

# National report of Sweden

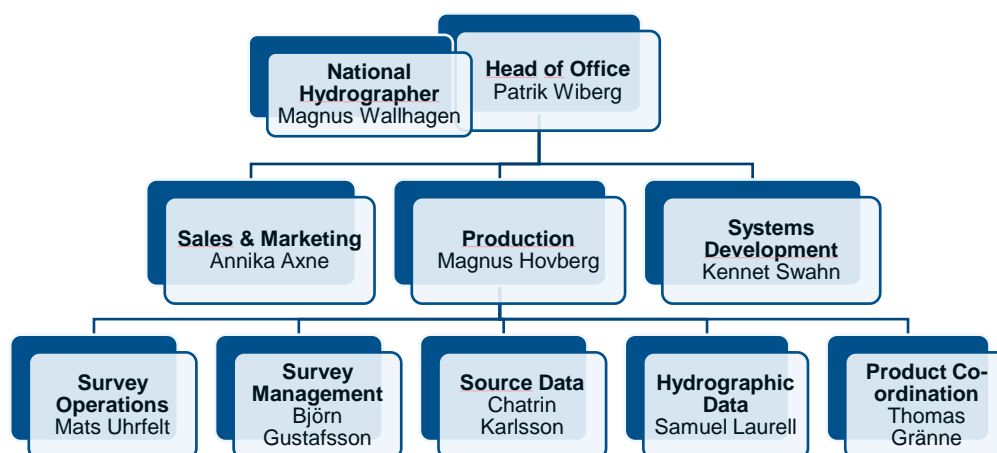
## Executive Summary

This Report highlights the main activities and achievements of the Swedish Hydrographic Office since BSHC Meeting in September 2024.

## 1 Swedish 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, such as Pilotage, Fairway Service, Icebreaking, SAR and VTS.

### 1.1 Organization



## 1.2 Improvement of Survey-to-ENC Process

The aim of this improvement work is to develop standardized criteria and instructions regarding the process of identifying and appointing significantly reduced depths discovered by recent hydrographic surveys. The process from survey to fully updated ENC takes several months outside fairway areas. In order for significant depth deviations to come to the attention of seafarers, an identification of the most important depths is necessary.

The main purpose is to gain a unified approach and definition of “important depths” and thereby making the process more effective and the output more consistent and reliable. In addition, this will minimize the subjective evaluation of depth varieties and enable a future automation of the process. To achieve this, tools have been identified to be used in the decision making process: the AHP-technique, (analytical hierarchy process), as well as a graphic tool. These tools enable a clearer communication about how discovered depths have been handled by different departments.

## 2 Surveys

### 2.1 Overall status and surveys 2024 and 2025

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 2023 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 funding such areas is planned to be finalized 2025 instead. Cat I areas has been finalized in 2022, and the remaining areas of Cat II is still planned to be surveyed 2025. From 2022 and onwards hydrographic surveying is also focused on surveying the shallower areas used for commercial shipping other than SOLAS vessels. These areas are also used by national authorities such as police, coast guard and navy, but also larger leisure crafts. 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.

One area has been surveyed in 2025 in the periodical re-survey program with moving seabed and critical under keel clearance, no such areas were surveyed in 2024. Ten specific wreck surveys have been performed during the year within the environmental dangerous wreck oil clean-up program. 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 2024 a total amount of 1300 km<sup>2</sup> was surveyed in Swedish waters by SMA. Sweden is still using the implementation of S-44 originally created together with Finland; named FSIS-44. The implementation of the new edition S-44 edition 6.1 is proceeding.

The table below summarize the total area of Swedish waters, surveyed in accordance with FSIS-44.

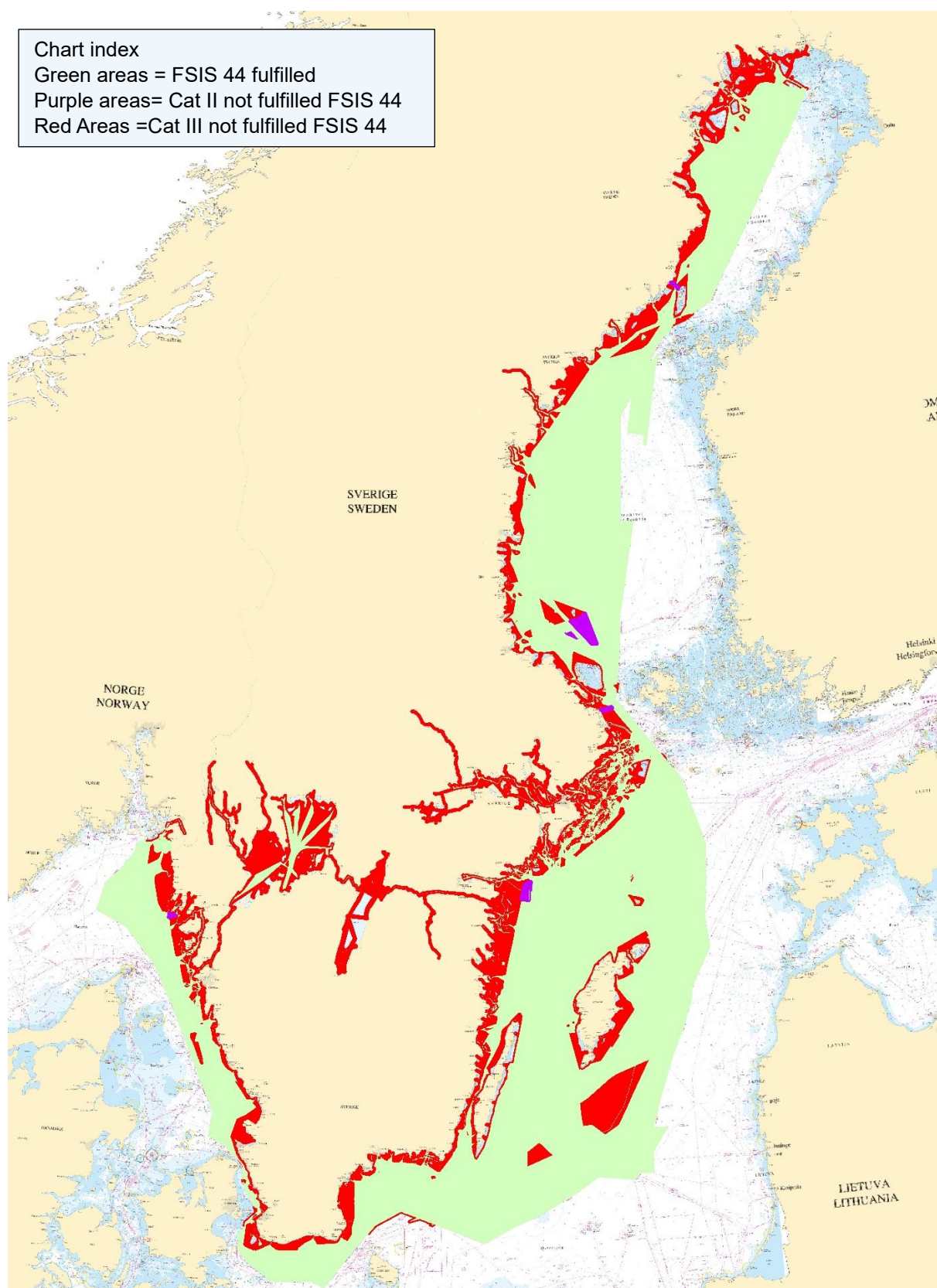
Category of SE waters (30June)	Area	FSIS-44 fulfilled	Percentage FSIS-44 fulfilled
<b>Total area SE waters</b>	165 347 km <sup>2</sup>	128 076 km <sup>2</sup>	78 %
<b>Shipping routes HELCOM Cat I and II</b>	117 831 km <sup>2</sup>	116 933 km <sup>2</sup>	99 %
<b>Other waters HELCOM Cat III + inland waters</b>	47 516 km <sup>2</sup>	11 143 km <sup>2</sup>	23 %

Chart index

Green areas = FSIS 44 fulfilled

Purple areas= Cat II not fulfilled FSIS 44

Red Areas =Cat III not fulfilled FSIS 44



Survey status dec 2024



## 2.2 Survey Vessels



*All SMA Survey vessels are equipped with multibeam and Applanix POS-MV INS-systems. Above the survey launch Petter Gedda. In the middle the two vessels 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.*

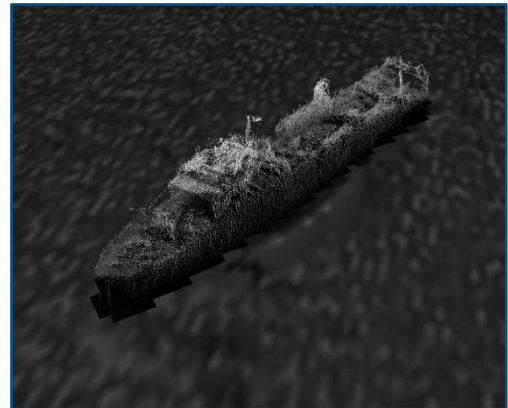


*Left: Bar sweeping vessel Gustaf af Klint. The bar is transverse across the stern and submerged into the water. Right: Autonomous survey craft "Skräddaren", intended for shallow water with troublesome bottom vegetation, four singlebeam echosounder mounted 0,5 meter apart.*

## 2.3 Depth Database

The SMA Depth information database (DIS) is managed in an ESRI-system with some specialized tools developed by a Swedish GIS company specialized on ESRI platforms. The database stores depths and metadata related to each depth, in addition to this, SMA produces different types of bathymetry products.

The database is constantly updated with the latest bathymetry data, received from completed hydrographic surveys. In August 2025 there were 318 302 507 635 (about 318,3 billion) depths stored in DIS.



## 3 New charts and updates

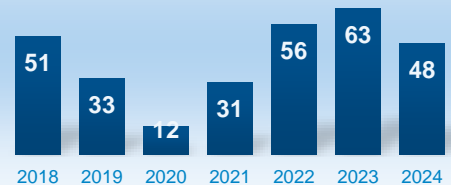
### 3.1 Paper Charts

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.

The SMA has improved the process for planning and producing New Editions for paper charts. When a chart has fulfilled at least one of four criteria our goal is to release it within six months. Result of this is better timing of needed NE and possibility to produce more when needed.

At the [SMA chartviewer](#) under the headline *Se på sjökort*, a chart index is available. Under the headline *Djupinformationens kvalitet* the quality of depth data in the depth data base is presented.

Number of New editions



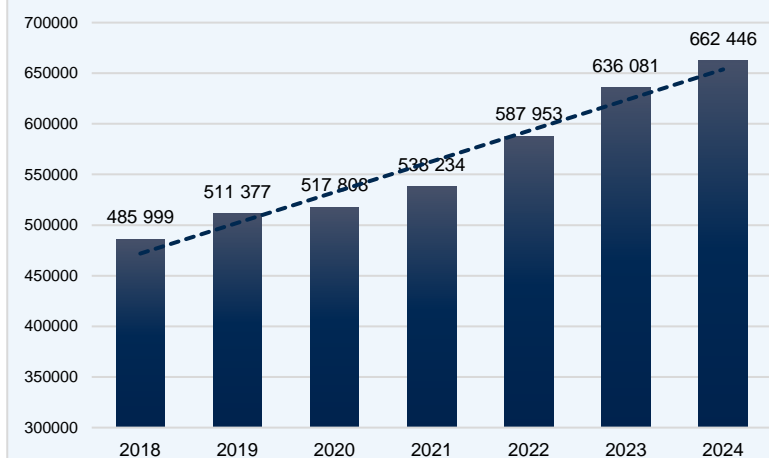
Sold Paper Charts



### 3.2 ENC's

- The Swedish ENC portfolio consists of 581 cells.
- The portfolio was expanded with scaleband Overview in January 2025
- 457 New Editions (EN) and 1121 Revisions (ER) of ENC's were published 2024.

**Number of sold ENC's**



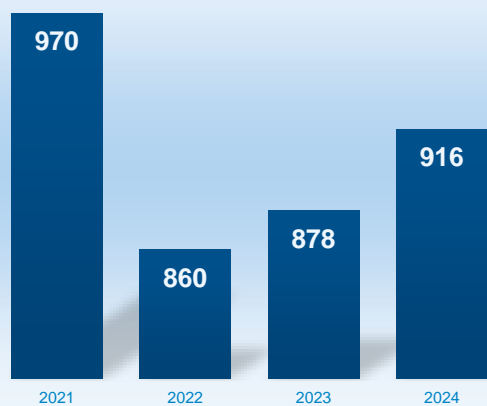
*The sales of Swedish ENC's increased 4 % during the last year.*

## 4 New publications and updates

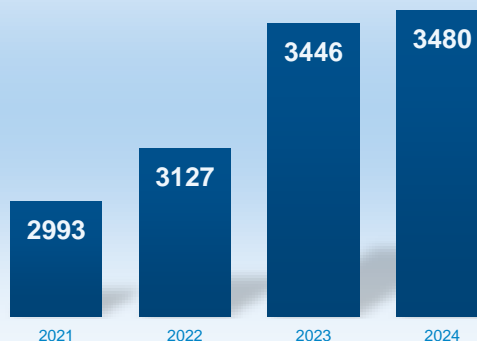
### 4.1 Ntm

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 SMA website.

**Number of NtM notices**



**Number of updates**



## 4.2 Other publications

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 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.

## 5 MSI



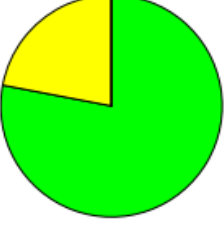
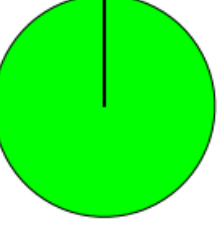

In Swedish waters, MSI is broadcasted via VHF and/or Navtex, as well as MF. All navigational warnings and meteorological warnings are broadcasted from the Sweden Traffic center, operated by the Swedish Maritime Administration. The Sweden traffic center is operated 24/7, contact: Phone +46 771 63 06 85, e-mail: [swedentraffic@sjofartsverket.se](mailto:swedentraffic@sjofartsverket.se)

Weather information, meteorological warnings and forecasts is provided by SMHI (Swedish Meteorological and Hydrological Institute).

The Baltic Sea area is a sub-area to NAVAREA I. UK is responsible for MSI transmissions for NAVAREA I. Sweden is the coordinating country for the Baltic Sea area's MSI management, and is responsible for NAVTEX broadcasts for all countries in the Baltic Sea area. The NtM office of the SMA Hydrographic Office has the role "Baltic Sea Sub-area Coordinator".

## 6 C-55

The latest update regarding Sweden in the C-55 database was delivered to the IHO Secretariat in March 2023.

Survey coverage Couverture hydrographique Cobertura hidrográfica			Depth < 200m Profondeur < 200m Profundidad < 200m			Depth > 200m Profondeur > 200m Profundidad > 200m		
 %	Adequately surveyed Correctement hydrographié Adecuadamente levantado		78	22	0	100	0	0
 %	Re-survey required Nécessitant de nouveaux levés Requiere nuevo levantamiento							
 %	Never systematically surveyed Jamais hydrographié systématiquement Nunca levantado sistemáticamente							



## 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 and S-100 oceanographic services

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. To be able to setup S-100 services for water level information in S-104 and surface currents S-111 SMA and SMHI is cooperating to develop the SMHI models to fulfil the requirements for high precision navigation. Partly financed by the Baltic Sea e-Nav project and also in cooperation with the Finnish Meteorological Institute (FMI) SMHI has started the development of the oceanographic models 2025.

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

### 8.2 GEBCO and Seabed 2030

The EU Commission has taken the initiative to implement the EMODNet Bathymetry portal to make bathymetry available for European waters. These bathymetry data are used for the Seabed 2030 project and the GEBCO bathymetric model. SMA has coordinated the provision of bathymetric data in the Baltic Sea Region for the EMODNet Bathymetry portal for several years now.

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 in the Seabed 2030 project and GEBCO international centres are established. One of these centres is the department of Geological Sciences, Stockholm University, which is responsible for the North Pacific and Arctic Ocean.

## 9 Marine Spatial Infrastructure

The SMA is, together with 14 other national agencies, part of the Swedish Council of Geodata. The Council is led by *the Swedish Land Survey Authority (Lantmäteriet)*. One of the proposed future programs is the *Survey of shallow waters* though not approved to be funded yet by the Swedish Government.

## 10 Innovation

### 10.1 Upgrade of Depth Information System (DIS)

DIS is SMA's data management system for bathymetric survey data, which consists of a nationwide bathymetric database and various extensions for data management developed by ESRI Sweden. DIS is built on ESRI's ArcMap Desktop platform and as "Desktop" reaches end-of-life in 2026 an implementation

project has transformed the underlying platform to ArcGIS Pro. The new platform was successfully put into production in december 2024.

## 10.2 Automatic Sounding selection and contouring from bathymetric data

In 2018 a set of cartographic guidelines was developed by SMA's senior cartographers. In 2020, a procurement was launched to find an on-the-shelf software that could be used as support in the process where soundings are selected and contours are generated from bathymetric survey data to later be used in various chart products. Teledyne Caris Base Editor was selected as the winning tool from the procurement. During implementation of Base Editor, a collaboration started with the Canadian Hydrographic Service (CHS) that was using Base Editor since many years. SMA and CHS started to exchange configurations for Base Editor, which now have resulted in that Base Editor is used by SMA to create an automatic sounding selection. During 2024, SMA have started to use Base editor also to automatically create depth contours. We hope that the use of Base Editor can cut 70 % of the existing manual work with sounding selection and contouring.

## 10.3 Management of Zone of Confidence

### Management of Zone of Confidence

In 2019, the Swedish Maritime Administration decided to implement differentiated Zone of Confidence (ZOC) values in ENC's. However, the decision did not address future management of the ZOC values. SMA has identified an increased need to be able to manage the information flow where the quality of the information can differ depending on the collection method, timeliness and impact on the seabed due to moving seabeds. Furthermore, the introduction of new S-100 products requires increased demands on how quality information is encoded and kept updated due to dependencies between the products. During the autumn of 2025, the SMA will start to develop methods that concerns the control program and quality management of ZOC to ensure that the management works throughout the entire process from nautical survey to ENC/chart.

The impact objectives for the method development are:

- Hydrographic information from SMA should have a coherent process regarding quality management from nautical survey to products.
- SMA should be able to handle depth information of different quality in its databases and products.
- SMA has a control program that ensures that the minimum depth in sensitive fairway sections is ensured according to established intervals.
- SMA has a control program management where the method for introducing or removing areas is described.
- SMA updates the quality (ZOC) in the chart database and further to chart products according to established routines. These are based on geography, maximum fairway depth, age and quality of depth data.
- The release of the SMA's new product S-102 shall follow the established quality (ZOC) and as far as possible be coordinated with the release of S-101.
- Stakeholders shall be aware of the management of the quality encoding of depth data.

## 11 Other activities

### 11.1 International Committees and Working Groups

<b>Committee/WG</b>	<b>Delegates from Sweden</b> <b>*Head of delegation</b>
IHO Assembly	Magnus Wallhagen*, Annika Axne, Benjamin Hell
IHO Council	Magnus Wallhagen*, Annika Axne
HSSC	Benjamin Hell*, Magnus Wallhagen (Chair)
S-100WG	Benjamin Hell
S-101PT	Klas Östergren
S-102PT	Per-Olof Seiron, Anna Wall
ENCWG	Klas Östergren
NCWG	Klas Östergren
DQWG	TBD
TWCWG	Thomas Hammarklint
HSWG	Hans Öiås
NIPWG	Caroline Johansson
MASSPT	TBD
IRCC	Magnus Wallhagen, as HSSC Chair
WWNWS-SC	Johan von Bülzingslöwen
S-124 PT	Johan von Bülzingslöwen
WENDWG	Annika Axne*, Magnus Wallhagen as PAC Chair
IENWG	Annika Axne
BSHC	Magnus Wallhagen*, Magnus Hovberg
CDWCWG	Thomas Hammarklint* (Chair), Henrik Tengbert
MWG	Anders Åkerberg
BSMSIWG	Johan von Bülzingslöwen (Chair)

BSICCWG	Elisabeth Farrington, Stefan Cederberg
NHC	Magnus Wallhagen*, Annika Axne
NCPEG	Thomas Gränne
NSEG	Anders Åkerberg
NSHC	Magnus Wallhagen*, Annika Axne
NSICC	Elisabeth Farrington, Stefan Cederberg
TWG	Thomas Hammarklint
PAC	Magnus Wallhagen (Chair), Annika Axne
PMG	Annika Axne (Chair)
PFWG, PSWG	Annika Axne, Magnus Wallhagen
TEWG	Klas Östergren