



## Questionnaire to BSHC Member States on their implementation status of the transition to a Harmonised Vertical Reference, Baltic Sea Chart Datum 2000.

Please return to Thomas Hammarklint by email ([thomas.hammarklint@sjofartsverket.se](mailto:thomas.hammarklint@sjofartsverket.se)) at the latest by **25 January 2019**.

Member state	Finland
Date of reply	2019-01-24
Point of Contact	Jyrki Mononen, Finnish Transport and Communications Agency <a href="mailto:jyrki.mononen@traficom.fi">jyrki.mononen@traficom.fi</a>

### 1. Are all the decisions done to implement the Baltic Sea Chart Datum 2000?

1.1. When the decisions has been done or planned to be done?

All the decisions are done.

- The decisions to adopt BSCD2000 in Finland was made 2007 and 2015.
- Official approval of the implementation plan was made 12 December 2018.

1.2. What are the national decisive organizations?

- Finnish Transport and Communications Agency including Hydrographic Office (HO) concerning nautical charts and navigational publications and fairway information.
- Finnish Transport Infrastructure Agency concerning practical communication with ports and they are responsible of fairway data management.
- National Land Survey (NLS) concerning the Finnish national height system, which already is N2000 as a realization of EVRS.
- Finnish Meteorological Institute (FMI) concerning water level information on sea areas.
- Finnish Environment Institute (SYKE) concerning water level stations and information in inland waters.

### What is the national status of implementation of chart datum?

2.1. What actions have already been done?

- Implementation plan has been finalized.
- Transformation parameters for depth data has been defined majority of Finnish sea areas.
- Transformation procedures for fairway information (nominal depth, safe clearance depth) has been made. Fairway information has been transformed for main parts of the Bay of Bothnia.
- Transformation of bathymetric data has been started from the northern part of the Bay of Bothnia.



- The new datum is implemented in the data models of data management systems (bathymetric data, chart data, fairway data).
- The ongoing preparations for BSCD2000 charts has been started from the north part of the Bay of Bothnia.
- Co-operation with the Finnish Meteorological Institute has been started concerning the water level information/provision to users in the BSCD2000. Finnish Meteorological Institute has started a project about water level system change.
- Communication and co-operation with relevant stakeholders has started.

2.2. What actions have been planned to be executed and what is the schedule?

- Basically all the needed actions has already been started and will be continuing and any new actions should not be needed. Schedule - see 2.3

2.3 Which ENC Approach have been updated with the new reference datum? If possible, attach a chart datum overview covering Your countries nautical charts, designed graphically or as a table, updated around January, 2019. Also, if possible, include an attribute to each named chart describing the CD difference to BSCD2000 in cm (CD minus BSCD2000). Example attached at the end of the Questionnaire (Annex).

- Not yet published any charts in BSCD2000, the plan is to publish first editions later half 2020.
- We don't have a chart where MSL-BSCD2000 differences for each chart has been shown.

### **3. Has Your country established the national realization of EVRS and are the water level stations connected to this new height system (BSCD2000)?**

3.1 Which organization/-s is responsible for the water level stations/data in Your country?

- The Finnish Meteorological Institute (FMI)

3.2 Which reference are used today to present water level information? Does Your country planning to present water level information referring to BSCD2000? Doing it already today? Date decided for change the reference to BSCD2000?

- Today sea level information is provided mainly in MSL (current year theoretical mean sea level, calculated in FMI)
- Differences between MSL and N2000(BSDC2000) are provided as a table <https://en.ilmatieteenlaitos.fi/theoretical-mean-sea-level>.
- Sea levels are given in N2000 (BSDC2000) if asked.
- The plan is to provide sea level information in both MSL and N2000 (BSDC2000) from 2020 ->



3.3 Are there any plans for digital service/-s intended for the users to have the option to choose MSL or BSCD2000 as the reference level for water level information?

- During transition period when there are charts in MSL and in BSCD2000, also the water level information shall be informed and provided for the users in both datums.
- N2000-option will be added to FMI's open data service.

3.4 GNSS supported UKC control/confirmation is probably the reality in a few years. But we also need reliable water level predictions for carrying out optimal loading and real time water level data to check the GNSS data. Do we need a shared service in the Baltic Sea for water level information (predictions/real-time), that fulfils nautical needs and demands?

?

- Shared service could be an option for water level information, but the practical issues are e.g. who will be responsible of organizing the service and where to get the needed funding and recourses.
- IHO S-100 products includes standard for water level information, S-104 Water Level Information for Surface Navigation ([http://www.iho.int/mtg\\_docs/com\\_wg/HSSC/HSSC\\_Misc/List\\_of\\_S-100\\_Product\\_Specifications.pdf](http://www.iho.int/mtg_docs/com_wg/HSSC/HSSC_Misc/List_of_S-100_Product_Specifications.pdf)), which includes real-time water level observations and predictions/forecasts. When S-100 based ENC and compatible ECDIS are in use those should be the primary way of providing the navigational/nautical data to mariners.
- The organizations responsible for water level information are essential stakeholders when discussing what kind of information is needed for mariners.

3.5 Do we need to work together with the development of the IHO S-104 standard?

- IHO TWCWG is dealing with that standard, thus contributing that work would benefit best. Check IHO-web pages [http://www.iho.int/srv1/index.php?option=com\\_content&view=article&id=630&Itemid=371&lang=en](http://www.iho.int/srv1/index.php?option=com_content&view=article&id=630&Itemid=371&lang=en). All the input from CDWG would be welcome. Also agencies responsible for water level information would be good to take into development of S-104.

#### **4. Are the relevant national contacts and interest groups defined for the change of chart datum and water level reference?**

4.1. What are the essential national interest groups in Your country?

- Relevant stakeholders has been defined and listed in the Transition plan. Here are listed the most relevant stakeholders:
  - Finnish Transport Infrastructure Agency
  - Finnish Meteorological Institute
  - Finnpilot Ltd
  - Ports
  - Fairway owners
  - Traffic Management Finland, VTS Finland
  - Ship owners
  - Maritime education institutes



4.2. Are the relevant point of contacts known and contacts been made to them?

- Relevant point of contacts are known and communication has been defined in the Transition plan.

4.3 Are You planning any information campaign about the change of chart datum and water level reference? If, yes have you published information about this somewhere?

- There are defined different information campaigns and materials for different stakeholder groups (e.g. ports, fairway operators, pilots...)
- General information will be presented in the Finnish Transport and Communications Agency (Traficom) web-pages. The information is still located in the web-pages of Finnish Transport Agency (In Finnish: <https://vayla.fi/ammattimerenkulku/merikartat/korkeusjarjestelma-n2000#.XDx47eR7k2w>  
In Swedish: <https://vayla.fi/web/sv/yrkessjofart/sjokort/hojdsystemet-n2000#.XDx5eOR7k2w>  
In English: <https://vayla.fi/web/en/merchant-shipping/paper-charts/baltic-sea-chart-datum-2000#.XDx5r-R7k2w>)
- Information will be given also in the International Boat Fare in Helsinki.
- Information campaign in co-operation with FMI

## 5. Have You identified any obstacles or major issues concerning transition to the harmonized vertical reference?

5.1. What are the major obstacles or issues?

- Lack of resources: at the same time renewal of bathymetric data management system and chart production system (essential for the transition)
- Informing and education of the users. If the users don't understand the new reference system then the benefits will not be reached.
- During the transition period the synchronization of chart publishing and providing water level information in both datums has to be done in a way that users are not confused.

5.2. What measures has been planned to avoid them?

- Resources are planned and tasks prioritized. Relevant concrete milestones and project plan has been made and is monitored in the transition project organization (project group and steering group).
- Outsourcing as many tasks as feasible. To get extra resources.
- Information plan has been made to keep relevant stakeholders informed.
- Synchronizing the implementation with systems renewal projects.

## 6. Connections to neighbouring countries

6.1. Which are the relevant countries to cooperate?

All the neighbouring countries, Sweden, Estonia and Russian Federation. Especially Sweden and Estonia because both countries has been started the implementation.



6.2. Are the needed points of contacts already known?

All the relevant contact points are known.

6.3. What actions have been agreed with the relevant countries (e.g. synchronising plans and schedules)?

Not any specific agreements have done with neighbouring countries. Finland will follow the time schedules agreed within BSHC/CDWG as far as feasible.

Bilateral meetings has been kept with Sweden and Estonia. And we see that it is important to continue bilateral meetings.

**7. Are there any needs for support from BSHC?**

All the measures to help member states to communicate and execute the transition in synchronized manner are valuable.

**8. Do you have any other proposals or guidance to the CDWG to help and foster the transition process?**

Common information and promotion of the Baltic Sea Chart Datum 2000.

All member states to commit to adoption of the Baltic Sea Chart Datum 2000 and inform the implementation status.

Co-operate with FAMOS-project to foster needed gravity measurements and calculation of the new geoid model for the Baltic Sea.

**9. Are you using GNSS and GNSS augmentation services for referring to your (bathymetric) surveys to the chart datum?**

9.1 What GNSS augmentation service is used for hydrographic surveys? (If there are several augmentation services, list all of them.)

Not in vertical referencing at this moment, except some specific surveys (Saimaa-canal 2015-16).

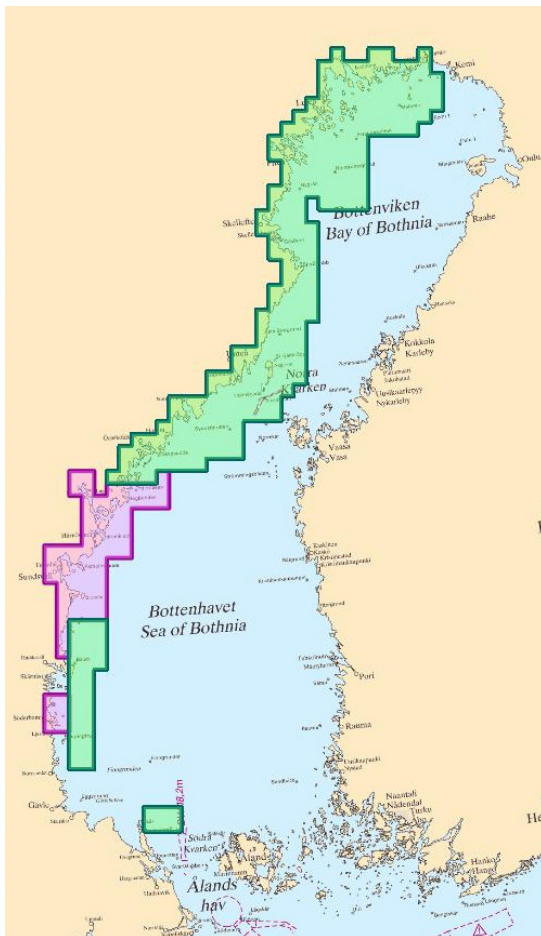
In horizontal positioning contractors uses commercial services (E.g. Fugro Marinestar, Trimnet (Geotrim Oy), @Fokus (Indagon Oy)) or data from FinnRef GNSS network.

9.2 To which coordinate system, and vertical reference level/frame the GNSS augmentation service is referred to? (If there are several systems in use, list all of them.)

ITRS, EUREF-FIN (ETRS89 realization in Finland) -> coordinate system ETRS-TM $n$  ( $n$  is the central meridian).



## Annex



Example of ENC Approach from Sweden: **Green** cells are referring to the new chart datum BSCD2000, **purple** cells are ongoing adjustments to BSCD2000 and the rest of the cells refer to various Mean Sea Level.