# 24 BSHC Conference
# National Report of Germany

September 2019

## Executive Summary

The present report outlines and summarizes the activities carried out since the 23nd BSHC Conference by the Federal Maritime and Hydrographic Agency (BSH). The report concentrates on the Baltic Sea.

Issues of special interest have been:

- Replacing the survey, wreck search and research vessel ATAIR. The new vessel will be equipped with a hybrid engine using mainly LNG (Liquid Natural Gas);
- Investigation of the regular use of communication satellites to broadcast the GNSS corrections to the survey vessels in a higher precision and in real-time;
- Automatic derived contour lines and soundings from a nautical high resolution DTM.

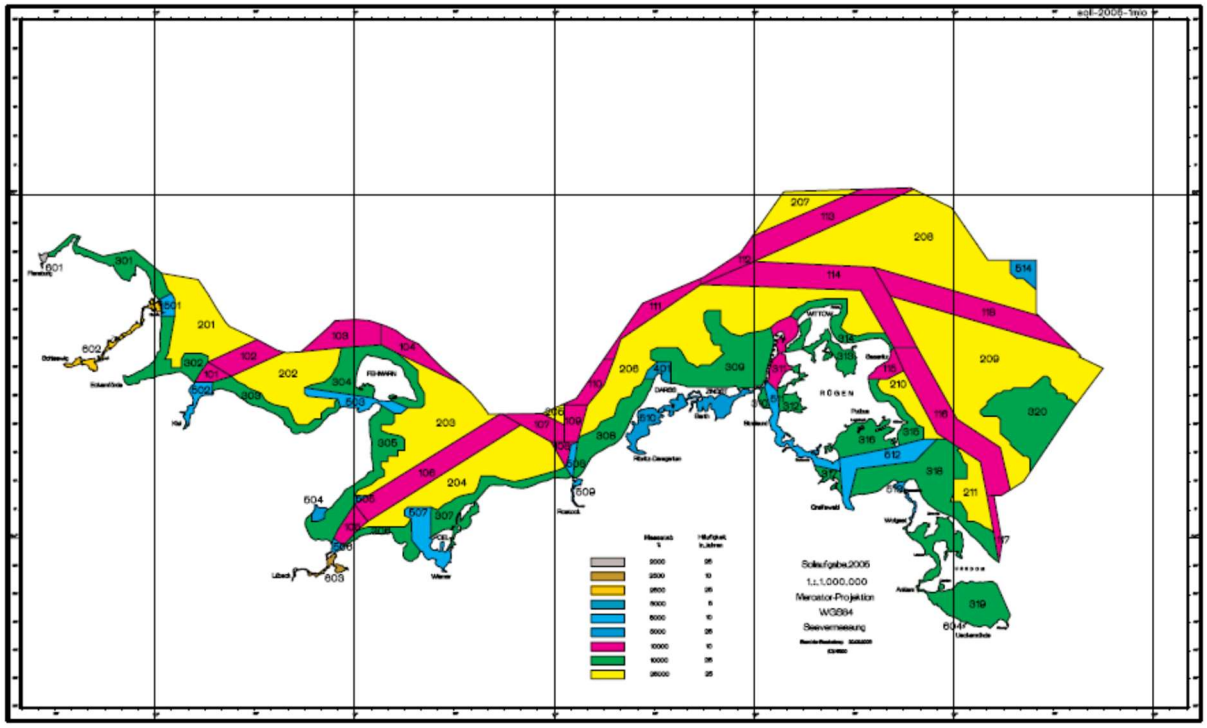
## 1. Hydrographic Office

The Bundesamt für Seeschifffahrt und Hydrographie (BSH, Federal Maritime and Hydrographic Agency of Germany) is an agency within the remit of the Federal Ministry of Transport, Building and Urban Development 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 situated in Rostock. Alongside the BSH the national Waterways and Shipping Administration (WSV) belonging to the same Ministry manages and maintains the federal maritime waterways.

## 2. Surveys

### Coverage of new surveys

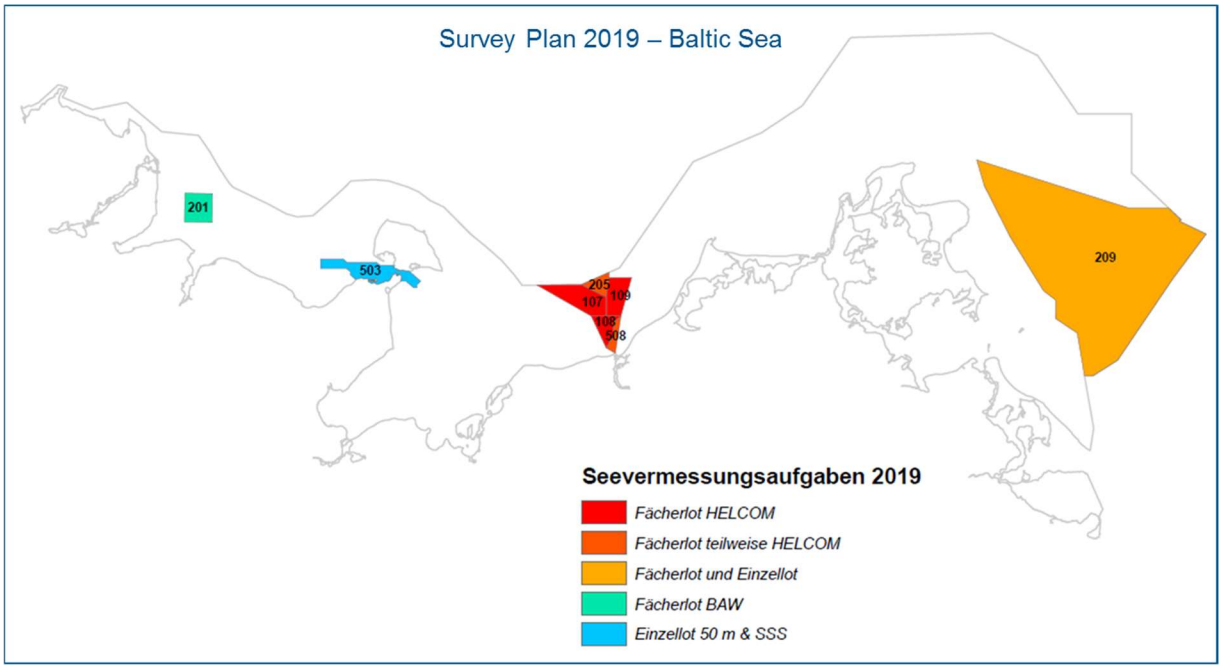
The BSH conducts hydrographic surveys on a general schedule, which is being updated on a yearly basis and amended if necessary. The survey area is subdivided into different slices of similar quality demands. The quality aspects include the re-survey rate as well as survey standards.



<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 2019 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 2019 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 2019:

| | | |
|---|---|---|
| 107 | Rostock T-Weg | in process |
| 108 | Ansteuerung Rostock | in process |
| 109 | Rostock – Kadetrinne | in process |
| 205 | Mecklenburger Bucht O | planned |
| 508 | Warnowmündung | in process |
| 209 | Oderbank | in process |
| 503 | Route Fehmarnsund | planned |
| 201 | Kieler Bucht Nord | planned |

**Wreck search**

BSH investigated 58 wrecks in 2018 in the Baltic Sea, eight of them were new found obstructions or wrecks, the others were reinvestigated on a regular schedule. 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 realization of BSH' concept for 3D positioning in sea surveying applications is finalized. Solely the problem of reliable and precices GNSS correction terms for the German EEZ in the North Sea is part of a further R&D study.

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

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 profiels using dense in situ measurements and distribution model data.

BSH is working intensively on automatic data analysis techniques like stone detection and classification in geometric and radiometric multibeam echosound data or coast line extraction from multi-spectral aerial imagery.

BSH is addressing virtual reality (VR) technologies in the context of operator-based data evaluation.

**New ships**

The survey, wreck search and research vessel ATAIR is going to be replaced by a new one in 2020.This new vessel will be equipped with modern hydrographic equipment and a hybrid engine using mainly LNG (Liquid Natural Gas).


**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 have been covered with 226 ENCs in various navigational bands. All the ENCs are updated on a weekly basis. Started with the approach cells of the German North Sea area a gridded cell system is going to be established.

**ENC Distribution method**
All the German produced ENCs and updates (ERs) are distributed through a network of IC-ENC authorized distributors.

**INT charts**
47 German published INT charts (for the North Sea, the Baltic Sea and Antarctic Waters) have been updated. For the Baltic Sea, BSH is the producer of 22 INT charts.
BSH has begun to change the paper size to DIN A0. Already 12 charts have been finished for the North Sea and 2 charts for the Baltic Sea yet.
In 2018 the 9th Edition of Chart 1 - Symbols, Abbreviations, Terms used on Paper Charts was published on behalf of the IHO.

**National paper charts for domestic waters**
BSH has published and updated 57 North Sea and 2 Baltic Sea DIN A1 papercharts. The remaining 12 larger size national charts for the Baltic Sea will be replaced by DIN A1 papercharts during the next years.
Additionally 4 SOLAS complient Small Craft Charts Series and a general planning chart are issued and updated for the German part of the Baltic Sea.

**National 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

**Withdrawal of paper charts for foreign waters**
The from PL adopted INT chart 1299 (DE 1517) was withdrawn and replaced by INT charts 12991 (DE 1518) and 12992 (DE 1519).

**Other charts, e.g. for pleasure craft**
For Polish waters, 3 Small Craft Charts Series are issued and updated in co-operation with the Polish Hydrographic Office (HOPN). Updates for all small craft charts via internet

**Problems encountered**
None

## 4. New publications & updates:

**New Publications**
None

## Updated Publications (September 2019)

| | | |
|---|---|---|
| **20031** | Ostsee-Handbuch, südwestlicher Teil<br>Flensburg bis Kolobrzeg und Flensburg bis Sandhammaren | 2019 |
| **20061** | Nordsee-Handbuch, südöstlicher Teil<br>Lister Tief bis Ems | 2018 |
| **4001** | Leuchtfeuerverzeichnis, südwestliche Ostsee | 2019 |
| **4003** | Leuchtfeuerverzeichnis südöstliche Nordsee | 2019 |
| **2011** | VTS Guide Germany | 2018 |
| **2115** | Gezeitentafeln Europäische Gewässer<br>Europäische Gewässer | 2019 |
| **2119** | Nachrichten für Seefahrer<br>Einzelbezug (analog/digital) | |
| **2119.1** | Nachrichten für Seefahrer<br>Monatsbezug (analog/digital) | |
| **2119.2** | Jahrgangs CD Digitale Nachrichten für Seefahrer<br>2017 oder 2018 | |
| **2175** | Nautisches Jahrbuch<br>Ephemeriden und Tafeln | 2019 |
| **5000** | Handbuch Nautischer Funkdienst | 2019 |
| **2155** | Funkdienst für die Klein- und Sportschifffahrt | 2019 |

**Superseded and updated publication**
Publication 5001 (Revierfunkdienst) has been superseded. The relevant content has been incorporated as Part D in both Sailing Directions (20031 and 20061).

**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-122 (Marine Protected Area) and S-123 (Radio Services) under development**
BSH is working on finalising the first S-122 and S-123 data sets. These data sets are S-100 compliant. They are GML based and can be used in future ECDIS for navigational purposes as well as in GIS applications.

## 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 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 naviagtional warnings**
BSH is engaged in the development of S-124. S-124 intends to provide navigatinal warnings in digital format which could be potentially projected on electronic charts. Several sea trials (such as under the STM-umbrella) show that this projection could improve the mariner’s situation awareness.

## 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 | |

## 7. Capacity Building

BSH is providing the chair of the Capacity Building Subcommittee since 2011 and the CB-Coordinator for the BSHC. A Cat A course in Hydrography is offered in English language at the Harbour City Universtity (HCU) in Hamburg.

## 8. 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.

## 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,
- S-100 WORKING GROUP, S101PT, S102 PT
- TWCWG - TIDES, WATER LEVEL AND CURRENTS WORKING GROUP
- HSPT – HSSC Project Team on Standards for Hydrographic Surveys.

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),
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.

Germany (BSH and BKG, Federal Agency for Cartography and Geodesy) is taking part in the FAMOS project, especially in relation to the vertical reference. In this framework, Germany conducts gravity measurement to improve the quality of the quasi geoid.

### 9.3 Automatic derived contour lines and soundings from a nautical high resolution DTM

The BSH work on the automatisation for a database-supported nautical surface of the German North- and Baltic Sea as well as for the German estuaries. This nautical surface is the essential condition for the upcoming BSH Service to provides bathymetric ENC (Additional Bathymetric Layer ABL) for the German Pilots and VTS.

Parallel to the BSH work, other HO´s change there workflows to optimise the production of contour lines and soundings. They are also involved in the development of new software tools to try finding new solutions. To harmonise the knowledge and to chair the ideas, Germany had arranged a workshop on this issue.

The BSH has invited to a joint workshop of data producers and software developers to exchange technical possibilities and requirements regarding the processing of bathymetric data and thus to receive valuable input for the development of efficient solutions in data management and the production of nautical data products.

The workshop was organized as result of the last meetings of BSHC and NSHC. A further goal of this workshop was to discuss and collect common requirements concerning high density ENCs using the current S-57 and concerning future S-102 gridded data.

## 10. Conclusions

None