



**Minutes**  
**BSHC CDWG10 Meeting**  
**7-8 February 2018**  
**Arkö, Sweden**

**28 February 2018**

**Minutes**

**1. Welcome and formalities**

The meeting convened on 7 February 10:30 a.m. The Chair, Mr Thomas Hammarklint, welcomed all the participants to the meeting [[CDWG10 List of Participants](#)].

Mr Jyrki Mononen was elected as a secretary for the meeting.

Chair reviewed the program for the meeting including visit to [Arkö mareograph](#) before lunch and group photo on Thursday after the coffee break.

Chair introduced the agenda with one change. Agenda item 8: The presentation of “Harmonization of Swedish tide gauges” was moved to be given after agenda item 2 due to Mikael Stenström needed to leave on Wednesday.

Agenda was adopted with this amendment.

Apologies not to be able to participate the meeting were received from Latvian representative Mr Armands Murans.

The meeting took following reservation by Russian Federation delegate, Dr Sergey Reshetniak: “All decisions that would be taken during CDWG10 meeting would be accepted by Russian Hydrographic Service only after consultations and should be confirmed by Department of Navigation and Oceanography of the Ministry of Defence of the Russian Federation.”

**2. Review the work of the CDWG and actions since the last meeting**

Chair reviewed the results of CDWG work since the last meeting. Presentations were given, attended to conferences, IHO working group meeting, reported to BSHC22. In addition transition period road map and time line were updated [[CDWG Roadmap](#)], BSHC CDWG – web pages [[CDWG Website](#)] were maintained and a sketch of implementation process and relevant connections was drafted [[CDWG10 Chair’s Report](#)].

Chair reviewed the actions from CDWG9 and the status of actions was updated and not finished actions were moved to action list of CDWG10 [[CDWG10 List of Actions](#)].

**Action 1:** Thomas to contact Polish contact at Eurogoos meeting 2018.

**Action 2:** Jyrki to write a letter to Russian HO to ask a point of contact in Russia responsible for geodetic data in Russian Baltic regions. Jonas and Mirjam to proof-read and comment. Thomas to send the letter to Russian HO as a chair of CDWG.



Chair reviewed the minutes of the last CDWG meeting [[CDWG9 Minutes](#)]. No comments concerning the minutes.

Presentation of Harmonization of Swedish tide gauges was moved here. Presentation was given by Mr Mikael Stenström from SMHI [[Presentation SHIP](#)]. Harmonization is part of the FAMOS Freja/Odin subactivity 2.3. Tide gauge network consist of all together 50 stations, in three different classes. Almost all stations are already connected to national precise levelling network. Radar sensor tests in freezing conditions since 2016. Data is available via internet (VIVA-network).

### 3. Outcome of the BSHC 22<sup>nd</sup> Meeting

Chair reviewed action given to CDWG by BSHC22 conference. The handling of the matter was postponed to agenda item 15.

### 4. Review the national implementation plans and the status of implementation

Answers to the Questionnaire were received from Denmark, Estonia, Finland, Germany, Latvia, Russian Federation and Sweden.

Participants presented national implementation status and they are briefly summarized here. [[Summary Implementation status](#)]

**Sweden:** It is planned to change datum for water level information in 2018. Some further plans need to be done, not to end up situation with different datums. Goal is to have sea areas transformed to BSCD2000 in 2021 and inland waters 2022. Today ten paper charts and related ENC's have been transformed to BSCD2000 in the northern part of Bay of Bothnia. A recognized issue is how to inform users to avoid confusion of what is the true usable water depth after the transition. [[SWE answer to questionnaire](#)]

**Denmark:** Denmark will follow Swedish publication time table. GNSS EUREF/DVR90. [[DEN answer to questionnaire](#)]

**Estonia:** A recognized issue is how to inform mariners about the real water depth, because depths on charts decreases around 20 cm. Web-page for questions and articles and information leaf-letters. Estonia ready to start publishing charts in the new datum, 2018 already couple of new charts published, but not yet in bigger numbers. QUESTION to CDWG what should be used in paper charts mean sea level although it is not mean sea level. Estonian has taken EH2000 in use in 1 jan 2018 and published information in web-pages also concerning water level info. [[EST answer to questionnaire](#)]

**Action 3a:** Gabriela to provide information to Thomas Hammarklint about the difference between EH2000/BSCD2000 and MSL/BK77, for all Estonian tide gauges.

**Finland:** Test chart has been done. Contacting for neighbouring countries and relevant national stakeholders has been started. Implementation plan including recourse and time estimations will be finalized during spring 2018. The plan is to start implementation and chart publishing from norther Bay of Bothnia. Some implementation tasks have already been started. One major issue is how to inform mariners and other users of charts and depth data



what is real usable water depth, because depth figures in charts will decrease. This issue includes also the question how to synchronise publication of charts in BSCD2000 and water level information in N2000, which is accordance with BSCD2000. MSL- and BSCD2000-based charts will be in use in same time during the implementation period. [[FIN answer to questionnaire](#)]

**Germany:** DHHN-2016 has been adopted in to use Jan 2018. It is in accordance with NAP and it is a realization of BSCD2000. Not major issues, because not big changes are needed to be done. [[GER answer to questionnaire](#)]

**Action 3b:** Patrick to provide information to Thomas Hammarklint of difference between DHHn-2016 and BSCD2000.

**Latvia:** Chair reviewed the report because Latvian representative could not participate the meeting. [[LAT answer to questionnaire](#)]

**Russian Federation:** Russia is using Kronstadt datum. Situation is basically the same than last year. Russian representative gave a short presentation of different hydrographic organizations in Russia to describe the decision making procedures in Russian Federation. Two main organizations responsible of hydrographic activities are Department of Navigation and Oceanography of the Ministry of Defence (DNO) and Ministry of Transportation. DNO is responsible of the whole sea areas, ministry of transport is responsible of ports, fairways to ports and North-East Passage. Ports and shipping routes are divided to two organizations: 1) the ports and passages to ports and 2) hydrographic services responsible of the North-East passage. All issues concerning the Baltic Sea are under DNO responsibility. [[RUS answer to questionnaire](#)]

## 5. Review and update the *joint* road map, time line and communication plan [\[All\]](#)

The Chair gave a review of development of the [CDWG Website](#). Following proposals were given in the meeting:

- Short introduction/statement what is the purpose of CDWG: Implementing BSCD2000 (**Action 4: Thomas**)
- To make a map of differences between MSL and BSCD2000 (**Action 5: Jonas and Thomas**)
- To provide links to national web-pages concerning BSCD2000 (**Action 6: all to provide Thomas links to relevant web-pages**)
- To add relevant keywords to find the web-page to ease to find the page (**Action 7: Thomas**)
- To add group photo to web-page (**Action 4: Thomas**)
- To make a map or other presentation telling in what phase implementation is within the whole Baltic Sea. This needs to be defined better how this can be done. Not assigned to anyone. Maybe the Questionnaires need to be adjusted to fulfil this action. (**Action 8: ongoing/TBC**)
- To propose an informative fact sheets of the Baltic Sea Chart Datum 2000 to be added in the web page. (**Action 9: Thomas**)
- To write a short description for the public of the Baltic Sea Chart Datum 2000 to be added in the web-page. (**Action 10: Jonas**)

- To develop the time line more interactive and informative telling what milestones has been achieved and what planned and to further develop a presented sketch of implementation process. (Action 11: Thomas and Lars)
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## 6. Draft specification for Baltic Sea Chart Datum 2000

Jonas gave an overview of the specification. Amendments which were agreed in the CDWG9 meeting were done. Hydrographic engineering added as one task where BSCD2000 should be applicable and used for [[Specification BSCD2000](#)].

Amendments proposed in the meeting (Action 12: Jonas, Gunter, Jyrki):

- Section 2 *Realization item c) point 2* "...within the level of a few centimeters." to replace few with numerical interval to be more clear.
- To be removed from text *Section 2 item c)* "...(*like in Russia*)..."
- Amendment to section 2 "*Offshore, BSCD2000 shall be realized based on the national GNSS positioning services (e.g. SWEPOS, FINNREF, SAPOS,...), the...*" Clarifying text it is not restrict using mareographs in surveying.
- Section 2 e) "*Land uplift corrections shall be applied in areas with significant land uplift*". Clarifying text where the corrections should be applied.
- Include MSL (2018) in BSCD2000 picture to specification.

## 7. Cooperation and communication with BOOS

- Thomas gave a presentation concerning BOOS [[Presentation BOOS](#)]. SMA has been a partner of BOOS since May 2017.
- All SMA oceanographic data will be available in real-time, e.g. sea level (36 tide gauges)
- [BOOS Sealevel-product](#): Today the data is presented with different reference levels, but future goal is to provide water level data from tide gauges in the same reference level. CDWG should promote BSCD2000 as the reference level (MoU between BOOS and BSHC on transition to harmonized vertical references – good to remember when discussing with institutes who are member of BOOS).

## 8. Cooperation with FAMOS

Jonas gave a presentation of FAMOS Freja (2014-2016), Odin (2017-2018), interim FAMOS geoidmodel and gravity surveys and plans. Gravity surveys and geoid computations are FAMOS subactivities 2.1 and 2.2.

- Status of FAMOS efforts to improve Baltic Sea geoid model
  - o gravity and GNSS levelling databases
  - o gravity campaigns which has been performed 2015, 2016, 2017: dedicated campaigns, piggy bag campaigns, campaigns with Stena line
  - o lots of measurements some places (southern Baltic, Estonian coast, Bothnian Sea), but still areas with inadequate gravity data (eastern end of the Gulf of Finland, central Baltic),
  - o German, Sweden, Danish gravimeters has been used

- FAMOS gravity database version 2017-01-11, managed by DTU Space. Data missing for FAMOS geoid model e.g. in Poland although the data is in Nordic database. It is needed to have a permission to input the data to FAMOS database. Issue is to find right connections to Poland.
- GNSS levelling database. GNSS-measurements in benchmarks. Version 2017-01-09, managed by Lantmäteriet in Gävle, Sweden. Created based on corresponding NKG and BKG databases. Networks are different in density in different countries, but there is also differences in accuracy of observation points.
- Future plans:
  - Interim LM4a computed adding the new dataset to old ones. The next step is to analyse how to deal with old datasets, keep or discard something.
  - Plans to update FAMOS gravity database. Preliminary end of May 2018 FAMOS and to keep geoid computation workshop.
  - Plans for 2018 gravity campaigns:
    - DTU Space (Jens Sörensen), opportunity based, airborne campaign in Kattegat and together with Lantmäteriet (SWE), a ferry-based campaign.
    - Lantmäteriet: survey vessel Jacob Hägg 2018, semi-dedicated campaign, Airborne campaign with DTU, possibly a campaign in Finland with National Land Survey/FGI if suitable boat available, possibly test campaign with Swedish geological survey
    - GFZ (BKG for Deneb): survey vessel Deneb 2018, dedicated campaign, close to Polish border, vessel notification has been submitted, unclear outcome due to the lack of Polish contacts
    - A new ferry based campaign (Travemunde – Helsinki)

Harmonization of the Swedish tide gauges, status, plans (FAMOS Freja/Odin, subactivity 2.3) [[Presentation SHIP](#)]

Mirjam gave a presentation concerning Pilot study of shipborne GNSS-campaign 2015, to evaluate geoid models at sea (FAMOS Freja 2.4) [[Presentation](#)]

- The goal: How well geoid can be determined on sea by GNSS observations
- Several factors like roll, pitch, draft, squat has to be taken into account (all effects several centimeters)
- Comparison with geoid models: with smoothed data fit was good in some lines (mean 9.5 cm std 1.8), but in some lines (problematic ones) even smoothed data fitting was not good.
- Comparison against FIN2005N00 geoid: good lines show good accordance (within 5 cm).
- Test was done also with R/V Aranda 2017, but no results is yet available, but can be anticipated that results are not as good as in the campaign 2015 using the survey vessel Airisto.

## 9. CDWG TORs

The Chair reviewed TORs [[CDWG TORs 2017-2018 5Apr2017](#)]

Terms of references were updated and decided to propose to be endorsed by BSHC23 [[CDWG TORs 2018-2019 8Feb2018](#)]

**Action 13 (Thomas):** To investigate how to communicate with other regional commissions, e.g. NSHC and NHC.

## 10. CDWG work programme for 2018-2019 and future work

The Chair reviewed WP 2017-2018 [[CDWG WorkProgramme 2017-2018 5Apr2017](#)]

Work programme was updated and decided to propose to be endorsed by BSHC23 [[CDWG WorkProgramme 2018-2019 8Feb2018](#)]

## 11. IHO Specifications and Resolutions

- IHO Resolution 3/1919 -IHO CL10/2017 [[document](#)]

Norway questioned if the area north of Øresund could be considered as non-tidal.

- IHO Specification S-104 Tides [[document](#)]

All to look at the specification and comment if needed.

- IHO Specification S-111 Currents [[document](#)]

All to look and comment if needed.

## 12. Water level information to mariners

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, for example M-3].

- Chair reviewed the summary of CDWG proposals and BSHC decisions concerning displaying the name Baltic Sea Chart Datum 2000 in S-57 ENCs and paper charts. The answer to BSHC23 will be based on the summary [[Summary BSCD2000](#)].

Finland noted that it can be expected when taking S-100 ENCs to use also S-57 ENCs are used during transition period. This causes situation of different ways of showing the datum in products (paper charts, S-57 ENCs and S-100 ENCs) and should be taken into account not to cause unnecessary conflicts and confusion to users.

The Chair reviewed a proposal and description for including Baltic Sea Chart Datum 2000 (BSCD2000) as a chart datum in S-100 registry. BSHC23 will be requested to endorse the proposal. [[Chairman's proposal to CDWG10](#)]

The Chair reviewed proposal how BSCD2000 should be shown in S-57 and paper charts [[Chairman's proposal to CDWG10](#)]. Proposal follows earlier decisions of CDWG:

- in S-57 ENCs VERDAT value 3 is proposed to be used
- and



- in paper charts following expression:

Mean Sea Level (Baltic Sea Chart Datum 2000<sup>national realization name</sup>) or

Mean Sea Level (Baltic Sea Chart Datum 2000)

When sufficient, the following abbreviation of Baltic Sea Chart Datum 2000 should be used: BSCD2000. BSHC23 will be requested to endorse the proposal.

### 13. Any other business

- Election of CDWG secretary: Jyrki Mononen volunteered to be secretary for the next meeting.
- Update the list of members: List of members was updated.
- Last TWCWG-meeting in Victoria: Jyrki gave a short report of TWCWG meeting and asked all to provide information of tide gauge inventory list in TWCWG-web pages as well as following and commenting the development of S-104 Water Level Information for Surface Navigation product specification and S-111 in found important to member state.
- Coming meetings, conferences (TWCWG3, 16-20 April 2018, Valparaiso, Chile): Jyrki will most probably attend and reviews the BSCD2000 implementation status as well as other relevant matters in the Baltic Sea.

### 14. Review of actions and unresolved issues of this meeting

List of actions was reviewed and approved [[CDWG10 List of actions](#)].

There were no any unresolved issues from the meeting.

### 15. Report to BSHC 23<sup>rd</sup> meeting

- list of matters to be reported
  - o answer to BSHC22 action to CDWG [[Summary BSCD2000](#)]
  - o results of the CDWG work
- list of actions requested from BSHC
  - o to note the CDWG report
  - o to approve CDWG ToRs
  - o to approve CDWG Work Programme
  - o to approve proposal of including Baltic Sea Chart Datum 2000, BSCD2000 as a chart datum in S-100 list of datums (for the moment the same as for S-57)
- BSHC 23<sup>rd</sup> meeting will be held 28-30 August 2018, Ålborg, Denmark
  - o The Chair will attend and represent CDWG.

### 16. Next meeting

- Philip volunteered to find out if the next meeting could be held in Denmark.
- Proposed date is 5-6 February 2019.



**17. Closing of the meeting** *[Chair]*

The Chair thanked the participants and closed the meeting 13:07.