



BSHC Chart Datum Working Group (CDWG)

CDWG Report to the BSHC 22nd Conference

The CDWG TORs requests the CDWG to report annually to the BSHC.

1. Status of Work of CDWG since BSHC 21st Conference

Mr Jyrki Mononen has acted as the Chair. There is no permanent secretary for the CDWG. *Dr Wilfried Ellmer* was elected as the secretary of the CDWG 9th meeting.

All the BSHC countries have nominated members to the working group, however not all have been active or participated to the meetings. BOOS has nominated Point of Contact. Observers are nominated from Finnish Geodetic Institute, Swedish National Land Survey, Federal Agency for Cartography and Geodesy (Germany), and Norwegian Mapping Authority.

CDWG has supported the implementation of the Baltic Sea Chart Datum 2000, reviewed the progress of implementation, promoted development of a common geoid model for the Baltic Sea, and cooperated with relevant international bodies.

The communication within the CDWG has been done by meeting and by e-mails. Meeting was held on 4-5 April 2017 in Rostock, Germany.

Members of CDWG:

Denmark	Mr Lars Hansen
Denmark	PhD Joanna Gerlings
Estonia	Mr Peeter Väling
Estonia	Mr Tõnis Siilannarusk
Estonia	Ms Nele Savi
Finland	Mr Jyrki Mononen
Germany	Dr Wilfried Ellmer
Latvia	Armands Murans
Lithuania	Mr Mindaugas Zakarauskas
Poland	Cdr Sławomir Lipiński
Poland	Lt Cdr Marcin Banaszak
Russia	Capt S. Travin
Russia	Capt Sergey Progudin
Russia	Ph.D. Andrey Sharkov
Russia	Dr Sergey V. Reshetniak
Sweden	Mr Lars Jakobsson
Sweden	Mr Henrik Tengbert
Sweden	Mr Thomas Hammarklint

Representative of BOOS: Sweden Mr Thomas Hammarklint

Observers:

Finland	Mrs Mirjam Bilker-Koivula
Sweden	Dr Martin Lidberg
Sweden	Dr Jonas Ågren
Norway	Mr Aksel Voldsund
Germany	Dr Gunter Liebsch



2. CDWG 9th meeting 4 – 5 April 2017, Rostock, Germany

One of the most important items in the meeting was to review national plans and status of implementation of the Baltic Sea Chart Datum 2000. The national implementation plans were reviewed by participants. A questionnaire of national plans and status was done before the meeting to gather information from all the member states regardless participation in the meeting. However, answers were given only by Finland, Germany, Latvia, Russian Federation and Sweden. The coverage of answers was deemed not to be sufficient for monitoring and coordinating the implementation of the Baltic Sea Chart Datum 2000. It was stressed out that all BSHC member states should contribute by answering the CDWG questionnaires and if possible participating the meetings. It can be concluded that most member states has made actions to implement the common vertical datum.

A good geoid model for the whole Baltic Sea was deemed to be an essential component for the Baltic Sea Chart Datum 2000. Gravity surveys are needed to cover the Baltic Sea area with sufficient data for the geoid model. To get all the needed work done, financing for the gravity surveys and geoid calculations should be ensured. It was proposed that member states could e.g. commit to continuation of EU co-financed FAMOS-project (Finalising Surveys for the Baltic Motorways of the Sea) which includes gravity surveys and improvement of the geoid model for the Baltic Sea.

Mr Thomas Hammarklint was unanimously supported to be the new chairman and BSHC 22nd meeting is requested to approve him as the chairman.

BSCD2000 was agreed to be proposed as an abbreviation of the Baltic Sea Chart Datum 2000 to be approved by the BSHC 22nd meeting.

It was agreed that the Baltic Sea Chart Datum 2000 shall be proposed as a new chart datum to IHO S-100 Registry.

The specification for the Baltic Sea Chart Datum 2000 was reviewed and few amendments were proposed and agreed to include in the specification. It was agreed that specification will be presented to BSHC after the final geoid model is ready. The specification is an essential document for applying and realizing the Baltic Sea Chart Datum 2000 in all BSHC member states.

Other items were to plan the cooperation with BOOS in future, to review and update the TORs and the Work Programme for the years 2017-18 and plan the future work of CDWG.

3. Future Work of the CDWG

CDWG will continue to guide and follow up the progress of the implementation of the harmonised vertical reference.

Further develop the first version of "the specification for Baltic Sea Chart Datum 2000".

Continue cooperation with FAMOS concerning improving geoid model for the whole Baltic Sea, promoting studies and further development of dynamic topography of sea surface and promote improving precise real-time GNSS navigation. However, it should be noted that it is not sure that FAMOS-project continues after the end of 2018.



Continue cooperation with BOOS concerning water level information. Cooperation is important for the implementation and usage of the harmonised vertical reference.

Continue communication with relevant organisations and inform users by giving presentations and participating in relevant conferences.

To activate all the member states to send representatives to CDWG meetings.

The CDWG plans to have its next meeting on week 6, February 2018 in Norrköping, Sweden.

4. The results of the CDWG during 2016-2017

CDWG has promoted studies and development of a common geoid model for the Baltic Sea by supporting FAMOS-project. Within FAMOS-project several gravity-surveying campaigns were executed in the Baltic Sea during 2015-2016 and interim geoid models have been calculated during 2016.

In cooperation with BOOS partners, the CDWG have compiled a list of the mean sea level in the Baltic Sea Chart Datum 2000 at tide gauges located in the Baltic Sea. The list can be downloaded from here:

http://www.boos.org/wp-content/uploads/mwreg_boos.pdf

Presentations were given by CDWG members as planned in the communication plan in following conferences:

- GGH2016 (Gravity, Geoid and Height Systems) symposium in Thessaloniki, Greece, on 19-23 September 2016: "On the definition and realisation of the Baltic Sea Chart Datum 2000"
- FAMOS Freja/Odin meeting, 8-10 March 2017, Malmö, Sweden
- BOOS Annual Meeting, 22-24 May 2017, Copenhagen, Denmark
- FIG Working Week, 29.5.-2.6.2017, Helsinki, Finland

5. Actions for the BSHC 22nd Conference

The BSHC 22nd Conference is requested to

1. note this Report
2. approve *Mr Thomas Hammarklint* as a chairman of CDWG
3. approve the proposed abbreviation for the Baltic Sea Chart Datum 2000: *BSCD2000*
4. support gravity measurements and geoid computation independent of future EU co-financing
5. endorse CDWG TORs (*Annex 1*)
6. endorse CDWG Work Programme 2017-2018 (*Annex 2*)
7. give further guidance to CDWG, as seen appropriate

Annexes:

1. CDWG TORs
2. CDWG Work Programme 2017-2018



Annex 1

BSHC Chart Datum Working Group Terms of Reference

[5 April 2017]

Proposed to be approved by BSHC22nd conference, September 2017

The BSHC18 (September 2013) decided to continue CDWG work and wished the harmonized Baltic Sea vertical reference to be implemented.

The Working Group should

1. To continue implementation of the EVRS.
2. To prepare the road map for transition, including e.g:
 - to establish a network of relevant bodies involved into the transition and efficiently communicate and give guidance within this network
 - to invite relevant bodies to inform the users
 - to review of progress of national plans and actions
 - to propose harmonization actions.
3. To cooperate with relevant bodies on water level related issues e.g:
 - to promote studies on the validation, status and distribution of water level information, and to promote studies on interpolation and prediction of water levels
 - to promote studies on displaying schemes for joint Baltic Sea water level information
 - to promote studies on recommendations to IHO how the sea level and its variations should be shown on nautical paper and ENC charts and publications, and conveying water level information to mariners [ref. IHO Technical Resolutions].
4. To further development of a common harmonized height reference, including further development of a common geoid model for the whole Baltic Sea area and supporting geoid and oceanographic studies relevant to these purposes.
5. To cooperate with BOOS and other relevant international bodies.
6. To liaise with relevant IHO bodies.

The Working Group should report to the BSHC Conferences.



Annex 2

Proposed BSHC Chart Datum Working Group Work Programme for 2017 – 2018

[5 April 2017]

[Proposed to be approved by the BSHC 22nd Conference, September 2017]

Note: This Work Programme includes those Tasks which were identified as the priority issues and which are expected to be fostered during 2017 - 2018 bearing in mind the resources the BSHC members have.

Tasks:

1. Guide the implementation process of vertical reference within the Baltic Sea region.
 - a. To monitor and follow up the status of the relevant actions identified.
 - b. To ensure efficient communication with relevant bodies.
 - c. To propagate and explain the idea of harmonized chart datum.
2. Review of progress of national plans and actions.
3. Propose harmonization actions.
4. Promote studies and further development of a common geoid model and dynamic topography for the whole Baltic Sea, mainly by supporting and collaborating with FAMOS project, e.g. organizing ship time for gravity measurements.
5. Promote the work of FAMOS to improve precise real-time GNSS navigation for the future.
6. Cooperate with BOOS and other relevant institutes and organizations.
7. Support other IHO working groups and European projects in issues concerning vertical references.