BSHC25_C2_SE_CDWG Presentation

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IHO

BSHC

SWEDISH MARITIME ADMINISTRATION

Objectives

1. Answers to BSHC24 Actions – no Actions from BSHC24 to CDWG
2. Status of CDWG work: Meeting 2020 / Summary of implementation
3. Member list of CDWG
4. Proposed CDWG TORs 2020-2021
5. Proposed CDWG Work Programme 2020-2021
6. How member states benefits best of CDWG
7. Actions requested from the BSHC25 Conference

2. Status of CDWG work: Meeting 2020 / Summary of implementation

BSHC25_C2_SE_CDWG Report

Since the BSHC 23rd Conference, *Mr Thomas Hammarklint* has acted as Chair
Mr Jyrki Mononen has been elected as the ordinary secretary

The communication within the CDWG has been done by e-mail correspondence and the CDWG12 meeting. The meeting was held on 3-4 March 2020 in Gdynia, Poland. 16 delegates attended the meeting. The meeting was very appreciated by the attendees.

The main objectives of the CDWG 12th meeting was to update the TORs, Work programme, List of Actions, national implementation status and plans of the Baltic Sea Chart Datum 2000, coordinate our work and plan the continuation of the FAMOS-project, i.e. finalize the FAMOS Geoid model for the whole Baltic Sea, in cooperation with the FAMOS Data Owners.

The CDWG work have been presented at the following meetings and conferences in 2019-2020:
- CDWG11, Ålborg, 5-6 February 2019
- NKG meeting, Lyngby, 11-13 March 2019
- TWCWG4/GLOSSGEXVI, Busan, 8-13 April 2019
- BOOS Annual Meeting, Rostock, 12-13 June 2019
- BSHC24, Gdansk, 10-12 September 2019
- CDWG12 Gdynia, 3-4 March 2020

The CDWG website have been updated with a lot of new information

Next meeting (CDWG13) will be held in Gothenburg, Sweden, 27-28 April 2021

Summary of implementation status 2020:

Country	Status	Other remarks
Denmark	Chart datum in practice close to EVRS-based chart datum.	Will follow the Swedish approach and implement BSCD2000 when Sweden do in waters close to Denmark.
Estonia	All decisions are taken and the implementation is ongoing. Used in charts and water level information from 2018-01-01. Water level presented both in BK77 and EH2000/BSCD2000. The changes is up to 30 cm in new charts.	Levelling for national height system has been finalized. Data in depth database will be transformed. New charts with the new reference will be produced continuously, the first charts have been produced in 2018 and will continue in 2019. Notices to Mariners 2017-12-01. New reference homepage and booklet. EMA has written 2 dedicated articles in two different maritime magazines and given an interview to a maritime radio about the changes in navigational information that arise from the new vertical system. Information day in December 2017 for ports, pilots and other interested parties.
Finland	Ongoing. All decisions are taken already in 2008 and 2015. Implementation plan finalized 2018-12-12. The N2000/BSCD2000 has been implemented in the data models of bathymetric data and fairway management system and chart production system.	Finnish Meteorological Institute (FMI) has started a project concerning water level information in the Baltic Sea. Differences between MSL and N2000/BSDC2000 are provided as a table. Sea level observations and forecasts will be available in BSCD2000 for the public simultaneously with Traficom nautical charts, starting at the end of 2020.
Germany	EVRS realization in use in practice. The vertical chart datum of BSCD2000 is close to the national height system of Germany (ETRS1989+DHHN2016). All published products will refer to this datum.	The database refers to national height system. The official introduction was decreed in January 2018 and is binding for all institutions coming under the jurisdiction of the German Waterway and Shipping Administration.
Latvia	BAS77 still used. New national height system LAS2000,5 (EVRS-based) into use in 2015. Decisions on implementation will be made after clarifying the Baltic Sea geoid, probably in the middle of 2020.	Differences between BAS77 and Baltic Sea Chart Datum 2000 is well known and can be accessed by web-application and info in all nautical charts how to transform depths to BSCD2000.
Lithuania	BHS-77 still used. National height system LAS07 (EVRS-based) came into force 2016-01-01.	National height system is LAS07 (EVRS based), into use in 2016. The difference between BHS-77 and LAS07 is well known (about 13 cm) and is also written in nautical charts. Tide gauges in Lithuania belongs to the Lithuanian Hydrometeorological Service. Data from tide gauges are presented in BHS-77.
Poland	Currently - local datum Amsterdam NN55 is in use. New datum PL-EVRF2007-NH/BSCD2000 is been defined. Ongoing surveys and works to transform data to the PL-EVRF2007-NH.	Poland have an legal act about reference systems, which allows to use other than PL-EVRF2007-NH datum no longer until the end of 2023. Institute of Meteorology and Water Management (IMWM) runs the Polish water level stations. The difference between the local datum and PL-EVRF2007-NH (BSCD2000) is less than 9 cm.
Russia	Actions and plans are dependent on the implementation of the new state coordinate system.	A new State Coordinate System 2011 (GSK-2011) for consumers, navigation, geodesy and cartography implemented 1 January 2017. Any decisions concerning the transition to the harmonized vertical reference could be done not earlier than the end of GSK-2011 implementation.
Sweden	Ongoing. All decisions are taken. Many charts already published. All water level information is related to RH2000/BSCD2000, since 2019-06-03. The difference between mean sea level and BSCD2000 at the water level stations are presented in this table.	Implementation is a part of the ”Chart Improvement Project”, to be concluded on time at the latest in 2024. Cooperation with SMHI on water level information. Notices to Mariners 2019-05-15. Information compaigns in 2019 for ports, pilots and other interested parties. Several articles written in magazines and on webpages. New Info Sheet about BSCD2000 from SMA/SMHI.

Notices to mariners

Example from Sweden, 2019-05-15 English version

*** 14040**

Sweden. not area bound. New reference system for sea level, nautical charts and warnings. BSCD2000 / RH 2000.

Expired notices: 2019:754/13917

See: 2018:716/13140

As of June 3, 2019, the Swedish national height system 'Rikets Höjdsystem 2000', or RH 2000 (international name 'Baltic Sea Chart Datum 2000', BSCD2000) will constitute the reference level for observations and forecasts of the water level in Swedish waters.

The zero level in RH 2000 is fixedly linked to land, and is not affected by land uplift, changes in sea level or geographical variations.

The change means that observations, forecasts, and warnings in the Swedish Maritime Administration's and Swedish Meteorological and Hydrological Institute's (SMHI) viewing services from 3 June 2019, or soon thereafter, refer to the new reference level and no longer to the 'mean sea level'.

The Swedish Maritime Administration is gradually adapting the charts to the new reference system. This is a time consuming process which will take several years to complete. During the transition period, it is important to know which reference level is used in the different charts. If the text 'Baltic Sea Chart Datum 2000', or 'BSCD2000' is printed in the chart, the update has been performed.

More information: www.sjofartsverket.se/RH2000 and www.smhi.se

www.sjofartsverket.se/RH2000 www.smhi.se

SMHI och Sjöfartsverket. Publ. 15 May 2019

Difference between old reference system and BSCD2000

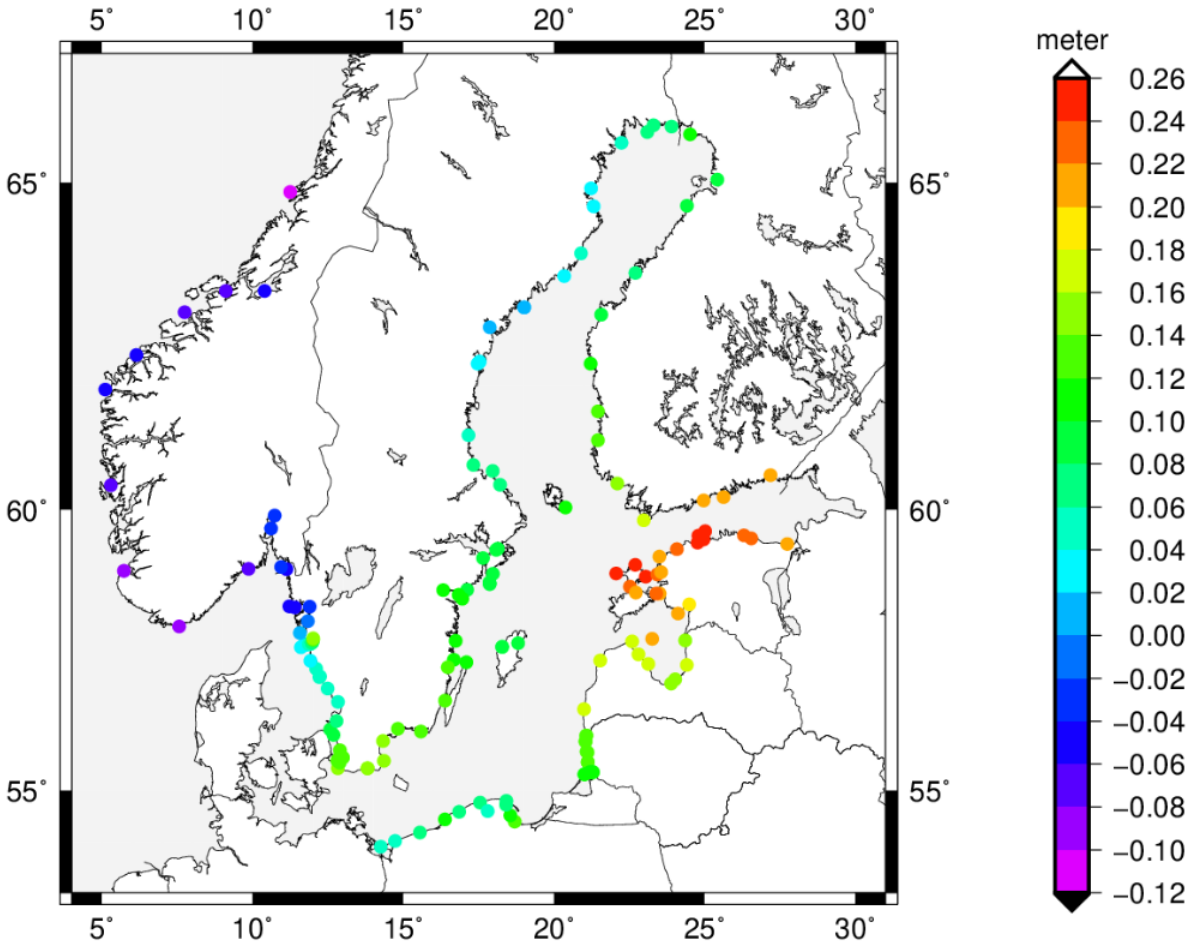


Fig. 4b: Differences between the reference levels of the old national chart datums with respect to Baltic Sea Chart Datum (BSCD2000). In Sweden and Finland, the old reference levels are equal to Mean Sea Level transferred to year 2020 (according to different national conventions). The values from Norway shows the Mean Sea Level over the period 1996-2014, relative NN2000/BSCD2000. In Estonia, Latvia and Lithuania, the Kronstadt reference level is used as old chart datum. In Poland, the local Polish Height System Amsterdam NH_{55} is used as chart datum. Notice how postglacial rebound reduces the magnitude of the mean sea level in the Bay of Bothnia; it is now just a few cm near the land uplift maximum. The values are shown in this Table.

3. CDWG Member list

Members of CDWG:

Denmark	Mr Peter Ladegård Sørensen
Estonia	Mrs Gabriela Kotsulim
Finland	Mr Jyrki Mononen (Secretary)
Finland	Mrs Janina Tapia Cotrino
Germany	Dr Patrik Westfeld
Latvia	Mr Bruno Špēls
Lithuania	Mr Mindaugas Zakarauskas
Poland	Cdr Sławomir Lipiński
Poland	Mr Witold Stasiak
Russia	Dr Sergey V. Reshetniak
Sweden	Mr Thomas Hammarklint (Chair)
Sweden	Mr Lars Jakobsson
Sweden	Mr Henrik Tengbert

Representative of BOOS:

Sweden	Mr Thomas Hammarklint

Observers:

Finland	Mrs Mirjam Bilker-Koivula
Finland	Katri Leinonen
Sweden	Dr Jonas Ågren
Sweden	Dr Per-Anders Olsson
Sweden	Mr Mikael Stenström
Norway	Mr Aksel Voldsund
Germany	Dr Gunter Liebsch
Germany	Dr Joachim Schwabe

4. Proposed CDWG TORs 2020-2021 (changes in red)

BSHC Chart Datum Working Group
Terms of Reference 2020-2021
4 March 2020

To be approved by the BSHC 25th Conference, 22-24 September 2020

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

The Working Group should

Report to the BSHC Conferences.

1. To continue implementation of the Baltic Sea Chart Datum 2000 (EVRS with land-uplift epoch 2000).
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 bodies 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 support development of a common harmonized height reference, including further development of a common geoid model for the whole Baltic Sea area:
   - to promote geoid computations and gravity measurements in the Baltic sea, as is needed to realize the Baltic Sea Chart Datum 2000
   - to coordinate the finalization of the FAMOS Geoid model
   - to support geoid and oceanographic studies relevant to these purposes.

BSHC Chart Datum Working Group

5. To cooperate with relevant international bodies, for example organizations responsible for delivering water level information (e.g. BOOS and NOOS) and geodetic infrastructure (e.g. EUREF and NKG).
6. To liaise with relevant IHO bodies and study relevant IHO resolutions and specifications.

5. Proposed CDWG Work Programme 2020-2021 (no changes)

BSHC Chart Datum Working Group
Work Programme 2020-2021
4 March 2020

To be approved by the BSHC 25th Conference, 22-24 September 2020

Note: This Work Programme includes those Tasks which were identified as the priority issues and which are expected to be fostered during 2020-2021 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.
   d. To foster national efforts for realization of S-104 in the Baltic Sea.
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 relevant projects, e.g. organizing ship time for gravity measurements. Invite member states to consider gravity measurements and geoid computation and provide an overview where additional gravity measurements are needed.
5. Promote improvement of 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.

6. How member states benefits best of CDWG

- Sending representatives to meetings
- Answering to questionnaires – helps coordination of implementation
- Fostering national transition to the Baltic Sea Chart Datum 2000 (BSCD2000)
- Supporting complementary gravity surveys and common geoid model computation in the Baltic Sea – i.e. participating in the continuation of the FAMOS-project

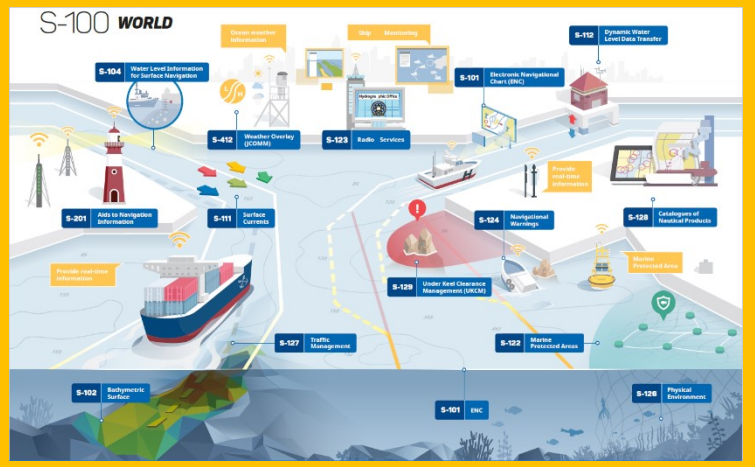
FAMOS Continuation project (without any funding)

FAMOS Freja+Odin Infrastructure

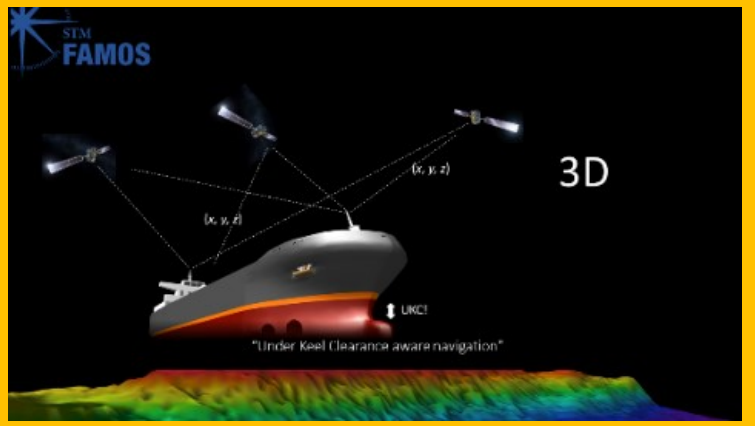
- FAMOS Gravity surveys
- FAMOS Geoid computations
- Baltic Sea Chart Datum 2000
- FAMOS Hydrographic surveys
- Oceanographic observations
- Oceanographic model

FAMOS Continuation

- FAMOS Geoid model
- Bathymetry
  - S-101 ENC
  - S-102 Bathymetric Surface
- Water level
  - S-104 Waterlevel Information for Surface Navigation
- Surface Currents
  - S-111 Surface Currents
- Navigational Warnings
  - S-124 Navigational Warnings



- Under Keel Clearance
  - S-129 Under Keel Clearance Management (UKCM)



7. Actions requested from BSHC 25th Conference

1. Note this report
2. Endorse the proposed CDWG TORs 2020-2021
3. Endorse the proposed CDWG Work Programme 2020-2021
4. Give further guidance to CDWG, as seen appropriate
5. Decide on continuation of CDWG work

Thank you for your attention!

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