



# Final Minutes

of the

BSHC CDWG7 Meeting on 11-12 February 2015

on Estonian Maritime Administration  
Tallinn, Estonia

[By 20 March 2015]

## 1. Welcome and formalities

Meeting convened on 11 February 9:30 a.m. Chair welcomed all the participants to the meeting and reviewed shortly the program of the meeting. [\[Draft Program\]](#)

The General Director of Estonian Maritime Administration, Andrus Maide welcomed the meeting and pointed out the importance of the CDWG work on harmonizing the vertical datums in the Baltic Sea region. Harmonized vertical datum will benefit navigational, oceanographical and environmental tasks. He also noted that CDWG was established by Estonian initiative in 2005, because it was already at that time deemed to be important to harmonize vertical chart datums in the Baltic Sea. Also it was noted that meeting had honour to have the first CDWG *Chair, Dr Vaido Kraav*, as a participant.

Since CDWG doesn't have appointed secretary, *chair* proposed *Henrik Tengbert* as a secretary for the meeting helping *chair* to keep the minutes. *Henrik Tengbert* was appointed as a secretary for to meeting.

The draft agenda was adopted with following amendments: [\[Draft Agenda\]](#)

- Presentation of status of NKG (Nordic Geodetic Commission) geoid model project and FAMOS (Finalising the Motorways of the Sea) was added in the agenda item #7. Presentation was given by *Dr Jonas Ågren*.
- Agenda item #4 decided to handle during Wednesday starting at 2:00 p.m.
- Chair noted that BOOS (Baltic Operational Oceanographic System) couldn't participate to the meeting, thus agenda item #3 was decided to handle shortly in Thursday after other items.

Participants introduced themselves briefly.

[\[List of participants\]](#)

*Mrs Mirjam Bilker-Koivula* replaced as an observer *prof Jaakko Mäkinen* due to retirement of *prof Mäkinen*.

Apologies not to be able to participate were received from *Thomas Hammarklint* and *Tor Tørresen*.

The meeting took reservation by Russian Federation delegation concerning the decisions of CDWG7 meeting for further discussions and necessary consultations with Head Department of Navigation and Oceanography after receiving the Draft Minutes. After receiving the draft minutes, the Russian Federation Hydrographic Office informed to agree with the CDWG7 Draft Minutes and Draft List of Actions. The letter of agreement signed by Captain Sergey Travin follows as an Appendix 1.

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

CDWG6 minutes and status of actions were reviewed and approved.

[\[CDWG6 Final Minutes 5-6 Feb 2014\]](#), [\[CDWG6\\_List of Actions\]](#)

Memorandum of Understanding between BSHC and BOOS was signed. [\[MoU BOOS and BSHC\]](#)

An article "A Harmonized Vertical Reference System for the Baltic Sea" was published in BOOS Newsletter May 2014.

IHR Baltic Sea Special Edition was published in November 2014 including articles:

- Baltic Sea Hydrographic Commission (BSHC) and co-operation on Hydrographic Issues with other Baltic Sea Organizations.
- Harmonization of Vertical References on the Baltic Sea.

Cooperation with FAMOS (Finalizing the Motorways of Sea) and CDWG was established during the FAMOS application concerning the new geoid model for the Baltic Sea.

A presentation "Baltic Sea Harmonized Vertical Reference System" was given in NKG (Nordic Geodetic Commission) General Assembly in Gothenburg, Sweden on 2<sup>nd</sup> of September 2014.

Russian delegation asked to clarify the abbreviation "EVRS" mentioned in the CDWG6 meeting item #6 in connection to explanation of "Baltic Sea Chart Datum 2000". EVRS (European Vertical Reference System) is specified by EUREF, a regional part of IAG (International Association of Geodesy), dealing with definitions and related work to the European Reference Frame. A short explanation is included as a separate explanatory document [\[EVRS short description\]](#) (Action #1).

BSHC 19<sup>th</sup> Conference outcome concerning CDWG was reviewed by Chair.

[\[BSHC19 10-12 Jun 2014 summary concerning CDWG\]](#). [\[BSHC19 C2 CDWG Report\]](#)  
[\[BSHC19 CDWG presentation\]](#)

BSHC 19<sup>th</sup> Conference required CDWG to "Clarify the use of the common name of Baltic Harmonized Chart Datum" (BSHC19 action #4). Meeting understood the BSHC19 action #4 in a way that CDWG should make clarification how the proposed name "Baltic Sea Chart Datum 2000" should be portrayed in the paper charts and ENCs.

Meeting agreed on the general principle that the same information of the chart datum shall be portrayed in both paper charts and ENCs. Thus firstly it has to be taken into account what restrictions and possibilities "verdat" (vertical datum) -values of S-57 and S-101 gives for usage of the name. It was noted that in S-57 there is restricted number of "verdat" -values to be used. S-101 gives more flexibility to add "verdat" -values to be used as datum names. Because in S-57 there was not any equivalent "verdat" -value for the "Baltic Sea Chart Datum 2000", it was agreed that it should be used some existing value. The feasible existing values found were "verdat" -values 3 or 19, "Approximate Mean Sea Level" and "Mean Sea Level".

Meeting agreed that following concept could be used for portraying the chart datum name in paper charts:

Approximate Mean Sea Level (Baltic Sea Chart Datum 2000<sup>National realization name</sup>)

E.g. in Swedish paper charts it would be respectively:

Approximate Mean Sea Level (Baltic Sea Chart Datum 2000<sup>RH2000</sup>)

Meeting didn't agree the usage of the expression "*Approximate*" and it was discussed if the text "Approximate" should be removed and used only expression "Mean Sea Level".

It was proposed that in S-57 based ENC's possible "verdat" -values to refer to the harmonized vertical datum would be 3 or 19 dependent on if expression "Approximate" will be deemed to be feasible or not. Similar issue applies also for S-101 based ENC's.

*Dr Wilfried Ellmer* proposed that he can discuss with *Dr Mathias Jonas* in BSH (Bundesamt Für Seeschifffahrt Und Hydrographie) what would be the best way of adding the name of the harmonized chart datum in S-101. (Action #2).

Meeting decided to give the concept as a proposed answer to the BSHC19 action #4 and at the same time meeting decided to invite BSHC to give further instructions to develop the concept for usage of the name for harmonized vertical datum for the Baltic Sea.

It was decided that all CDWG members should present the agreed concept of usage of the datum name and how it can be adopted to be nationally used in charts (paper and ENC's) with the national experts and BSHC delegates. (Action #3).

It was noted to be useful to collect the information how the proposed common vertical datum name "Baltic Sea Chart Datum 2000" can be approved nationally in each member country. Questionnaire including procedures of approval, organizations of approval and time frame for approval procedure will be sent to members of CDWG. (Action #4).

During the discussion it was noted important to write a separate definition document for EVRS and it's conventions and used epochs to document how it shall be applied for Baltic Sea harmonized vertical datum, "Baltic Sea Chart Datum 2000". It was agreed that *Chair* and *Dr Jonas Ågren* will make a draft definition and *chair* will send the draft to CDWG members for amendments. (Action #5). The draft amended definition will be reviewed in the next CDWG meeting. At least following items was decided to define and explain:

- EVRS (reference to EVRS specification) and the explanation included in the minutes from CDWG6
- land uplift epoch (2000.0)
  - o This land uplift epoch is used by the national height systems (EVRS realisations) on land in Sweden, Finland and Norway (even though a land uplift epoch is *not* specified in the EVRS definition). The epoch 2000.0 is also used for the latest common European realisation EVRF2007 and is about to be implemented also by the Baltic countries, except Latvia using epoch 2000.5.
  - o Have to be aware of that during years land uplift decreases the depths.
  - o Explanation of the importance to use land uplift model for the countries affected of land uplift and geoid modelling when using 3D GNSS navigation for height measurements
    - =>end users have to be aware of how much the effect is.
  - o Effect of land uplift to depths (applicable correction models, national authorities role to provide corrections).
  - o A new land uplift model covering the whole area needs to be developed and maintained. The existing model NKG2005LU is good enough for the work right now but not in the future.

Other related issues:

-epoch of land uplift of geoid (the secondary effect on the geoid caused by land uplift is small; close to negligible for relevant applications)

### 3. Cooperation and communication with BOOS

Chair noted that Memorandum of Understanding between BOOS and BSHC has been signed in 2014 (decision made in BSHC19). MoU is signed by BSHC chair (Taivo Kivimäe) and BOOS chair (Urmas Lips) June 2014. MoU should be published on BSHC web.

BOOS activities were not presented because BOOS representative couldn't participate on the meeting due to overlapping meeting.

It was emphasized that co-operation and discussion between BOOS and CDWG is important for the implementation of the harmonized chart datum and get it as a common vertical reference also in other oceanographic purposes. It was agreed that *chair* asks from *Thomas Hammarklint* when and where BOOS annual meeting 2015 will be held and if there is possibility to present CDWG activities. (Action #6).

*After the meeting Thomas Hammarklint informed that 2014 annual BOOS-meeting was held in Riga and that in 2015 annual BOOS-meeting will be held 5-7 May in Sweden (Norrköping) and a workshop 6 May open to all. Thomas Hammarklint also encourages CDWG to present the work at the workshop.*

### 4. Review the *national* implementation plans

Invited participants from Estonia gave presentations covering following subjects (presentations will be provided in meeting documents):

- *Karin Kollo* (Estonian Land Board, Dept. of Geodesy): Estonian Geodetic System [[EST\\_geodetic\\_system1\\_KarinKollo](#)]
- *Dr Andres Rüdja* (Planserk): Towards New Height System (in Estonia)
- *Prof Artu Ellmann* (Tallinn University of Technology): Estonian (quasi)geoid model EST-GEOID2011 and result from test measuring the shape of the sea surface by laser from air and the calculated difference to the geoid model. [[Ellmann\\_ESTgeoid](#)]

Estonia is going to change national height system to EVRS based system in near future. New heights will be provided near to mareographs. Geoid model will be more accurate due to new gravimetric data and availability of new modelling methods. Also participation to NKG2015 geoid modelling work was mentioned. The Baltic Levelling Ring is now closed and has been calculated by *Dr Gunter Liebsch* (including Russian data) to a closing error of 42 mm. All this supports the implementation of harmonized vertical datum in the Baltic Sea.

Answers to questionnaire of national implementation status were given by Finland, Germany, Latvia and Sweden (replies will be provided in meeting documents). Replies were shortly reviewed by national representatives. Based on replies it can be summarized that all answered member states have been executed actions to implement EVRS-based vertical datum, although there is differences in degree of readiness of implementation plan and schedule.

*Armands Murans* gave a presentation of height systems in Latvia including the determination of differences between BAS77 and EVRF2007 in Latvia. Differences can be examined by web-based application.

Russian Hydrographic Service is planning to renew cartographic production system in 2017 and at the same time going to change to the new national coordinate system from

SK-24 to PZ-90.11 and GSK-2011. After this Russian Hydrographic Service can be ready to consider transition to the harmonized vertical datum in Baltic Sea.

It was noted that questionnaire of national implementation status shall be done to follow the progress of implementation of the harmonized chart datum. (Action #7).

#### 5. Review and update the *joint* road map, time line and communication plan

Due to lack of time *joint* roadmap and timeline was briefed very shortly. They will be included in the meeting documents and all members are asked to propose amendments noticed to be feasible. Proposed amendments are asked to send to *chair* by email.

[CDWG6 5-6 Feb 2014, RoadMap\_Draft\_ver03.pdf]

[CDWG6 5-6 Feb 2014, RoadMap\_TimeLine\_ver03.pptx]

CDWG members are asked to propose updates to the list of relevant conferences, other meetings and potential participation of CDWG members. Proposals are asked to send to *chair* by email. (Action #8). [Relevant meetings to CDWG.pdf]

#### 6. CDWG work programme for 2015-2016

*Chair* reviewed the Work Programme 2014-2015 [CDWG WorkProgramme\_2014-2015\_V6] as a basis for WP 2015-2016. It was noted that item 1a has been done in WP 2014-2015 and can be removed. It was agreed that a following new item 1a will be added: "To develop a recommended concept how the name for the harmonized vertical reference system should be indicated in the products." Item 4 and 5: "Foster studies".... changed to "Promote studies". With these changes the WP 2015-2016 was approved.

*Chair* reviewed the proposed TORs and noted that BSHC19 requested some changes in wording. It was agreed that item number 3 will be amended by removing wording "to study" and replacing it by "to promote studies".

Amended Terms of References and Work Programme 2015-2016 will be proposed to BSHC20 for approval. [ChartDatumWG TORs 12Feb2015], [CDWG Work Programme 2015-2016 12Feb2015]

The issues to be reported to the BSHC20<sup>th</sup> Conference on September 2015 were listed as follows:

- Report of the results of CDWG work for information.
- BSHC is invited to give further instructions to develop the concept of usage of the name.
- Edited CDWG TORs for approval.
- Amended Work Programme 2015-2016 for approval.

E.g. following issues was noted to be included to the report to BSHC20:

- Drafting the definition of CD.
- Relation to FAMOS activity 2.
- To emphasize the importance of commitment to co-operation with BOOS and importance to tighten up the dialog with BOOS.
- To emphasize the importance that all member states could send representatives to the CDWG meeting.
- Importance of supporting contacts to relevant organizations which would be interested to take part in FAMOS in future.

Jyrki will forward the draft BSHC20 report to CDWG Members for comments by 15<sup>th</sup> of May and all should comment the draft within two weeks (by 29<sup>th</sup> of May). (Action #9). Final Report to BSHC20 will be by 12<sup>th</sup> of June, although the date is not yet sure because BSHC20 deadlines for documentation has not been published. (Action #10).

## 7. Future work of CDWG

At this moment CDWG don't have appointed secretary. *Chair* emphasized that it is important for efficient work of CDWG to have a secretary for the working group. *Chair* asked all the members to propose secretary candidates before the next meeting. (Action #11).

It was noted that political or EU-level support to the implementation of harmonized chart datum will be useful and important. Possibly best way to get support could be to get HELCOM involved by e.g. including harmonization of chart datums in a ministerial declaration. One organisation to be considered could be also EUSBSR (EU Strategy for Baltic Sea Region).

All the members were asked to check the CDWG national representatives and contact information. (Action #12). List of members will be provided together with the meeting documents. Corrections were asked to send by email to *chair* ([jyrki.mononen@liikennevirasto.fi](mailto:jyrki.mononen@liikennevirasto.fi)). [*CDWG List of Members 4Feb2015*]

It was noted concerning IHO TWCWG7 (Tides, Water Level and Currents WG) meeting (21-24 April 2015) that resolution IHO 3/1919 was not accepted by HSSC. HSSC6 invited TWCWG to submit a new draft resolution IHO 3/1919 and relevant definitions to HSSC in liaison with HDWG taking into account observations from member states (ref. IHO CL 44/2014, [http://www.iho.int/mtg\\_docs/circular\\_letters/english/2014/CL\\_ENG\\_14.htm](http://www.iho.int/mtg_docs/circular_letters/english/2014/CL_ENG_14.htm)) . In the draft agenda of TWCWG7 item number 4.10 is handling IHO technical resolutions. No one of CDWG meeting participants informed to participate to the TWCWG7 -meeting. TWCWG7 documents can be found in IHO web-pages: [http://iho.int/mtg\\_docs/com\\_wg/IHOTC/TWLWG%207/TWLWG7.htm](http://iho.int/mtg_docs/com_wg/IHOTC/TWLWG%207/TWLWG7.htm)

FAMOS (Finalizing the Motorways of the Sea) was noted as important project to co-operate and it will support remarkably the work of CDWG. *Dr Jonas Ågren* gave presentations of FAMOS activity 2 [*FAMOS\_act2\_Agren\_CDWG\_Feb2015*] and Status of the on-going computation project of NKG2015 geoid model [*NKG2015geoid\_Agren\_CDWG\_Feb2015*]. The goal for FAMOS activity 2 is to improve the geoid model for the whole Baltic Sea.

## 8. Any Other Business

No any other issues.

Additional reading written by Estonian geodesists concerning some aspects of "Correcting Tide Gauge Series Due to Land Uplift and Differences between National Height Systems of the Baltic Sea Countries" was provided by *Prof Artu Ellmann* after the meeting. It will be provided together with other meeting documents [*Liibus\_etal\_2014\_TideGaugeSeries\_BSverticalDatums*].

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

The list of actions was reviewed. [*CDWG7\_List of Actions*]

It was agreed that *chair* will send Draft Minutes and List of Actions on 20<sup>th</sup> of February (Action #13) and the participants should comment these within two weeks by 6<sup>th</sup> of March (Action #14).

Final minutes and all meeting documents will be sent to all CDWG members soon after that (Action #15).

10. Next meeting

Proposed time for the next meeting was in the end of February (after 15<sup>th</sup> of February) 2016. *Chair* will ask proposals for the date and place for the next meeting (Action #16).

11. Closing of the meeting

Chair thanked all participants for their active contribution and Estonian Maritime Administration for hosting and excellent arrangement of the meeting. The meeting was closed on 12<sup>th</sup> of February at 16:00.

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## Appendix 1

МИНИСТЕРСТВО ОБОРОНЫ  
РОССИЙСКОЙ ФЕДЕРАЦИИ

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Jyrki Mononen  
Chair  
BSHC Chart Datum Working Group

№ 944

« 05 » March 2015

Dear Jirki,

Department of Navigation and Oceanography of the Russian Federation Ministry of Defense agrees on Draft minutes and Draft List of Actions of the 7-th Baltic Sea Hydrographic Commission BSHC Chart Datum Working Group Meeting in Tallinn, 11-12 February 2015.

Best regards,

A handwritten signature in blue ink, appearing to read 'Sergey Travin', with a large, stylized flourish at the end.

Captain Sergey Travin,  
Department of Navigation and Oceanography  
of the Russian Federation Ministry of Defense,  
The Head