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26 March 2025

**Minutes of Meeting  
BSHC CDWCWG2 Meeting  
25-26 March 2025  
Tallinn, Estonia**

**Tuesday 25 March 2025 ([Tallink Spa & Conference Hotel](#), Sadama 11a, Tallinn)**

**Welcome and opening of the meeting.**

Chair thanked Estonia for hosting the meeting and welcomed participants warmly to the meeting.

Welcome from Estonian Transport Administration by Olavi Heinlo, Head of Cartography Department.

**Introduction round**

Participants presented shortly themselves. All the member states except Lithuania and Russia were present. Several observers and experts joined the meeting.

Mrs Gabriela Kotsulim was appointed secretary of the meeting.

The [List of Participants](#) was reviewed. 23 participants attended the meeting. Maria Bahmatova participated only on day 1 and Peeter Väling only on day 2.

Chair reviewed CDWCWG2 [Program](#), [Logistics](#) and [Agenda](#). Agenda adopted as proposed.

**Review the work of the CDWCWG and actions since CDWCWG1.**

Chair presented the [Chair's Report](#)

Chair gave an overview of the CDWCWG work and the importance of co-operation between different organizations. The Baltic Sea was highlighted as an excellent example of successful regional cooperation. The continuity management of BSCD2000 and related work programs were reviewed, with no actions or decisions assigned to CDWCWG from BSHC29. Meetings and major outcomes for 2024–2026 were outlined. [Summary](#) implementation of BSCD2000, S-104 and S-111 status was also provided for 2025.

**Discussion about water level information.**

It was pointed out that water level information for Finland, Estonia, Lithuania and Poland was transmitted in the old reference system in [Copernicus Marine Service \(link to Baltic Sea in-situ observations\)](#). For example Denmark has not yet fully updated water level reporting, and some reporting is still done in the old system of DVR90, which at points deviates significantly from BSCD2000. DMI is however working on this and is expected to have it finished in the near future.

It was also noted that the reference system is often hard to identify from metadata alone and usually requires downloading the data to determine it, highlighting the need to clearly include the used datum on the webpage and to ensure that any changes to metadata are also reflected in the data itself.



**Action #11:** Coordinate the shift of water level data to BSCD2000

**Action #12:** Check, harmonize and correct the metadata of the water level in BOOS, Copernicus Marine Service and EMODnet. Proposal according to naming convention and abbreviation used in the nautical charts, e.g. in Sweden BSCD2000 (RH 2000) or BSCD2000

Chair gave an overview of Implementation of a Harmonized Reference System, S-104 Water Level and S-111 Surface Currents in the Baltic Sea [[RoadMap](#)].

[Minutes](#) from CDWCWG1 Meeting [[Photo](#)] were reviewed and approved without any comments.

[List of Actions](#) from the CDWCWG1 Meeting was reviewed.

Minutes and Actions from the [29<sup>th</sup> BSHC Conference](#).  
No actions or decisions assigned to CDWCWG from BSHC29.

[Group photo](#) was taken.

**Review the national implementation plans and the status of implementation of BSCD2000, S-104 and S-111**, e.g. time schedules of implementation, publication plans, rising issues, good practices etc. Answers to [Questionnaire 2025](#): [Summary](#), [Denmark](#), [Estonia](#), [Finland](#), [Germany](#), [Latvia](#), [Lithuania](#), [Poland](#), [Sweden](#)

*The transformation of charts to BSCD2000 has been implemented in different ways in member states regarding the chart scales/bands and areas. In some countries the implementation has been done first for all the same scales/bands and in some countries the implementation has been done for all the scales in one area.*

Presentations of national reports/Questionnaires: [Finland](#), [Denmark](#), [Estonia](#), [Poland](#)  
Some notes based on presentations and national reports.

### Denmark

Noting that the BSCD2000 transition involved mostly cosmetic changes, with a 10 cm difference observed for the island of Bornholm. A national S-100 working group was established, along with a national coordination group that meets approximately every two months.

S-104, S-111 status: DMI and FCOO (Forsvaret Center for Operativ Oceanografi) is responsible for water level and current information. Have a plan for S-104 and S-111. DGA and DMI coordinates the work.

An intriguing question was raised to the CDWCWG, leading to a lively discussion: How can we ensure that the quality of oceanographic models is suitable for navigation (liability)? The discussion covered aspects such as data input, model verification, and acceptable uncertainty levels.

Some surprise was expressed over the expectation from mariners to receive forecasts up to 7 days in advance—while technically possible, such predictions should be used with caution. It was further noted that the model performs well for typical water level conditions but struggles with extreme events.



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## Estonia

Harbour ENC-s (17), berthing ENC-s (79), harbour paper charts (9) and berthing paper charts (11) are in BSCD2000. Approach cells are being released in three parts. The process began in 2024, first part will be hopefully ready in May. The second batch is expected to be completed by early 2026, with the full transition of approach cells finalized within the same year. Following this, work will begin on Coastal cells, followed by General cells.

S-104, S-111 status: automatic production workflow of both S-104 and S-111 has been established. Development done mid Dec 2024 – first half of Jan 2025. Update daily for next 24 hours. Currently both datasets are uploaded to PRIMAR test environment, each new edition replaces the old one (edition numbers are increasing). Plans to move to production environment – S-104, S-111 and S-102, so they can be used under PRIMAR licenses.

## Finland

All charts from Tornio to northern part of Åland islands have been published. Plan is to complete transition to BSCD2000 in 2026. The status of transition can be found in <https://www.traficom.fi/en/finnish-nautical-charts-portfolio>.

S-104, S-111 status: S-104 and S-111 test products are developed in the Baltic Sea e-Nav-project. Some test products have been created, but further development is needed. They can be viewed at the [Baltic Sea e-Nav meeting in Rauma](#).

A general comment was made about the positive presence of all three institutions at the meeting, noting that this collaboration is fostering growth and bringing together diverse expertise. An important question was raised about who will be responsible for delivering S-104 and S-111 products to the end user.

## Germany

Transition to BSCD2000 in Germany is complete.

S-104 and S-111 status: after the successful production of test-datasets for water level and surface currents, the development of an automated production of S-104 and S-111 over the North Sea and Baltic Sea is planned in the third quarter of 2025. Plans to expand S-104 to include long-term Tide predictions besides the water level forecast are also ongoing.

## Latvia

BSCD2000 fully implemented in 2024.

S-104 and S-111 status: meeting with LVGMC officials has been held about S-104 and S-111

## Lithuania

National height system LAS-07 (BSCD2000) came into force 2016-01-01. BHS-77 still used. The difference between BHS-77 and LAS-07 is well known (about 13 cm) and is also written in nautical charts. S-104 and S-111 status: Data owner has been identified. LHMS is responsible for water level information and Klaipeda University (KU) for currents.

## Poland

BSCD2000 implementation was completed in November 2024, all bands, covering 33 paper charts and 68 ENCs. It was mentioned that the working group helped speed up BSCD2000 implementation. S-104, S-111 status: S-104/S-111 development is still at an early stage. There is an initial arrangement with the Institute of Meteorology and Water Management on model data delivery for S-104 and S-111 purpose. Decisions regarding who will deliver the product are expected mid-year, along with a finalized roadmap.



## Sweden

BSCD2000 implementation: Ongoing. Many charts (ca 50%) already published. Implementation is a part of the "Chart Improvement Project", to be concluded at the latest in 2030. S-104, S-111 status: Discussions started between SMA and SMHI. SMA and SMHI take part in the Baltic Sea e-Nav-project in cooperation with FMI on this. We will take further actions in 2025. SMA coordinates the work.

Artu Ellmann presented: [Synergy of oceanographic and geodetic data using machine learning](#). Focuses on improving existing hydrodynamic models.

Joachim Schwabe presented **Results from altimetry in the Baltic**.

### **FAMOS project continuation of Activity 2**

Joachim Schwabe presented the work [[Presentation](#)].

Germany and Latvia are updating their national geodetic reference frames, with minimal impact expected on the BSCD 2000 grid near Germany, and slightly larger changes in Latvia, especially near the Gulf of Riga.

General organizational matters and the management of the BSCD2000 height transformation grid (geoid model) were discussed. [[Landing page](#)]

**Action #13:** Make BSCD2000 visible in Google search

### **Review the [Specification of the BSCD2000](#)**

Figure 4b was updated with new reference levels. Concerns were raised regarding the figure text. Differences in vertical datums for water level were observed: Estonia, Latvia, and Lithuania display deviations based on BHS77 (Kronstadt Datum), while the Polish data show a different pattern (local datum).

A discussion took place about what the figure is intended to illustrate. It was suggested that the caption should be revised. It was also proposed that mean sea level references be removed to avoid confusion. In Finland and Sweden, charts are based on different mean sea level years, and some charts contain survey data based on varying reference levels. Uncertainty was expressed about how to interpret the text correctly. The possibility of removing the figure entirely was raised.

**Action #10** To check if amendments needed to the [Specification of the BSCD2000](#).  
Figure 4b subgroup referred

### **Cooperation and communication with [BOOS](#) [[Presentation](#)]**

EMU was discussed in connection with BOOS and the use of numerous tide gauges. It was noted that tides are related to different reference systems, and a common reference datum should be used. The next BOOS meeting will take place in May. Chair is unable to attend but suggested that if someone else is going and wishes to present something on behalf of the group, it would be welcome.

A question was raised regarding the number of users. It was noted that there appear to be no active users, and it was suggested that the service might even be considered for closure.



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## [IHO Tides, Water Level and Currents Working Group \(TWCWG\)](#)

It was mentioned that the work of working groups must be organized so that they do not duplicate each other.

### [Presentation of TWCWG at GLOSS GEXVIII](#)

[S-104](#) and [S-111](#) Product Specifications

### [S-158:98 Cross Product Validation](#)

The importance of cross-validation between S-104, S-111, and S-158 product specifications was introduced. It was emphasized that each product must be validated individually. For instance, S-102 is closely linked to S-104, and when S-104 is submitted to PRIMAR (RENC), general validation checks are performed. This process applies to all related products. Short report from the last TWCWG-meeting ([TWCWG9](#)), [[Photo](#)], presented by the Chair. A successful TWCWG9 meeting was held in Monaco from 19–22 November 2024. The product specifications for S-104 and S-111 were finalized. Chair gave presentation on behalf of CDWCWG, introducing BSCD2000 and our ongoing activities—this is available on the website. A total of 65 participants were registered, with 29 attending on-site, representing 57 member states.

### **Trip and visit to the Vessel Traffic Service centre and Traffic Management Centre**

At the end of the first day host organized a tour to Estonian Transport Administration Vessel Traffic Service center and Traffic Management Centre, Valge 3, Tallinn.

Participants were introduced to the work of both centers.

### **Wednesday 26 March 2025**

#### [Baltic Sea e-Nav and implementation of S-104 and S-111 in the Baltic Sea](#)

#### [S-104 and S-111 in Baltic Sea e-Nav](#)

Chair and Anni presented an overview of the e-Navigation project, focusing on aspects relevant to S-104 and S-111. Eight hydrographic offices are involved in the project. A roadmap was shown, supporting the implementation of S-104 and S-111 within the S-100 framework. Currently in the implementation phase. Full readiness is expected by 2028 (by 2026 within the project). S-100 products will be mandatory from 2029. Harmonization and validation issues were raised, highlighting the need for a clear rollout plan.

An open discussion was held on how to coordinate the implementation of S-104 Water Level and S-111 Surface Currents products in the Baltic Sea, focusing on what aspects should be harmonized—such as reference systems, models, interpolation methods, and product delivery. Overlapping data and the need for smooth cross-border. It was questioned whether one country, like Finland, could produce products for another, such as Poland. The idea of a regional harmonization document was supported.

A question was raised about whether one or two separate documents should be created, and it was agreed that two documents will be prepared. It was suggested that the existing S-102 harmonization document provides a solid foundation for this work.

Task to CDWCWG to write a harmonization document.

**Action #14** Organize a S-104 and S-111 harmonization document subgroup and invite members to the group.



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## S-104 and S-111 Implementation in Estonia presented by Peeter Väling

A basic workflow was presented, showing how automatic scripts generate daily datasets at 12:00 and send them directly to the PRIMAR test environment. Only free and open-source software is used in the process. A detailed explanation was given on creating S-104 and S-111 datasets from the NEMO model. Both are limited to the EEZ area, with the model cutting out data beyond it. The PRIMAR test ECDIS display of S-111 was demonstrated, where the data was split into four parts due to the test ECDIS limits. The plan is the transition of S-104, S-111, and S-102 into the production environment under PRIMAR licensing. It was clarified that signatures are not necessary, as PRIMAR handles that. The pricing was not yet decided.

It was clarified that signatures are not necessary, as PRIMAR handles that. The topic of data delivery to vessels remains unresolved in the S-100 context. It was also asked whether updates will become more frequent - currently once per day, with a goal to move toward twice-daily updates in the future.

Chair asked whether any amendments were needed to the Terms of Reference and a suggestion was made to include the harmonization of S-104 and S-111. As a result, updates were made to points 1, 2, and 4. The content of point 7 was integrated into other sections, and the point itself was removed. The updated Terms of Reference will be presented at the BSHC30 for approval.

Review and update the Work Programme

No new amendments to the work programme.

Review and update the joint Road map, timeline and communication plan.

### **Any other business**

Update the List of Members

Some members were added, and some removed.

Review the Webpage

Chair gave an overview about webpage and asked if anybody has some interesting page – he can add this also to the home page.

Review the List of Actions and unresolved issues of this meeting were reviewed and improved.

CDWCWG Report to the 30<sup>th</sup> BSHC Conference, 22-24 September 2025 in Riga, Latvia and list of matters to be reported [CDWCWG Presentation]

Artu Ellmann invited all to attend NKG Summer School: From Struve to Space 25-29 August 2025 in Tartu, Estonia. Marine geoid topics.

Proposal for the place and date of the next meeting [CDWCWG3]

Chair's proposal: 24-25 March 2026 in Riga, Latvia. Latvia happily accepted the proposal. The next CDWCWG3 meeting will take place during 24-25 March 2026 in Riga.

The Chair closed the meeting and thanked everybody for the active participation in the meeting.

Closing of the meeting