



## National Report of Finland

### Executive Summary

This Report highlights the main activities and achievements of the Finnish Hydrographic Office since BSHC 20<sup>th</sup> Conference in September 2015.

- Hydrographic surveys has been performed as planned and goals in HELCOM Cat I and II surveys were reached this year
- Production of nautical charts has been performed as planned
- Projects for developing Bathymetric Database, Nautical Chart Production system and Online NtMs / Nautical Publications service are on their way.

### 1. Finnish Hydrographic Office

Small changes in organisation since last meeting. Staff is now 50 persons, including 5 consultants. Annual budget for hydrographic operations and activities is about 10 million euros.

The FHO has working according to the Quality Management System (ISO 9001:2008). A new annual quality auditing by Inspecta Oy was performed successfully in June 2016, without deviations.

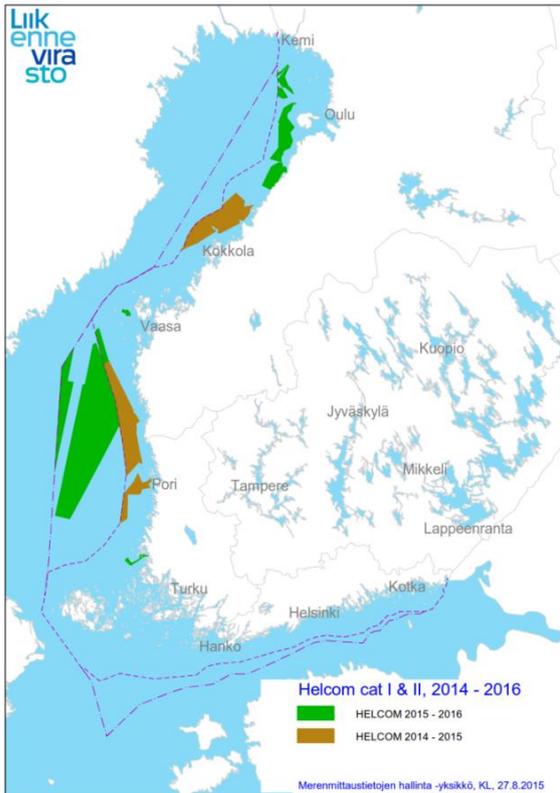
### 2. Hydrographic surveys

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 2015 was 95% as the remaining is data to be delivered. Goals in HELCOM Cat I and II surveys were reached during April 2016. All field hydrographic surveys were completed during 2015. HELCOM cat I & II areas cover about 62.000 km<sup>2</sup>.

There were open procurements for three survey tasks; on Bay of Bothnia Raahe-Oulu-Kemi 2015 (BBROK2015), Bothnian Sea Exclusive Economic Sea area (BSEEZ2015), both part of the EU INEA CEF (TEN T) funding program FAMOS Freja and on inland lake area in Lake Saimaa Suur-Saimaa Sulkava 2015 (SSSU2015). In the [Table 1](#) there are statistics of 2015 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 <sup>2</sup> ]	Line sounding [km <sup>2</sup> ]
The Bothnian Sea BSEEZ2015	<i>Meritaito Oy</i>	7.100	
The Bay of Bothnia BBROK2015	<i>Clinton Mätkonsult Ab</i>	1.300	
Lake Survey 2015 SSSU2015	<i>Meritaito Oy</i>	250	130

*Table 1: Survey statistics for 2015.*



*Fig. 1. Hydrographic Surveys in 2014 (brown) and in 2015 (green).*



*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.

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 (2017-2018) application, headed by Swedish Maritime Administration for support on completing the HELCOM Cat I&II surveys. Finland has received about 5 M€ funding from EU TEN-T grant programs for about 41.000 km<sup>2</sup> of hydrographic surveys during 2005 – 2015.

[Link](#) to Finnish Transport Agency Hydrographic Survey Program 2015-2020.



## Hydrographic data processing and management

The renewal of the Bathymetric database is continuing. Negotiating procurement for the contract has been initiated.

External human resources has been rent from private companies in order to fulfil obligations and 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 limits of Finnish national legislation. Information will be updated continuously after new surveys.

## 3. Nautical Charts

### Printed charts

A tendering process for printing, marketing and delivering paper charts was made in 2015. The new contract with John Nurminen Marine came into effect from the beginning of 2016. The new agreement also allows the end-user prices for Finnish Nautical Charts fell by 6 %.

Printed charts in 2015 have been produced generally according to the plans. New editions were published on two chart series (B,C) and 15 nautical charts. Continuous updating of the printed charts covers now all Approach and Harbour scale charts in the Baltic Sea waters. [Link](#) to new chart catalogue 2016.

Chart product (printed)	2011	2012	2013	2014	2015
<b>International traffic</b>					
General charts	1772	1620	1977	1984	<b>1874</b>
Coastal charts					
Approach charts	3580	5379	4943	5434	<b>3939</b>
Harbour charts	732	1267	1313	2162	<b>718</b>
Chart series (inland areas)	2103	1998	1490	1538	<b>1412</b>
<b>Domestic traffic</b>					
General & approach charts	1384	1000	748	645	<b>747</b>
Chart series (sea areas)	11695	11116	11489	12600	<b>16574</b>
Chart series (inland areas)	1862	1503	1913	2496	<b>1750</b>
Other charts	5	0	0	0	<b>74</b>

*Table 2 Statistics of sold Finnish nautical charts in 2011 – 2015.*

Statistics for sold charts are shown below in *Table 3*. In addition to these there are many adopted charts sold by UKHO.

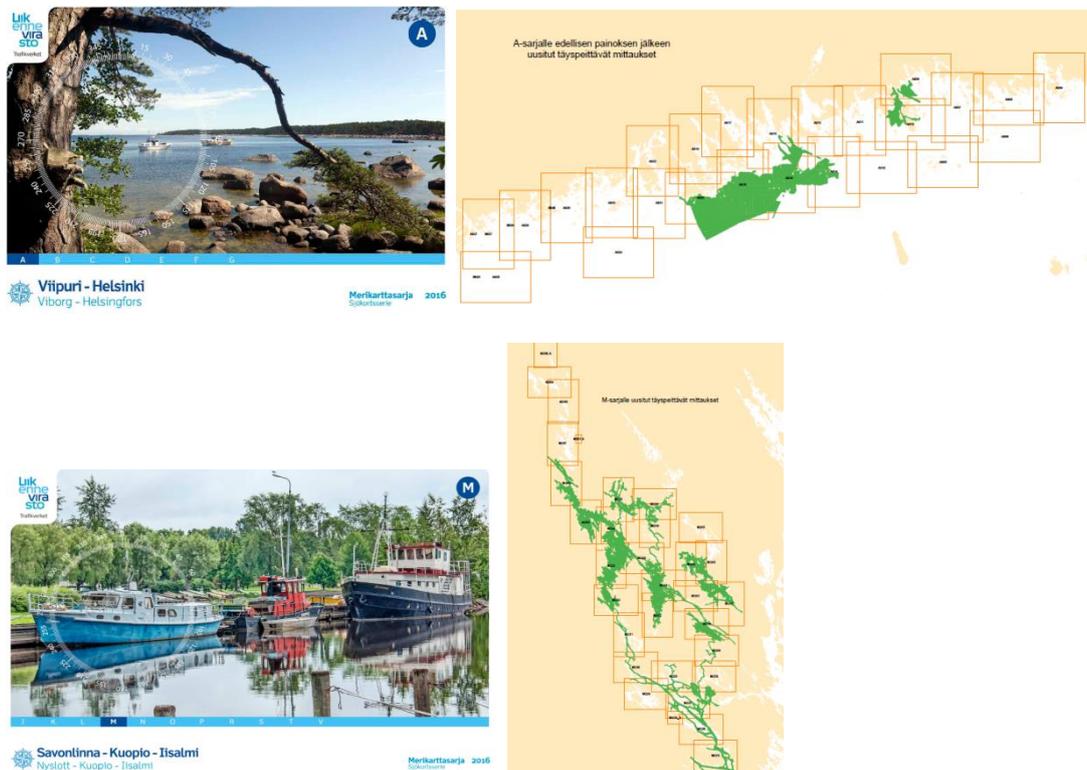


Published printed charts	2010	2011	2012	2013	2014	2015
<i>General charts</i>	2	1	3	2	4	<b>3</b>
<i>Approach Charts</i>	15	11	10	18	13	<b>11</b>
<i>Harbour Charts</i>	2	4	6	10	8	<b>2</b>
<i>Chart Series</i>	2	3	3	3	4	<b>2</b>
<i>Other Charts</i>	1	1	-	-	-	-

*Table 3 Statistics of published New Editions of Finnish nautical charts in 2010 – 2015.*

During spring 2016 two nautical chart series for yachtsmen were published, see cover pages with index of new surveys. *Fig. 2.*

- A (Viipuri - Helsinki, Gulf of Finland)
- M (Savonlinna-Kuopio-Iisalmi, Saimaa Lake District)



*Fig.2. New editions of nautical chart series for leisure craft spring 2016.*

■ New surveys

In future Finland will publish Coastal and General (scale band) ENC's covering all Finnish sea areas and inland waters of Vuoksi watercourse area. Finland will published uniform set of printed charts in scale 1: 250 000, covering all of Finnish coastal waters (including chart INT1210/ FI954, will be published 2017) and the Vuoksi waterways. Printed charts in scale 1: 500 000 will not be published and only one chart in scale 1: 100 000 (INT1130/ FI935) will be included for future production plan.



## ENC production and distribution

ENC production and distribution has been mainly according to the plans. In 2015 25 new cells and 48 new editions have been released. The new cells focused mainly in harbour usage band. The number of ENC Statistics are in *Table 4* and *Table 5*.

Number of releases	2010	2011	2012	2013	2014	2015
<i>New ENC's</i>	54	14	8	4	3	25
<i>New editions</i>	23	1	44	33	43	48
<i>Total amount of enc-cells</i>	151	205	192	180	175	189

Table 4. Statistics of produced Finnish ENC's

Table 5: Statistics for the use of Finnish ENC's

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

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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.

Quality control of ENC's 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

The new system for Source data management "*LOKI*" was adopted in June 2013. "*LOKI*" speed up performance of passing through time of source data, offers better tools for analysing source data and control of workflow. Second phase of the development work of the *LOKI* and TM Online publication system was completed April 2016.

Harmonization of depth information in ENC –project with Sweden discontinued on October of 2015 due to a struggle with resources in the project. The following things were completed before the "time out"

- Chart data update has been completed and new ENC editions have been released.
- Testing of proposed guidelines has been completed in all navigational purposes in the test area and printed chart plot and S-57 file from the test area have been produced.



- Writing of guidelines almost finished on General scale band, but has not been started on Coastal and Approach scale yet.

ENC harbour coverage, especially for small ports was complemented.

Finland is evaluating solutions in order to renew the existing chart production system. Invitation to tender for a new system will take place in the beginning of 2017.

Study to determine product specifications for Bathymetric Surface model (S-102), was started 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, printed chart production and quality assurance of printed charts and ENC.

#### 4. Nautical publications

NtMs has been published according to the plans. The printed version of NtM was discontinued on 1<sup>st</sup> Jan 2015. On-line web-service for distribution of Notices to Mariners will start during Autumn 2016.

The traditional printed publications of List of Lights have substituted by downloadable PDF publications in June 2016, including:

- Finnish Lights - General information
- Finnish List of Lights - Coastal area
- Finnish List of Lights - Inland Waterways

NtM Online -service will be taken into use during Autumn 2016.

Statistics for Notices to Mariners and chart updating service are shown in Table 6.

Publication / Service	2010	2011	2012	2013	2014	2015
<i>Notices to Mariners, volume of publications</i>	28	31	32	33	34	<b>34</b>
<i>Number of NtM Notices</i>	596	680	398	422	397	<b>391</b>
<i>Number of ER-updates</i>	477	766	449	431	534	<b>594</b>
<i>Charts in chart updating service</i>		38	56	82	86	<b>86</b>

Table 6: Statistics for chart updating service

#### 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 236 navigational warnings were published during 2015. 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
<i>Navigational Warnings</i>	244	248	412	276	234	<b>236</b>

*Table 7: Statistics for navigational warnings*

## 6. C-55

C-55 was updated during spring 2015. Next update will be done in Autumn 2016.

## 7. Capacity building

Nothing to report.

## 8. Oceanographic activities

A research project to change the chart datum of nautical charts and navigational information from MSL-based to EVRS-based datum, "Transition to Baltic Sea Chart Datum 2000", has been done. Objective is to study what effects there are to data, products and services in Finnish Transport Agency and find out solutions how the transition can be done. The production of the first test chart started in July 2016. After that more precise production and recourse plans will be done. The FHO is chairing BSHC Chart Datum Working Group (CDWG). The CDWG work concerns harmonization of the vertical datums 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 has 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.

Airborne bathymetric LiDAR-tests have been executed in two test areas on sea and Lake Puruvesi during November and December 2105. Reports have been received in February 2016. Further analysis of the data will be done within a Master's thesis during 2016.

## 9. Other activities

Based on the updated Bilateral Arrangement the adoptions with UKHO have been expanded as the technical challenges regarding with streamlining the adoption process were solved.

The FHO has continued the development of "Open Data" services. The new versions of view and download services were released (WMS, WMTS, WFS, file



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download service) [link](#). The licensing was changed to use mainly Creative Commons terms and conditions. Some navigation critical feature classes are still licensed under restrictions.

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

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

## 10. Conclusions

This report highlights the main activities of the Finnish Hydrographic Office since BSHC 20<sup>th</sup> Conference 2015.