

28th BSHC Conference National Report of Germany

September 2023

Executive Summary

The present report outlines and summarizes the activities carried out since the 27th BSHC Conference by the Federal Maritime and Hydrographic Agency (BSH). The report concentrates on the Baltic Sea.

Issues of special interest have been:

- New survey, wreck search and research vessel ATAIR in service. Process of replacing the vessels DENEK and WEGA has started.
- S-100 test dataset creation (S-128 – Catalogue of Nautical Products)
- Conversion of German Notice to Mariners to an exclusive digital version free of charge
- Start of the implementation of a new semi-automated and common workflow of bathymetric data for the derivation of navigational products (ENC, bENC, S-102, Paper chart)

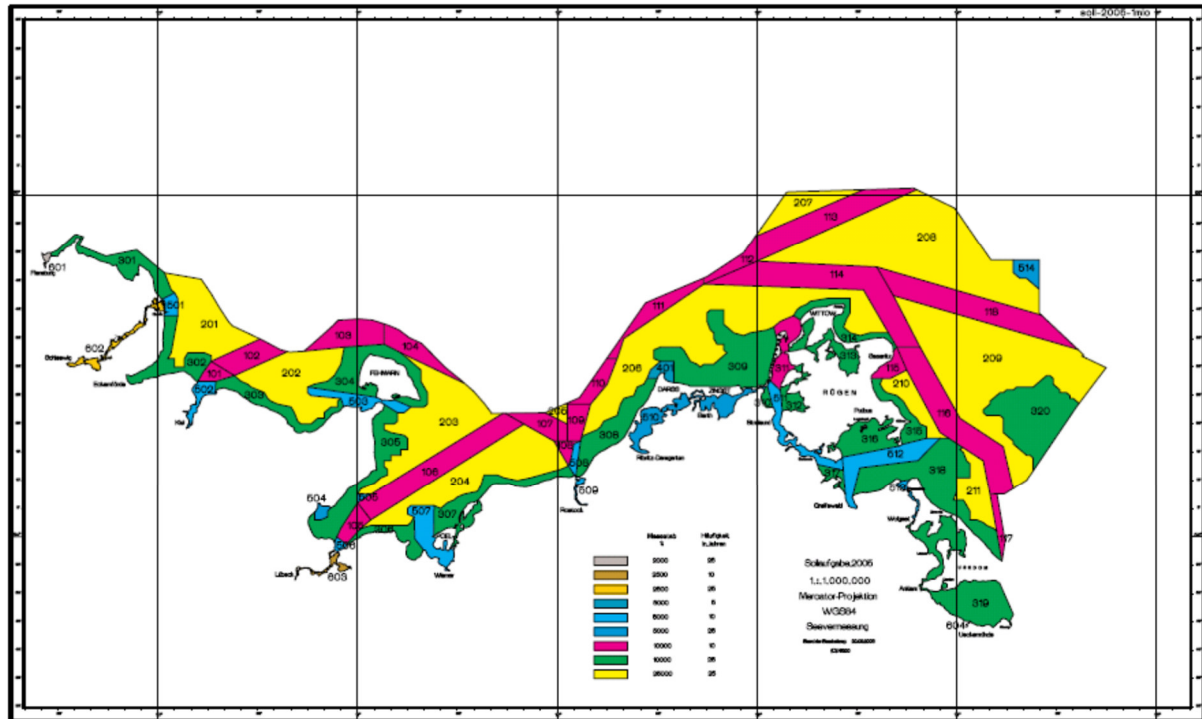
1. Hydrographic Office

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.

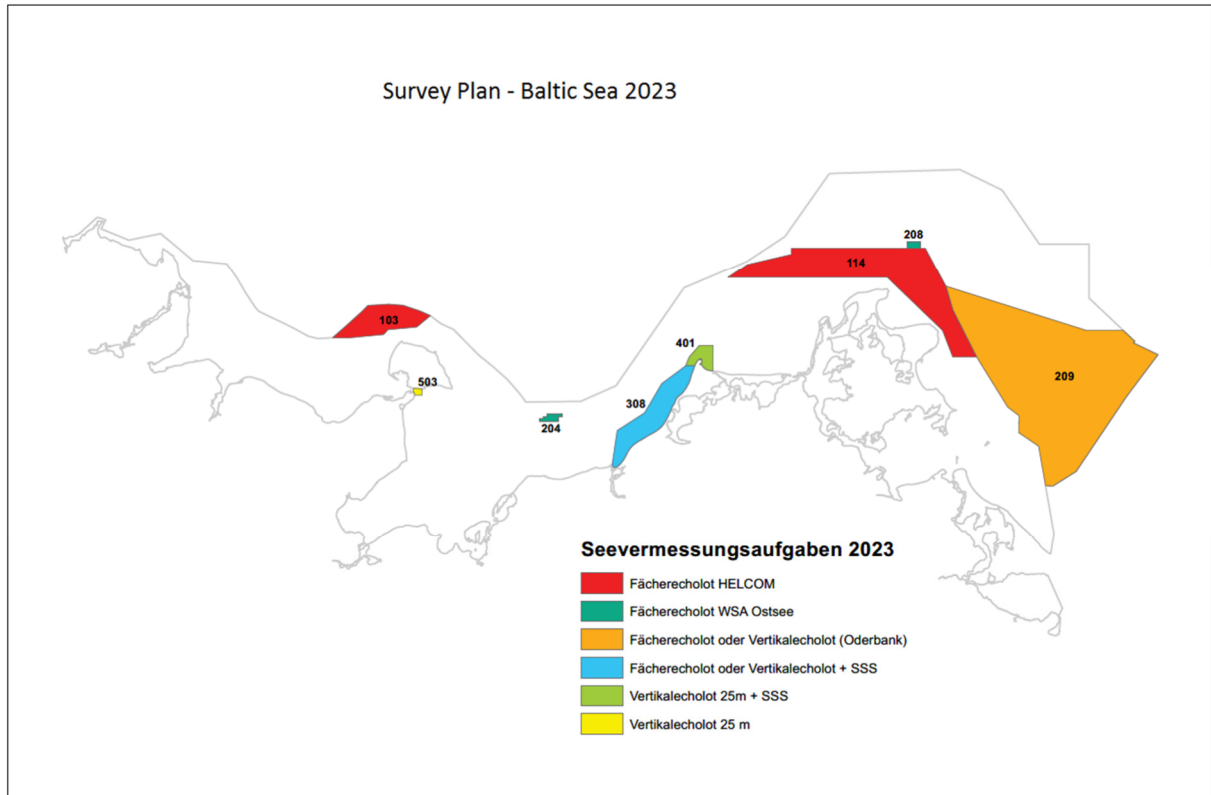


<general survey scheme for the German part of the Baltic Sea>

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 2023 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 2023:

103	Weg H	planned
209	Oderbank	in process
308	Rostock bis Darss	in process
114	Route Sassnitz 2	in process
204	Mecklenburger Bucht S	finished
208	zw. Rügen u. Bornholm S	finished
401	Darsser Ort	finished
503	Route Fehmarnsund	finished

Wreck search

BSH investigated 54 wrecks in 2022 in the Baltic Sea, three 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

BSH is investigating and evaluating how new measurement techniques like airborne laserbathymetry, UAV imagery, satellite-derived bathymetry etc. can serve as complementary data

sources besides hydroacoustic measurements, and how data from heterogeneous sources can be processed jointly to exploit the full information potential.

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

BSH is working intensively on automatic data analysis techniques like stone detection and classification in geometric and radiometric multibeam echosound data as well as coast line extraction from multi-spectral aerial imagery, partly using deep machine learning techniques like artificial neural network.

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

BSH investigates the potential of crowdsourced bathymetry strategies, in particular the accuracy and reliability of bathymetric measurements collected by non-survey vessels, as basis for decision-making in resource scheduling.

Together with the Hydrographic Offices of SE (coordinator), FI, DK, EE, LV, LT (associated) and PL(associated), BSH will work 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.

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 300 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.

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

42 German published INT charts (for the North Sea, the Baltic Sea and Antarctic Waters) have been updated. 15 North Sea and 15 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 24 INT charts. Three small scale INT charts are scheduled to be transferred to Denmark and Sweden for further processing. To concentrate more on the German waters, the adoption of 4 Polish INT charts in the area Zalew Szczecinski was stopped.

BSH started to change the paper size of all INT charts to DIN A0. The conversion of the North Sea charts is complete and 15 Baltic Sea charts have been converted.

National paper charts for domestic waters

BSH has published and updated 63 North Sea and 36 Baltic Sea paper charts in DIN A1 format during the reporting period. To provide chart coverage of new wind farms some New Charts are still planned. The remaining 4 larger size national charts for the Baltic Sea will be replaced by DIN A1 paper charts step by step.

Paper charts for foreign waters

Germany is the producer of INT 120 (DE 98) covering the whole Baltic and 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 (August 2023)

Following new editions of nautical books were published in the first and second quarter of 2023:

2155 Funkdienst für die Klein- und Sportschiffahrt 2023
4001 Leuchtfeuerverzeichnis südwestliche Ostsee 2023
4003 Leuchtfeuerverzeichnis südöstliche Nordsee 2023
5000 Handbuch Nautischer Funkdienst 2023
20061 Nordsee-Handbuch, südöstlicher Teil 2023
20005 Seeschiffahrtsstraßen-Ordnung 2023

New editions of nautical books scheduled for publication:

20031 Ostsee-Handbuch, südwestlicher Teil 2023 (

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.

With German NtM 27/2023 the official chart and publication correction service is available only in digital format and free of charge for all customer.

Please refer to:

https://www.bsh.de/DE/THEMEN/Schiffahrt/Nautische_Informationen/Nachrichten_fuer_Seefahrer/Nachrichten_fuer_Seefahrer_node.html

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

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. Nevertheless a new technical infrastructure might be necessary to produce this service. Germany needs to distinguish the responsibilities for the future.

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 Working Group (CDWG),
Resurvey Monitoring Working Group (MWG).

9.2 Other international activities

BSH is also participating in IMO Committees, namely NCSR as well as IOC.

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

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

The BSH is introducing a new workflow for the successive creation of a high-resolution (1m), non-overlapping Digital Terrain Model (DTM) for the German waters. The DTM will serve as a common database for all relevant navigational products. The new workflow will merge the previous parallel production lines for the ENC's/Paper charts and the bENC. In addition, S-102 data products can be derived automatically from the DTM in the next future.

The core element of this workflow is a PostgreSQL database with various functionalities for the automated harmonisation and intersection of all incoming bathymetric datasets (around 3200 data sets per year) from different data providers.

10. Conclusions

None