



CDWG Report to the BSHC 20th Conference

1. Status of the work of CDWG since BSHC 19th Conference

Mr. Jyrki Mononen has acted as the Chair. There is no permanent secretary for the CDWG. Mr. Henrik Tengbert acted as the secretary of the CDWG 7th 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 their Point of Contact. There are also observers from Finnish Geodetic Institute, Finnish Meteorological Institute, Swedish National Land Survey, Federal Agency for Cartography and Geodesy (Germany), Norwegian Mapping Authority.

The main tasks for the CDWG has been to continue the implementation of the EVRS in the Baltic Sea, to review the progress of transition to the harmonized vertical reference, to promote development of a common geoid model for the Baltic Sea, and to cooperate with relevant other international bodies e.g. BOOS.

The communication within the CDWG has been by CDWG Letters and e-mails. Meeting was held on 11-12 February 2015 in Tallinn, Estonia.

Members of CDWG:

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

Representative of BOOS: Sweden Mr Thomas Hammarklint

Observers:

Finland	Mrs Mirjam Bilker-Koivula
Finland	Dr Kimmo Kahma
Sweden	Dr Martin Lidberg
Sweden	Dr Jonas Ågren
Norway	Mr Tor Tørresen
Germany	Dr Gunter Liebsch



2. CDWG 7th meeting 11 – 12 February 2015, Tallinn, Estonia

The main subjects were to review national plans for transition to common vertical reference, to make a proposal how the chart datum name "Baltic Sea Chart Datum 2000" should be shown in ENC's and on paper charts (BSHC19 action 4) and further plan the cooperation with BOOS, to review and update the TORs and the Work Programme for the years 2015-16.

The national implementation plans were reviewed by participants. Presentations were given by invited guests concerning Estonian geodetic system, new height system and quasigeoid model.

Based on presentations and implementation status questionnaire made before the meeting, it can be concluded that most member states has made actions to implement the common vertical datum. There are differences concerning readiness of implementation plans and schedules.

Cooperation with FAMOS-project (Finalising Surveys for the Baltic Motorways of the Sea) and especially activity 2, geoid model, was noted to be important to support the work of CDWG. The goal for FAMOS activity 2 is to improve the geoid model for the whole Baltic Sea. FAMOS is EU-funded project which application has been done and the decision will be made during autumn 2015. Presentation of FAMOS-project activity 2 was given in the meeting and also status of the on-going NKG2015 geoid model computation was reviewed.

3. Future Work of the CDWG

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

Continue cooperation with FAMOS concerning improving geoid model for the whole Baltic Sea.

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

Write a definition for the "Baltic Sea Chart Datum 2000" based on EVRS conventions taking into account essential matters for navigation.

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.

It was noted in the CDWG7 meeting that EU-level political support would be important to foster the implementation of the common vertical datum. Feasible organizations to get involved would be HELCOM and EUSBR (EU Strategy for Baltic Sea Region).

The CDWG plans to have its next meeting on February – March 2016.



4. The results of the CDWG during 2014-2015

Memorandum of Understanding between BSHC and BOOS has been signed in 2014.

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

- Nordic Geodetic Commission General Assembly (2014)
- BOOS annual meeting (2015)
- EUREF Technical Working Group meeting (2015)
- EUREF Symposium (2015)

Articles about harmonized vertical datum written by CDWG members were published in following publications:

- BOOS Newsletter (2014)
- IHR Baltic Sea Special Edition (2014)

5. Actions for the BSHC 20th Conference

The BSHC 20th Conference is requested to

1. note this Report
2. approve CDWG TORs (*Annex 1*)
3. approve CDWG Work Programme 2015-2016 (*Annex 2*)
4. support CDWG proposal for displaying the name *Baltic Sea Chart Datum 2000* in ENC's and paper charts (tasked from BSHC19, action 4) or give further instructions as seen appropriate (*Annex 3*)
5. give further guidance to CDWG, as seen appropriate

Annexes:

1. CDWG TORs, 12 Feb 2015.
2. CDWG Work Programme 2015-2016, 12 Feb 2015
3. CDWG proposal for displaying the name "Baltic Sea Chart Datum 2000" in ENC's and paper charts



Annex 1 to the CDWG Report

BSHC Chart Datum Working Group Terms of Reference

Proposed to be approved by BSHC20th conference, September 2015
[12 February 2015]

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 to the CDWG Report

BSHC Chart Datum Working Group Work Programme for 2015 – 2016

Proposed to be approved by the BSHC 20th Conference, September 2015

[12 February 2015]

Note: This Work Programme includes those Tasks which were identified as the priority issues and which are expected to be fostered during 2015 - 2016 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 develop a recommended concept how the name for the harmonized vertical reference system should be indicated in the products.
 - b. To monitor and follow up the status of the relevant actions identified.
 - c. To ensure efficient communication with relevant bodies.
2. Review of progress of national plans and actions.
3. Propose harmonization actions.
4. Promote studies and further development of a common geoid model for the whole Baltic Sea area.
5. Promote studies related to dynamic topography of sea surface.
6. Cooperate with BOOS and other relevant institutes and organizations.
7. Support other IHO working groups and EU projects in issues concerning vertical references, e.g. FAMOS-project.



Annex 3 to the CDWG Report (Page 1 / 2)

CDWG Answer
to

the BSHC19th Conference Action number 4:
"CDWG to clarify the use of the common name of Baltic harmonized
Chart Datum ("Baltic Sea Chart Datum 2000")."

[24 June 2015]

In CDWG 7th meeting on 11-12 February 2014 two alternatives was proposed for showing how the chart datum name "*Baltic Sea Chart Datum 2000*" should be displayed on paper charts and respectively in S-57 based ENC's.

After the CDWG7 meeting a questionnaire was made to ask which alternative would be feasible for the Member States. Four Member States gave answers. Three proposed to use verdat value 3 referring to Mean Sea Level. One proposed to use verdat value 19 referring to Approximate Mean Sea Level.

CDWG proposal has been compiled based on the CDWG 7th meeting and questionnaire.

Alternative 1

In paper charts:

Mean Sea Level (Baltic Sea Chart Datum 2000 NATIONAL REALIZATION NAME)

E.g. in Finnish charts: Mean Sea Level (Baltic Sea Chart Datum 2000^{N2000}),
in Swedish charts: Mean Sea Level (Baltic Sea Chart Datum 2000^{RH2000}),
in Latvian charts: Mean Sea Level (Baltic Sea Chart Datum 2000^{LAS2000,5}).

Referring verdat value in S-57 ENC's: 3 (referring to "mean sea level" in S-57 Object Catalogue)

Alternative 2

In paper charts:

Approximate Mean Sea Level (Baltic Sea Chart Datum 2000 NATIONAL REALIZATION NAME)

E.g. in Finnish charts: Approximate Mean Sea Level (Baltic Sea Chart Datum 2000^{N2000}),
in Swedish charts: Approximate Mean Sea Level (Baltic Sea Chart Datum 2000^{RH2000}),
in Latvian charts: Approximate Mean Sea Level (Baltic Sea Chart Datum 2000^{LAS2000,5}).

Referring verdat value in S-57 ENC's: 19 (referring to "approximate mean sea level" in S-57 Object Catalogue)



Annex 3 to the CDWG Report (Page 2 / 2)

Advantages and disadvantages of the alternatives

Alternative 1: Mean Sea Level (Baltic Sea Chart Datum 2000 ^{NATIONAL REALIZATION NAME}) + verdat value 3	
Advantages	Disadvantages
<p><i>Mean Sea Level</i> is defined in IHO Standards and publications, S-32.</p>	<p><i>Baltic Sea Chart Datum 2000</i> is not fixed to the Mean Sea Level. It is fixed to the European Vertical Reference System (EVRS), which is a geodetic height system.</p> <p>Thus, using the <i>Mean Sea Level</i> and S-57 verdat value 3 conflicts with the <i>Baltic Sea Chart Datum 2000</i>.</p> <p>IHO S-32 Mean Sea Level: "<i>The average height of the surface of the sea at a tide station for all stages of the tide over a 19-year period, usually determined from hourly height readings measured from a fixed predetermined reference level (chart datum).</i>"</p>
<p>"Mean Sea Level" is common and known for mariners.</p>	

Alternative 2: Approximate Mean Sea Level (Baltic Sea Chart Datum 2000 ^{NATIONAL REALIZATION NAME}) + verdat value 19	
Advantages	Disadvantages
<p><i>Approximate Mean Sea Level</i> is not fixed to Mean Sea Level.</p> <p>Thus using the <i>Approximate Mean Sea Level</i> and S-57 verdat value 19, does not conflict with the <i>Baltic Sea Chart Datum 2000</i>.</p> <p>Definiton of verdat value 19 in S-57 object catalogue: "<i>an arbitrary level, usually within +/- 0.3m from that of mean sea level (MSL). (Hydrographic Service, Royal Australian Navy)</i>"</p>	<p><i>Approximate Mean Sea Level</i> is not defined in IHO Standards or publications.</p>

CDWG proposal

CDWG proposal as a recommendation how the common name of the Baltic Sea Chart Datum 2000 should be shown in S-57 ENCs and in Paper Charts:

In S-57 ENC
Verdat value 3.

In Paper Chart
Mean Sea Level (Baltic Sea Chart Datum 2000^{NATIONAL REALIZATION NAME})

BSHC20 is requested to support the proposal or give further instructions as seen appropriate.