



Questionnaire to BSHC Member States on the implementation status of Baltic Sea Chart Datum 2000 (BSCD2000), S-104 Water Level and S-111 Surface Currents

Please return to Thomas Hammarklint by email (thomas.hammarklint@sjofartsverket.se) at the latest by **15 March 2024**.

Member state	Denmark
Date of reply	2024-01-15
Point of Contact	Kristian V. K., Geodatastyrelsen, krkri@gst.dk

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

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

In Denmark BSCD2000 is implemented in ENC's and will be implemented in paper charts when reprinted. In Denmark BSCD2000 is implemented by the use of DVR90 which is equal to BSCD 2000. MSL data in charts is referring to DVR90.

Before year 2000 depth data has been referenced to the old Danish datum DNN and the difference between DNN and DVR90 is in worst case 12 cm. It was decided not to correct old depth data to DVR 90, since measuring precision before 2000 was less than 12 cm and most depths were given with decimetre resolution. This led Denmark to the conclusion that there has not been a need for conversion in the charts between DNN and DVR90.

1.2. What are the national decisive organizations?

Geodatastyrelsen

2. What is the national status of implementation of chart datum?

2.1. What actions have already been done?

See 1.1

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

If Denmark is publishing a new chart we will print 'BSHC2000-DVR90' on the chart.

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, 2023. 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).

Everything is updated.

2.4 If you implemented the attribute VERDAT in S-57 (ENC), are You using VERDAT=3 (Mean Sea Level)?

Denmark is using MSL or LAT and it is stated in the ENC.

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?

Danish Metrological Agency (DMI), Danish Coastal Authority (Kystdirektoratet), The Danish Environmental Protection Agency (Miljøstyrelsen)

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?

Water levels are referenced to DVR90.

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?

No.

3.4 GNSS supported UKC control/confirmation is probably the reality in a few years. 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), which fulfils nautical needs and demands?

There is no policy regarding the need for this, but work related to it is being done via the Interreg Baltic Sea e-Navigation project. Regardless, GST wishes to cooperate across sea-borders to harmonize future products.

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

GST participates in the TWCWG, but isn't directly involved in the S-104 project team.

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?



Agency for Data Supply and Infrastructure (SDFI)

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

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?

No

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?

None

5.2. What measures has been planned to avoid them?

None

6. Connections to neighbouring countries

6.1. Which are the relevant countries to cooperate?

None

6.2. Are the needed points of contacts already known?

None

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

None

7. Are there any needs for support from BSHC?

No

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

No

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.)

DGNSS and RTK



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.)

ETRS89

9.3 Does your HO require, in-house or procured, that Hydrographic survey system shall be prepared to be able to measuring the GNSS-height and refer the depth to the geoid?

Ellipsoidally referenced surveys are the common practice.

9.4 Do you discuss within your HO the need of an altimetric measured Mean Sea Surface (MSS)? (For example, in order to support hydrodynamic models, shipping and / or adjust existing depth data)?

We have an altimetry-based MSS model available via partnership with SDFI (<https://sdfi.dk/Media/638167943870892273/008-DKMSL.pdf>)

9.5 Has your HO assessed the need for dynamic geodetic reference systems (time-dependent transformation relationship) between primarily national and global reference frames?

No

10. What is the national status of the implementation of IHO S-104 Water Level and S-111 Surface Currents?

10.1 What actions have already been done?

DGA is coordinating with DMI, but there are no concrete plans for providing S-104 and S-111 services yet.

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

We are following the progress in the other HO's and in IC-ENC. Further, DGA participates in the Interreg Baltic Sea e-Navigation project.

10.3 Are all the decisions done to implement the IHO S-104 Water Level Information?

No. There is no formal decision on which authority will be responsible for providing the Danish S-104 and S-111 services. Decisions on how the new service will be financed have not yet been made.

10.4 When the decisions have been done or planned to be done?

We aim to have a plan for S-104 and S-111 in 2024

10.5 Which organization/-s is responsible for observed and modelled/forecasted water level (Refer to 3.1) and currents in Your country?



DMI and FCOO (Forsvaret Center for Operativ Oceanografi)

10.6 How is Your country represented in the IHO Tides, Water Level and Currents Working Group (TWCWG)?

DGA has a representative in the working group.