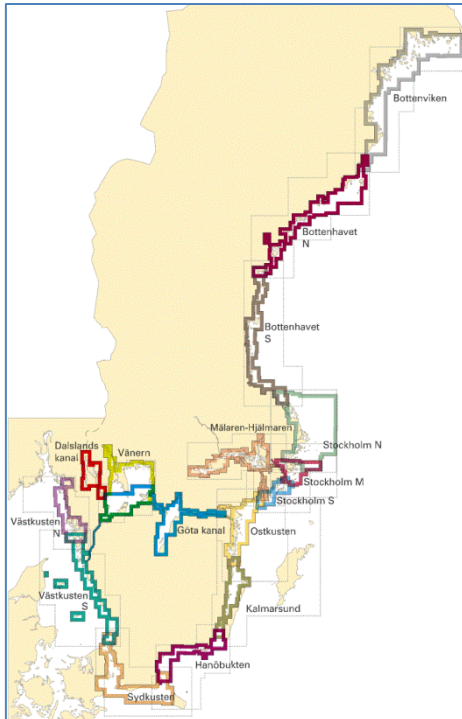


Figure 6 Changes after the Chart Improvement project in the Haparanda region, near the Finnish border.

### 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. To the 2018 season, small craft chart series are published covering Stockholm archipelago, Hanöbukten, Lake Vänern and Bay of Bothnia. Six series will be published in total.



**Figure 7 Small craft chart series in Sweden**

### 3.4 New Chart Production System

The previous chart production system at SMA was in use more or less 25 years. After a public procurement 2015 a contract was signed with CARIS in November the same year in order to deliver a new system for chart production. The new CARIS HPD system was taken in production in October 2016. ENC's were produced within weeks from production start-up, but the paper chart production is much more resource consuming to restore. All necessary cartography needs to be re-created. The first paper charts, produced from the new system, was published in August 2017. Three more New Editions were published later 2017 and as mentioned production of small craft chart series was been restored. The whole cartography migration work should be finalized 2018.

## 4. New publications and updates

### 4.1 NtM and other publications

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

1. 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.
2. 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.

The Swedish Chart Catalogue is published once per year. The small but comprehensive booklet Ufs A is from 2016 published biannual and is available on our web site as well as in paper format. This booklet contains general nautical information (about MSI, regulations, ENC and paper charts, fairway information, etc.) needed for safe navigation in Swedish waters. It is also available in English



[http://www.sjofartsverket.se/upload/Ufs/Ufs%20A%202016%20-%202017%20English\\_HQ.pdf](http://www.sjofartsverket.se/upload/Ufs/Ufs%20A%202016%20-%202017%20English_HQ.pdf). In April 2018 a new edition of Ufs A will be published. It will only be available in digital format at the SMA website.



## 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 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 in September 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.

MSI SWEDEN is co-located with SWEDEN TRAFFIC and VTS EASTCOAST in Södertälje.

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

Tel: +46 771 63 06 85

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

VHF: Call MSI SWEDEN on relevant VHF Channel

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. 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).

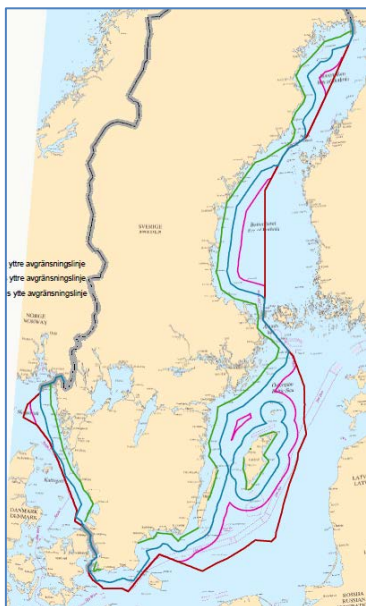


Figure 8 Maritime limits and boundaries in Swedish waters

### **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.