# 30th BSHC Conference

# National Report of Germany

September 2025

**Executive Summary**

The present report outlines and summarizes the activities carried out since the 29th BSHC Conference by the Federal Maritime and Hydrographic Agency (BSH). The report concentrates on the Baltic Sea.

## Issues of special interest have been:

* S-127 (Marine Traffic Management) completed and in updating routine, derivation of printed publication possible
* S-125 (Marine Aids to Navigation) completed and in updating routine, derivation of printed publications possible
* New HD ENC for the port of Mukran
* ENC gridding finalised
* Replacement of charts in A1 fomat by charts in A0 format commenced
* Ongoing participation at the EU Interreg Baltic Sea Region project “Shared waters – Same standards. Baltic Sea partnership for future navigation (Baltic Sea e-nav)”

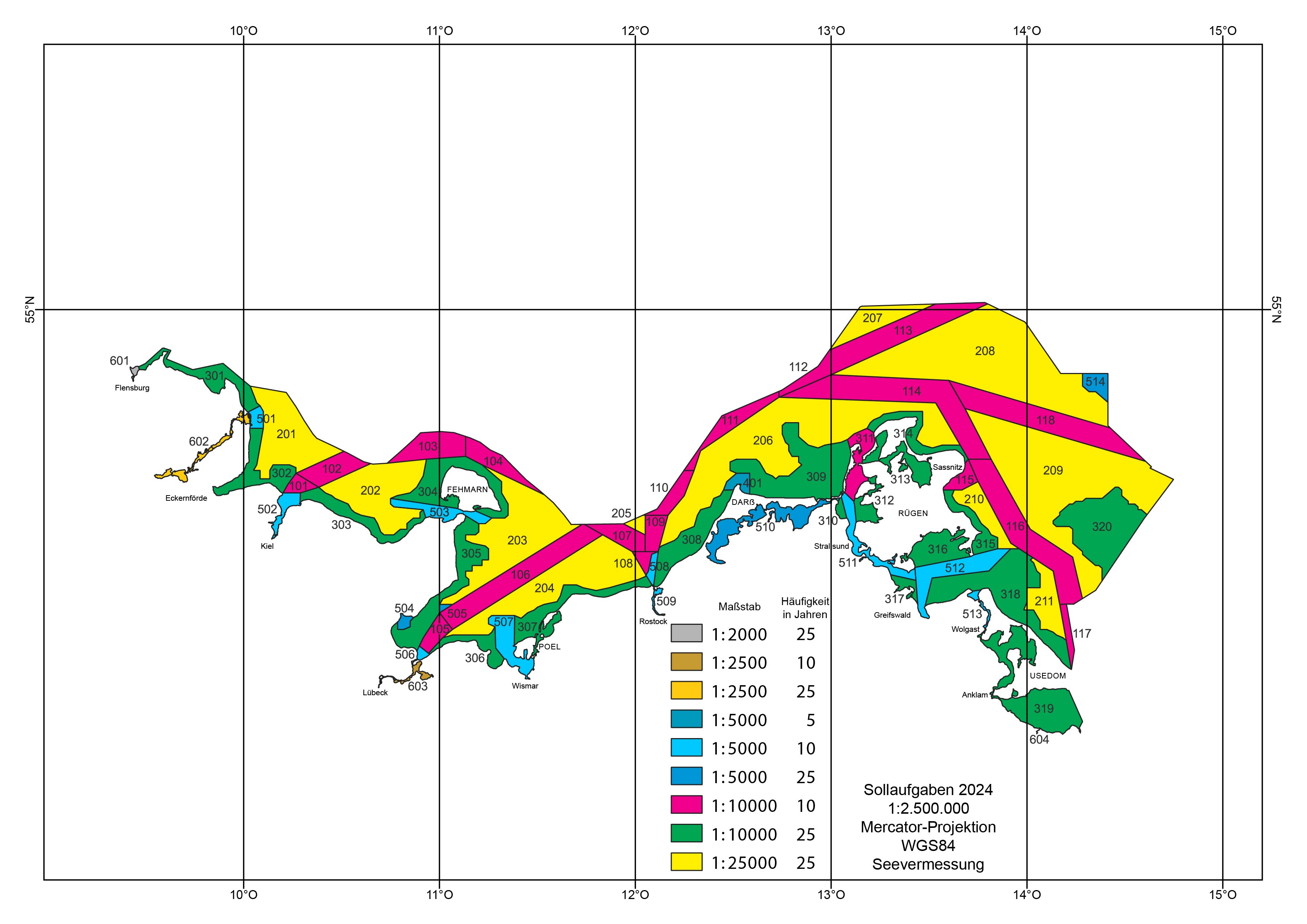
## 1. Hydrographic Office

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 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

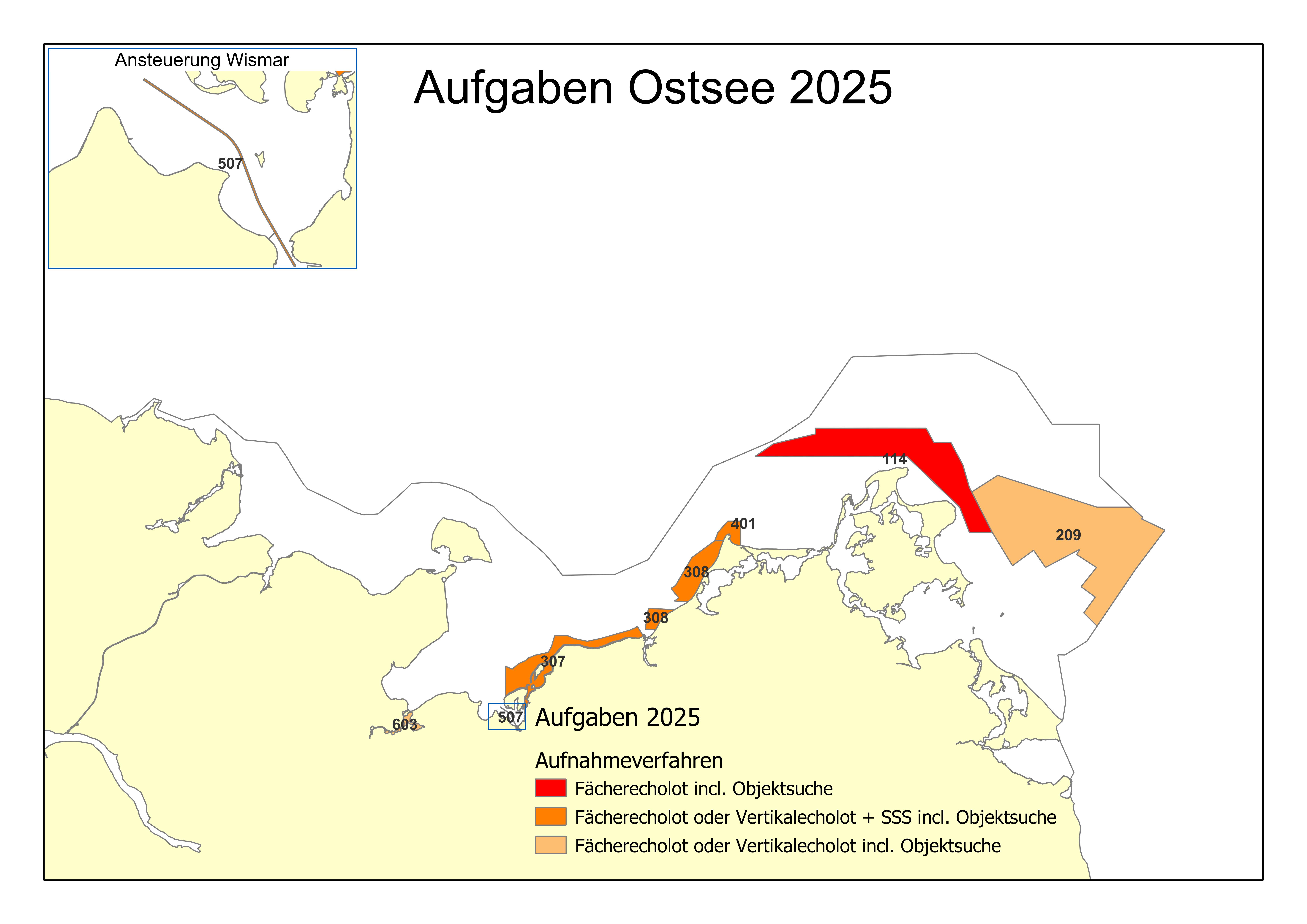
The BSH conducts hydrographic surveys on a general schedule, which is being updated on a yearly basis and amended if necessary. The survey area is subdivided into different slices of similar quality demands. The quality aspects include the re-survey rate as well as survey standards.

<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 2025 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 2025:

114 Route Sassnitz 2 planned

209 zw. Rügen u. Bornholm S planned

307 Wismarbucht O planned

308 Rostock bis Darss in process

311 ostwärts Hiddensee in process

401 Darsser Ort finished

507 Ansteuerung Wismar finished

603 Trave bis Lübeck planned

### Wreck search

## BSH investigated 18 wrecks in 2024 in the Baltic Sea, one of them was new wreck, 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, spectrally-derived bathymetry, crowed-sourced bathymetry etc. can serve as complementary data sources to hydroacutic 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 continiously 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 and implemented 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 processing and analysis techniques. Of particular note are: (i) Implementation of a workflow that has already been successfully developed for fully automated, AI-based boulder detection in hydroacoustic data. This workflow is implemented in a graphical user interface that allows the training and evaluation of detection models, the execution of boulder detection models and the post-processing of detection results, all without the need for programming. (ii) Implementation of an automatic processing chain for the extraction of coastlines from multispectral aerial and satellite imagery. (iii) The use of deep machine learning techniques to process multispectral satellite image sequences enables the derivation of shallow water bathymetry. Tracking techniques are used to monitor changes in seabed topography. The result is a smart and agile hydrographic resource planning service, which is currently finalised as an operational service at BSH. (iv) Development of AI-based software to support the acquisition and analysis of ASV-borne hydroacoustic data. This flexible, sensor-manufacturer-independent modular software application should integrate real-time data processing to control the measurement platform and the sensors implemented on it. The aim of real-time analysis of the seabed and all influencing systems and environmental parameters is to significantly improve the performance of the autonomous measurement system and meet the data quality requirements, particularly in the field.

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**

The start of the shipbuilding project to replace the two Survey, Wreck Search and Survey Vessels DENEB and WEGA had to be postponed mainly due to several political and budgetary reasons. The assignment of the contract is currently planned hopefully December 2025. 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 where encountered since the last report.

## 3. New charts & updates

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

ENCs

The German waters are covered by 317 ENC cells in various navigational bands. All ENCs are updated on a weekly basis. The rescheming of the North Sea is complete and for the Baltic Sea completion is scheduled for summer 2025.

Reflecting demands from shipping industry, BSH published new HD ENC for the port of Mukran.

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.

bENC

All main shipping areas and routes covered with bENC. All bENC are updated on a weekly basis.

S-102 Datasets

As part of the Baltic Sea e-nav project engagements, BSH is producing and updating S-102 datasets for Kadetrenden and Port of Rostock approaches and harbour areas. The S-102 datasets are updated on daily basis.

INT charts

40 German published INT charts (for the North Sea, the Baltic Sea and Antarctic Waters) have been updated. 16 North Sea and 21 Baltic Sea INT charts in DIN A0 format, for which BSH acts as producer, are produced in co-operation with UKHO and are distributed through UKHO chart agents.

National paper charts for domestic waters

BSH has published and updated 54 North Sea and 44 Baltic Sea paper charts in DIN A1 format during the reporting period. 9 charts of the Off-Shore-Windparks (OWP) were withdrawn in 2024. Aiming improved production efficiency, and preparing the production system chart scale systematic for the S-100 implementation, national paper charts in A1 format will be replaced by paper charts in A0 format in the comming months.

**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 Q3 2025)

4001 Leuchtfeuerverzeichnis, südwestliche Ostsee

5000 Nautischer Funkdienst

20031 Ostsee-Handbuch, südwestlicher Teil

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**

BSH is continuing to set up a working environment to produce all S‑12x products by HPD. The current HPD setup is challenging though.

Using inhouse developed application, the BSH is able to generate the Catalogue of Nautical Products according to the S‑128 standard on a weekly basis. Please refer to:

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

Based on QGIS and HPD content, BSH is able to produce and update an S‑127 (Marine Traffic Management) dataset. In addition, a printed publication meeting the German carriage requirements can also be generated from this S-127 dataset. Due to legal constrains the download of the file is publicly not available. BSH is considering provision of an extract for test environments by the end of this year.

The current HPD set up in combination with an inhouse software allows publication of an S-125 (Marine Aids to Naviagtion) dataset on a weekly basis.

BSH is considering provision of an extract for test environments by the end of this year.

The next edition of the printed publications ”List of Lights” and ”Winter buoyages in German waters” will be based on this S-125 dataset.

## 5. MSI

**Existing infrastructure for transmission**

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

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 24/7 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 for the German area of responsibility are broadcasted on 518 kHz (international NAVTEX service) by the Swedish coastal radio station Gislovshammar 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.

BSH, GDWS and DWD are enganged to consider the implementation of the S-124 standard.

The work on the national S-100 concept is ongoing. This might also affect implementation of a new technical infrastructure to provide navigational warnings from the maritime warning center through BSH to the transmission 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 passage/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 |  |

1. **Capacity Building**

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

Supporting the ”Empowering Women in Hydrography” initiative, a colleague from Chile joint the Nautical Information Service Directorate for her secondment.

1. **Oceanographic activities**

The BSH operates several services such as daily water level forcasts, 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.

1. **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 - Hydrographic Services and Standards Committee,
* IRCC - Inter-Regional Coordination Committee,
* CBSC - Capacity Building Sub-Committee,
* 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 – The 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 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 ENCs workflow and the to improve the cooperation between Hydrograhic 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 ENCs/Paper charts and the bENC. In addition, S-102 data products are derived automatically from the DTM.

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

1. **Conclusions**

None