

## NATIONAL REPORT OF SWEDEN

### 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 118 persons. See also the organisation scheme in figure 1.

All operations at the SMA are certified in accordance with the quality management system ISO 9001 and the environmental standard ISO 14001.

The covid-19 pandemic continued to influence the Hydrographic Office during 2021. Long periods most of the staff were working from home office. Despite the complicated circumstances, the Hydrographic Office has ensured continuous delivery of navigational warnings, Notices to Mariners, paper charts and Electronic Navigational Charts (ENC).

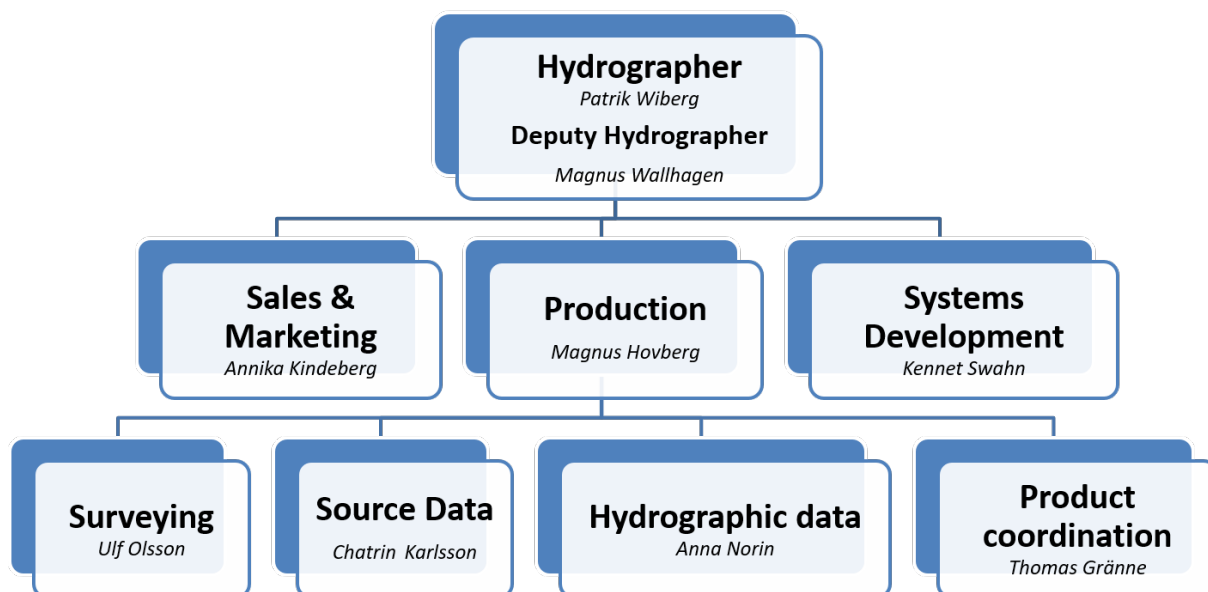


Figure 1 Organizational scheme of the Swedish Hydrographic Office

## 2. Surveys

### 2.1 Overall status and surveys 2021

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 S-44 standard. Almost all areas used by SOLAS vessels are surveyed by modern methods, but shallower areas still need to be surveyed.

Surveys and re-surveys until 2021 have been focused on shipping routes as defined as HELCOM Cat I and II areas in the HELCOM 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 had initially targeted that the surveying of Cat I and II areas should be finalized 2020, but due to decreased co-financing from EU-programmes the last such areas will be finalized 2023 instead. Although 97 % of all these areas were surveyed in the end of 2021.

From 2022 and onwards hydrographic surveying will be focused on surveying the shallower areas used for commercial shipping other than SOLAS vessels. These areas are also used by larger leisure crafts and national authorities such as police, coast guard and navy. In the HELCOM Re-Survey plan such areas are named Cat III high and medium priority. The plan is to have finalized the surveying of these areas by 2036. To optimize the surveying of these shallower waters the SMA has put another survey vessel into operation; Johan Månsson, which is a sister vessel to the survey vessel Anders Bure. 2021 was the last year our biggest survey ship Baltica was operating as a survey ship. Remaining areas in open seas and areas with moving seabed, where periodical re-surveying is required, will be surveyed with Jacob Hägg.

For surveying of even shallower areas a national programme on coastal zone mapping is requested by the SMA and other mapping agencies in Sweden, but at present no decision has been taken to fund such a programme.

In 2021 a total amount of 5 100 km<sup>2</sup> was surveyed in Swedish waters by SMA. Sweden and Finland have implemented a common of S-44; named FSIS-44. The implementation of the new edition S-44 edition 6.0.0 is proceeding. The table below summarize the total area 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>	125 700 km <sup>2</sup>	76 %
Shipping routes HELCOM Cat I and II	118 000 km <sup>2</sup>	114 500 km <sup>2</sup>	97 %
Other waters HELCOM Cat III + inland waters	47 000 km <sup>2</sup>	11 200 km <sup>2</sup>	24 %

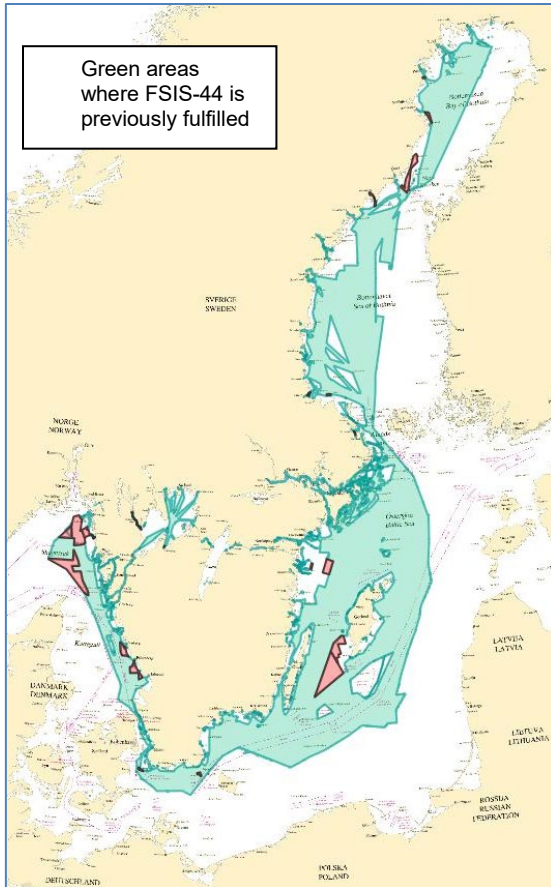
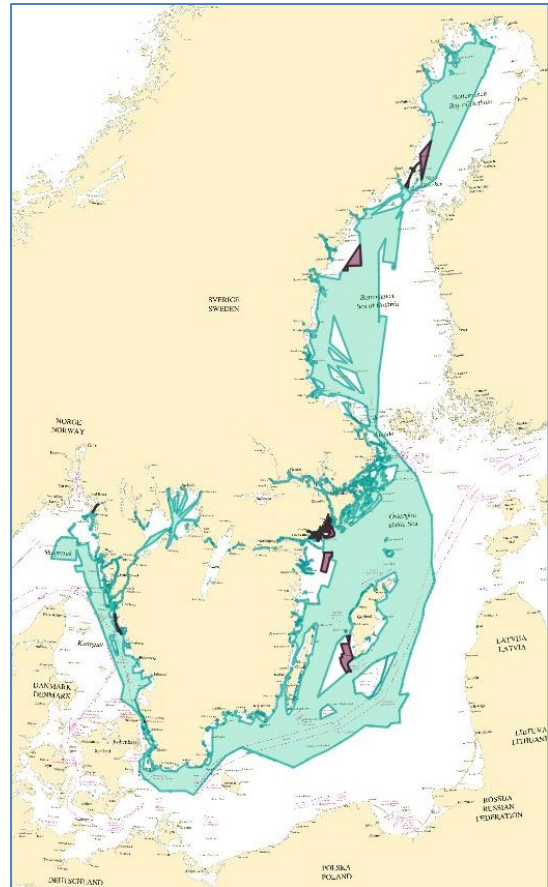


Figure 2 Surveys performed 2021



Surveys planned 2022

## 2.2 Survey Vessels



Figure 3- SMA Survey vessels equipped with multibeam. Above the survey launch Petter Gedda. In the middle the two launches Anders Bure and Johan Månsson. Below the survey ship Jacob Hägg where surveying is performed 24 hours per day and 7 days per week, weather permitted.



Figure 4 Bar sweeping survey vessel Gustaf af Klint. The bar is transverse across the stern and 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. In April 2022 there were 289 044 984 207 (289 billion) depths 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 end user service providers. To provide the manufacturers, delivering electronic charts for the leisure market, the PRIMAR service “GeoView” is used.

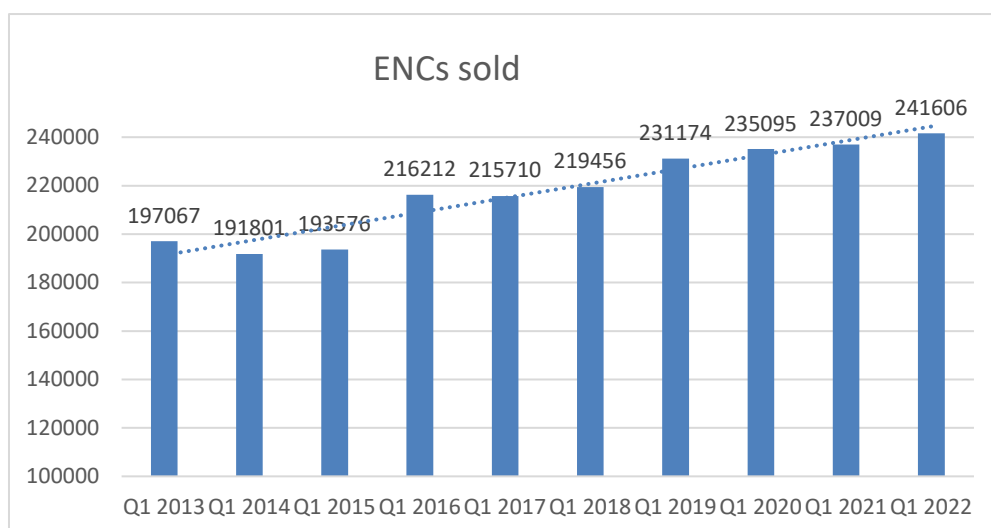
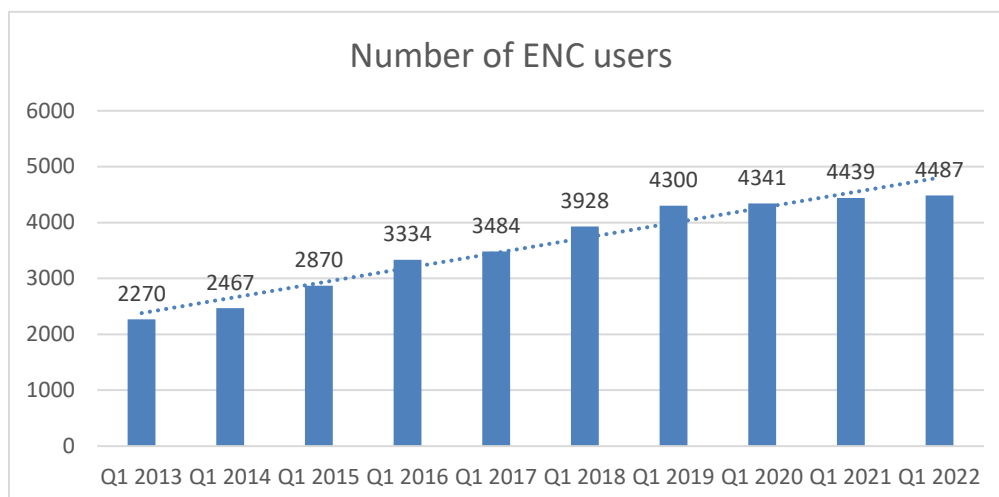
At the SMA website under the headline “Se på sjökort” a chart index showing Swedish charts is available at: <https://geokatalog.sjofartsverket.se/kartvisarefyren/>

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

31 New Editions (NE) of paper charts were published 2021.

731 New Editions (EN) and 693 Revisions (ER) of ENCs were published 2021.

The tables below report the sales of Swedish ENC's for the last 10 years.



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 – Sjöchartslyftet

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

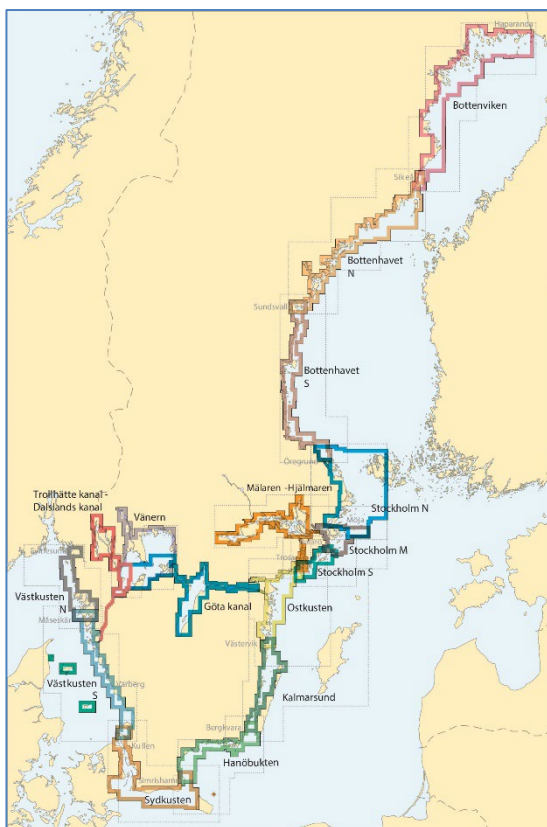


(Sjökortslyftet) 2015 in order to adjust the chart products to this new reference level. Apart from amending existing depth contours and depth figures, other quality improvements will be made at the same time such as:

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

The new vertical reference level will be implemented in all Swedish chart products (117 paper charts and 580 ENCs). There are some challenges with the timeline for the project due to lack of resources. The project is expected to be finalized 2024. In late 2020 the geographical area from the SE – FI border to Söderhamn, in southern Sea of Bothnia and some charts in Stockholm archipelago is finalized. The new surveyed coastline is updated beforehand and is implemented in all of the SE ENCs and paper charts covering the coast and lake Mälaren.

### 3.3 Small Craft Charts



The sales of Swedish small craft charts is very important for the SMA net result. For the 2022 season six New Editions of small craft charts were published covering Stockholm N, Stockholm M, Stockholm S, Hanöbukten, Lake Vänern and Göta Canal.

Figure 5 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. See [Search the database](#).
- Each week one Swedish and one English PDF-file are 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. It is published as a pdf version available both in Swedish and in English at the SMA website. The link to the English version is [https://www.sjofartsverket.se/upload/Ufs/Ufs\\_A\\_en.pdf](https://www.sjofartsverket.se/upload/Ufs/Ufs_A_en.pdf). It is easy to print the pdf version for the customers. The ambition is to update the information at least once per year.

The Swedish Chart Catalogue is published yearly. It is available as a printed version as well as published at the SMA website. See [link](#)

## 4.2 Swedish Pilot

Swedish pilot publications in printed version have not been produced in several years. Important nautical information is published at the SMA website. To secure more harmonized nautical information and utilize for harbours to more easily contribute, an improved web service is planned to be developed.

## 5. MSI

All Swedish navigational warnings are drafted and broadcasted by the station **SWEDEN Traffic**. 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 24/7. Contact information: Tel: +46 771 63 06 85  
E-mail: [swedentraffic@sjofartsverket.se](mailto:swedentraffic@sjofartsverket.se)

The NtM section of the Hydrographic Office maintains the role “Baltic Sea Sub-area Coordinator”, including the role 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 IHO Secretariat in March 2021.

## 7. Capacity building

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

## 8. Oceanographic activities

### 8.1 Tide gauge network

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. The network has been modernized through extra financing from



the FAMOS Odin project. From 3 June 2019 all water level information from SMHI and SMA is presented in Baltic Sea Chart Datum 2000 instead of Mean Sea Level.

Other oceanographic actors are the Swedish Geological Survey, universities and research institutes.

## **8.2 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. This will be performed by four Regional Data Assembly and Coordination Centres (RDACCs) and a Global Data Assembly and Coordination Centre (GDACC). One of the RDACCs is the Department of Geological Sciences, Stockholm University, Sweden, which is responsible for the North Pacific and Arctic Ocean.

## **9. 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 (climate change related) and marine spatial planning. In Sweden there is no specific initiative to establish a geodata portal only for marine data. The Swedish Land Survey Agency – Lantmäteriet – is the coordinator for all geodata in Sweden including marine data. At [Geodataportalen](#) 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 waters from one nautical mile outside the limit of baseline to the shoreline. 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 perform their planning.

## **10. Innovation**

SMA, together with HO:s in the Baltic Sea, academia partners in Finland and Sweden and one industry partner, is preparing an EU-application to Interreg Baltic Sea Region to startup a EU-funded project for implementation of S-101 ENC, S-102 Bathymetry and S-104/S-111 water level and surface currents service. The project is called Baltic Sea e-nav and is planned to 1 April 2023 – 1 April 2026 depending of approval. HO:s from DE, DK, EE, FI, LV and SE are full partners and HO:s from LT and PL are associated partners.

## **11. Other activities**

### **11.1 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.

## **11.2 Maritime Boundaries**

The SMA has been tasked by the Ministry for Foreign Affairs to assist with refining the maritime boundaries between Sweden and neighbouring countries. The Swedish Ministry of Foreign Affairs will prioritize and make contact with respective Foreign Ministry.