



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 **14 March 2025**.

Member state	Denmark
Date of reply	2025-03-17
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?

Denmark has implemented BSCD2000 in ENC's and will implement in paper charts when reprinted.

Denmark has implemented BSCD2000 primarily through the use of DVR90 (Danish Vertical Reference 1990) which is mostly equivalent to BSCD2000.

However, around the island of Bornholm DVR90 does not adequately approximate BSCD2000, and the IHO released BSCD2000 model is used to transform data in that area.

1.2. What are the national decisive organizations?

Danish Geodata Agency

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?

When publishing new charts Denmark indicates "Mean Sea Level (BSCD2000^{DVR90})" to indicate the vertical system in use.

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. 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 as stated in the ENCs.

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), The Danish Agency for Climate Data (KDS)

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?

This is being discussed with DMI.

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 are many considerations to this question. A shared service could be a possibility, as well as harmonized national services.

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

DGA 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 Climate Data (KDS) (Contains the National Geodetic Office)

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?

DGA has issued a press release. (<https://gst.dk/nyheder/2024/nov/nyt-referenceniveau-for-dybder-i-soekort-bscd2000>)

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 (Private services regulated by BEK nr 546 af 29/05/2024, *Bekendtgørelse om registrering af GNSS-positioneringstjenester*)

- 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?

Ellipsoidal 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?

DGA participates in the Interreg Baltic Sea e-Navigation project. Meetings with DMI have been scheduled in the first half of 2025.

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?

See 10.3

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 (Defence Centre for Operational Oceanography)

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.