

National Report of Finland

Executive Summary

This Report highlights the main activities and achievements of the Finnish Hydrographic Office since NHC Meeting in March 2023.

- The hydrographic surveys continues on shallow, nearshore HELCOM category III areas with LiDAR and multibeam technologies.
- The bathymetric data migration of the sea area to the Bathymetric Data Management System (MERTA) has progressed well. Also the migration of inland waters is ongoing.
- The implementation of the "New vertical chart reference BSCD2000" (~FIN N2000) has completed in the Bay of Bothania, the Quark and the Bothanian Sea.
- An ongoing work to develop S-101, S-102, S-124 production capability and capacity.
- A lot of activities for National Coordination of the S-100 implementation.

1. Finnish Hydrographic Office

Mr. Jarkko Saarimäki has been appointed to a new Director General for the Finnish Transport and Communications Agency Traficom. His five years post started at 20.12.2023.

Another change took place in February when a Fairways Unit was established and which is now responsible for waterways related tasks. The FHO's teams structure was reviewed respectively.

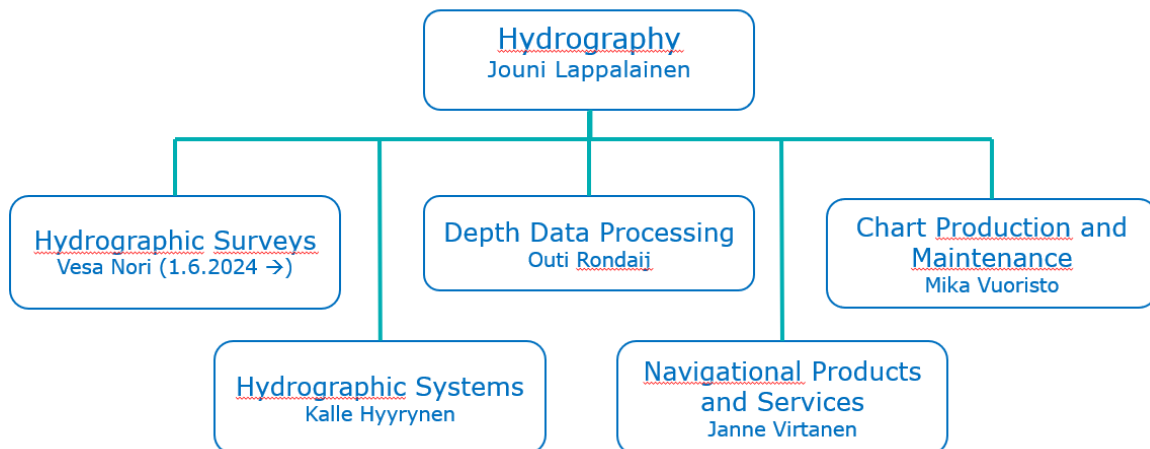


Fig.1. Hydrography unit with underlying teams.

The staff working for hydrography consist 51 employee and the annual budget for hydrographic activities is about 12,5 million euros.

The FHO is refreshing the Quality Management System based on the ISO 9001 standard for a full external audit.

2. Hydrographic surveys

During 2023, hydrographic surveys took place in Bay of Bothnia area consisting approaches to Kemi fairway and in inland waters the project Haukivesi-Kolovesi was going on. An USV survey platform has been piloted in HKJA2022 inland lakes surveys. Also a small area LiDAR survey and shallow shoreline surveys were conducted in the Archipelago Sea. Large areas of earlier surveyed data have been verified and inserted to the database.

The survey of Finland territorial sea border base points was performed successfully with TopoLiDAR and areal photography by BSF Swissphoto AG and Tripodi Finland Oy. Calculations and coordinate listing are carried out during 2024.

Task	Surveyed by	Multibeam [km ²]
Approaches to Kemi fairway (BBKE2023)	<i>Arctia Meritaito Oy</i>	800
Haukivesi-Kolovesi (HKJA 2022)	<i>Clinton Marine Survey AB</i>	175

Table 1: Survey statistics for 2023.

The Finnish part of the HELCOM-BSHC Revised Harmonised Hydrographic Re-Survey Scheme has been enhanced. Aging of Cat I surveys need to be studied.

HELCOM Cat I fairway surveys were updated about 500 km².

HELCOM Cat III new areal survey data to register about 1000 km².

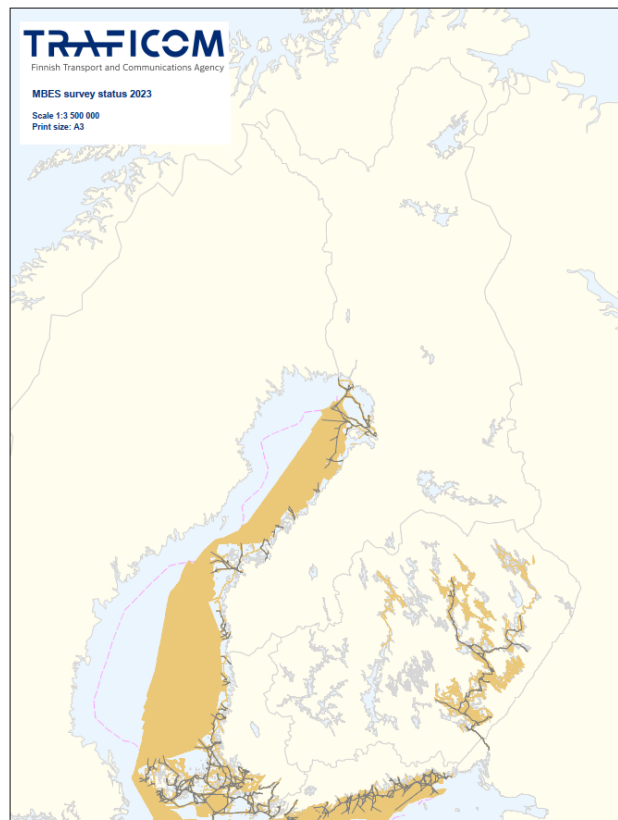


Fig.2. Hydrographic re-survey coverage at the end of 2023 surveyed according to IHO S-44 and FSIS-44 standards.

3. New Charts and updates

Printed charts

Due to the ongoing Ahti Development Project and ongoing N2000 fairway and nautical chart reform -project, limited amount of new editions of printed charts or ENC's was published in 2023. The chart correction service for both printed and ENC charts has been provided without interruption, though.

Published printed charts	2018	2019	2020	2021	2022	2023
General charts	2	1	-	-	2	2
Approach charts	6	3	-	10	12	6
Harbour charts	1	1	-	4	3	2
Chart series	2	-	-	-	1	1
Other charts	-	-	-	-	-	-

Table 2. Statistics of published New Editions of Finnish nautical charts in 2018– 2023.



Fig.3. New Chart catalogue 2024.

More information about Finnish nautical charts is available in the Chart Catalogue 2024.

[Link](#)

The statistics of sold printed charts are presented in the *Table 3*. The overall sales of the nautical chart series decreased in 2023. It was likely influenced by the fact that new editions of popular nautical chart series were not published in 2023.

Printed paper charts	2018	2019	2020	2021	2022	2023
AO-size	5155	4136	3579	3923	3806	2581
Chart series	9747	7592	11855	12869	6549	4574
Total sold copies	14902	11728	15434	16792	10355	7155

Table 3. Statistics of sold printed charts 2018-2023.

In addition, there are many adopted printed charts from Finnish area of responsibility sold by UKHO.

ENC production and distribution

The ENC Statistics are visible in the *Table 4* and *Table 5*.

The number of ships and number of customers using ENCs increased slightly in 2023.

Released ENCs	2018	2019	2020	2021	2022	2023
New ENCs	1	-	-	1	4	2
New editions	47	13	71	31	46	34

Table 4. Statistics of produced Finnish ENC 2018-2023.

Use of ENC	2018	2019	2020	2021	2022	2023
ENCs sold annually (excluded trial, training and demo usage)	107101	115462	141973	144916	142429	139505
No of ships (annually)	4492	4698	4841	4921	5307	5546
No of customers (annually)	1467	1439	1401	1411	1512	1553

Table 5. Statistics for the use of Finnish ENCs 2018-2023.

Quality control of ENCs has been further improved with the new chart production process. Some software tools for hydrographic data quality control and operation guidance have been enhanced.

4. New publications and updates

Sailing directions for Finnish waters

The volume Sailing directions for Finnish waters - Part 1 - General information, contains general information and instructions. Further information and updated versions for download are found online https://fiho.fi/npub/sd/SD_1_EN.pdf

The volume Sailing directions for Finnish waters - Part 2 - Main approach channels, contains channel design data of the main approaches. These volumes are published by area, following the introduction of nautical charts in Baltic Sea Chart Datum 2000

(N2000).

The table shows published and planned volumes of the Sailing directions for Finnish waters - Part 2. Gray color indicates planned volumes. For an updated list of currently published publications see; <https://fiho.fi/lnk/sd/en>

- Part 2.1.1 - Main approach channels - Gulf of Finland, East
- Part 2.1.2 - Main approach channels - Gulf of Finland, West
- Part 2.2.1 - Main approach channels - Archipelago Sea
- Part 2.2.2 - Main approach channels - Aland Sea
- Part 2.3.1 - Main approach channels - Sea of Bothnia (2023)
- Part 2.3.2 - Main approach channels - The Quark (2022)
- Part 2.3.3 - Main approach channels - Bay of Bothnia (2021)
- Part 2.4.1 - Main approach channels - Inland waterways

Notices to Mariners

Notices to Mariners are distributed via website including a download service (PDF) and NtM Online web-service. Clients can filter the Notices by time of publication, area of interests or charts in hand. [Link to NtM service](#)

The Lists of Lights are published for coastal areas and inland waterways. The Lake Saimaa area is now included as a part of the publication for inland waterways. The List of Lights are available as downloadable PDFs and in addition, information of lights can be search based on ID, area of interest or related chart product. [Link to List of Lights](#)

Finnish nautical publications are also available in Primar's Nautical Publication Service.

Publication /service	2018	2019	2020	2021	2022	2023
Notices to Mariners, vol of publications	35	35	35	35	36	36
Number of NtM notices	366	306	296	340	292	275
Number of ER updates	776	562	595	595	580	383

Table 6. Annual statistics for nautical publications 2018-2023.

5. MSI

Finnish Transport and Communications Agency is responsible for safety radio communications in Finnish territorial waters and for distress radio communications in the deep channels of the Saimaa waterways system. The Traffic Management Company Fintraffic Ltd. (government owned company) is operating the national navigational warnings service.

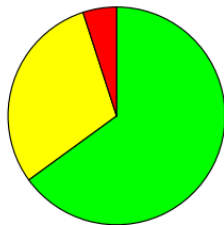
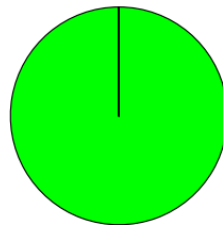
In total 346 navigational warnings were published during 2023.

Publication / Service	2018	2019	2020	2021	2022	2023
Navigational Warnings	200	84	244	262	202	346

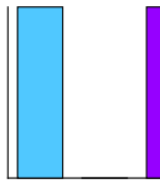
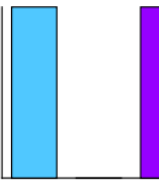
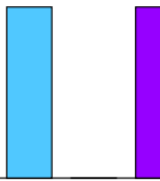
Table 7. Annual statistics for navigational warnings 2018-2023.

6. C-55

Status of hydrographic Surveys

Survey coverage Couverture hydrographique Cobertura hidrográfica	Depth < 200m Profondeur < 200m Profundidad < 200m			Depth > 200m Profondeur > 200m Profundidad > 200m		
	<p>█ Adequately surveyed Correctement hydrographié Adecuadamente levantado</p> <p>█ Re-survey required Nécessitant de nouveaux levés Requiere nuevo levantamiento</p> <p>█ Never systematically surveyed Jamais hydrographié systématiquement Nunca levantado sistemáticamente</p>	65	30	5	100	0
						

Status of Nautical Charting

Coverage of charts published Couverture des cartes publiées Cobertura de cartas publicadas	Offshore passage Navigation au large Pasaje offshore			Landfall and Coastal passage Atterrissage et navigation côtière Recalada y Pasaje costero			Approaches and Ports Approches et ports Aproches y puertos		
	<p>█ Covered by INT or other paper charts meeting S-4 Couvert par des cartes papier INT ou autres conformes S-4 Cubiertas por cartas de papel INT o otras cumpliendo S-4</p> <p>█ Covered by RNC meeting S-61 Couvert par des RNC conformes S-61 Cubiertas por RNC cumpliendo S-61</p> <p>█ Covered by ENC meeting S-57 Couvert par des ENC conformes S-57 Cubiertas por ENC cumpliendo S-57</p>	100	0	100	100	0	100	100	0
									

7. Capacity building

Several training courses has been arranged for the staff of the Finnish HO. A Python programming course and a follow up course of Geoinformatics was held during 2023.

8. Oceanographic activities

The implementation project for "New vertical chart reference N2000" (Baltic Sea Chart datum 2000) is ongoing. BSCD 2000 vertical reference will be introduced on the nautical charts with a new hydrographic chart data management and production system AHTI. The first new charts with new vertical reference were publish in the end of 2021 and the reform has now progressed as far as the Åland and Archipelago Sea region (see figure 4).

Alongside vertical level corrections, a significant amount of new bathymetric data are processed to chart database and further on to the Finnish ENCs and other navigational products.

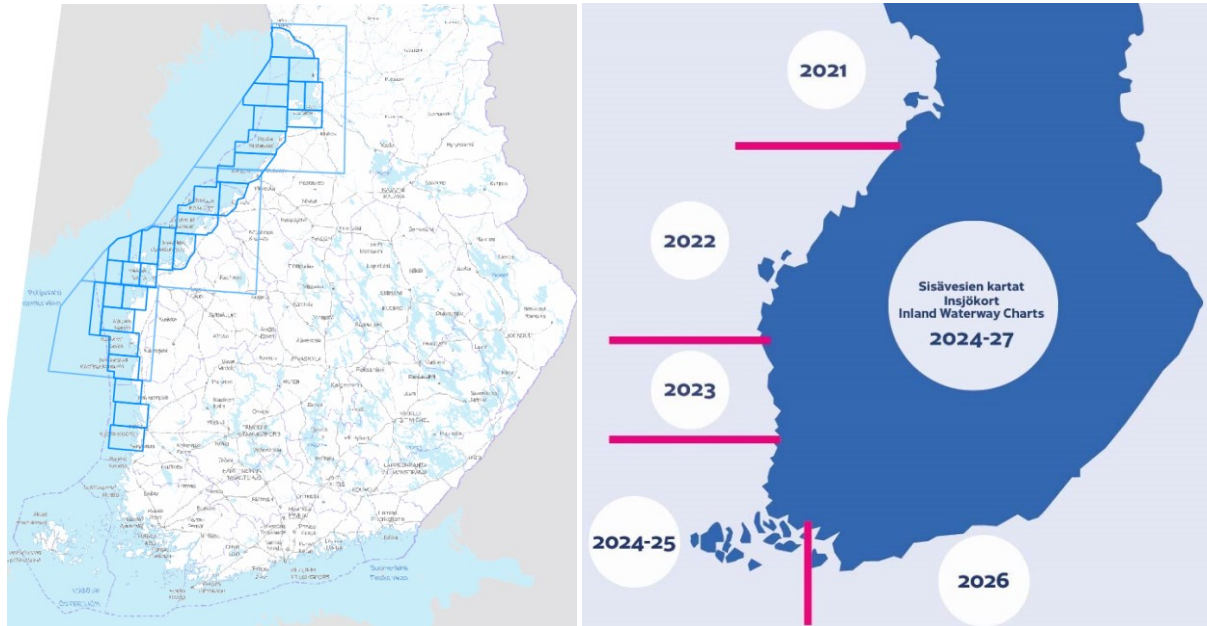


Fig.4. The Finnish N2000 charts coverage (Baltic Sea Chart Datum 2000) as of February 2024 and the schedule for N2000 charts.

[Chartlink](#) showing the progress of N2000 fairway and nautical chart reform.

9. Spatial data infrastructure

National Geodata Portal

The non-navigational use of hydrographic data has increased exceedingly. Especially, there has been a lot of requests for wind farm projects.

Traficom's open data view and download services

Finnish Transport and Communications Agency's services for data viewing and downloading include

- Web Map Service (WMC) - nautical charts in raster format
- Tiled map service (WMTS) - nautical charts in raster format
- Web Feature Service (WFS) - nautical chart data

Link to services:

<https://julkinen.traficom.fi/oskari/?lang=en>

Link to interfaces:

<https://www.traficom.fi/en/news/spatial-dataset-material/calls-interfaces>

The datasets available from above services are not suitable for navigation and does not meet the requirements for an official nautical chart.

A viewing service is in use via the interface of National Geodata Portal providing Inspire specific national spatial data sets, for example. The FHO is actively supporting hydrographic data to the National Geodata Portal. The metadata of FHO is also available at the National Geodata Portal.

Link to National Geodata Portal, "Paikkatietoikkuna":
<http://www.paikkatietoikkuna.fi/?lang=en>

10. Innovation

Hydrographic survey data processing and management

The improvements to the Bathymetric Data Management System (MERTA) are now completed providing tools for data migration and high level automation for the data maintenance. The MERTA, as March 2024, holds 85 % of all FHO MBES datasets and 71 % of all other datasets (i.a. Single Beam and LiDAR).

Chart data processing and management

Traficom has started investigating and building capabilities for the production of the future S-100 products. The main focus is on the S-101 (ENC) and S-102 (Bathymetric Surface) products, however the other S-100 products are investigated as well, such as S-128 (Catalogue of Nautical Products).

The initial plan for the S-101 and S-102 production was finalized in 6/2022. In nutshell, the plan is to migrate the current S-57 based source database into a new source database that is based on the S-101 data model, from where all navigational chart products (S-57 ENCs + S-101 ENCs + paper charts) are then compiled.

The work so far has mainly focused on the internal investigation of the source database conversion and required changes to the source database model. Next steps include, among other things, the S-101 and S-102 product configurations, development the interfaces to the external systems and configuration of the validation checks. The investigation and development are done in close cooperation with the software provider (Teledyne Caris).

Timewise the objective is to have the systems ready and capable of producing S-57, S-101 and S-102 products before the end of the year 2024.

11. Other activities

FHO has Bilateral Arrangements with UKHO (adoptions of printed Charts), Norway (ENC RENC services), Sweden, Estonia and Germany.

Finland participate the Council, HSSC and IRCC meetings. Finnish experts are actively working in;

- HSSC/NCWG (as a Chair)
- HSSC/ENCWG
- HSSC/S-100WG and HSSC/S-101PT
- HSSC/DQWG
- HSSC/NIPWG (as a Vice Chair)
- HSSC/TWCWG
- HSSC/HSWG
- HSSC/MASSPT
- IRCC/WEND-WG (representing BSHC)
- IRCC/MSDIWG
- Baltic Sea Hydrographic Commission including BSHC/BSICCWG (Chair), BSHC/MWG (Chair), BSMSIWG, BSHC/CDWG, BSHC/BSBDWG
- Nordic Hydrographic Commission including NHC/NCPEG, NHC/NSEG



- Arctic Region Hydrographic Commission (Associate Member) including ARHC/OTWG and ARHC/ARMSDIWG.

Finland is member of the PRIMAR and contribute actively to the work of PRIMAR PAC and PRIMAR WGs.

11. Conclusions

This report highlights the main activities of the Finnish Hydrographic Office since NHC Meeting in March 2023.