

29th BSHC Conference National Report of Germany

September 2024

Executive Summary

The present report outlines and summarizes the activities carried out since the 28th BSHC Conference by the Federal Maritime and Hydrographic Agency (BSH). The report concentrates on the Baltic Sea.

Issues of special interest have been:

- New S-100 test dataset creation (S-127 – Marine Traffic Management – VTS Guide)
- New product, in 2024 the BSH published the first HD ENC.
- Release of the Baltic Sea Chart Datum 2000 (BSCD2000), a harmonized chart datum for the entire Baltic Sea
- Start of the EU Interreg Baltic Sea Region project “Shared waters – Same standards. Baltic Sea partnership for future navigation (Baltic Sea e-nav)”
- Implementation of public access to the hydrographic survey database (<https://svdb-portal.bsh.de/svdb-portal/>)

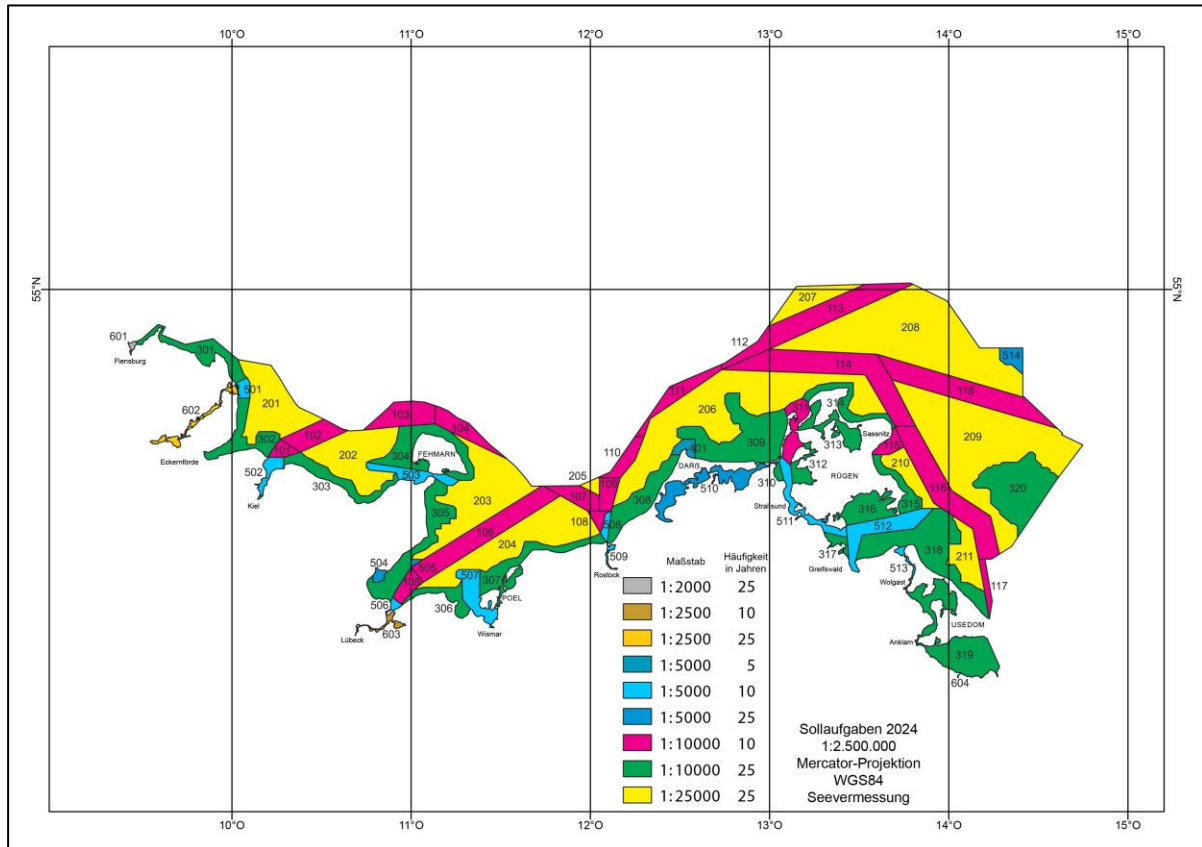
1. Hydrographic Office

The Bundesamt für Seeschifffahrt und Hydrographie (BSH, Federal Maritime and Hydrographic Agency of Germany) is an agency within the remit of the Federal Ministry for Digital and Transport and has headquarters in Hamburg and Rostock. It encompasses responsibilities in hydrography, oceanography and shipping. The department “Nautical Hydrography” covers the obligations as the national Hydrographic Office and is mainly located in Rostock. Alongside the BSH, the national Waterways and Shipping Administration (GDWS) belonging to the same Ministry manages and maintains the federal maritime waterways.

2. Surveys

Coverage of new surveys

The BSH conducts hydrographic surveys on a general schedule, which is being updated on a yearly basis and amended if necessary. The survey area is subdivided into different slices of similar quality demands. The quality aspects include the re-survey rate as well as survey standards.

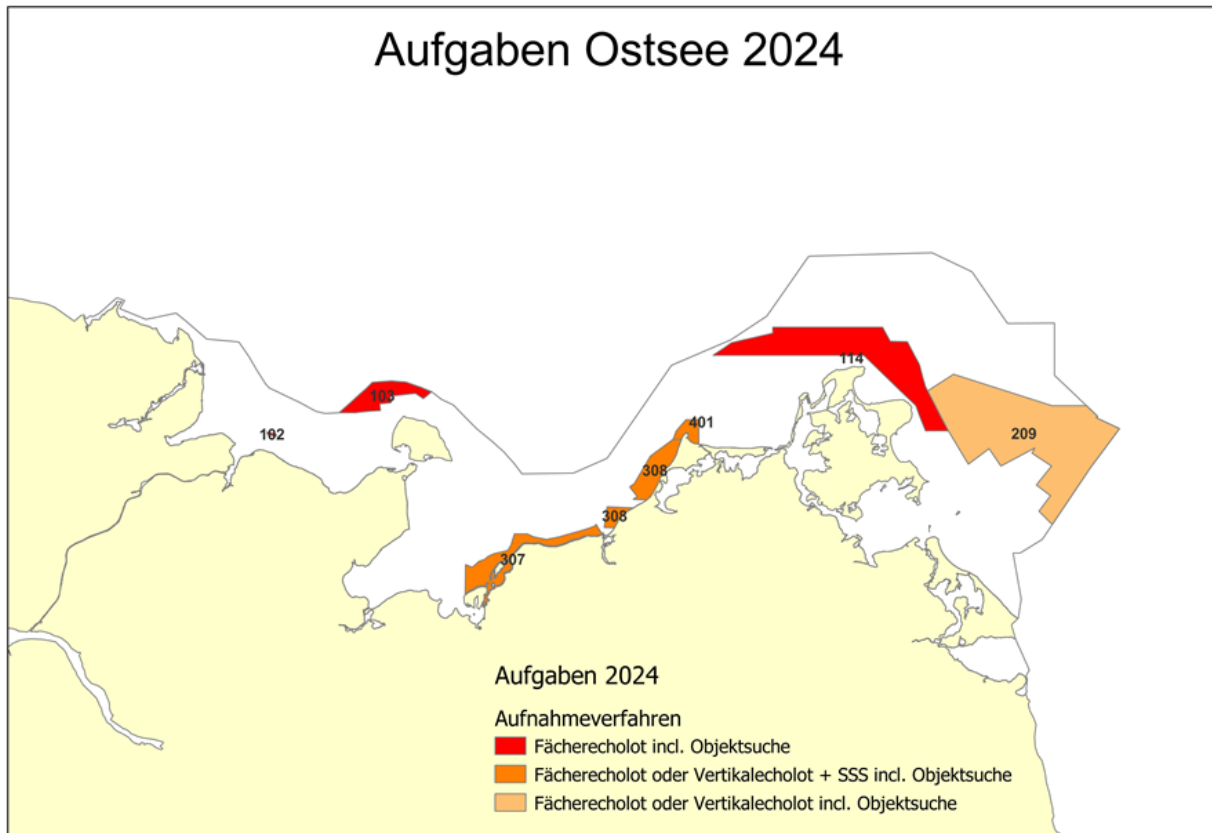


<general survey scheme for the German part of the Baltic Sea>

The hydrographic surveys are being executed by vessels from the Hydrographic Office. Due to the relatively high mobility of the seafloor and high morphological energy in combination with dense traffic and many obstructions and wrecks, the area is being resurveyed quite often. The resurvey rate ranges from 5 to 25 years. In 2020 Germany continues to resurvey the main routes according to the latest S-44 Standard for the second time using multi beam.

The detailed survey plan for 2024 is provided in a graphical format on the next page. For further details reference is made to the HELCOM Resurvey Site:

<https://helcomresurvey.sjofartsverket.se>



Surveys in 2024:

102	Ansteuerung Kiel 2	finished
113	Weg H	in process
114	Route Sassnitz 2	planned
209	zw. Rügen u. Bornholm S	planned
307	Wismarbucht O	planned
308	Rostock bis Darss	in process
401	Darsser Ort	planned

Wreck search

BSH investigated 99 wrecks in 2023 in the Baltic Sea, seven of them were new found obstructions or wrecks, the others were reinvestigated on a regular schedule or investigated within hydrographic surveys. The reinvestigation is necessary due to possible changes caused by currents or other effects. The frequency of the reinvestigation is depending besides other aspects mainly on the likeliness and the impact of changes.

New technologies and / or equipment

The BSH researches, implements and evaluates how new measurement techniques such as airborne laserbathymetry, UAV imagery, satellite-derived bathymetry, etc. can serve as complementary data sources to hydroacoustic measurements, and how data from heterogeneous sources can be processed jointly to exploit the full information potential.

With the aim to deriving consistent 3D underwater terrain model from multibeam sonar data, the BSH is currently working on the development of improved techniques to determine spatio-temporally resolved water sound velocity profiles (SVP) using dense in-situ measurements and distribution model data. In this context, strategies are also being developed to predict water body characteristics in real time during hydrographic surveys in order to adjust SVP measurements accordingly.

BSH is working intensively on the development and implementation of automated data analysis techniques. Of particular note are: (i) Development of a workflow for fully automated AI-based boulder detection in hydroacoustic data, implemented in a graphical user interface that allows training and evaluation of detection models, execution of boulder detection models, and post-processing of detection results without programming. (ii) Development and implementation of an automatic processing chain for the extraction of coastlines from multispectral aerial and satellite imagery. (iii) Integrated processing of multispectral satellite image sequences using deep machine learning techniques to derive bathymetry from optical imagery and tracking techniques to monitor changes in seabed topography for intelligent hydrographic resource planning.

BSH is addressing augmented reality (AR) technologies for crewed hydrographic surveys and public relations.

Together with the Hydrographic Offices of SE (coordinator), FI, DK, EE, LV, LT (associated) and PL(associated), BSH works on the Interreg Baltic Sea Region project “Shared waters – Same standards. Baltic Sea partnership for future navigation (Baltic Sea e-nav)”. Baltic Sea e-nav aims (i) to develop production capabilities for S-101 ENC, S-102 bathymetry and partly S-104 water level, (ii) to establish harmonization rules for S-10x-products, (iii) to test, evaluate and refine S-10x products and (iv) to stimulate the commercial rollout for S-101 and S-102 in the Baltic Sea.

New ships

In 2023 the allocation of the replacing buildings DENE and WEGA was planned. Due to high inflation and new requirements the start of the shipbuilding project had to be postponed to 2024. Both vessels will be operated with environmentally friendly and climate neutral fuels.

Due to the current budget situation in Germany, the funding for two vessels is not guaranteed yet.

Problems encountered

No new problems were encountered since the last report.

3. New charts & updates

Charts (paper as well as ENC) covering the German waters are produced and updated by BSH.

ENCs

The German waters are covered by 308 ENC cells in various navigational bands. All ENCs are updated on a weekly basis. The rescheming of the North Sea is complete. Now the gridded scheme will be implemented step by step for the main harbour and the approach cells of the Baltic Sea.

BSH published the HD ENC DE6HOSRO at the end of May 2024. Other HD ENCs will follow in the coming months.

ENC distribution method

All the German produced ENCs and updates (ERs) are distributed through a network of IC-ENC authorized distributors. Supported by IC-ENC S-101 readiness checks and constantly updated conversion software the German HPD data base gets prepared for producing S-101 ENCs.

INT charts

36 German published INT charts (for the North Sea, the Baltic Sea and Antarctic Waters) have been updated. 15 North Sea and 19 Baltic Sea INT charts in DIN A0 format are produced in co-operation with UKHO and are distributed through UKHO chart agents. For the Baltic Sea, BSH is the producer of 20 INT charts and 16 for the North Sea.

BSH transferred the INT chart 120 (DE 98) to UKHO and the INT chart 1201 (DE 40) to SMA.

BSH changed the paper size of all INT charts to DIN A0. The conversion of the North Sea charts is completed.

National paper charts for domestic waters

BSH has published and updated 63 North Sea and 41 Baltic Sea paper charts in DIN A1 format during the reporting period. The remaining 3 larger size national charts for the Baltic Sea will be replaced by DIN A1 paper charts by the end of 2024.

Paper charts for foreign waters

Germany is the producer of 3 INT charts for Antarctic waters.

Other charts, e.g. for pleasure craft

None

Problems encountered

None

4. New publications & updates:

New Publications

None

Updated Publications (as per Q1 2024)

★ **DE. BSH. Nautischer Informationsdienst. Seebücher**

(Siehe Mitteilung im Heft 03/2024)

Im I. Quartal 2024 erschienen folgende Neuauflagen von Seebüchern:

2155 Funkdienst für die Klein- und Sportschiffahrt 2024
4001 Leuchtfeuerverzeichnis südwestliche Ostsee 2024
4003 Leuchtfeuerverzeichnis südöstliche Nordsee 2024
20031 Ostsee-Handbuch, südwestlicher Teil 2023

Beabsichtigte Neuauflagen von Seebüchern:

2011 VTS Guide Germany 2024
2115 Gezeitentafeln Europäische Gewässer 2025
2117 Gezeitenkalender 2025
20001 Handbuch für Brücke und Kartenhaus 2024
20061 Nordsee-Handbuch, südöstlicher Teil 2024

★ **DE. BSH. Navigational Information Service. Nautical Publications**

(See Notification in NfS issue 03/2024)

Following new editions of nautical books were published in the first quarter of 2024:

New editions of nautical books scheduled for publication:

(BSH N2/24) 14/24

Superseded and updated publication

None

Supplements

None

Means of delivery, e.g. paper, digital

Nautical Publications will be delivered as paper copies. Selected Publications are digital and are only available on the Internet.

Charts will be delivered as paper copies and ENC. GeoTiffs are available for all charts. Alternative digital formats and products such as pdf or shape files will be produced on request.

Problems encountered

None

New S-100 compliant data sets for S-12x Products under development

Work on all S-12x products commenced. It is attempted to produce the S-12x data set by the HPD. The requested HPD capability to handle such data and to generate S-100 compliant data sets is expected in the next years to come .

The BSH is able to generate already the Catalogue of Nautical Products as per upcoming S-128 standard on a weekly basis. All applicable workflows were updated. The dataset is available free of charge. Please refer to:

https://www.bsh.de/DE/PUBLIKATIONEN/Naut_Produktkatalog/naut_produktkatalog_node.html

Furthermore, the BSH is generating an test dataset comprising Marine Traffic Management. VTS Guide NPUB information are used to create an S-127 compliant dataset. Ongoing developments make it possible to create a similar VTS Guide product which could meet carriage requirements, too.

5. MSI

Existing infrastructure for transmission

Incoming hydrographic data is immediately assessed for vital information. Urgent updates are issued as chart-updating Notices to Mariners (NtMs) or Navigational Warnings (Radio Navigational Warnings - NAUTISCHE WARNNACHRICHTEN, NWN).

The NtMs are issued weekly by the BSH. The NtMs provide information on important navigational measures, incidents, and changes concerning the German navigable waterways and the German EEZ.

NWN are issued by the VTS centres for their areas of responsibility, and by the 24-h maritime warning service in Emden for the entire German warning area, and are broadcasted as radio messages. In special cases, the maritime warning service also informs on dangers outside its area of responsibility (e. g. dangerous wrecks in the main shipping lanes).

Navigational warnings in English language relating to the area of responsibility of the Federal Republic of Germany are broadcasted on 518 kHz (international NAVTEX service) by the Swedish coastal radio station Gislövshammar Radio, identification character J, for the Baltic Sea, and by the Pinneberg radio station of the German Meteorological Service (DWD), identification character S, for the North Sea.

A national NAVTEX service in German language is broadcast on 490 kHz by the Pinneberg radio station (identification character L) for the German navigational warnings area of the North and Baltic Seas.

New infrastructure in accordance with GMDSS Master Plan

None

Problems encountered

None

New IHO Standard S-124 (Navigational Warnings) for providing navigational warnings

BSH is engaged in the development of S-124. S-124 intends to provide navigational warnings in digital format which could be potentially projected on electronic charts.

S-124 will be a service developed by the existing German Navigational Warning and Information System. A national working group is engaged to rethink the implementation of the new standard comprising BSH, GDWS and DWD. BSH is working out a S-100 concept which need to be confirmed by the German Ministry to Digitalization and Transport to propell the development on the legal basis. Nevertheless, a new technical infrastructure might be necessary to produce this service by the GDWS and the transmission by Pinneberg radio station.

6. C-55

Excerpt of C-55 for Germany in INT Region E updated July2019.

Status of surveys

A1	A2	B1	B2	C1	C2	Comment
100	0	0	0	0	0	A regular re-survey scheme is in place, taking into account the rapid changes of the sea floor topography. For more details for the Baltic Sea see http://helcomresurvey.sjofartsverket.se/HELCOMRESURVEYSITE/

Status of nautical charting

Offshore pas- sage/Small			Landfall Coastal passage/Medium			Approaches Ports/Large			Comment
A	B	C	A	B	C	A	B	C	
100	0	100	100	0	100	100	0	100	

7. Capacity Building

A Cat A course in Hydrography is offered in English language at the Harbour City University (HCU) in Hamburg.

8. Oceanographic activities

The BSH operates several services such as daily water level forecasts, storm surge warnings, ice reports, ice charts and charts of the sea-surface-temperature. It surveys and evaluates the physical and chemical conditions of the North and Baltic Sea.

9. Other activities

The BSH is responsible for spatial planning and is the building permit authority within the German EEZ. It has several administrative tasks in the shipping sector and is certified for type testing and approval. It is as well certifying body for the construction and operation of offshore wind energy farms in the German EEZ.

9.1 Participation in IHO Working Groups

BSH is actively involved in the work done by

- HSSC,
- IRCC,
- CBSC,
- NIPWG - Nautical Information Provision Working Group,
- MSDIWG - Marine Spatial Data Infrastructures Working Group,
- WENDWG - Worldwide ENC Database Working Group
- S-100 Working Group, S-101PT, S-102PT, S-57 to S-101 Conversion Sub-Group
- TWCWG - Tides, Water Level and Currents Working Group
- HSWG – Hydrographic Surveys Working Group,
- CSBWG – Crowdsourced Bathymetry Working Group,
- TSM – Test Strategy Meeting (S100WG sub-group)
- DQWG – Data Quality Working Group
- IHR – International Hydrographic Review
- WWNWS – World Wide Navigational Warning Service Sub Group

Within BSHC:

Baltic Sea Bathymetric Database Working Group (BSBDWG),
Baltic Sea International Charting Coordination Working Group (BSICCWG),
Baltic Sea Marine Spatial Data Infrastructure Working Group (BSMSDIWG),
Baltic Sea Maritime Safety Information Working Group (BSMSIWG)
Chart Datum, Water level and Currents Working Group (CDWCWG),
Resurvey Monitoring Working Group (MWG).

9.2 Other international activities

BSH is also participating in IMO Committees, namely NCSR as well as in the IOC. BSH experts are members of the HELCOM Expert Group Safe Nav and are participating actively in the Baltic Sea Maritime Safety Information Working Group (BSMSIWG)

The BSH participates actively in technical conferences to improve the general ENC's workflow and the to improve the cooperation between Hydrographic Offices and the IC-ENC.

9.3 Operation of a semi-automated and common workflow of bathymetric data for the derivation of navigational products (ENC, bENC, S-102, Paper chart)

The BSH produces a high-resolution (1m), non-overlapping Digital Terrain Model (DTM) for selected areas of the German EEZ in the Baltic Sea. The DTM serves as a common database for all relevant navigational products. The workflow merges the previous parallel production lines for the ENC's/Paper charts and the bENC. In addition, S-102 data products are derived automatically from the DTM.

The resolution will deteriorate to a 10mx10m grid for products provided to international shipping.

10. Conclusions

None