



National Report of Finland

Executive Summary

This Report highlights the main activities and achievements of the Finnish Hydrographic Office since BSHC21st Conference in September 2016.

- Hydrographic surveys have been performed as planned.
- Production of nautical charts has been performed as planned
- Project for developing Bathymetric Data management System is in the implementation phase.
- Project for renewal of the Nautical Chart Production System is in the procurement phase. Projects for Source Data Management and Online Publication systems are completed.
- The implementation project "New vertical chart reference N2000" has started.

1. Finnish Hydrographic Office

There have been no major changes in the Hydrographic Office after the last meeting. Staff is now about 50 including 6 consultants. Annual budget for hydrographic activities is about 10 million euros. Restrictions in replacement recruits are in effect.

The Ministry of Transport and Communications is planning a major reorganization for the year 2019. According the preliminary plan there will be two administrations to where existing functions from the Finnish Transport Agency, the Finnish Transport Safety Agency and the Finnish Communications Regulatory Authority will be reorganized. In addition, a new state owned Traffic Management Company including i.e. VTS -services will be established.

The FHO has working according to the Quality Management System based on the new ISO 9001 (2015) standard. External Audit (by DNV) has made on 27-26 June 2017.

2. Hydrographic surveys

Finland has succeeded to fulfil the HELCOM ministerial meetings 2001, 2007, 2010 and 2013 decisions on category I and II fairways and shipping routes re-surveys up to today's IHO S-44 ed5 standard. The status at the end of June 2016 was 100%, totalling about 62.000 km². Although a milestone has been succeeded, some re-survey needs will eventually come.

There were open procurements for three survey tasks; on Shipping Fairways (VAYLA2016) as part of the EU TEN-T CEF funding program FAMOS Freja and on inland lake area in Lake Saimaa Savonlinna - Varkaus 2016 (SAVA2016). In the [Table 1](#) there are statistics of 2016 on these tasks. In [Fig.1](#) there are shown the surveyed HELCOM areas in 2014 and 2015 and [Fig.2](#) shows the re-survey status in Finnish territorial sea and EEZ area.

Task	Surveyed by	Multibeam [Km ²]	Line sounding [Km ²]
VAYLA2016	Meritaito Oy	300	
Lake Survey 2016 SAVA2016	IIC Technologies Ltd	30	35
Saimaa Canal	Meritaito Oy	5	

[Table 1](#): Survey statistics for 2016.



Fig. 1. HELCOM hydrographic Surveys (A, B and C) in 2016 and inland waters 2016 (2).



Fig. 2. Hydrographic re-survey coverage in 2016

The Finnish part of the HELCOM-BSHC Revised Harmonised Hydrographic Re-Survey Scheme has been enhanced and the database updated. The HELCOM survey plan has been the driving force to perform the hydrographic surveys in Finnish waters. As a total Baltic Sea re-survey scheme, the requirements of the HELCOM Moscow 2010 Ministerial Declaration are in progress in all Baltic Sea countries.

Co-operation with Swedish Maritime Administration in procurement and service provider work supervision has been most helpful.

Finland is participating into a EU INEA CEF Transport TEN-T grant program FAMOS Freja (2014-2016) and FAMOS Odin (2016-2018) application, headed by Swedish Maritime Administration for support on completing the HELCOM Cat I&II surveys and renewing the bathymetric database.

FHO has piloted LiDAR in some areas during 2016 and 2017. The results indicate, that it is a useful method to replace costly single beam surveys near the shoreline and to acquire shoreline and some inland topographic data. LiDAR is intended to be used in coming procurements.

A link to Finnish Transport Agency Hydrographic Survey Program 2015-2020:

http://www.liikennevirasto.fi/documents/20473/120564/Liikennevirasto_merenmittausohjelma_2015_2020_julkinen.pdf/000a9f87-cf9e-422f-80ab-b5c79995b264



Hydrographic data processing and management

The renewal of the Bathymetric Data Management System (MERTA) is continuing. The MERTA will be a system for validating, handling, storing hydrographic survey data and it will stand for a primary data source for chart production and other waterborne activities i.e. fairway maintenance. MERTA system purchase contract was signed December 2016 with Teledyne Caris Inc and the installation and configuration of the pilot system started at the end of 2016. The aim is that MERTA will be taken into use February 2018. Nordic & Baltic co-operation has been active, also within FAMOS Freja funding program.

External human resources have been rent from private companies in order to ease workload on data processing and validation tasks.

Several data sets of bathymetric data have been provided for the Baltic Sea Depth Model within the restrictions of Finnish national legislation. Information will be updated continuously after new surveys.

3. Nautical Charts

Printed charts

Printed charts in 2016 have been produced generally according to the plans. New editions were published on two chart series (A Viipuri-Helsinki, Gulf of Finland) and M (Savonlinna-Kuopio-Iisalmi, Saimaa Inland Waters) and on 16 nautical charts. Two new general charts numbers 955 and 956 (1:250 000) from Sea of Bothnia were published.

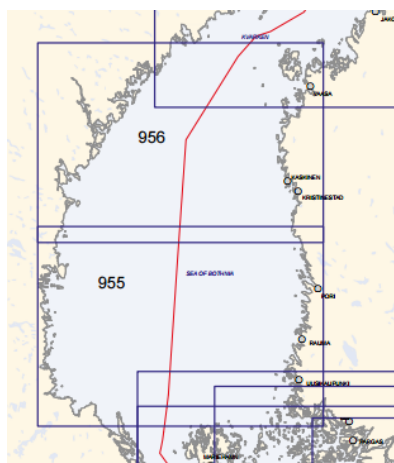


Fig.3. New general charts 955 and 956 were published in 2016

Published printed charts	2011	2012	2013	2014	2015	2016
General charts	1	3	2	4	3	3
Approach charts	11	10	18	13	11	7
Harbour charts	4	6	10	8	2	4
Chart series	3	3	3	4	2	2
Other charts	1			-		

Table 2 Statistics of published New Editions of Finnish nautical charts in 2011 – 2016.



In 2017 new edition of nautical chart series F "Merenkurkku, Kvarken" will be published. New INT chart 1210/ FI954 (1:250 000) according original INT -scheme will be published during Spring 2017. [Link](#) to a new chart catalogue 2017.



Fig.4. New edition of nautical chart series F for leisure craft spring 2017. New surveys

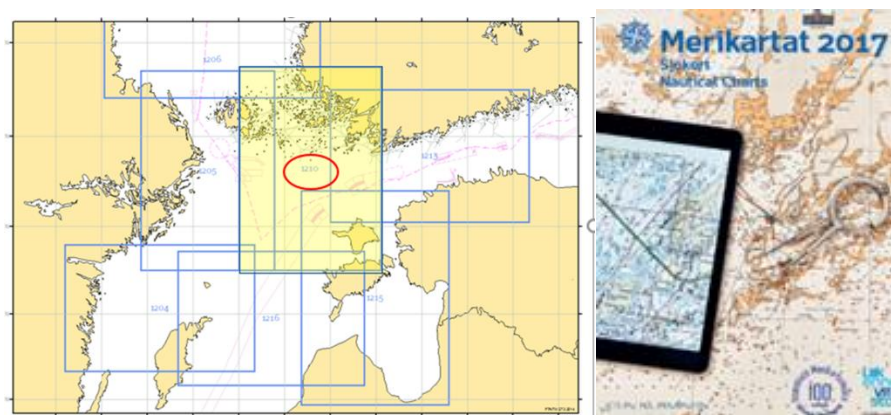


Fig.5. New edition of nautical chart series F for leisure craft spring 2017. New Chart catalogue.

Statistics for sold charts are shown below in [Table 3](#). In addition to these there are many adopted charts sold by UKHO. There was a big drop on the sales of paper charts.

Chart product (printed)	2011	2012	2013	2014	2015	2016
International traffic						
General charts	1772	1620	1977	1984	1874	1241
Coastal charts						
Approach charts	3580	5379	4943	5434	3939	2800
Harbour charts	732	1267	1313	2162	718	991
Chart series (inland areas)	2103	1998	1490	1538	1412	1525
Domestic traffic						
General & approach charts	1384	1000	748	645	747	341
Chart series (sea areas)	11695	11116	11489	12600	16574	7419
Chart series (inland areas)	1862	1503	1913	2496	1750	698
Other charts	5	0	0	0	74	28
Total sold copies	23470	24006	24078	26 859	27088	15043

Table 3 Statistics of sold Finnish nautical charts in 2011 – 2016.

Sales reduction has contributed etc.:

- Change of publishing house
- Increased use of ENC on SOLAS vessels and digital charts in chart plotters



- Economic downturn
- Limited number of new editions of most selling charts
- A growing amount of adopted charts sold by UKHO

The new contract for printing, marketing and delivering paper charts by John Nurminen Marine came into effect from the beginning of 2016. The new agreement reduced the end-user prices fell by 6 %.

ENC production and distribution

ENC production and distribution has been realized mainly according to the plans. In 2016 17 new cells and 38 new editions have been released. The new cells focused mainly in inland waters (Saimaa Lake area). The number of sold ENCs increased 16 % and amount of ships using ENCs increased 19 % in 2016. The number of ENC Statistics are shown in *Table 4* and *Table 5*.

Released ENCs	2011	2012	2013	2014	2015	2016
Total amount of ENC sells	205	192	180	175	189	202
<i>New ENCs</i>	14	8	4	3	25	17
<i>New editions</i>	1	44	33	43	48	38

Table 4. Statistics of produced Finnish ENCs

Use of ENC	2011	2012	2013	2014	2015	2016
<i>ENCs sold annually (excluded trial and demo usage)</i>	47430	50832	61022	69982	77533	89927
<i>No of ships(annually)</i>	1772	1769	1908	2270	2713	3212
<i>No of customers (annually)</i>	498	595	669	793	898	1054

Table 5: Statistics for the use of Finnish ENCs

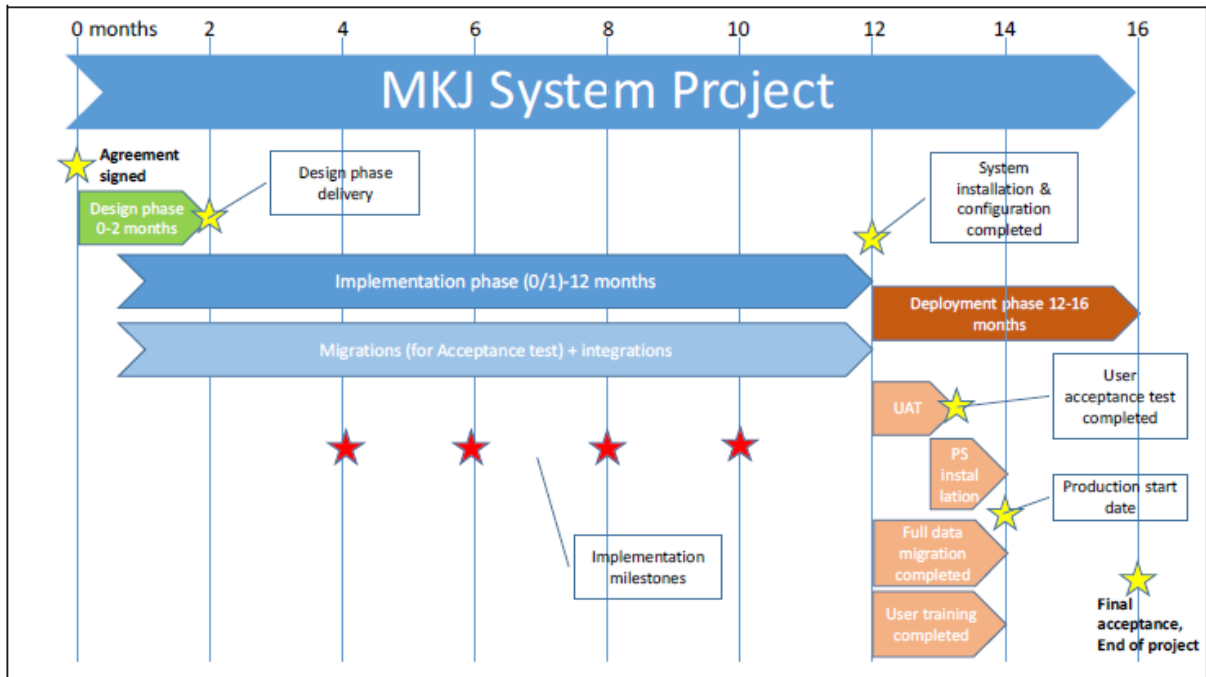
A service for governmental users i.e. the Finnish Navy and the Finnish Coast Guard and also for derived product producer's use was taken into operational use 2016.

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

Chart data processing and management

ENC and Paper Chart Production System and related services competitive bidding
Procurement process for new nautical chart production system has been finalized. Finnish Transport Agency decided to award the contract to Teledyne Caris, Inc. that submitted the winning tender.

Project time schedule and phasing according to call for tenders and draft project plan as follows:



The following milestones have been set:

- Signed agreement – tentative date is latest August 31, 2017
- Design phase delivery - completed within two (2) months after signed agreement
- Implementation milestones - completed within 12 months after signed agreement

Implementation milestones are set according to approved project plan

- System is configured for ENC, AML and paper chart production – Completed within 12 months after signed agreement
- Acceptance Test – Completed within 13 months after signed agreement
- User Training – Completed within 14 months after signed agreement
- Production start – Completed within 14 months after signed agreement
- Final acceptance of delivery – Completed within 16 months after signed agreement

Other projects

The new version for Source data management software, LOKI was completed in April 2016. LOKI speeds up source data registration and offers sophisticated tools for source data analysis and workflow control.

The new version for Source data management "LOKI" was completed in April 2016.

"LOKI" speeds up performance of passing through time of source data, offers better tools for analysing source data and control of workflow.

Study to determine specifications and a portfolio for Bathymetric Surface products (based on IHO/S-102), was continued as a part of Smart Marine Fairway Project under FTA's DIGI 2016 - 2020 Program.

External human resources have been rent from private companies in order to ease workload on depth data processing to the chart database and quality assurance of printed charts and ENC.



4. Nautical publications

NtMs has been published according to the plans. Notices to Mariners are distributed from website as download service (PDF), free of charge. In the beginning of 2017 the additional NtM Online web-service was opened, with capability of viewing the Notices filtered by time of publication, area or charts affected.

All printed Lists of Lights were substituted by downloadable online publications in 2016. The tables of lights are separated into two different publications for coastal areas and inland waterways. The Saimaa area is now included as a part of the publication for inland waterways.

Statistics of nautical publications are shown in *Table 6*.

Publication / Service	2010	2011	2012	2013	2014	2015	2016
<i>Notices to Mariners, volume of publications</i>	28	31	32	33	34	34	35
<i>Number of NtM Notices</i>	596	680	398	422	397	391	366
<i>Number of ER-updates</i>	477	766	449	431	534	594	504

Table 6: Statistics for nautical publications

5. MSI

Finnish Transport 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.

In total 237 navigational warnings were published during 2016. From February 2015 also local warnings are read in Turku Radio only in english (in web-service also in Finnish and in Swedish).

Publication / Service	2010	2011	2012	2013	2014	2015	2016
<i>Navigational Warnings</i>	244	248	412	276	234	236	237

Table 7: Statistics for navigational warnings

6. C-55

C-55 updated 2017.

7. Capacity building

Nothing to report.

8. Oceanographic activities

The implementation project "New vertical chart reference N2000" has started on May 2017. Timeframe for changing Finnish nautical charts for the new vertical datum will be defined during autumn 2017.



The FHO is chairing BSHC Chart Datum Working Group (CDWG). The CDWG work concerns harmonization of the vertical datum in the Baltic Sea nautical charts and other navigational products.

The FHO has acquired shipborne gravity surveys in the Sea of Bothnia during 24 September to 30 October 2015. Gravity surveys are done within FAMOS activity 2 geoid modelling for the Baltic Sea supporting the transition to the Baltic Sea Chart Datum 2000. Gravity surveys consists around 3800 km survey line length. Surveys have been done in co-operation with the Finnish Geospatial Research Institute of National Land Survey and Deutsches GeoForschungs Zentrum using Meritaito Ltd as a contractor for survey vessel.

9. Other activities

Based on the updated Bilateral Arrangement the adoptions by UKHO have been expanded. Arrangement with Sweden has updated and arrangement with Estonia is under review.

The FHO has continued the development of "Open Data" services. The new WMTS-service was released with a licensing of creative commons terms and conditions [link](#).

Finland is participating to the following IHO Committees and WGs: HSSC, IRCC/WEND-WG (representing BSHC), IRCC/MSDIWG, HSSC/ENCWG, HSSC/S-100 WG, HSSC/DQWG (Chair), HSSC/NCWG (Chair), HSSC/NIPWG, HSSC/TMCWG, HSSC/S-101PT, HSSC/UKCMPT, BSHC, NHC, ARHC (Observer/Associate member), BSHC/CDWG (Chair), BSHC/BSICCWG (Chair), BSHC/BSDIWG, BSHC/BS-NSMSDIWG, BSHC-HELCOM/MWG (Chair), NHC/NCPEG, NHC/Workshop on validation of multi-beam data and ARHC/technical committee.

Finland is member of PRIMAR and is actively participating Advisory committee and its WGs.

In 2017 Finnish Hydrographic Office celebrates 100 -years independency of Finnish State and Hydrography.



10. Conclusions

This report highlights the main activities of the Finnish Hydrographic Office since BSHC 21st Conference in September 2016.