



BALTIC SEA
HYDROGRAPHIC
COMMISSION



Baltic Sea Chart Datum 2000, S-104 and S-111

TWCWG Tides, Water Level and Currents
Working Group, 9th meeting, Monaco
2024-11-19

Thomas Hammarklint



Baltic Sea Hydrographic Commission (BSHC)



BALTIC SEA HYDROGRAPHIC COMMISSION

Home About Services Relations Working Groups Meetings Contact



The Baltic Sea Hydrographic Commission,

which is an integral part of the International Hydrographic Organisation (IHO), promotes the technical co-operation in the domain of hydrographic surveying, marine cartography and nautical information among the neighboring countries of the Baltic Sea region.

The main objectives of the Commission are the coordination of the production of the Baltic Sea INT Charts, the coordination of hydrographic re-surveys, harmonization of chart datums, harmonization of Baltic Sea ENCs, and the exchange of information and the harmonization of practices with regard to various issues related to hydrography.

The most recent development is the [Baltic Sea Bathymetric Database](#) – accessible via this portal.

International Hydrographic Organization

The International Hydrographic Organization is an intergovernmental consultative and technical organization that was established in 1921 to support safety of navigation and the protection of the marine environment. The object of the Organization is to bring about:

- The coordination of the activities of national hydrographic offices
- The greatest possible uniformity in nautical charts and documents
- The adoption of reliable and efficient methods of carrying out and exploiting hydrographic surveys
- The development of the sciences in the field of hydrography and the techniques employed in descriptive oceanography

You are here: Home

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Chart Datum, Water level and Currents Working Group (CDWCWG)

Chart Datum, Water level and Currents Working Group (CDWCWG)

"To implement a common reference system, S-104 and S-111 in the Baltic Sea"

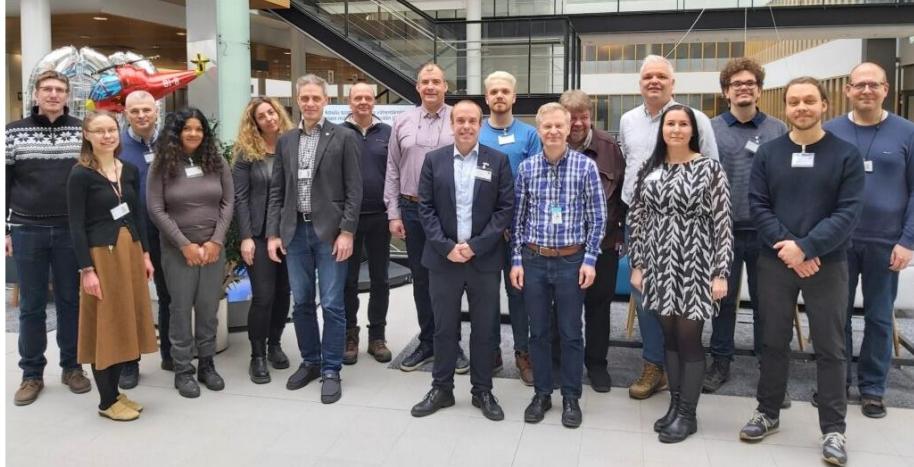


Photo: Chart Datum, Water level and Currents Working Group 1st meeting, 26-27 March 2024, Helsinki, Finland

<https://www.bshc.pro/working-groups/cdwccwg>

Members of CDWCWG:

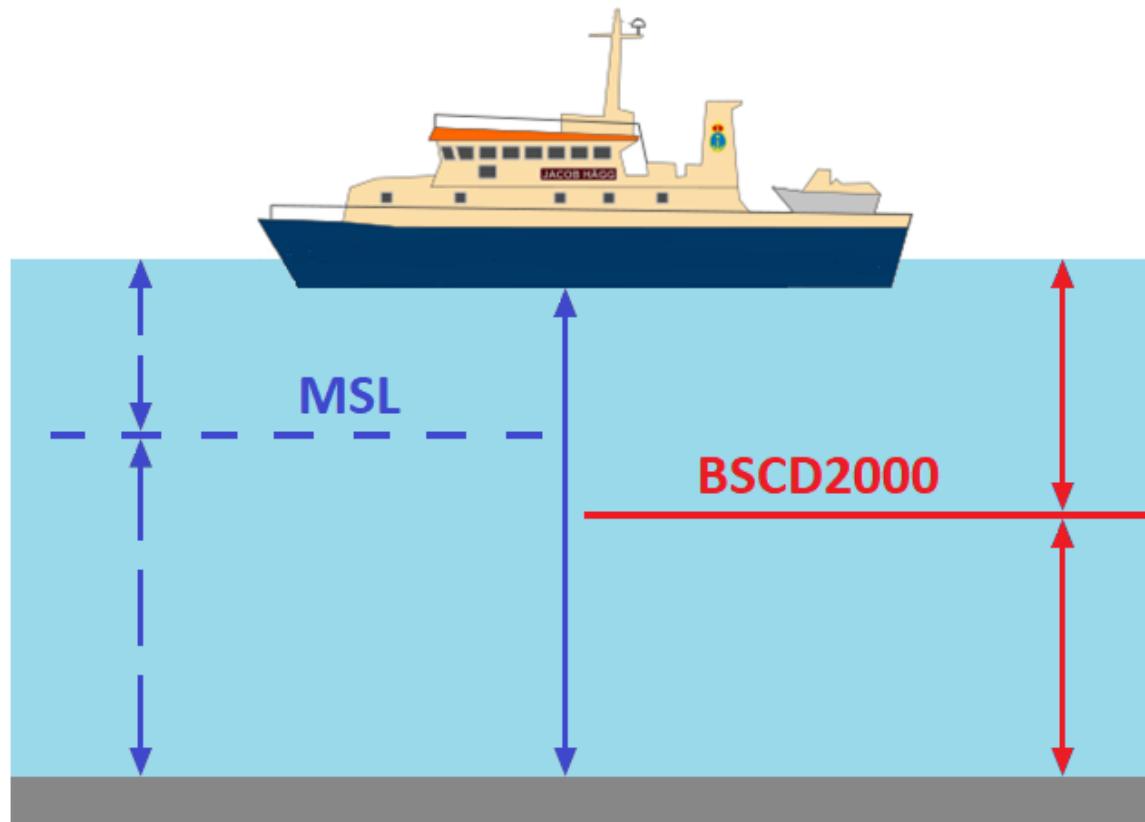
Denmark	Mr Nikolaj Møller
Denmark	Mr Kristian Villadsen Kristmar
Estonia	Mrs Gabriela Kotsulim
Finland	Mr Jyrki Mononen
Finland	Mrs Anni Jokiniemi
Germany	Dr Patrick Westfeld
Latvia	Mr Bruno Špēls
Lithuania	Mr Mindaugas Zakarauskas
Poland	Mr Witold Stasiak
Poland	Mrs Alicja Olszewska
Russia	Mr Leonid Shalnov
Russia	Dr Sergey V. Reshetniak
Sweden	Mr Thomas Hammarklint (Chair)
Sweden	Mr Henrik Tengbert

Observers and Experts:

Estonia	Prof. Artu Ellmann
Estonia	Dr Sander Varbla
Estonia	Dr Nicole Camille Delpeche-Ellmann
Finland	Mr Jarmo Mäkinen
Finland	Dr Jani Särkkä
Finland	Dr Mirjam Bilker-Koivula
Finland	Dr Timo Saari
Germany	Dr Gunter Liebsch
Germany	Dr Joachim Schwabe
Latvia	Mr Armands Murans
Latvia	Mr Krists Dzenis
Lithuania	Mr Emīlis Tertelis
Lithuania	Mr Romuald Obuchovski
Norway	Mr Aksel Voldsund
Poland	Mr Krzysztof Pyrchała
Poland	Mrs Małgorzata Pająk
Poland	Dr Monika Wilde-Piórkko
Poland	Dr Małgorzata Szelachowska
Sweden	Dr Jonas Ågren
Sweden	Dr Per-Anders Olsson
Sweden	Mrs Johanna Linders



New reference level



The water depth remains!

Baltic Sea Chart Datum 2000 (BSCD2000)

➤ Definition:

The datum refers to each Baltic country's realization of the European Vertical Reference System (EVRS) with land-uplift epoch 2000, which is connected to the Normaal Amsterdams Peil (NAP).

➤ Justification:

The Baltic Sea is an international shallow, non-tidal area in the northern part of Europe with dense traffic. IHO BSHC has approved the name and the adoption of the Baltic Sea Chart Datum 2000 ([specification](#)).

➤ Height systems used as national realization of BSCD2000 (EVRS-based):

Sweden RH2000	Denmark DVR90	Germany DHHN2016
Poland PL-EVRF2007-NH	Lithuania LAS07	Latvia LAS2000,5
Estonia EH2000	Finland N2000	Norway NN2000

➤ Chart datum name to be shown in paper charts and water level information:

Mean Sea Level (Baltic Sea Chart Datum 2000^{national realization name})

Mean Sea Level (Baltic Sea Chart Datum 2000)

Baltic Sea Chart Datum 2000^{national realization name}

Baltic Sea Chart Datum 2000

BSCD2000 (national realization name)

BSCD2000

National realization name

CHART DATUM: Mean Sea Level (Baltic Sea Chart Datum 2000^{RH2000})

REFERENSNIVÅ: Medelvattenytta (Baltic Sea Chart Datum 2000^{RH2000})

SYMBOLS and ABBREVIATIONS: see INT 1

BETECKNINGAR och FÖRKORTNINGAR: se KORT 1

Referensnivå



SWEDISH MARITIME
ADMINISTRATION

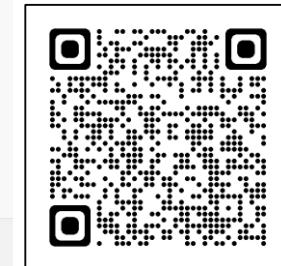
Baltic Sea Chart Datum 2000 in IHO Registry

BSCD2000 is now included in IHO Geospatial Information (GI) Registry, as chart datum number 44:

The screenshot shows the IHO Geospatial Information Registry's Data Dictionary Register. The left sidebar includes links for HOME, HELP&GUIDANCE, GI REGISTERS, PROPOSAL, TEST BED, Open Online Platform, and 2nd GI Registry(Old). The main content area displays the following information for BSCD2000:

[Listed Value] Dictionary Details		
Domain	IHO Hydro	
Name	Baltic Sea Chart Datum 2000	
CamelCase	balticSeaChartDatum2000	
Item identifier	1213 ?	
Definition	The datum refers to each Baltic country's realization of the European Vertical Reference System (EVRS) with land-uplift epoch 2000, which is connected to the Normal Amsterdams Peil (NAP).	
Data type	Enumerated value	
Associated Attribute	Attribute type	Name
	Enumerated type	Vertical Datum
Reference		
Reference Source	Baltic Sea Hydrographic Commission	

At the bottom, there is a copyright notice: COPYRIGHT © IHO Geospatial Information Registry. ALL RIGHTS RESERVED. and a link to KHOA Acknowledgements.



Implementation status Baltic Sea 2024

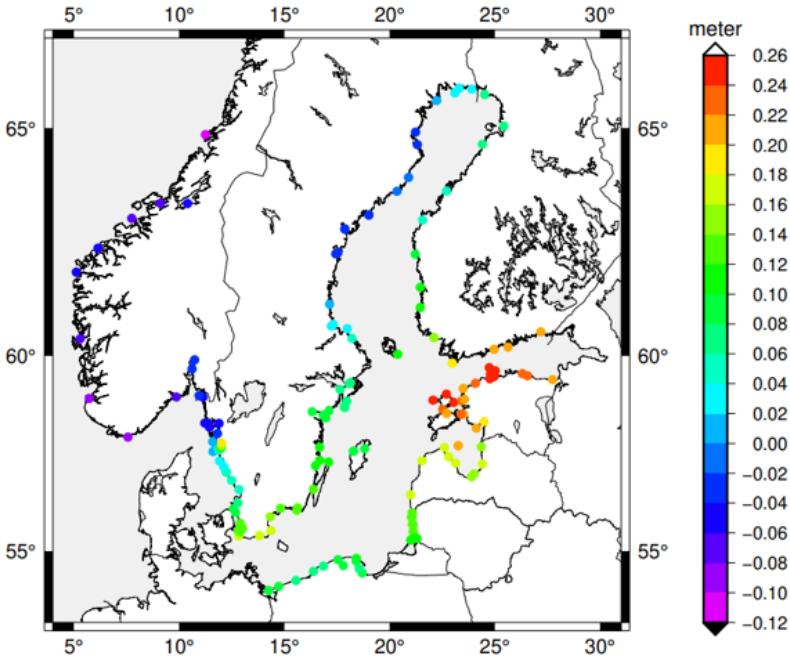
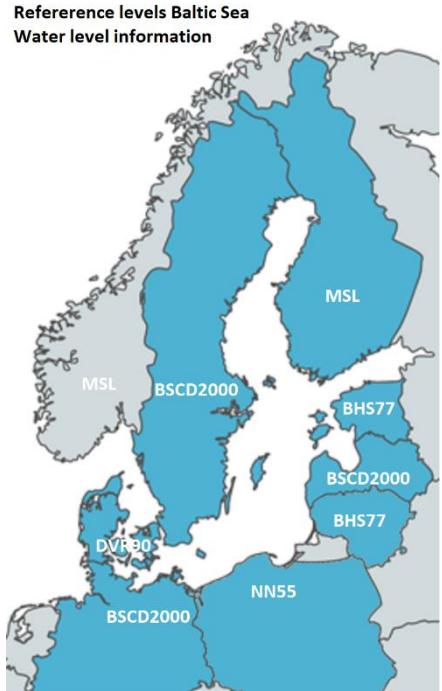
Summary implementation of BSCD2000, S-104 and S-111 status 2024:

Country	Status BSCD2000 for charts	Status BSCD2000 for water level (see mwreg_boos)	Status S-104/S-111
Denmark	Chart datum in practice close to EVRS-based chart datum (DVR90). BSCD2000 is implemented in ENC and will be implemented in paper charts in the order of reprinting.	All Danish water level stations are connected to DVR90 (BSCD2000). Data distributed to BOOS/CMEMS in relation to DVR90 . Responsibility of Danish Meteorological Institute (DMI), Danish Coastal Authority (Kystdirektoratet) and Danish Environmental Protection Agency (Miljøstyrelsen).	DMI and FCOO (Forsvaret Center for Operativ Oceanografi) is responsible for water level and current information. Aim to have a plan for S-104 and S-111 in 2024. DGA and DMI coordinates the work.
Estonia	All decisions are taken and the implementation is ongoing. Official use in charts and water level information from 2018-01-01. Notices to Mariners 2022-12-01, Info Sheet . Web application Nutimeri displays Estonian Transport Administration's official electronic navigational charts.	All Estonian water level stations are connected to EH2000 (BSCD2000). Data distributed to BOOS/CMEMS in relation to BK77 (old system) . The difference between BK77 and EH2000 reaches up to 26 cm in the Gulf of Finland. Responsibility of Talltech Marine Systems Institute (MSI) and Estonian Environmental Agency (EEA).	Discussions are ongoing between EMA and MSI. MSI and EEA are responsible for water level and current information. EMA coordinates the work.
Finland	Ongoing. All decisions are taken already in 2008 and 2015. Approach charts from Tornio to Vaasa have been published. The publication status of N2000 charts and Finnish nautical charts portfolio . New video about the N2000 fairway and nautical chart reform.	Water level information provided in both systems, mean sea level (MSL) and N2000 (BSCD2000). The differences between MSL and N2000 is provided as a Table . Water level observations and forecasts will be available in N2000 for the public simultaneously with Traficom nautical charts. Data distributed to BOOS/CMEMS in relation to MSL . Responsibility of Finnish Meteorological Institute (FMI).	The first test products of S-104 and S-111 will be created by FMI in the Baltic Sea e-Nav-project until 2026. FMI is responsible for water level and current information. Traficom and FMI coordinates the work.
Germany	EVRS realization in use in practice. The vertical chart datum of BSCD2000 is close to the national height system of Germany (ETRS1989+DHHN2016). All published products will refer to this datum. In August 2021, BSCD2000 was officially introduced as chart datum for German waters in the Baltic Sea . The official introduction was decreed in January 2018 and is binding for all institutions coming under the jurisdiction of the Federal Waterways and Shipping Administration (WSV).	All German water level stations refers to the national height system DHHN2016 (BSCD2000). Data distributed to BOOS/CMEMS in relation to DHHN2016, but metadata refers to SNN76/Kronstadt (old system) . Responsibility of Federal Waterways and Shipping Administration (WSV).	BSH is responsible for water level and current information. BSH coordinates the work.
Latvia	Implementation continues. New national height system LAS-2000,5 (BSCD2000) into use in 2015. LAS-2000,5 to new editions of charts in a following sequence – harbour charts, coastal charts, general charts. Harbour charts are either already implemented to LAS-2000,5 or they are in progress. Differences between BAS-77 and LAS-2000,5 is well known and shown in chart notes.	All water level stations is connected to LAS-2000,5 (BSCD2000). Data distributed to BOOS/CMEMS in relation to LAS-2000,5 . Responsibility of Latvian Environment, Geology and Meteorology Centre (LVGMC).	Meeting between MAL and LVGMC officials has been held about S-104 and S-111. MAL coordinates the work.
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.	All water level stations is connected to LAS-07 (BSCD2000). Data distributed to BOOS/CMEMS in relation to BHS-77 (old system) . Responsibility of Lithuanian Hydrometeorological Service (LHMS).	Data owner has been identified. LHMS is responsible for water level information and Klaipeda University (KU) for currents. LTSA coordinates the work.
Poland	A written decision was issued by HOPN in July 2021 - Guidelines and timetable for the implementation of PL-EVRF2007-NH (BSCD2000). Bathymetric data transferred to the vertical reference system PL-EVRF2007-NH. Information campaign about the new chart datum. 2021 and onwards new editions of all INT harbour, approach and coastal charts.	All water level stations is connected to PL-EVRF2007-NH (BSCD2000). Data distributed to BOOS/CMEMS in relation to Amsterdam NN55, but metadata refers to BHS77 . The difference between the NN55 and PL-EVRF2007-NH is less than 9 cm. Responsibility of Institute of Meteorology and Water Management (IMGW-PIB).	Agreement with IMGW and Institute of Oceanology of the Polish Academy of Sciences (IOPAN) to provide observed and modelled water level and surface currents data, respectively. HOPN coordinates the work.
Sweden	Ongoing. All decisions are taken. Many charts (ca 50%) already published. Implementation is a part of the "Chart Improvement Project", to be concluded at the latest in 2030. Information campaigns is ongoing for ports, pilots and other interested parties. Notices to Mariners 2019-05-15 . Several articles written in magazines and on webpages.	All water level information is presented in relation to RH2000 (BSCD2000), since 2019-06-03. Some applications can also present data in relation to mean sea level (MSL). The differences between MSL and RH2000 is provided in this Table . Data distributed to BOOS/CMEMS in relation to BSCD2000 . Responsibility of Swedish Maritime Administration (SMA) and Swedish Meteorological and Hydrological Institute (SMHI).	Discussions started between SMA and SMHI. SMA take part in the BS e-Nav-project in cooperation with FMI on this. We will investigate this in 2024 and take further actions in 2025. SMA coordinates the work.

2024-03-26



Reference levels in the Baltic Sea



BOOS SEA LEVEL STATIONS 2021
Mean Sea Level (MSL) in different height systems
MSL based upon regression analysis since measurement start (Sweden)
* = Correction of provided sea level data to BOOS to the Baltic Sea Chart Datum 2000 (BSCD2000)

COUNTRY	OWNER	NR	STATION NAME	LATITUDE	LONGITUDE	RH2000	Apparent (relative) cm/year	Correction * to landshaft m/year	BSCD2000
SWEDEN	SMHI	258/33088	Härjedalen discontinued	65.771667	23.903056	5.9	0.72	0.059	
SWEDEN	SMA	59/35103	KALIX KARLSBORG	65.788888	23.303333	6.1	0.72	0.061	
SWEDEN	SMHI	215/353051	KALIX STÖRN	65.696944	23.096113	5.3	0.73	0.053	
SWEDEN	SMA	115/35183	STRÖMAREN	65.549722	22.238333	4.4	0.75	0.044	
SWEDEN	SMHI	205/353052	FURUJØRUND	64.915813	21.230556	0.5	0.82	0.005	
SWEDEN	SMA	40/35140	GÅRDAREN	64.678613	21.219167	0.8	0.82	0.006	
SWEDEN	SMHI	205/353053	KÄTAN	64.383111	20.899202	2.4	0.80	0.004	
SWEDEN	SMA	57/35114	HOLMÅSUND	63.695833	20.347223	1.4	0.80	0.014	
SWEDEN	SMHI	232/353054	SKAGUDÖSE discontinued	63.190556	19.012500	-0.4	0.80	-0.004	
SWEDEN	SMA	110/35138	SKAGUDÖSE2	63.190556	19.012500	-0.4	0.80	-0.004	
SWEDEN	SMA	177/35209	LUNDEN	62.880556	17.876389	0.1	0.77	0.001	
SWEDEN	SMHI	206/353074	Draghalsen discontinued	62.333333	17.466667	0.7	0.74	0.007	
SWEDEN	SMHI	206/353055	SPIKARNA	62.363333	17.531111	0.7	0.74	0.007	
SWEDEN	SMHI	66/35127	LIUSNE ORRSKÄRSKAJEN	61.206944	17.145556	3.5	0.64	0.035	
SWEDEN	SMA	33/35119	BONAN	60.738613	17.048413	5.0	0.58	0.050	
SWEDEN	SMA	34/35120	GÅS	60.666667	17.048413	5.0	0.58	0.050	
SWEDEN	SMHI	206/353075	Björn discontinued	60.633333	17.066667	5.6	0.56	0.056	
SWEDEN	SMA	217/353054	FORSMARK	60.406611	18.210333	6.3	0.53	0.063	
SWEDEN	SMHI	67/35154	LOUDEN	59.341389	18.137222	8.4	0.38	0.084	
SWEDEN	SMHI	206/353057	STOCKHOLM	59.324167	18.081944	8.5	0.38	0.085	
SWEDEN	SMHI	173/35112	NYÅRS FISKEHAMN	59.817500	17.972222	8.1	0.31	0.081	
SWEDEN	SMHI	250/353058	LÄNSDÖRT NORRA	59.768889	17.858889	8.3	0.29	0.083	
SWEDEN	SMHI	207/353073	LÄNSDÖRT discontinued	59.750000	17.866667	8.3	0.29	0.083	
SWEDEN	SMHI	34/35124	EÅN BRON SÖDERÅLE	59.700000	17.866667	8.2	0.33	0.082	
SWEDEN	SMA	102/35118	ÖGDÖ OSUND VINTERÅSEN	58.635667	17.124722	9.3	0.30	0.059	
SWEDEN	SMA	58/35101	JUTER	58.634167	16.324722	9.8	0.25	0.098	
SWEDEN	SMHI	207/353059	Maryiken discontinued	58.553611	16.837333	9.8	0.25	0.098	
SWEDEN	SMHI	254/353085	ÅRÖ	58.484167	16.960556	9.8	0.25	0.098	
SWEDEN	SMA	93/35151	VÄSTERVIK	57.748333	16.675272	11.0	0.16	0.110	
SWEDEN	SMA	81/35114	SLUTE	57.705833	18.810000	9.0	0.12	0.090	
SWEDEN	SMHI	208/353086	VISBY	57.639167	18.284444	9.0	0.12	0.090	
SWEDEN	SMA	77/35204	SIMPEVARP	57.410278	16.678833	11.7	0.12	0.117	
SWEDEN	SMHI	208/353061	ÖLÅNGA NORRA UDDE	57.366111	17.048413	11.4	0.12	0.116	
SWEDEN	SMHI	209/353062	ÅGRÄSHAMN	57.333333	17.016667	12.0	0.12	0.120	
SWEDEN	SMA	60/35105	KALMAR	56.633889	16.378333	12.5	0.06	0.125	
SWEDEN	SMHI	209/353063	KUNGSHOLMSFORT	56.105278	15.584944	13.3	0.01	0.133	
SWEDEN	SMA	61/35131	KÄRLSHAMN	56.151467	14.821389	13.8	-0.01	0.138	
SWEDEN	SMHI	254/353083	Älvsnäs discontinued	55.928333	14.328611	15.1	-0.05	0.151	
SWEDEN	SMHI	232/353064	SHIRSMÄRHM	55.557500	14.357778	16.0	-0.08	0.160	
SWEDEN	SMA	55/35128	Ystad discontinued	55.426944	13.825333	15.8	-0.07	0.158	
SWEDEN	SMA	94/35159	YSTAD	55.422778	13.825556	15.8	-0.07	0.158	

Reference levels used in the Baltic Sea and differences with respect to the Baltic Sea Chart Datum 2000 (BSCD2000). In Sweden and Finland, the old reference levels are equal to Mean Sea Level (MSL) transferred to year 2025 (according to different national conventions). The values from Norway shows the MSL over the period 1996-2014, relative NN2000/BSCD2000. In Estonia, Latvia and Lithuania, the Kronstadt datum was previously used as chart datum. In Poland, the local Polish Height System Amsterdam NN₅₅ was used as chart datum. Notice how postglacial rebound reduces the magnitude of the MSL in the Bay of Bothnia. The values are shown in this [Table](#).



Notices to Mariners (NtM)

* 14040

**Sweden. not area bound. New reference system for sea level, nautical charts and warnings.
BSCD2000 / RH 2000.**

Expired notices: 2019:754/13917

See: 2018:716/13140

As of June 3, 2019, the Swedish national height system 'Rikets Höjdsystem 2000', or RH 2000 (international name 'Baltic Sea Chart Datum 2000', BSCD2000) will constitute the reference level for observations and forecasts of the water level in Swedish waters.

The zero level in RH 2000 is fixedly linked to land, and is not affected by land uplift, changes in sea level or geographical variations.

The change means that observations, forecasts, and warnings in the Swedish Maritime Administration's and Swedish Meteorological and Hydrological Institute's (SMHI) viewing services from 3 June 2019, or soon thereafter, refer to the new reference level and no longer to the 'mean sea level'.

The Swedish Maritime Administration is gradually adapting the charts to the new reference system. This is a time consuming process which will take several years to complete. During the transition period, it is important to know which reference level is used in the different charts. If the text 'Baltic Sea Chart Datum 2000', or 'BSCD2000' is printed in the chart, the update has been performed.

More information: www.sjofartsverket.se/RH2000 and www.smhi.se

www.sjofartsverket.se/RH2000 www.smhi.se

SMHI och Sjöfartsverket. Publ. 15 May 2019



A uniform reference system from land to sea

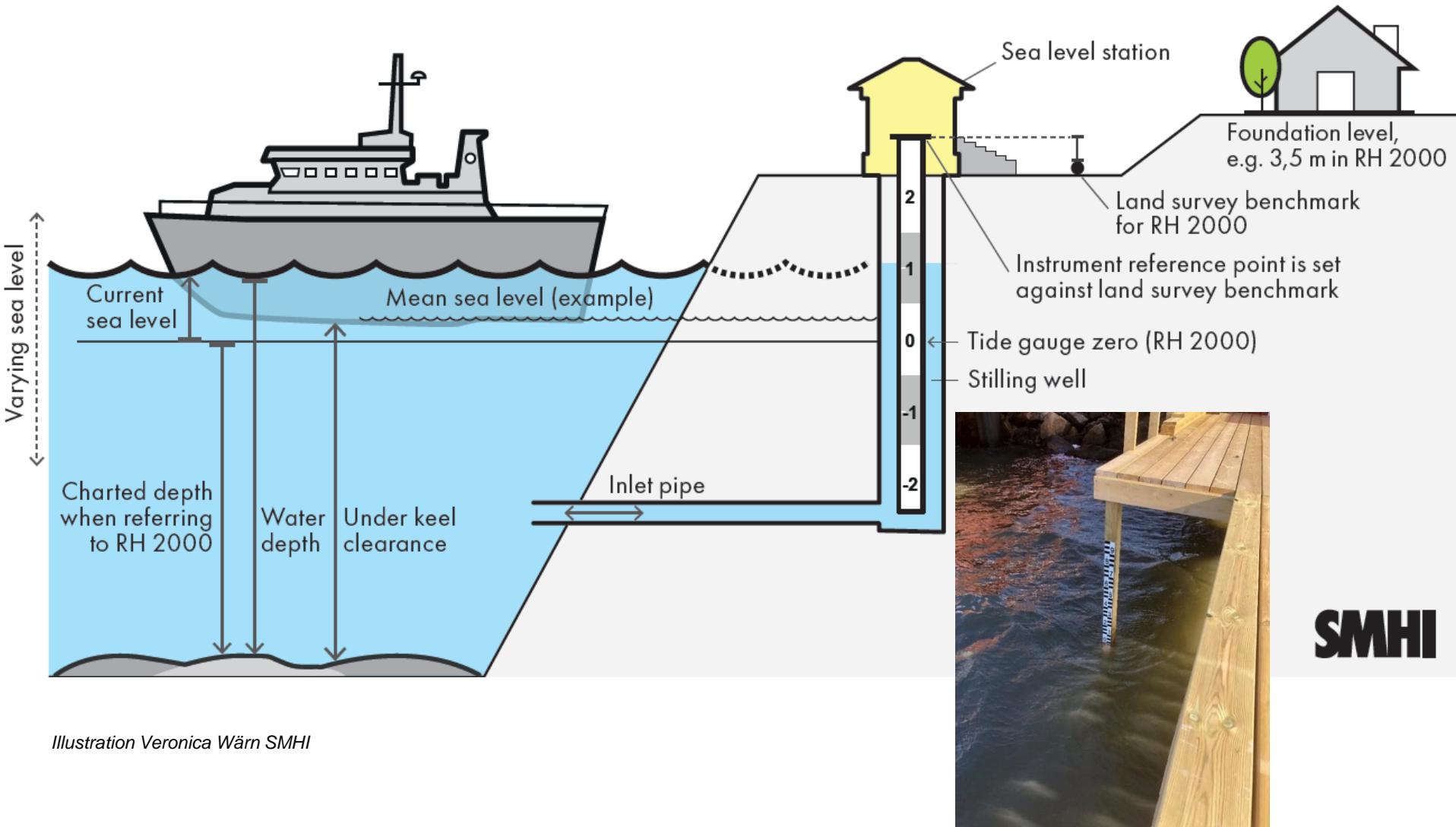


Illustration Veronica Wärn SMHI

SMHI



Swedish Sea Level Network



- Real-time data relative BSCD2000 from 60 stations
- 1-minute values with 1 cm accuracy
- Real-time and delayed mode quality control



Class I	Upgrade with battery backup
Class II	Upgrade without battery backup
Class III	Unchanged, temporary

27 stations (23 SMHI, 3 SMA, 1 CTH)
27 stations (23 SMA, 3 GBG, 1 SKB)
6 stations (6 SMA)

Present water level information are shown in Wind- and Water Information ([ViVa](#))

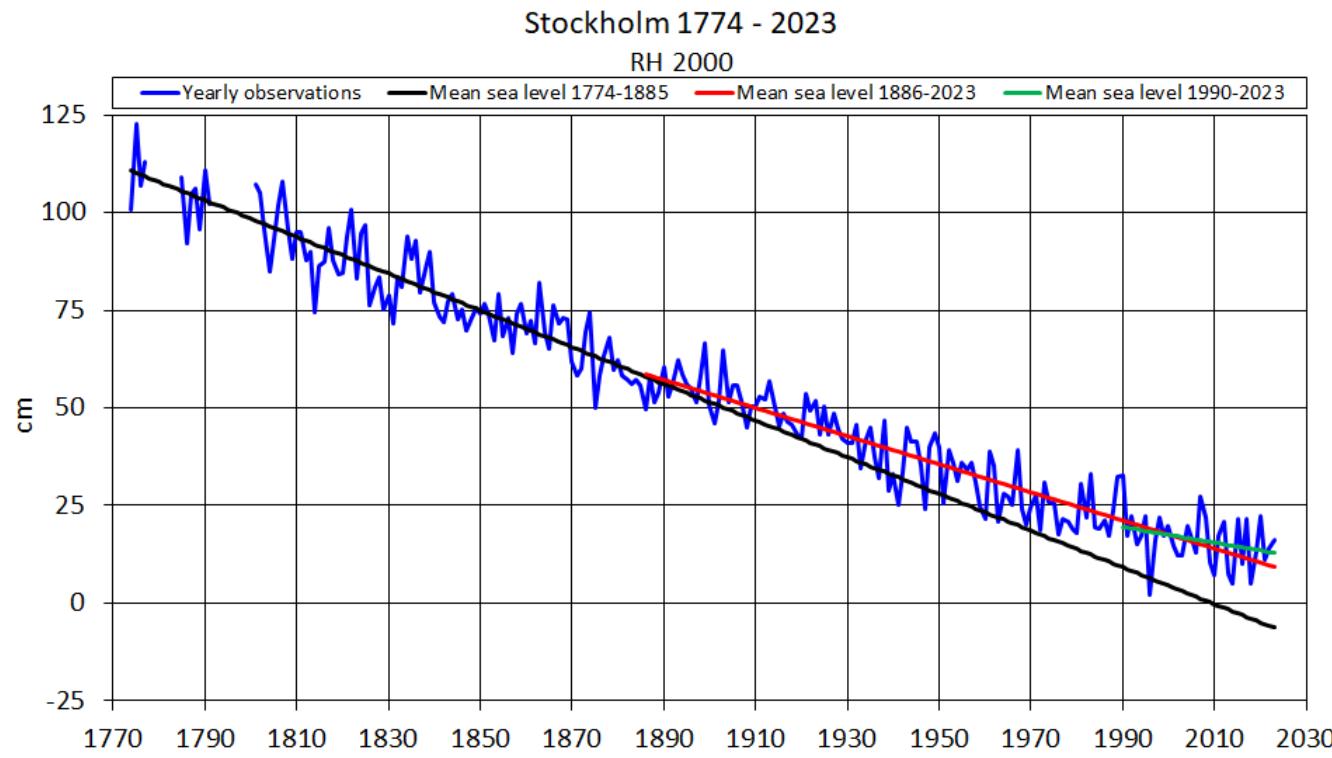
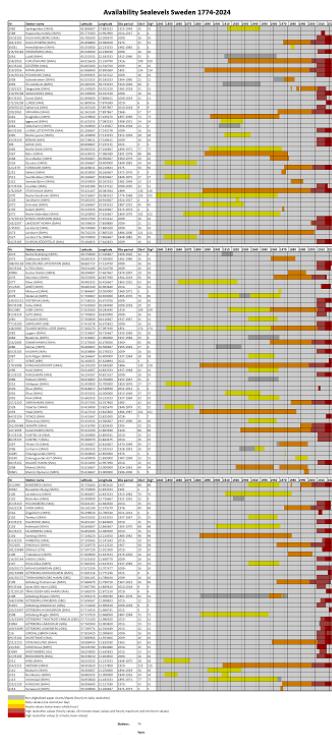
Swedish Sea Level observations 1774-2024

- First observations started in Stockholm 1774
- 140 sea level stations/records, 60 stations are active (2024)
- 4998 years of observations, 4630 years of data are digitalized (93%)
- 2240 years from continued stations, 100% digitalized

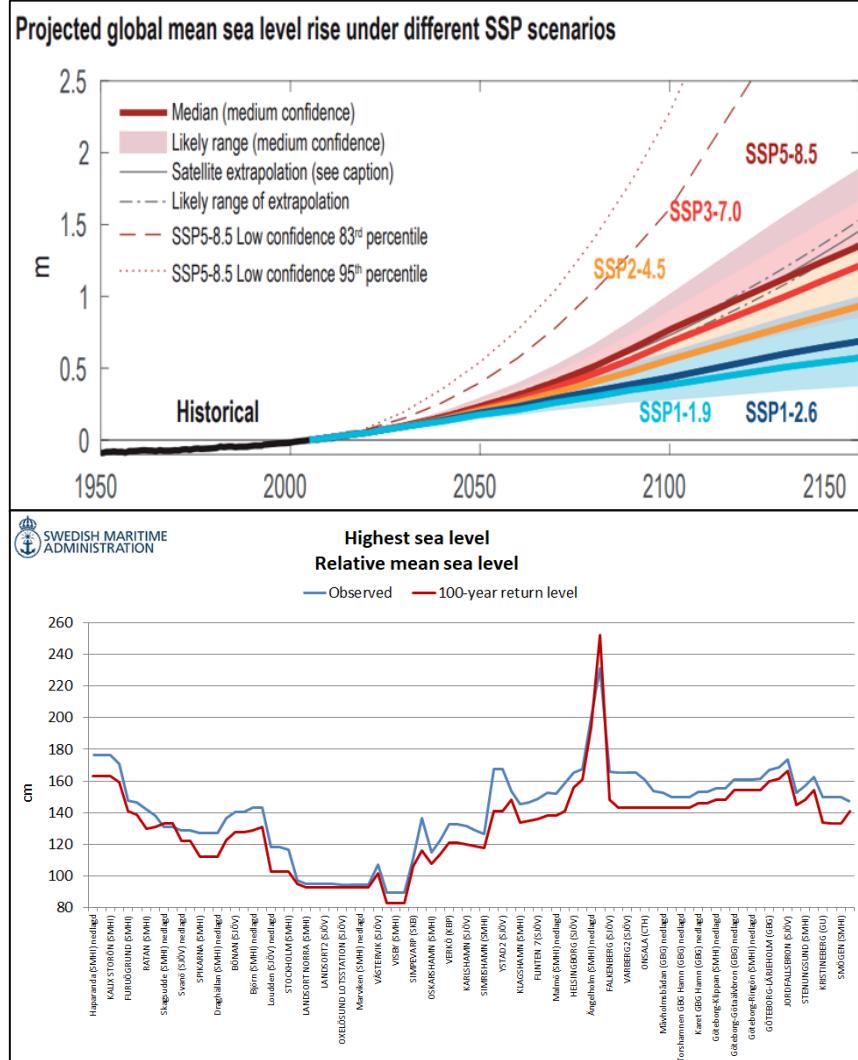
High-Resolution data (1-15 minutes)

Hourly values

Daily values



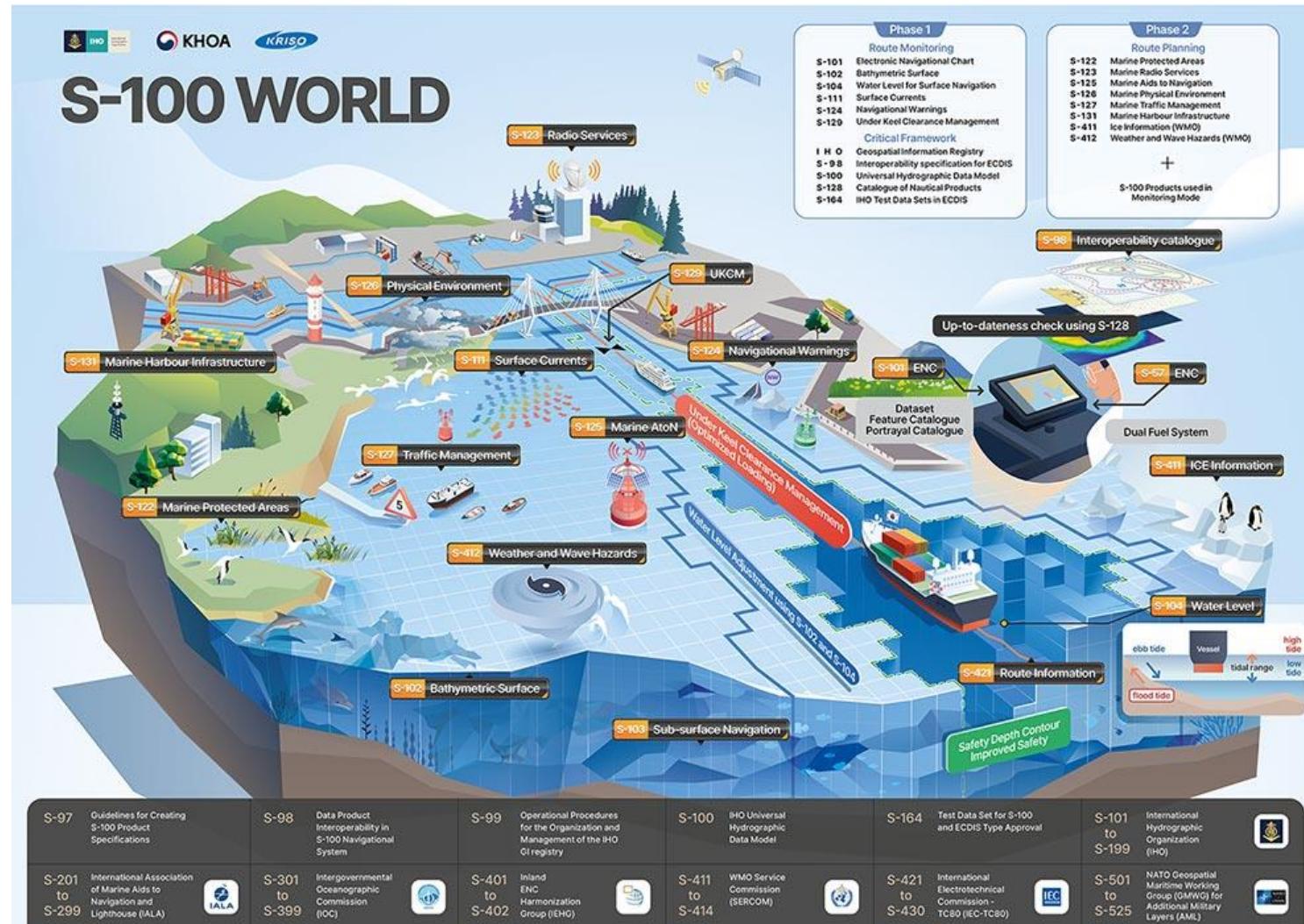
Future sea levels / climate adaptation



Future Maritime Services S-100



IHO



S-97 Guidelines for Creating S-100 Product Specifications

S-98 Data Product Interoperability in S-100 Navigational System

S-99 Operational Procedures for the Organization and Management of the IHO GI registry

S-100 IHO Universal Hydrographic Data Model

S-164 Test Data Set for S-100 and ECDIS Type Approval

S-101 to S-199 International Hydrographic Organization (IHO)

S-201 to S-299 International Association of Marine Aids to Navigation and Lighthouse (IALA)



S-301 to S-399 Intergovernmental Oceanographic Commission (IOC)



S-401 to S-402 Inland ENC Harmonization Group (IEHG)



S-411 to S-414 WMO Service Commission (SERCOM)



S-421 to S-430 International Electrotechnical Commission - TC80 (IEC-TC80)



S-501 to S-525 NATO Geospatial Maritime Working Group (GMWG) for Additional Military Layers (AML)



SWEDISH MARITIME ADMINISTRATION



S-100 Implementation

IHO S-100 Implementation Strategy

Table A – IHO list of S-100 products with special focus

First step – Route monitoring mode

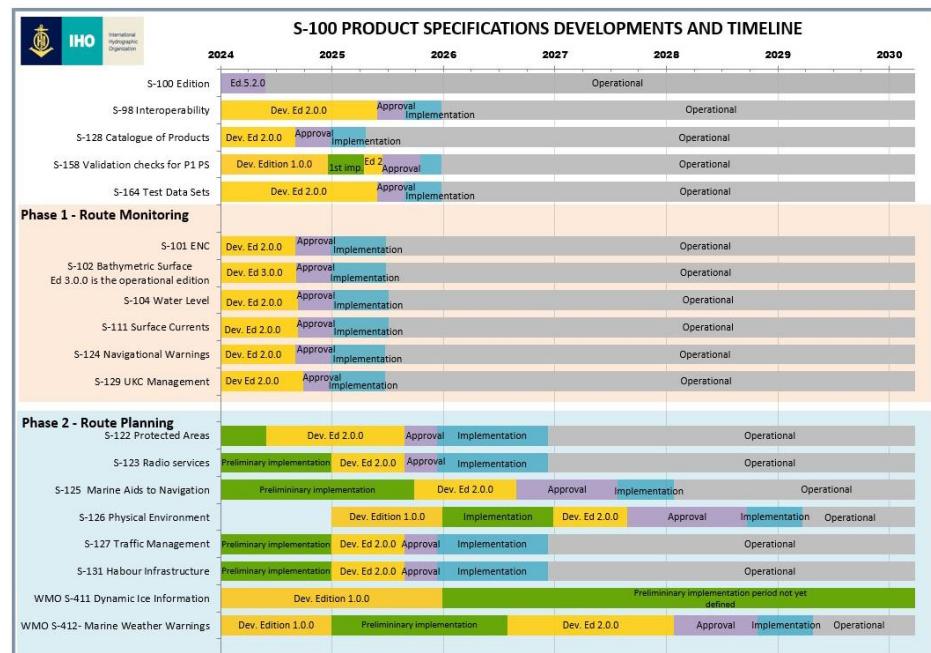
S-101	Electronic Navigational Chart (ENC)
S-102	Bathymetric Surface
S-104	Water Level Information for Surface Navigation
S-111	Surface Currents
S-124	Navigational Warnings
S-129	Under Keel Clearance Management

Critical Framework

	IHO Geospatial Information Registry
S-98	Interoperability Specification
S-100	Universal Hydrographic Data Model
S-128	Catalogue of Nautical Products
S-164	Test Data Set for S-100 and ECDIS Type Approval

Second step – Route planning mode

S-122	Marine Protected Areas
S-123	Marine Radio Services
S-125	Marine Aids to Navigational (AtoN)
S-126	Marine Physical Environment
S-127	Marine Traffic Management
S-131	Marine Harbour Infrastructure



This S-100 timeline is updated: 02.07.2024

2025

2026
Ships allowed
to use S-
products

2027

2028

2029
S-products
are
mandatory



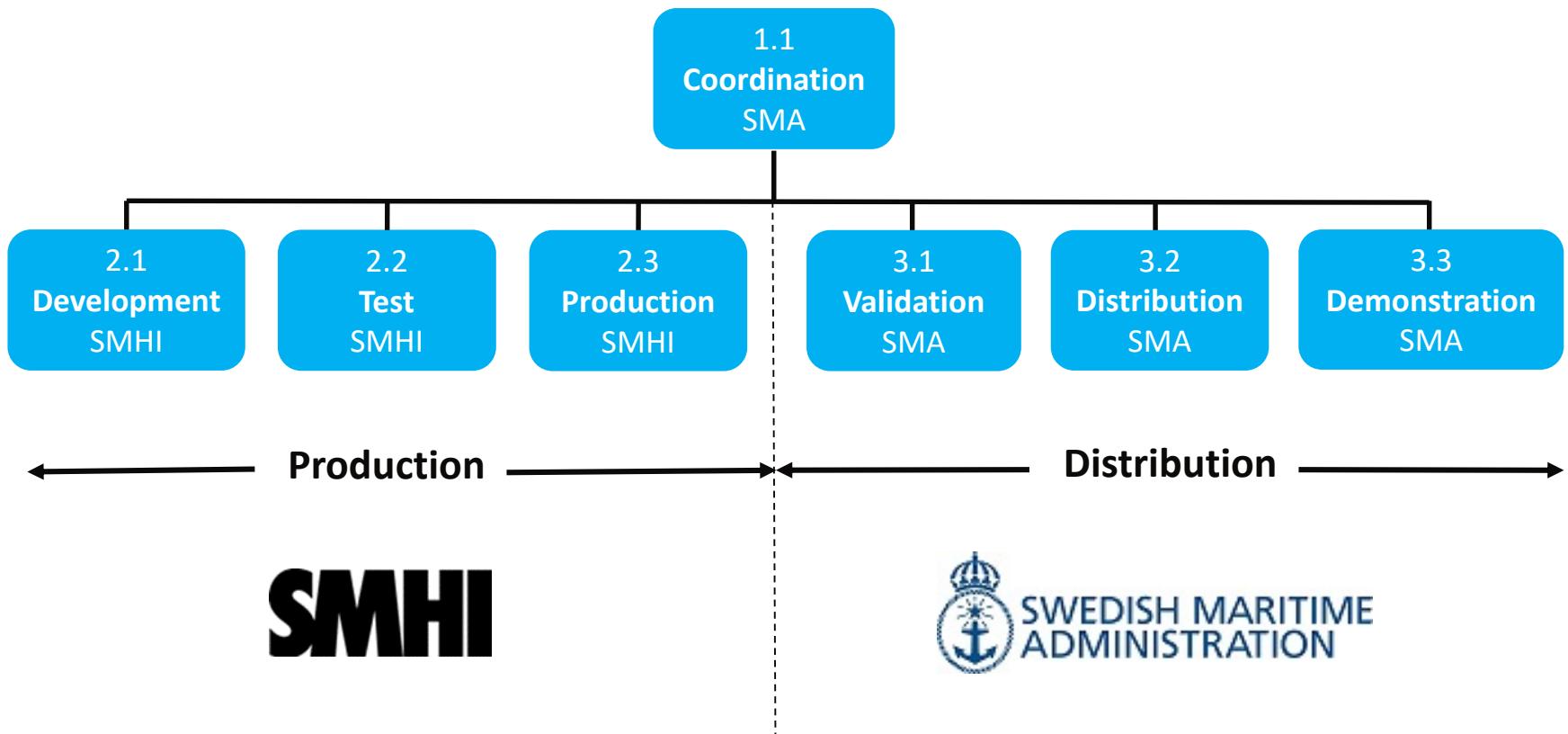
S-100 Implementation Sweden

Products	2024	2025	2026	2027	2028	2029	2030	2031	2032
ENC S-101									
Bathymetry S-102									
Ensuring confidentiality rules for S-102									
Catalogue of Nautical Products S-128 via PRIMAR									
Water Level S-104 (in cooperation with SMHI*)									
Surface Currents S-111 (in cooperation with SMHI*)									
Navigational Warnings S-124									
Marine Protected Areas S-122 (in cooperation with SwAM*)									
Marine Radio Services S-123									
Marine Traffic Management S-127									
Marine Harbour Infrastructure S-131									

*SMHI – Swedish Meteorological and Hydrological Institute, SwAM – Swedish Agency Marine and Water Management



S-104/S-111 Production Sweden

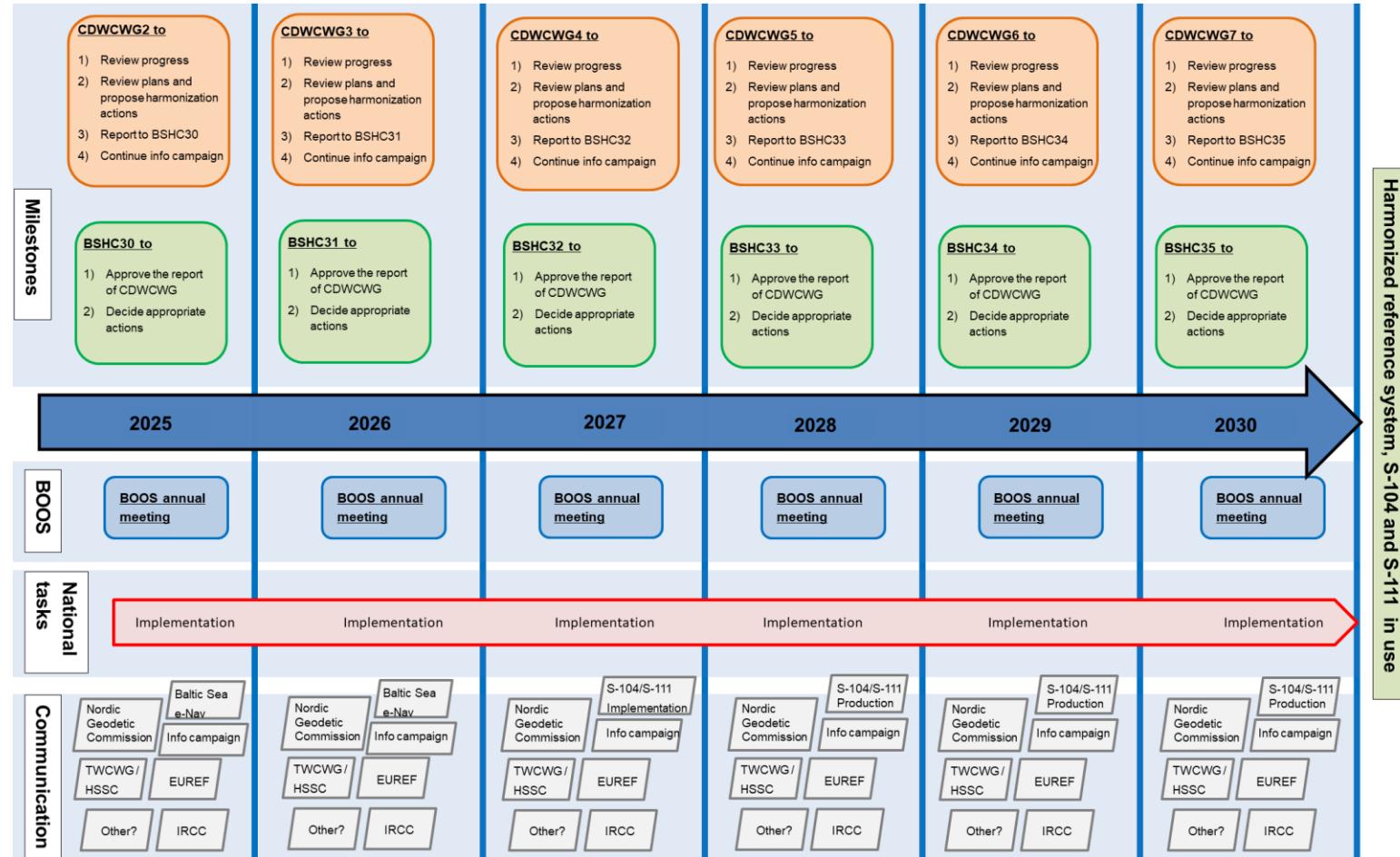


S-104/S-111 Implementation Baltic Sea

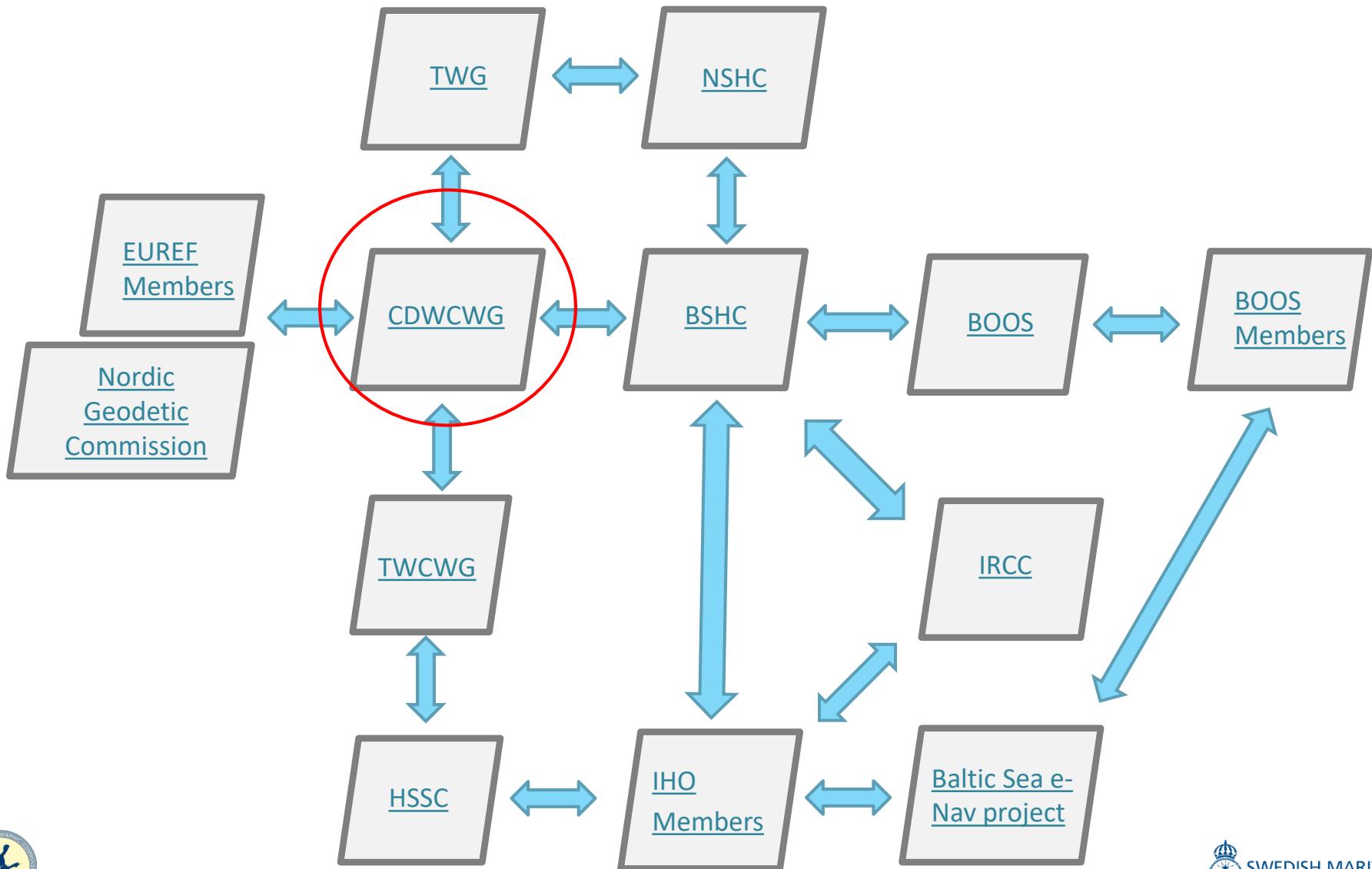
RoadMap

BSHC CDWCWG / Harmonized Reference System / S-104 and S-111 Implementation / Time Line

2024-10-11



CDWCWG International relations



Real Time Hydrographic and Environmental Information Service

Infrastructure



Co-financed by the Connecting Europe Facility of the European Union

Gravity surveys

Hydrographic surveys

Bathymetry database

Geoid model

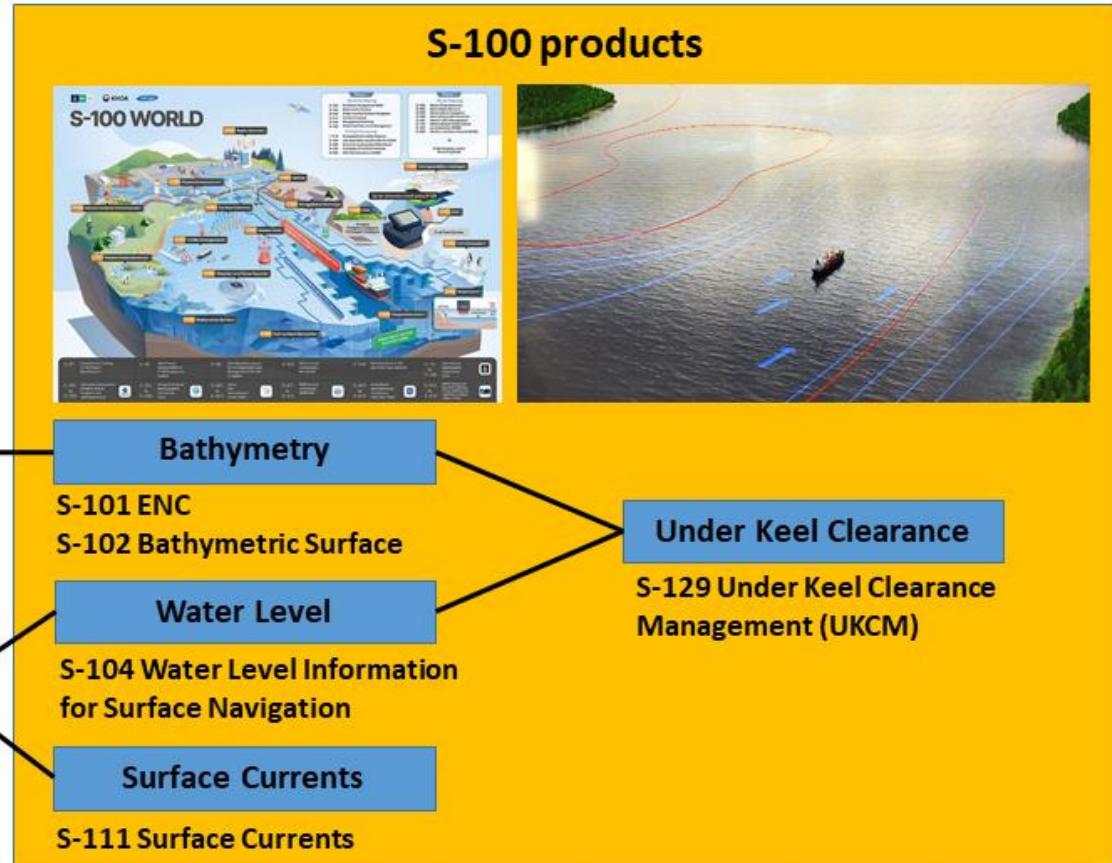
Baltic Sea Chart Datum 2000

Oceanographic observations

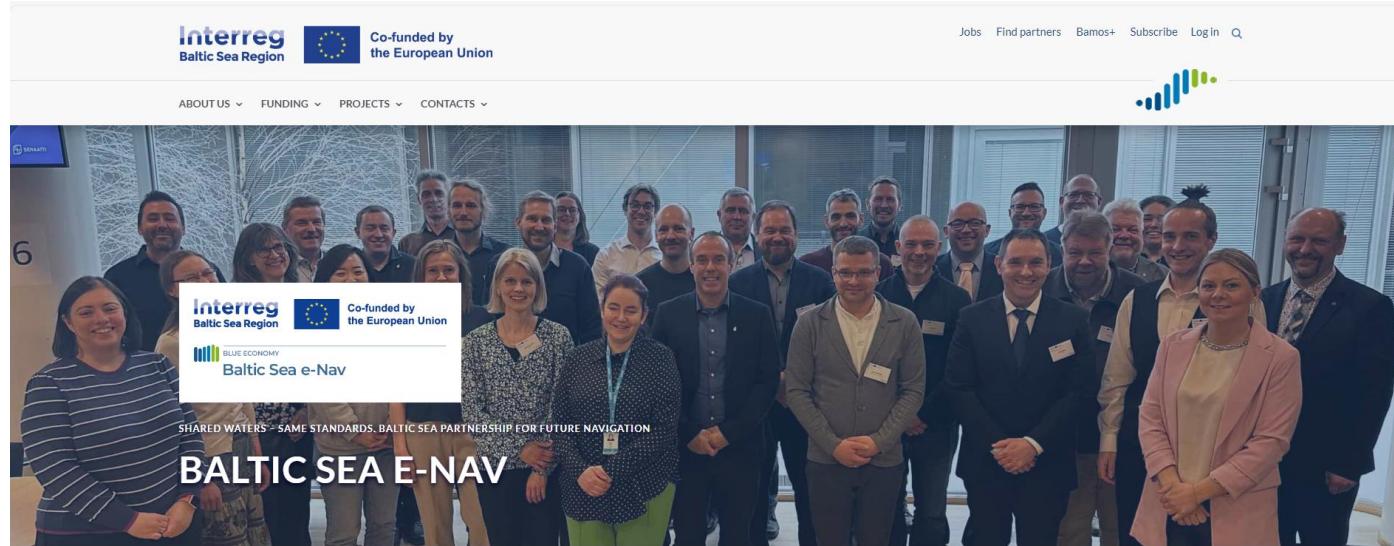
Oceanographic model



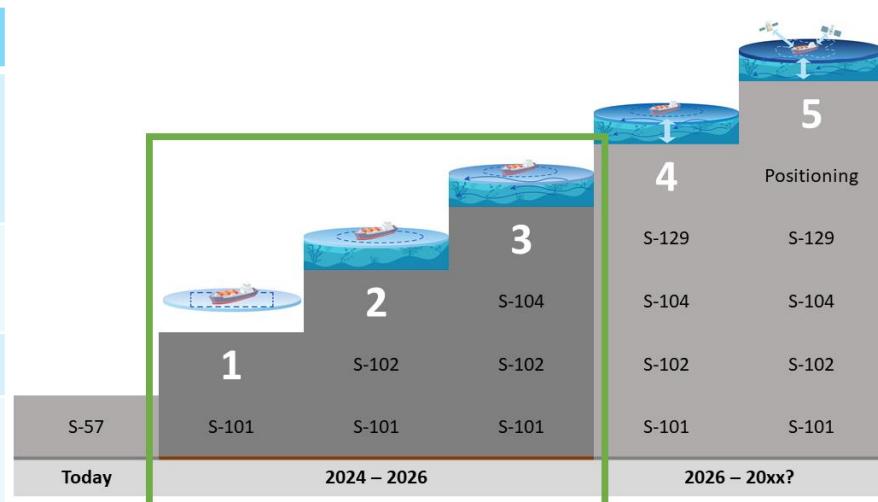
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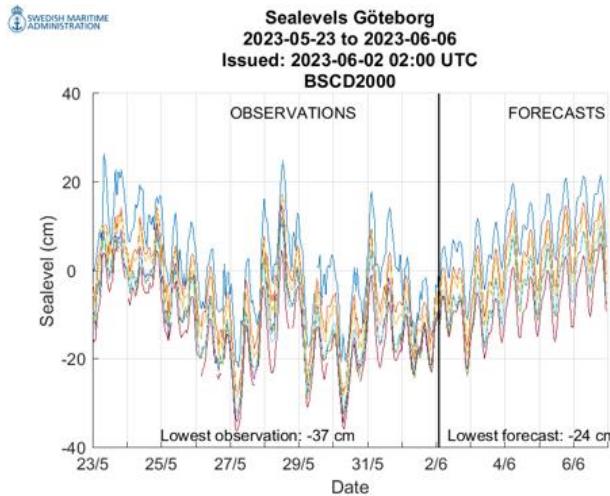
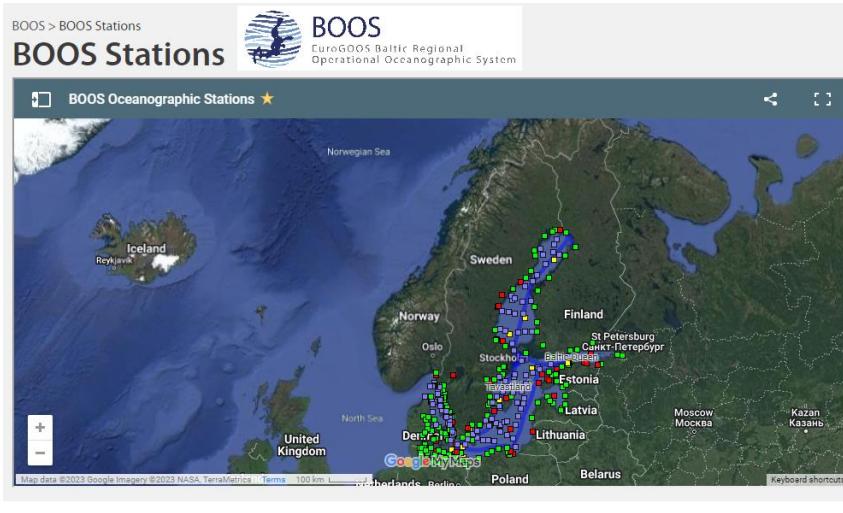
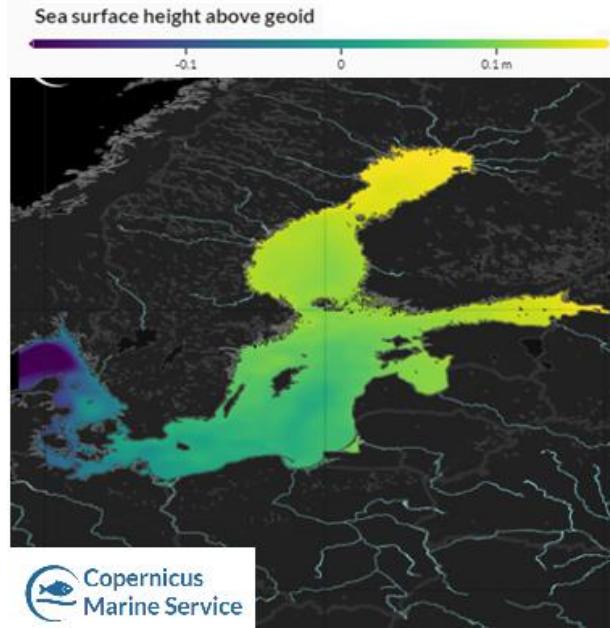
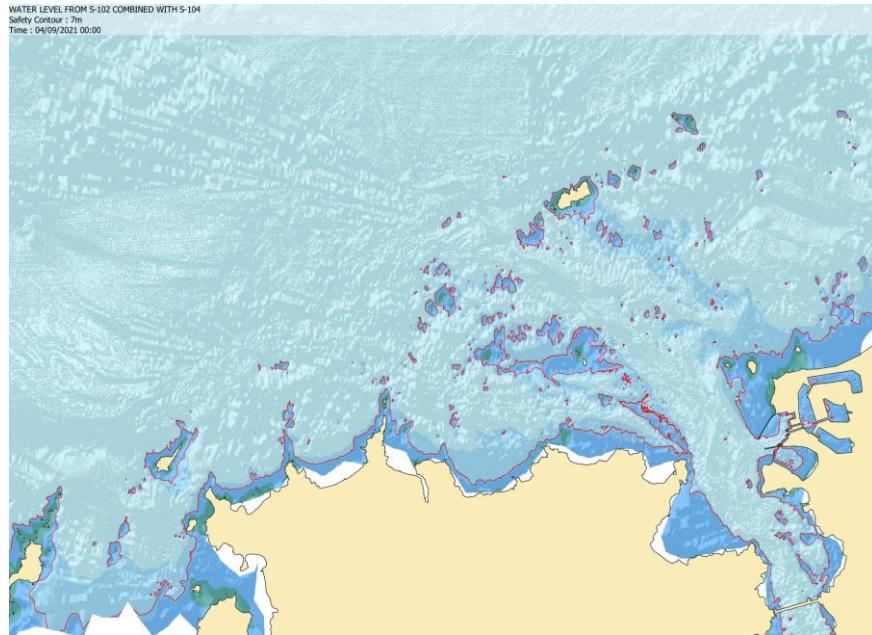
Baltic Sea e-Nav Interreg project 2023-2026



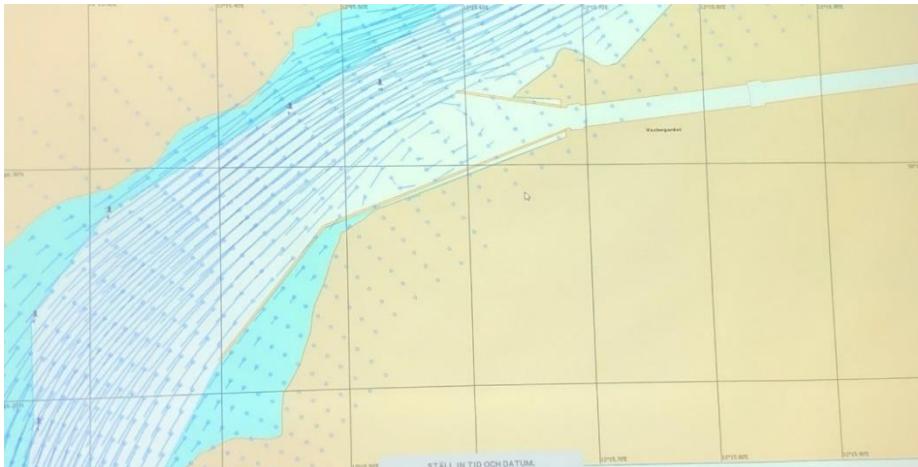
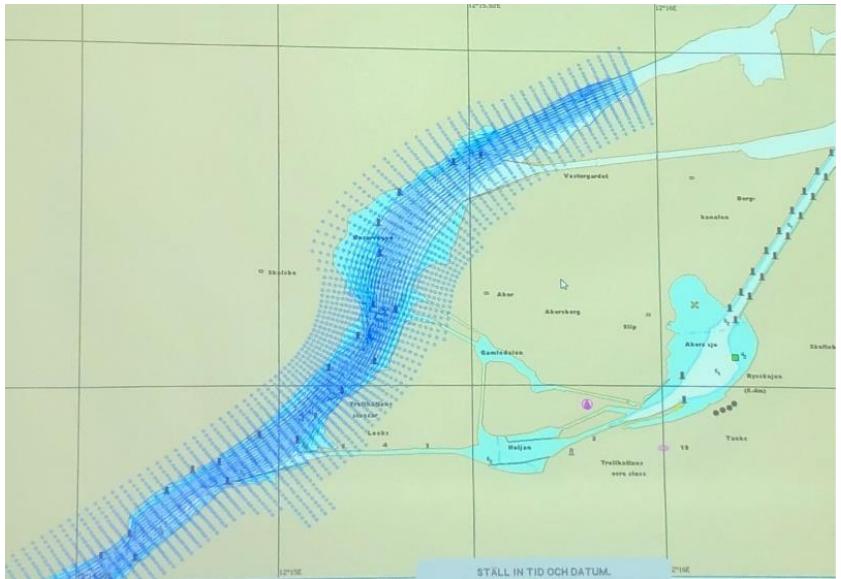
Goal	Period
Develop production capabilities for S-101 ENC, S-102 bathymetry and to some extent S-104 water level	2023-2025
Establish harmonization rules for S-10x-products, under the BSHC umbrella	2024-2026
Test, evaluate and refine the S-10x products	2025
Commercial rollout for S-101 and S-102 in the Baltic Sea. S-104 in parts of FI.	2026



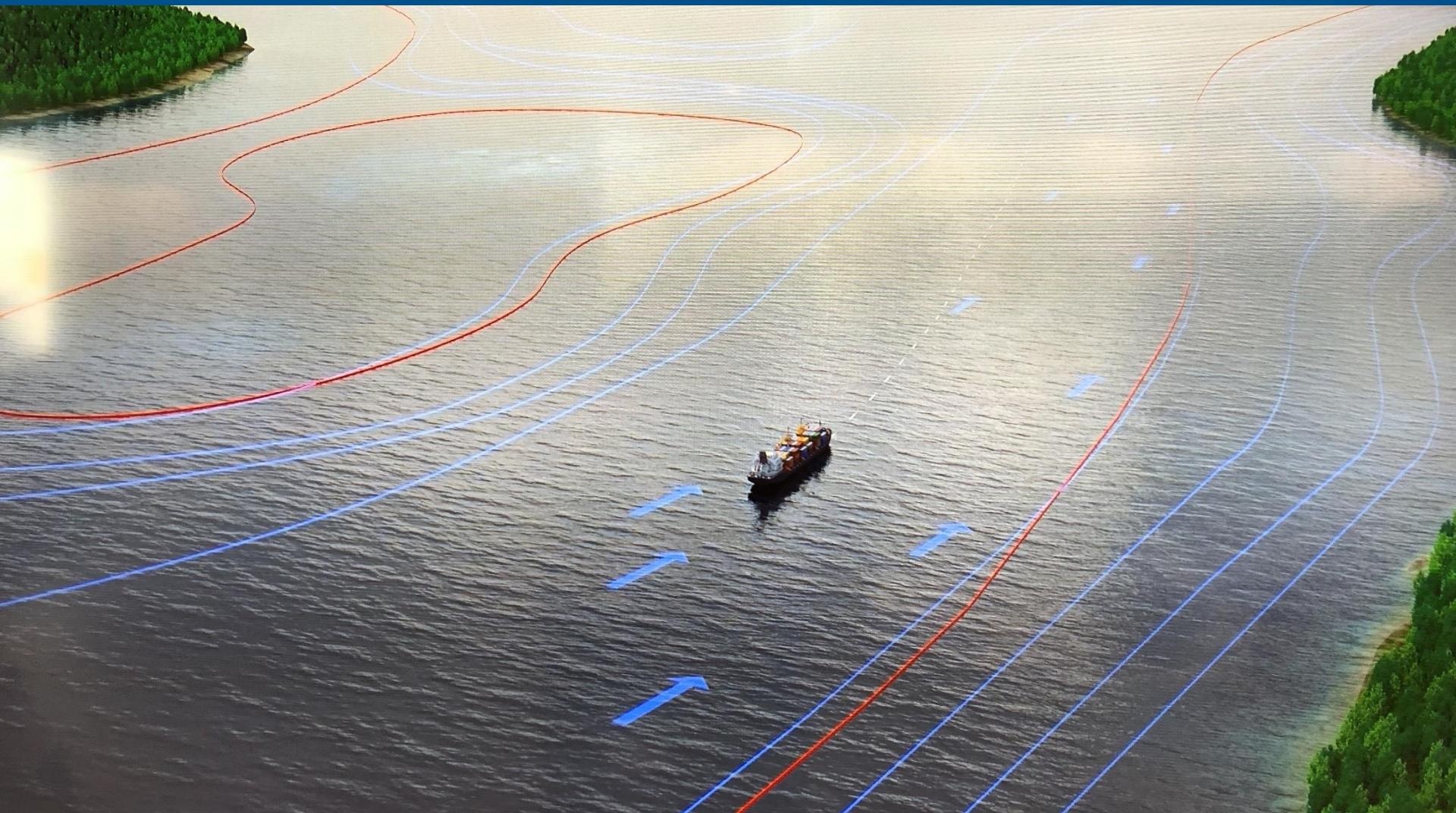
S-104 Water Level



S-111 Surface Currents



Future navigation



Thanks!



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