



Chair's Report to CDWG12

12th CDWG Meeting

3 March 2020

Gdynia, Poland

Thomas Hammarklint



BALTIC SEA HYDROGRAPHIC COMMISSION



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BSHC-Members



The Baltic Sea Hydrographic Commission,

which is an integrant part of the International Hydrographic Organisation (IHO), promotes the technical co-operation in the domain of hydrographic surveying, marine cartography and nautical information among the neighboring countries of the Baltic Sea region.

The main objectives of the Commission are the coordination of the production of the Baltic Sea INT Charts, the coordination of hydrographic re-surveys, harmonization of chart datums, harmonization of Baltic Sea ENCs, and the exchange of information and the harmonization of practices with regard to various issues related to hydrography.

The most recent development is the [Baltic Sea Bathymetric Database](#) – accessible via this portal.

International Hydrographic Organization

The International Hydrographic Organization is an intergovernmental consultative and technical organization that was established in 1921 to support safety of navigation and the protection of the marine environment.

The object of the Organization is to bring about:

- The coordination of the activities of national hydrographic offices
- The greatest possible uniformity in nautical charts and documents
- The adoption of reliable and efficient methods of carrying out and exploiting hydrographic surveys
- The development of the sciences in the field of hydrography and the techniques employed in descriptive oceanography

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BSHC Chart Datum Working Group

"To implement a common reference level in the Baltic Sea"



Photo: Chart Datum Working Group 12th meeting, 3-4 March 2020, Gdynia, Poland

The CDWG will have its next meeting (CDWG12)
3-4 March 2020 in Gdynia, Poland

<https://www.bshc.pro/working-groups/cdwg>

Members of CDWG:

Denmark Mr Peter Ladegård Sørensen
Estonia Mrs Gabriela Kotsulim
Finland Mr Jyrki Mononen
Finland Mrs Janina Tapia Cotrino
Germany Dr Patrick Westfeld
Latvia Mr Armands Murans
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 Dr Mirjam Bilker-Koivula
Finland Mrs Anni Montonen
Germany Dr Gunter Liebsch
Norway Mr Aksel Voldsund
Sweden Dr Martin Lidberg
Sweden Dr Jonas Ågren
Sweden Dr Per-Anders Olsson
Sweden Mr Mikael Stenström

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



Baltic Sea Chart Datum 2000 (BSCD2000)



➤ Definition:

The datum refers to each Baltic country's realization of the European Vertical Reference System (EVRS) with land-uplift epoch 2000, which is connected to the Normaal Amsterdams Peil (NAP).

➤ Justification:

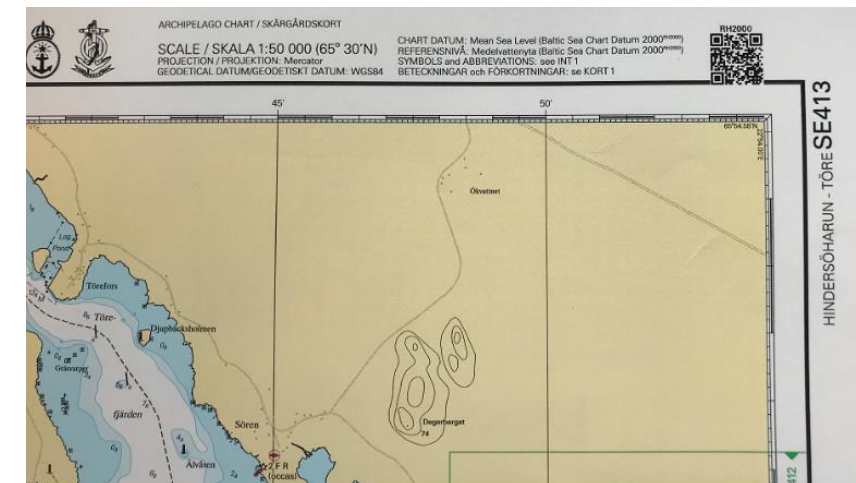
The Baltic Sea is an international shallow, non-tidal area in the northern part of Europe with dense traffic. IHO BSHC has approved the name and the adoption of the Baltic Sea Chart Datum 2000.

➤ Height systems used as national realization of BSCD2000 (EVRS-based):

Sweden	RH2000	Denmark	DVR90
Germany	DHHN2016	Poland	PL-EVRF2007-NH
Lithuania	LAS07	Latvia	LAS2000,5
Estonia	EH2000	Finland	N2000

➤ Chart datum name to be shown in paper charts:

Mean Sea Level (Baltic Sea Chart Datum 2000^{national realization name})
or
Mean Sea Level (Baltic Sea Chart Datum 2000)



CDWG Terms of References 2020-2021



BSHC Chart Datum Working Group

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

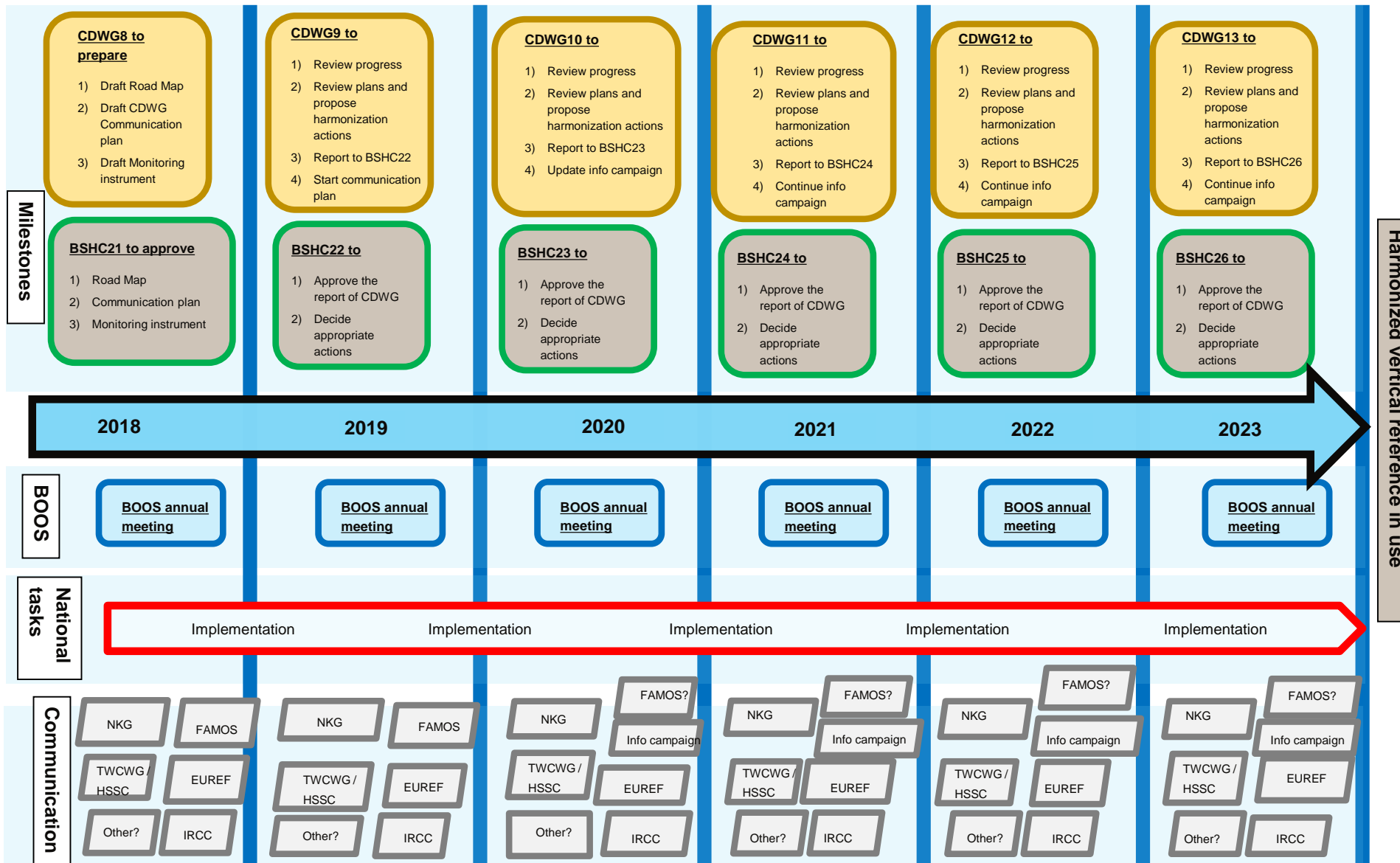
The BSHC18 (September 2013) decided to continue CDWG work and wished the harmonized Baltic Sea vertical reference to be implemented.

The Working Group should

Report to the BSHC Conferences.

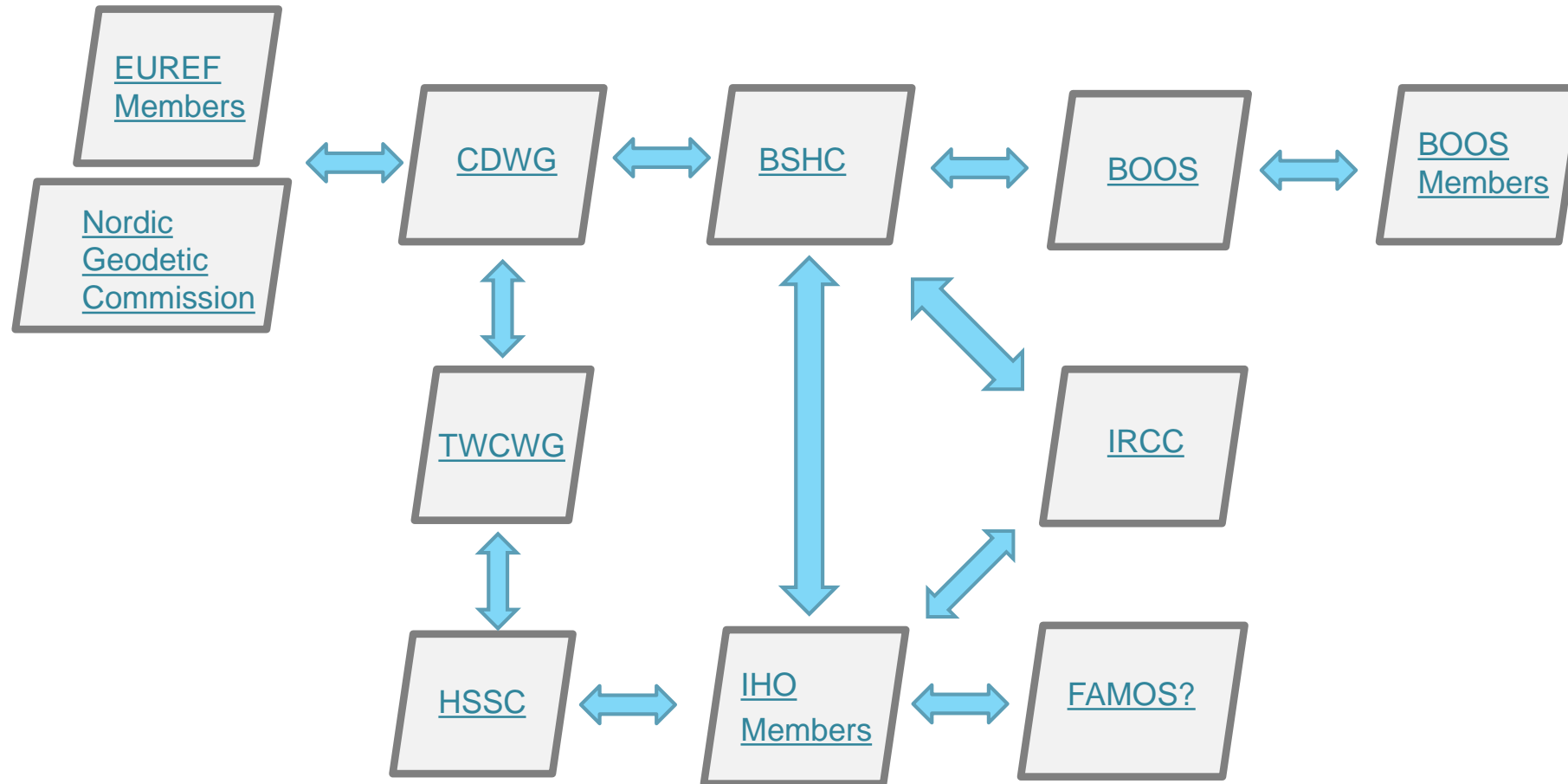
1. To continue implementation of the Baltic Sea Chart Datum 2000 (EVRS with land-uplift epoch 2000).
2. To prepare the road map for transition, including e.g:
 - to establish a network of relevant bodies involved into the transition and efficiently communicate and give guidance within this network
 - 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

CDWG Roadmap



Harmonized vertical reference in use

CDWG Implementation process



CDWG11 Action list



BSHC Chart Datum Working Group (BSHC CDWG)

List of Actions
BSHC CDWG11 Meeting
5-6 February 2019
at Danish Geodata Agency
Aalborg, Denmark

29 January 2020

Action #	Who	Action	Time schedule	Remarks / Status by
1	Thomas	Update the CDWG web with the short description of BSCD2000, proposal	ASAP	Done 2019-02-05
2	Thomas	Add to Work Program "Invite member states to consider gravity measurements and geoid computation and provide an overview where additional gravity measurements are needed"	ASAP	1 st part done 2019-02-05 2 nd part done 2019-09-02
3	Thomas Jonas Gunter Jyrki	Specify difference between old and new reference levels for each country. Receive info about MSL from some countries and update mwreg_boos.pdf	ASAP	Poland done 2019-02-15 Latvia done 2019-02-21 Sent to Jonas 2019-02-27
4	Thomas Jonas Gunter Jyrki	Update the Specification of BSCD2000 (new map etc.) and upload it to the CDWG Website	Before June 2019	Revision done 2019-06-03 Done 2019-06-13
5	Thomas	Update joint Road map. Delete 2016-2017. Add until 2023.	ASAP	Done 2019-02-05
6	Patrick	Germany to provide information about MSL in BSCD2000.	ASAP	
7	All	Support BOOS specifying vertical datums for the presented services.	ASAP	
8	Sweden Denmark Norway	Discuss the reference level within NSHC-TWG. Is LAT the best future reference level in the North sea and the rest of the world?	ASAP	Done 2020-02-07
9	Janina	Finland check if they can take care of ordinary secretary	ASAP	
10	Witold	Poland check members of CDWG	ASAP	Done 2019-02-06
11	Thomas	Continue to contact Russian HO about a contact person on gravimetry data	ASAP	Done 2020-01-28
12	Poland	Present data from Polish gravimetry campaigns 2019	Before CDWG12	
13	Thomas	Write CDWG-report to the BSHC24 Conference	February 2019	Done 2019-02-06

Outcome from BSHC24/2019: BSHC23 Actions #20-22



#20: To invite MS to consider gravity measurements and geoid computation (BSHC23#21)

->BSHC24 approved to include this in [Work Programme](#)


#21: Add task to WP to provide an overview where additional gravity measurements are needed (BSHC23#22)

->BSHC24 approved to include this in [Work Programme](#)

#22: To write letter to GI-Registry Manager to include BSCD2000 to the IHO GI Registry (BSHC23#23)

->Done 2018-10-17, approved 2018-10-18 - [Weblink](#)

BSCD2000 is now included in IHO Geospatial Information (GI) Registry, as chart datum number 44:



IHO
International
Hydrographic
Organization

IHO Geospatial Information Registry

Please sign in Sign in Join

KHOA Korea Hydrographic and Oceanographic Agency

Data Dictionary Register

Home / GI REGISTERS / Data Dictionary Register

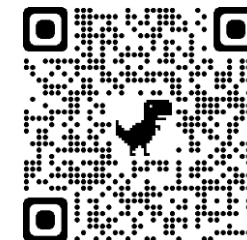
Feature Type 366 Information Type 26 Attribute Type 667 Complex Type 92 Enumeration Value 2273 Codelist Value 117

Domain ALL Status Valid Type ALL Category Name Q

[Listed Value] Dictionary Details

Domain	IHO Hydro
Name	Baltic Sea Chart Datum 2000
CamelCase	balticSeaChartDatum2000
Item Identifier	1213 ?
Definition	The datum refers to each Baltic country's realization of the European Vertical Reference System (EVRS) with land-uplift epoch 2000, which is connected to the Normaal Amsterdams Peil (NAP).
Data type	Enumerated value
Associated Attribute	Attribute type Enumerated type Name Vertical Datum
Reference	
Reference Source	Baltic Sea Hydrographic Commission

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KHOA Acknowledgements



Meetings and major outcomes 2019

- BSHC CDWG11, 5-6 February 2019, Aalborg, Denmark
Review and update of Actions since the last meeting
Received answers to the Questionnaire from 8/9 Baltic countries

[Website](#)
[Minutes](#)
[Summary 2019](#)

- NKG, 11-13 March 2019, Lyngby, Denmark
Nordic Geodetic Commission

[Website](#)
[Presentation](#)

- TWCWG4/GLOSSGEXVI, 8-13 April 2019, Busan, Korea
TWCWG4: Development of S-104 Specification on Water level etc.
GLOSSGEXVI: National report on Sea Level activities etc.

[Website](#)
[Presentation](#)

- BOOS annual meeting, 12-13 June 2019, Rostock, Germany
Present the CDWG work

[Website](#)

- BSHC24, 10-12 September 2019, Gdansk , Poland
Proposals from CDWG11 to BSHC24
Present the CDWG work
New Actions to CDWG12

[Website](#)
[Documents](#)
[Report](#)
[Presentation](#)

Meetings and major outcomes 2020

- NSHC TWG23, 5-6 February 2020, Reykjavik, Iceland

Present the CDWG work

[Website](#)
[Presentation](#)

- BSHC CDWG12, 3-4 March 2020 , Gdynia, Poland

Review and update of Actions since the last meeting

Received answers to the Questionnaire

[Website](#)
[Minutes](#)
[Summary 2020](#)

- NKG meeting, 10-11 March 2020, Reykjavik, Iceland

[Website](#)

- BSHC25, 22 September 2020, VTC

Proposals from CDWG12 to BSHC25

Present the CDWG work

New Actions to CDWG13

[Website](#)
[Documents](#)
[Report](#)
[Presentation](#)

- BOOS annual meeting, 5 November 2020, VTC

Present the CDWG work

[Website](#)
[Presentation](#)

Meetings and major outcomes 2021

- TWCWG5, 16-18 March 2021, VTC
Development of S-104 Specification on Water level etc.
- BSHC CDWG13, 7 September 2021, VTC
Review and update of Actions since the last meeting
Received answers to the Questionnaire
- BSHC26, 22-23 September 2021, VTC
Proposals from CDWG13 to BSHC26
Present the CDWG work
New Actions to CDWG13

[Website](#)
[Documents](#)

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Differences between old reference levels and Baltic Sea Chart Datum 2000 (BSCD2000)

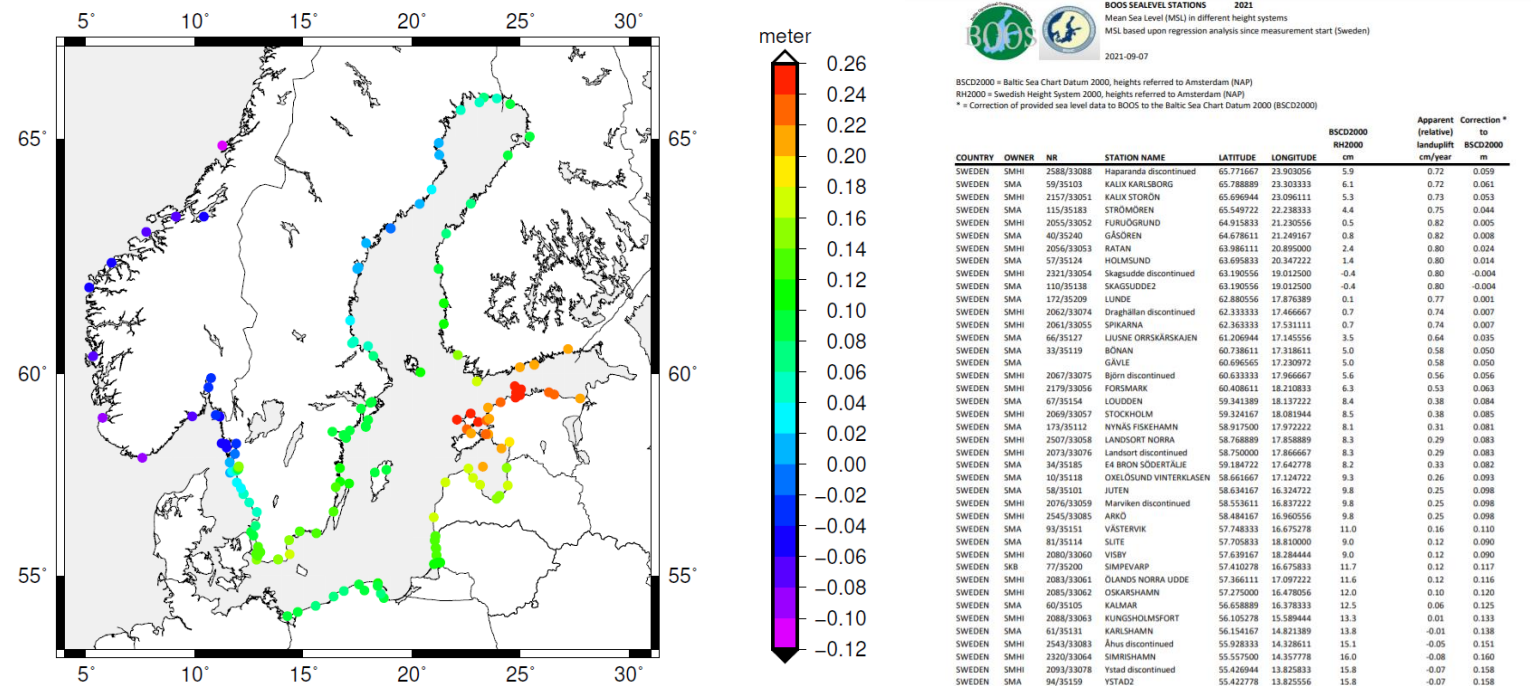


Fig. 4b: Differences between the reference levels of the old national chart datums with respect to Baltic Sea Chart Datum 2000 (BSCD2000). In Sweden and Finland, the old reference levels are equal to Mean Sea Level transferred to year 2022 (according to different national conventions). The values from 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 NN₅₅ 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](#).

Estonia - implementation status BSCD2000

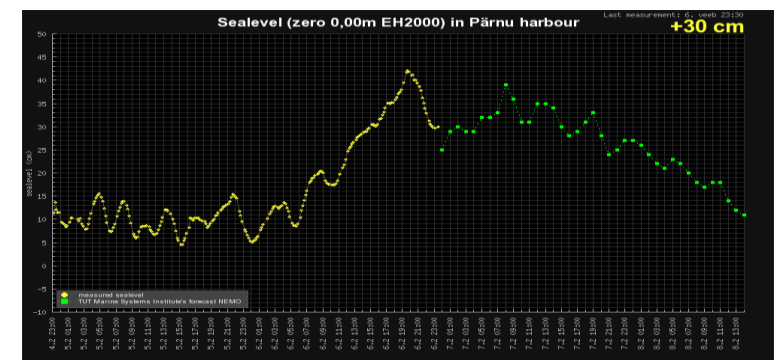
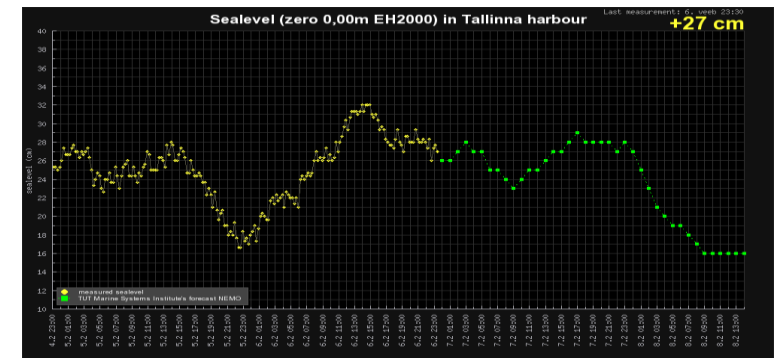
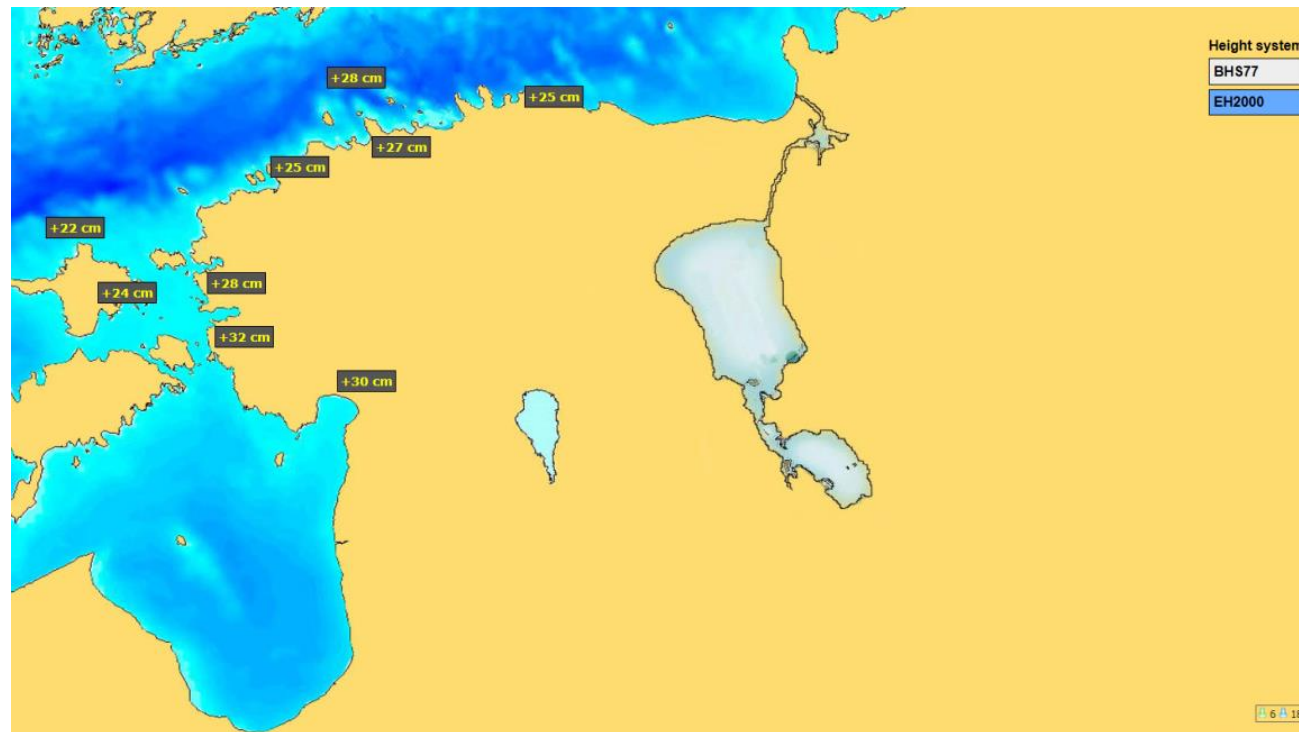


Notices to mariners (2017-12-01):

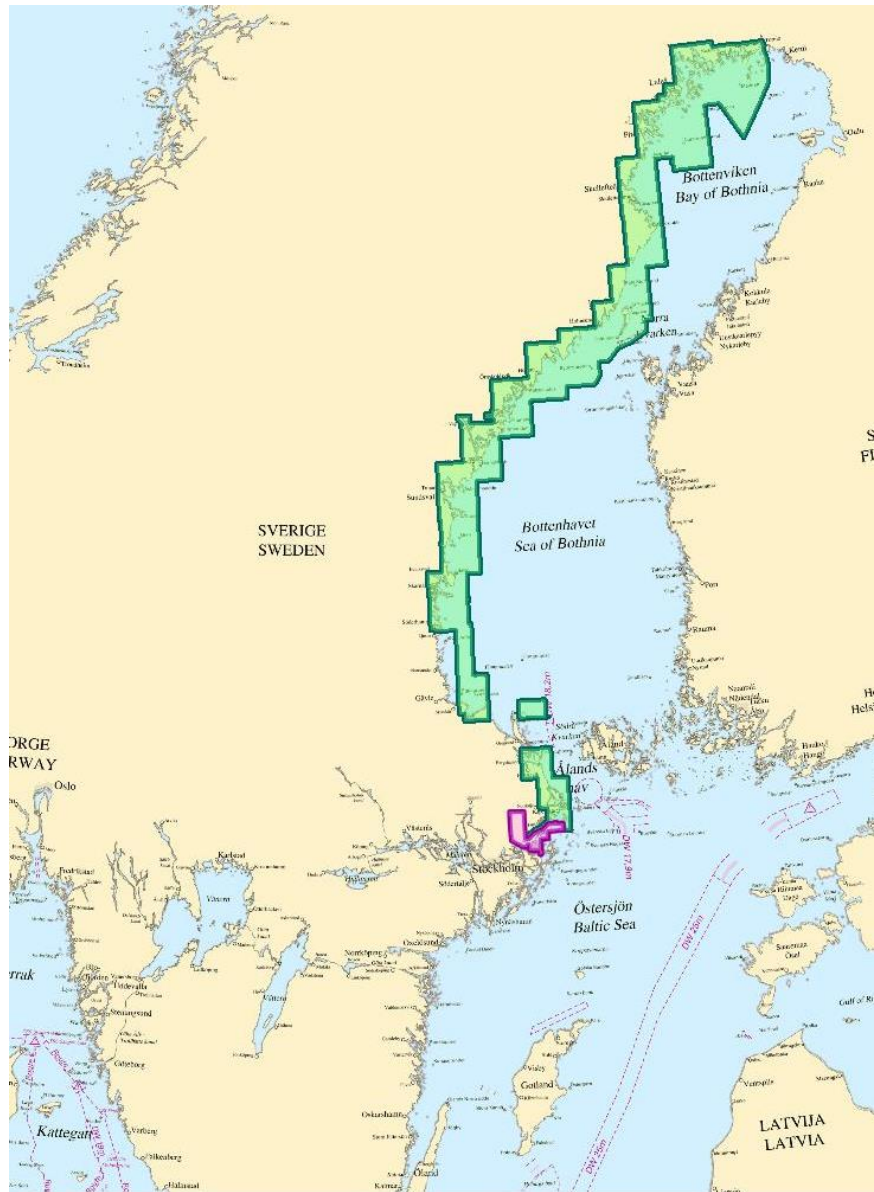
http://adam.vta.ee/teenused/tm/2017/TM_No.12-2017.pdf

Sea level information:

<http://on-line.msi.ttu.ee/meretase/?en>



Sweden – implementation status BSCD2000 in nautical charts



Updated March 2020

Sweden – fact sheet BSCD2000



Svensk



English



Status of implementation 2020



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/BSCD2000 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 campaigns 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 .

Thank you!



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