



Questionnaire to BSHC Member States on their implementation status of the transition to a Harmonised Vertical Reference, Baltic Sea Chart Datum 2000 (BSCD2000).

Please return to Thomas Hammarklint by email (thomas.hammarklint@sjofartsverket.se) at the latest by **21 February 2020**.

Member state	Finland
Date of reply	2020-02-19
Point of Contact	Jyrki Mononen, Finnish Transportation and Communications Agency (Traficom)

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?

Traficom: 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.
- Finnish Meteorological Institute (FMI) concerning water level information on sea areas.
- Finnish Environment Institute (SYKE) concerning water level stations and information in inland waters.
- National Land Survey (NLS) concerning the Finnish national height system, which already is N2000 as a realization of EVRS.

What is the national status of implementation of chart datum?

2.1. What actions have already been done?

FMI (Finnish Meteorological Insitute): Sea level observations are internally available in BSCD2000. Forecasts are under development.

Traficom:

- Transformation of bathymetric data has been started covering the Finnish territory of Bay of Bothnia and most of the Bothnian Sea.
- Also main parts of fairway information has been transformed from the same area.



- The BSCD2000 has been implemented in the data models of bathymetric data management system, chart production system and fairway data management system.
- Communication and co-operation with relevant stakeholders has been continuous.

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

FMI: Sea level observations and forecasts will be available in BSCD2000 for the public simultaneously with Traficom nautical charts.

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).

Traficom:

- Charts has not yet been published. The plan is to publish first BSCD2000 charts in the end of 2020.
- We don't have a chart where MSL-N2000 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?

FMI: Finnish Meteorological Institute

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 is presented in MSL. Sea level observations will be available in BSCD2000 for the public simultaneously with Traficom nautical charts in the end of 2020. Differences between MSL and N2000(BSDC2000) are provided in FMI web page:
<https://en.ilmatieteenlaitos.fi/theoretical-mean-sea-level> .

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?

FMI: FMI will have sea level available both in MSL and BSCD2000 in the future.

Traficom note: During the transition period charts will be published in MSL- and BSCD2000-datums, thus it is essential to provide also the water level information in both datums.



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?

Traficom:

- 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 how 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://s100.iho.int/S100/product%20specification/division-search/s-104-water-level-information-for-surface-navigation>), 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?

FMI: Yes.

Traficom: IHO Tides Water level and Currents Working Group (TWCWG) is responsible of developing S-104. There is more information in TWCWG web-page (<https://iho.int/en/twcwg>).

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?

Traficom, Finnish Meteorological Institute, Finnish Transport Infrastructure Agency, ports, pilots, mariners, maritime education institutes, communities, fairway owners, Traffic Management Finland, shipping companies, construction companies and general public.

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

FMI: Yes.

Traficom: Yes.

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?



FMI: Yes, by meeting stakeholders and via webpage (e.g. <https://en.ilmatieteenlaitos.fi/theoretical-mean-sea-level>).

Traficom:

- 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.

In Finnish: <https://www.traficom.fi/fi/n2000-vayla-ja-merikarttaudistus>

In Swedish:

<https://www.traficom.fi/sv/transport/sjofart/farleds-och-sjokortsreformen-n2000>

In English:

<https://www.traficom.fi/en/transport/maritime/n2000-fairway-and-nautical-chart-reform-improved>

- Information will be given also in the International Boat Fare in Helsinki.

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?

Traficom:

- Lack of resources due to major renewal of data management and chart production systems.
- Informing and education of users.
- Changes in fairway information and how users will understand how to utilize water level information (plus- and minus-water).

5.2. What measures has been planned to avoid them?

Traficom:

- Recourse planning and allocation to the most important tasks.
- Information plan, information campaigns and information web-pages to get users and stakeholders informed.

6. Connections to neighbouring countries

6.1. Which are the relevant countries to cooperate?

FMI and Traficom: Sweden, Russia and Estonia.

6.2. Are the needed points of contacts already known?

FMI and Traficom: Sweden and Estonia yes, Russia not really.

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



Traficom: 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?

Traficom: 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?

Traficom:

- 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.)

Traficom:

- Not for shipbourne surveys in vertical referencing at this moment, except some specific surveys (Saima canal 2015-16), but GNSS is used in bathymetric LiDAR-surveys for vertical referencing.
- 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).