



14th Meeting of the WENDWG

Report of the representative of the BSHC (Baltic Sea Hydrographic Commission)

Status of work and S-100 implementation in the Baltic Sea

Agenda Item 05.1Ab

WENDWG14, Norfolk, Virginia, USA, 20 – 22 February 2024



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REGION E- BALTIC SEA

International
Hydrographic
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- **Members:** Denmark, Estonia, Finland, Germany, Latvia, Poland, Russian Federation, Sweden
- **Associate Member:** Lithuania
- **BSHC Web site:** <http://www.bshc.pro/>

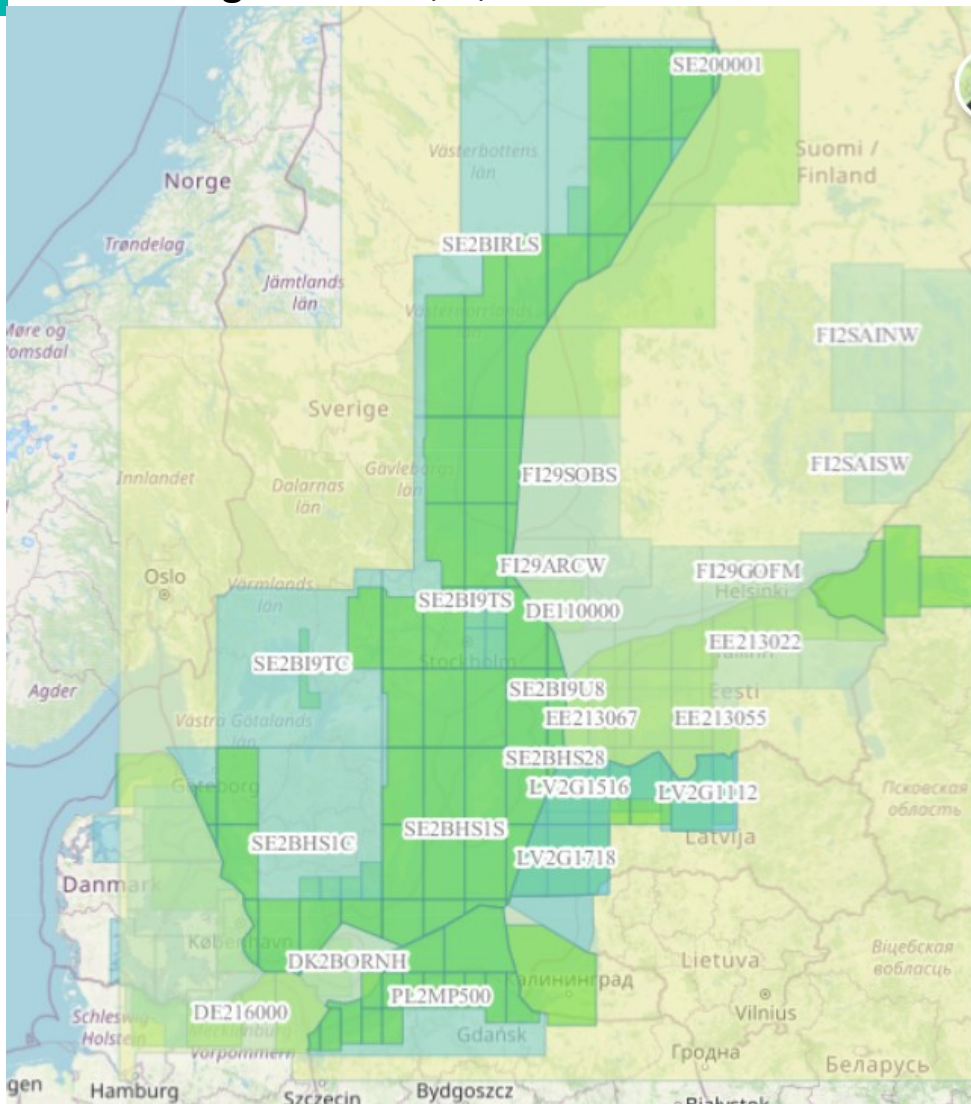




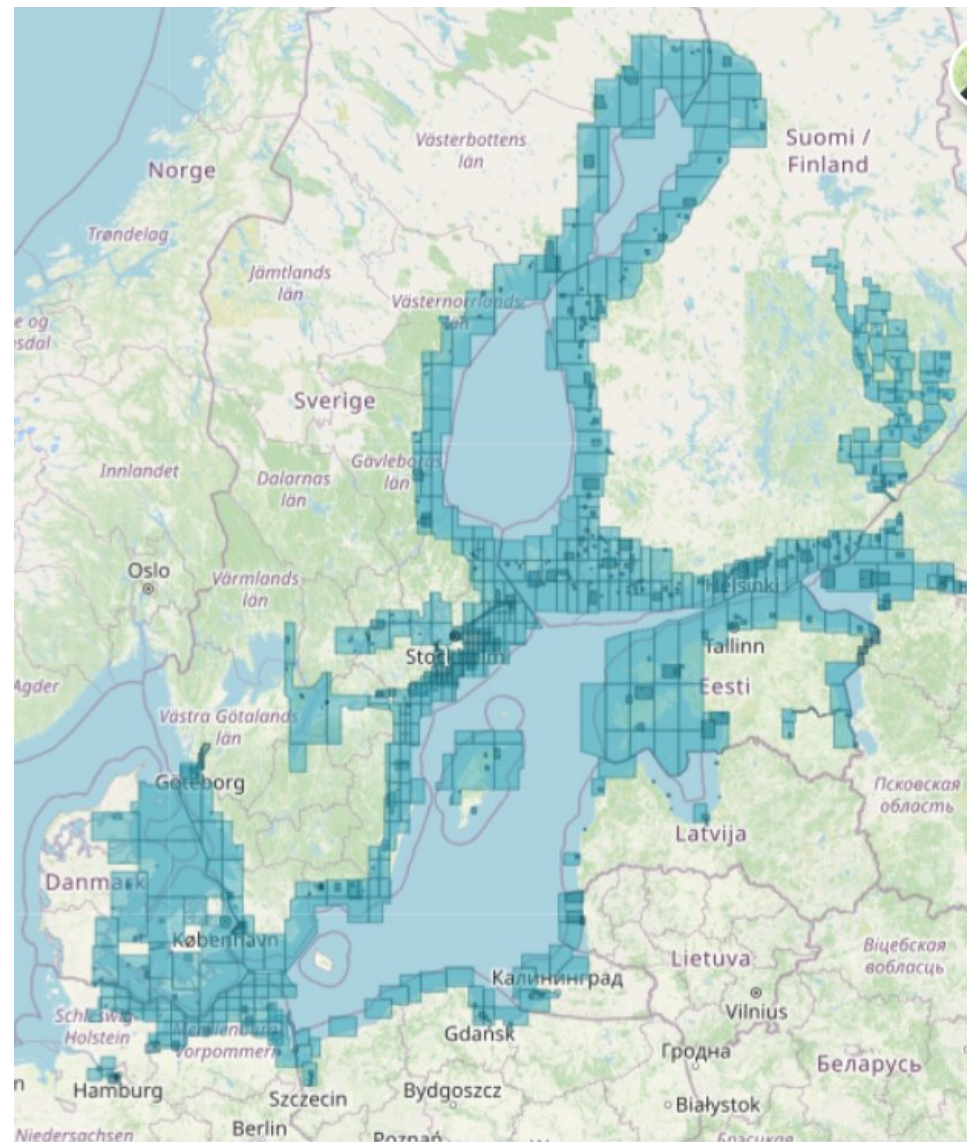
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S-57 ENC COVERAGE - BALTIC SEA

Usage bands 1, 2, 3



Usage bands 4, 5, 6



2024 (2023)

UB 1: 1 (1)

UB 2:44 (41)

UB 3 :121 (120)

UB 4: 469 (460)

UB 5: 618 (622)

UB 6: 223 (220)

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IC-ENC OVERLAP REPORT (JAN 2024)

International Hydrographic

ID	STATUS	RENC Membership	RHC	ENC 1	ENC 2	Usage Band	ENC 1 Scale	ENC 2 Scale	ENC 1 Edn	ENC 2 Edn	Overlap extent (Kmxkm) (m/square NM)	Impact Assessment	Justification	Action requested
1176	LIVE	IC-ENC - PRIMAR	BSHC	DE316004	PL3A0000	3	90000	90000	15	8	6ms	LOW	Thin overlap just over the 5m tolerance between 2 different producers	Reduce overlap if possible
1177	LIVE	IC-ENC - PRIMAR	BSHC	DE316004	PL3C0000	3	90000	90000	15	10	6ms	LOW	Thin overlap just over the 5m tolerance between 2 different producers	Reduce overlap if possible
997	LIVE	IC-ENC	BSHC	DK2FEMON	DE216000	2	180000	180000	38	4	6m x 163Km	LOW	Thin overlap just over the 5m tolerance between 2 different producers	Reduce overlap if possible
996	LIVE	IC-ENC	BSHC	DK2LILBL	DE216000	2	180000	180000	39	4	6m x 42Km	LOW	Thin overlap just over the 5m tolerance between 2 different producers	Reduce overlap if possible
995	LIVE	IC-ENC	BSHC	DK2STOBL	DE216000	2	180000	180000	54	4	6m x 55Km	LOW	Thin overlap just over the 5m tolerance between 2 different producers	Reduce overlap if possible
590	LIVE	IC-ENC - PRIMAR	BSHC	PL2MP500	DE216000	2	180000	180000	12	4	6m x 90Km	LOW	A very small sliver	Producers to share coordinates of extents.
706	LIVE	IC-ENC - PRIMAR	BSHC	DE416090	PL4MAP37	4	22000	22000	9	17	Tapers 1.5m to 10m x 2km	ACCEPT	Most of overlap is <5m. Overlap located over land	HO requested to clip cell
578	LIVE	IC-ENC	BSHC	DK2BORNH	DE216000	2	180000	180000	44	4	5m to 8m x 98Km	ACCEPT	A very small sliver. About 6m overlap	Producers to resolve overlap
591	LIVE	IC-ENC - PRIMAR	BSHC	PL3B3000	DE316004	3	90000	90000	7	15	Tapers 5m to 10m x 24km	ACCEPT	A very small sliver	Producers to share coordinates of extents.
1020	ACCEPT	IC-ENC	BSHC	DE216000	DK2SUNDT	2	180000	180000	4	44	4m x 1Km	ACCEPT	4m Overlap along the national border.	
1021	ACCEPT	IC-ENC - PRIMAR	BSHC/NHC	DE216000	SE2BHS1C	2	180000	180000	4	75	5m x 55Km	ACCEPT	5m Overlap along the national border.	
1064	ACCEPT	IC-ENC - PRIMAR	BSHC/NHC	DK2BORNH	SE2BHS1C	2	180000	180000	44	74	2m x 65m	ACCEPT	Overlap on band 2 coverage, relatively small area. No data other then DEPART within area. Mostly a gap now, Very short section of overlap which is <5m	
450	ACCEPT	IC-ENC - PRIMAR	BSHC/NHC	DK2BORNH	SE2BHS1S	2	180000	180000	44	73	1m x 80m	ACCEPT	Overlap on band 2 coverage, relatively small area. No data other then DEPART within area. Mostly a gap now, Very short section of overlap which is <5m	DK to amend geometry to remove overlap.
114	ACCEPT	IC-ENC - PRIMAR	BSHC/NHC	DK2KATGN	SE2BHS0W	2	180000	180000	48	24	1m x 97.9Km	ACCEPT	Small overlaps along median line between differing producers	None
1097	ACCEPT	IC-ENC - PRIMAR	BSHC/NHC	DK2KATGS	SE2BHS1C	2	180000	180000	73	68	1m x 46Km	ACCEPT	Small overlaps along median line between differing producers	None
115	ACCEPT	IC-ENC - PRIMAR	BSHC/NHC	DK2SKARK	SE2BHS0W	2	180000	180000	37	24	1m x 66.3Km	ACCEPT	Small overlaps along median line between differing producers	None
116	ACCEPT	IC-ENC - PRIMAR	BSHC/NHC	DK2SKARK	SE2BI9SW	2	180000	180000	37	23	1m x 52Km	ACCEPT	Small overlaps along median line between differing producers	None
447	ACCEPT	IC-ENC - PRIMAR	BSHC/NHC	DK2SUNDT	SE2BHS1C	2	180000	180000	44	74	1m x 236Km	ACCEPT	1m Overlap along the national border.	
418	ACCEPT	IC-ENC	BSHC	DK3BORNH	DE316004	3	90000	90000	53	15	<5m x 53Km	ACCEPT	Overlap is small, the result of an erroneously captured vertex along national boundary. Overlap of <5m along whole boundary	HO to delete excess vertex.

Gaps and overlaps analysis is an ongoing process through BSICC. Some small technical overlaps still exists-> to be solved 2024.



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STATUS OF S-100 COORDINATION

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The need of coordination for the S-100 implementation both **in regional level** and **national level** has been identified.

Roles for BSHC working groups:

BSICCWG (Baltic Sea chart coordination WG): S-101, S-102, Overall S-100 reporting

CDWCWG (Baltic Sea Chart Datum, Water level and Currents WG): S-104, S-111

BSMSIWG (Baltic Sea MSI WG): S-124

TOR's of BSHC WG's have been reviewed and updated as appropriate.

Example -BCICCWG TORs:

2. Terms of Reference

- 2.1 To study issues related to nautical charting of the region, in particular **overarching S-100 coordination (gathering plans from Member States and reporting as WEND representative of the BSHC). To specifically coordinate of S-101 ENC's and S-102 Bathymetry as well as to coordinate production of paper charts (INT charts) and S-57 ENC's,** that support ships engaged on international voyages.



Baltic Sea e-Nav – Scope

November 2023 – October 2026

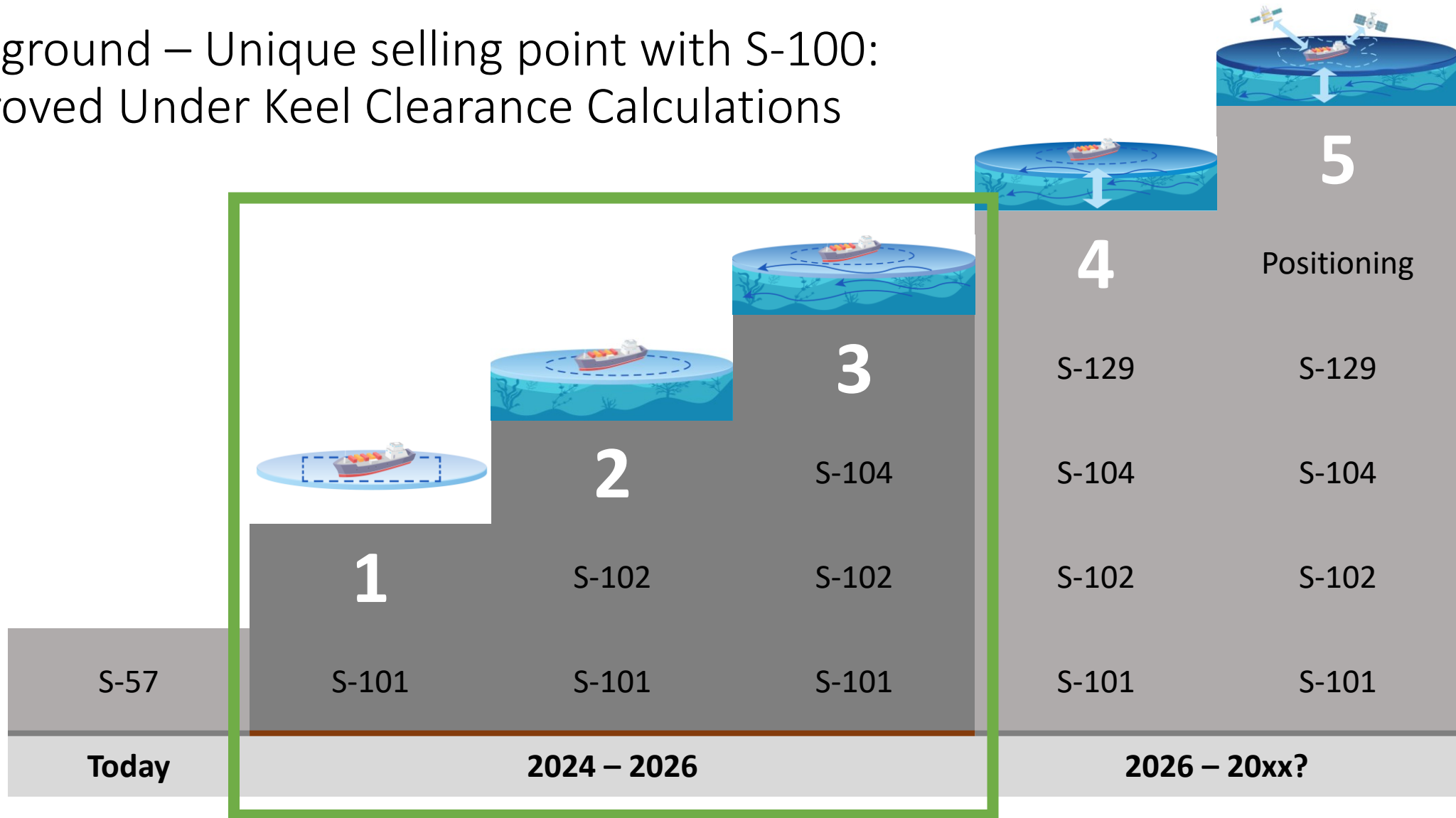
- Application submitted 14 March 2023
- Was approved June 2023
- Coordinator: Sweden

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

BALTIC SEA E-NAV -PROJECT



Background – Unique selling point with S-100:
Improved Under Keel Clearance Calculations





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BALTIC SEA E-NAV -PROJECT



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Baltic Sea e-Nav – Partners

LP	Swedish Maritime Administration	Sjöfartsverket	SE
PP	Federal Maritime and Hydrographic Agency	Bundesamt für Seeschifffahrt und Hydrographie	DE
PP	Danish Geodata Agency	Geodatastyrelsen	DK
PP	Republic of Estonia Transport Administration	Transpordiamet	EE
PP	Finnish Transport and Communications Agency Traficom	Liikenne- ja viestintävirasto Traficom	FI
PP	Maritime Administration of Latvia	Latvijas Jūras administrācija	LV
PP	Finnish Meteorological Institute	Ilmatieteen laitos	FI
PP	Satakunta University of Applied Sciences	Satakunnan Ammattikorkeakoulu	FI
PP	RISE Research Institutes of Sweden AB	RISE Research Institutes of Sweden AB	SE
PP	Furuno Finland	Furuno Finland Oy	FI

Baltic Sea e-Nav – Associate Partners

Lithuanian Transport Safety Administration	Lietuvos transporto saugos administracija	LT
Hydrographic Office of the Polish Navy	Biuro Hydrograficzne Marynarki Wojennej	PL
IC-ENC	IC-ENC	Other
PRIMAR	PRIMAR	NO



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S-101 (S-102) HARMONISATION

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Different sub-activities under Baltic Sea e-Nav-project, e.g.

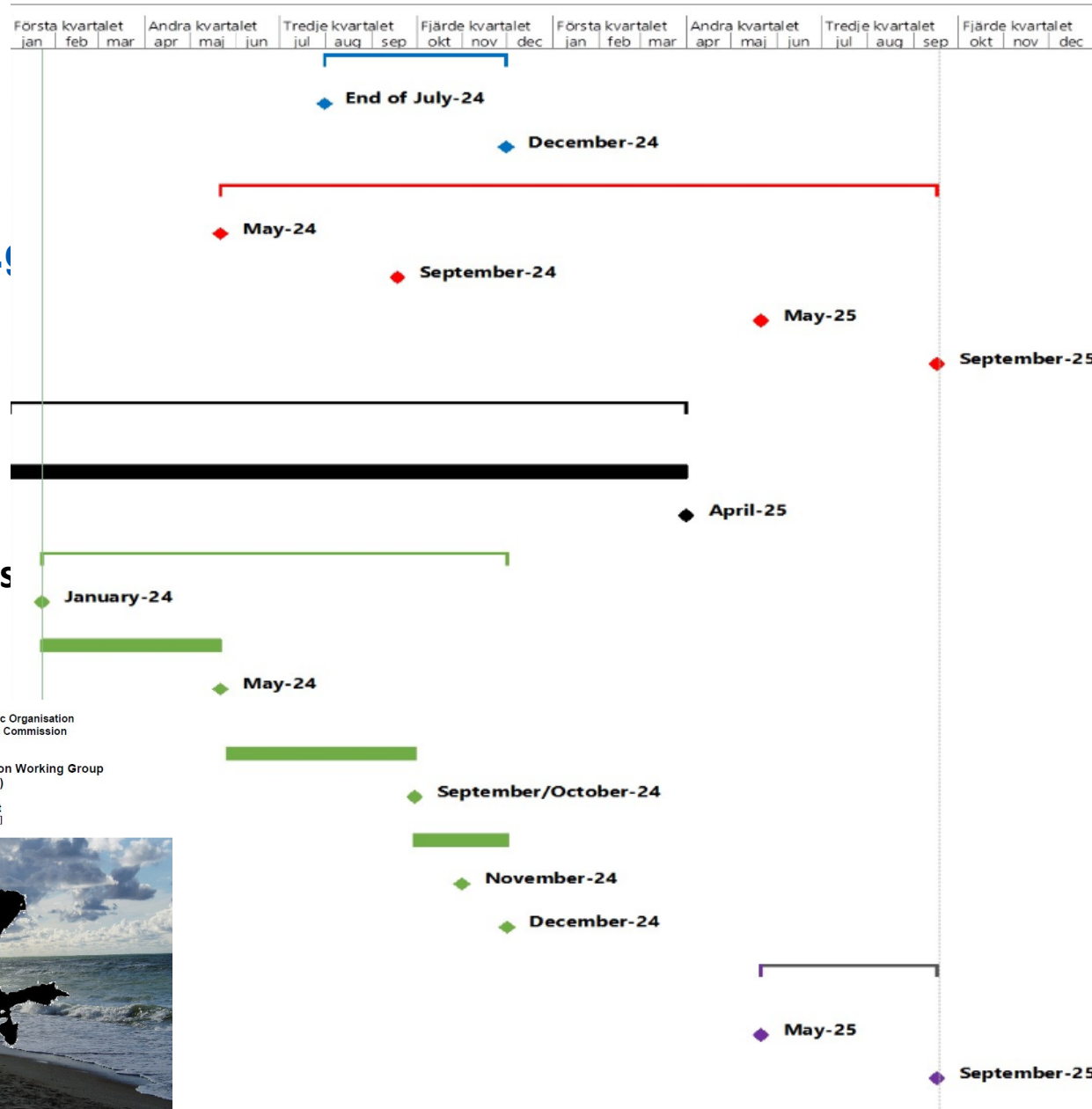
- S-101 ENC products harmonisation
- S-102 Bathymetric Surface products harmonisation

S-101 harmonisation:

- Evaluation of the current ENC harmonisation recommendations
- Need for new recommendations related to S-101?
- Specific need for a harmonised roll-out plan for S-101 within the Baltic Sea?

S-102 harmonisation

- Need for S-102 harmonisation will be evaluated



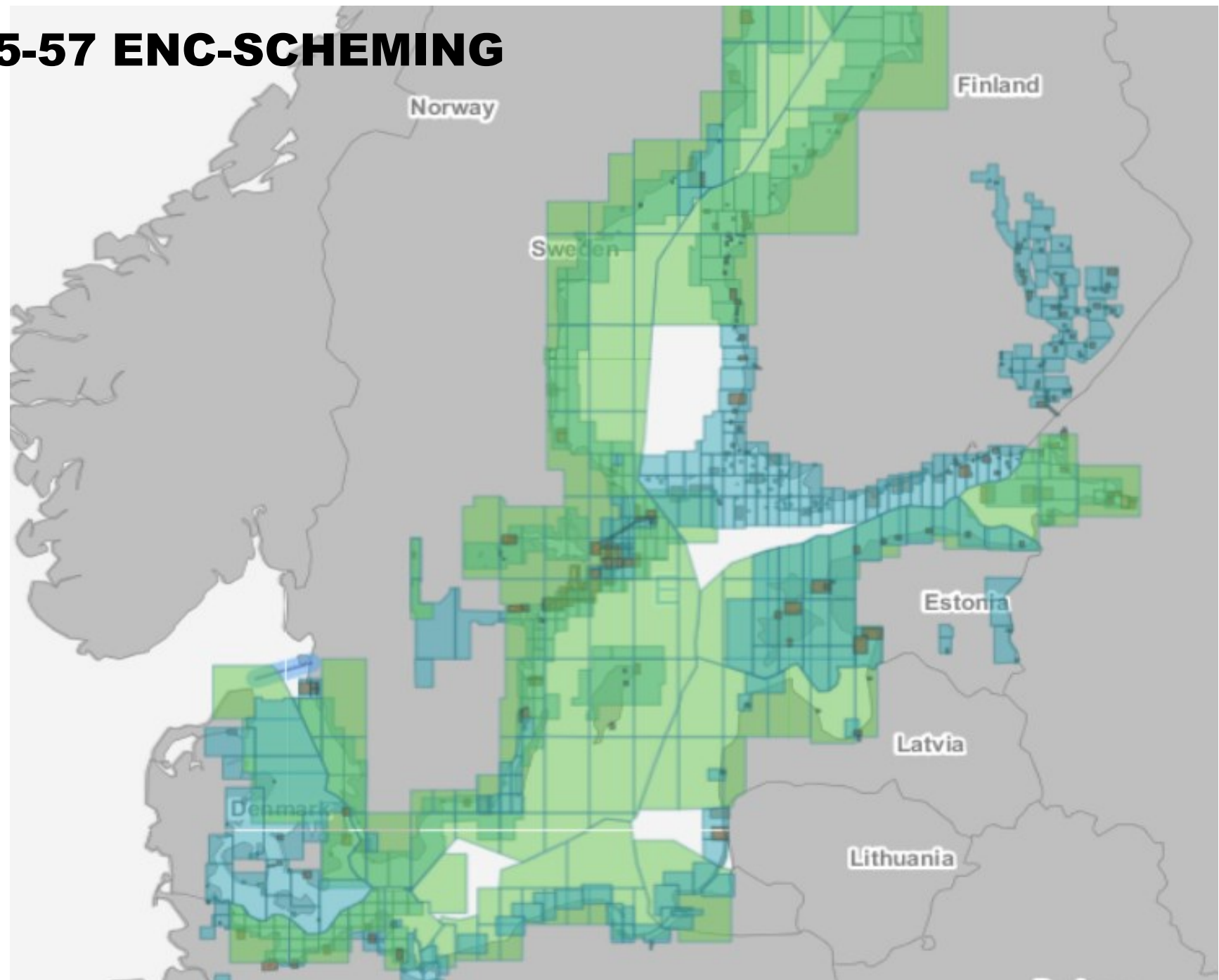


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EXISTING 5-57 ENC-SCHEMING

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**Coastal
Approach
Harbour**





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S-101 (S-102) SCHEMING PLANS IN THE BALTIC SEA

(STATUS 05/2023)

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Country	S-57	S-101	S-102	Remarks
Denmark	Grid/regular grid	Regular grid	Regular grid	
Estonia	Grid	Grid	Grid	No plans to change now
Finland	Grid	Grid	Grid	Have tried regular grid before
Germany	Grid/regular grid	Regular grid	Regular grid	
Latvia	Grid	Not decided	Not decided	
Lithuania	Grid	No info yet	No info yet	
Poland	Grid	Grid	-	Has studied reg grid
Russia	Grid	No info	No info	
Sweden	Grid/regular grid	Grid/regular grid	Grid/regular grid	



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S-101 (S-102) PRODUCTION PLANS

(status 05/2023)

- ▶ Many member states have conducted tests or are involved in various projects testing the making of S-101 and S-102 products. However, practical implementation plans are still at a fairly early stage. Technical readiness is quite good, on the other hand, the approval of the standard is still pending.

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Country	S-101	S-102	Remarks
<u>Denmark</u>	Test conversions to the data, developing work with ESRI	<u>Tested</u> , main focus S-101 <u>now</u>	<u>Ready to start</u> 2025/2026
<u>Estonia</u>	<u>Test conversations</u> , no <u>exact prod. plan yet</u>	<u>Tested</u>	<u>Ready to start</u> 2026
<u>Finland</u>	Database conversion 2024	<u>Tested</u> , <u>readiness exists</u>	<u>Ready to start</u> 2026
<u>Germany</u>	Has tested several conversion <u>softwares</u>	<u>Tested</u>	<u>Ready to start</u> 2026
<u>Latvia</u>	Has tested conversions	-	<u>Ready to start</u> 2026
<u>Lithuania</u>	No info	No info	
<u>Poland</u>	Several cells converted	-	<u>Ready to start</u> 2026 (<u>from main ports</u>)
<u>Russia</u>	No info	No info	
<u>Sweden</u>	<u>Database cleaning for S-101</u>	<u>Testing in Gornenburg area</u>	<u>Ready to start</u> 2025.

The readiness status and plans have clearly increased since the last BSICCWG meeting (05/2023). See slide 18- WEND questionnaire.



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S-101 (S-102) PRODUCTION PLANS IN THE BALTIC SEA

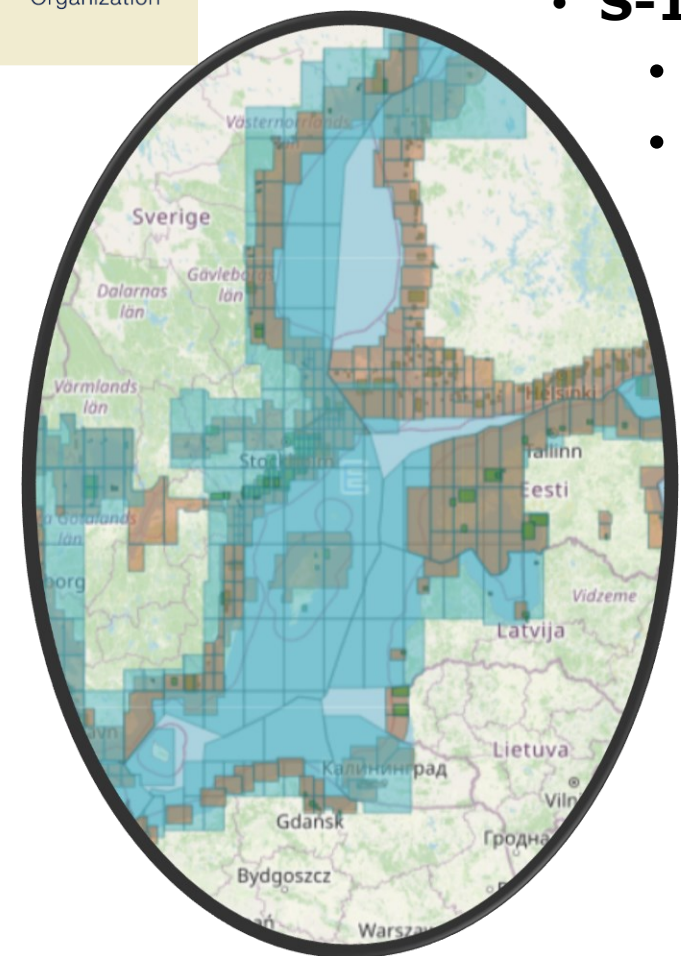
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- **S-101/S-102 production plans/time schedule**

- High dependency on software development (Caris/ESRI, D-kart, 7Cs)
- It is **very important**, that **all the countries** will start thinking **the areas where S-101 products could be first produced in 2026.**

Main harbours, high density traffic areas or..?

There must be a concrete **plan for the Baltic Sea area, where and when S-101** (and S-102) products will be **available?**





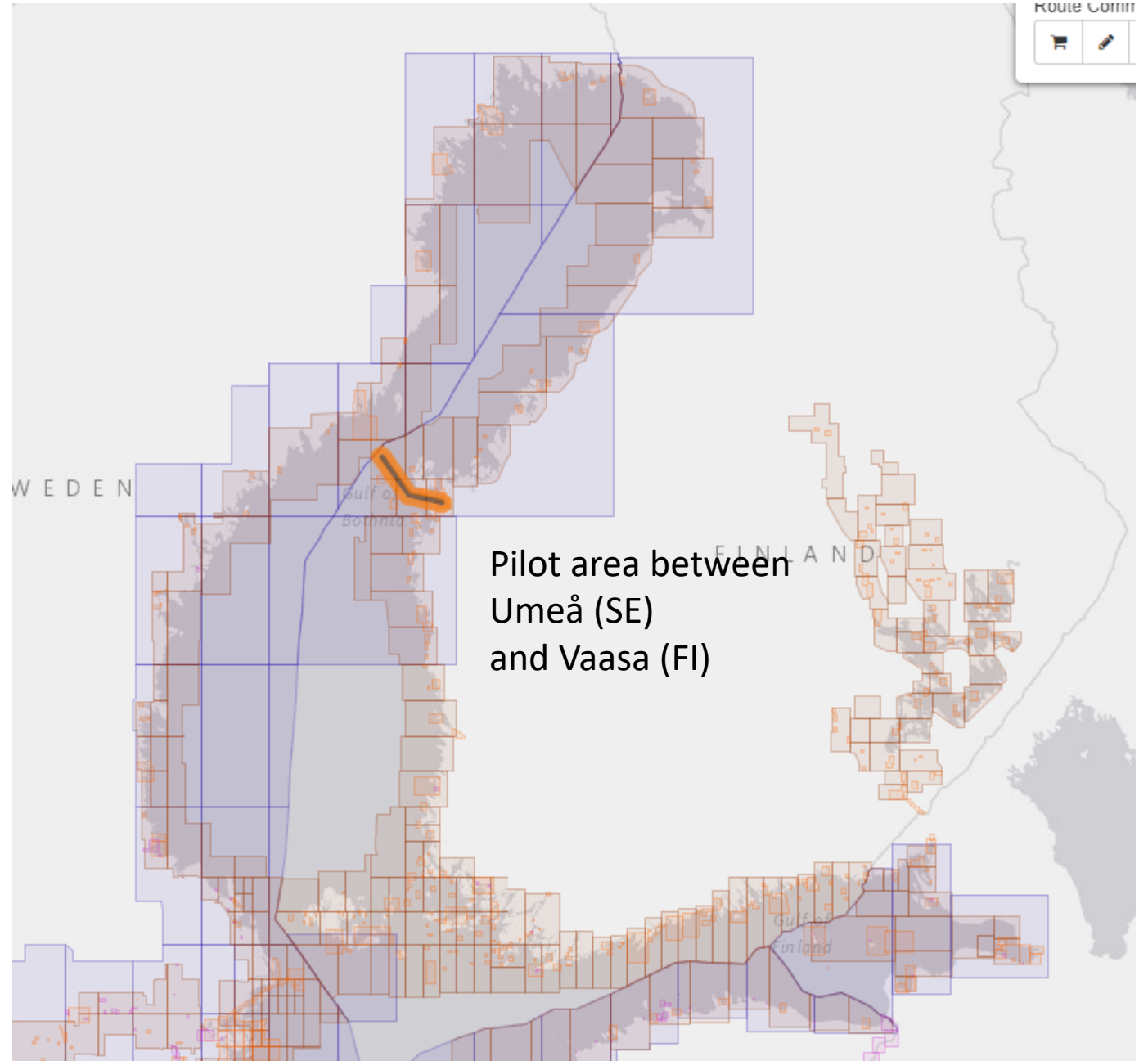
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S-101 PROTOTYPING AND PILOTING AREAS

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Proposed/discussed testing areas for S-101 and S-102 in the Baltic Sea:

- Kadetrenden/Kadetrinne and The Sound, Copenhagen Port (DK)
- Gothenburg port (SE)
- Irbe strait (EE, LV)
- Umeå-Vaasa (SE, FI)
- Rostock port (DE)
- + other areas?





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DEVELOPED STRATEGIES AND TECHNICAL READINESS FOR DATA MIGRATION FROM LEGACY S-57 FORMAT (EXAMPLE; FINLAND, TIMELINE 2024)

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• Preparation work in the HPD test environment

1. Create S-101+ catalog (extensions needed for reverse mapping to paper charts and S-57 ENCs)

- ✓ S-101 1.1.0 readiness achieved
- ✓ S-101 1.2.0 in progress
- S-101 2.0 (operational) starting after June/2024

2. Create S-57+ to S-101+ mapping

- ✓ S-101 1.1.0 readiness achieved
- ✓ S-101 1.2.0 in progress
- S-101 2.0 (operational) starting after June/2024

3. Prepare compound (S-57+ and S-101+) Source feature catalog

4. Run database migration (conversion perhaps a better descriptive word) (3-4/2024)

5. Update existing product lines (paper chart and S-57 ENC). Requires preparation of reverse mapping (from S-101+ to S-57+)

6. Adjust the compound Source catalog by getting rid of the S-57+ part

7. Create S-101 ENC product schema (extents) and possible mapping rules



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WEND100 IGIF-MATRIX (NOV 2023)

Increased since last year

Decreased since last year

International Hydrographic Organization

	S-101										S-102									
	SE	DE	DK	FI	LT	LV	PL	EE	BSHC	SE	DE	DK	FI	LT	LV	PL	EE	BSHC		
Governance and Institutions	11,1	11,1	11,1	11,1	3	8,4	8,4	8,4	8,4	5,7	8,4	8,4	11,1	3	5,7	8,4	8,4	8,4		
Policy and Legal	11,1	11,1	8,4	11,1	3	8,4	8,4	8,4	8,4	3	8,4	3	11,1	3	3	3	5,7	3		
Data	3	11,1	3	3	3	3	3	3	3	3	8,4	3	3	3	3	3	8,4	3		
Financial	11,1	11,1	11,1	11,1	3	5,7	3	5,7	11,1	3	8,4	3	5,7	3	3	3	5,7	3		
Innovation	5,7	0	3	5,7	3	5,7	5,7	3	5,7	11,1	5,7	5,7	5,7	3	3	5,7	5,7	5,7		
Standards	5,7	0	11,1	5,7	3	5,7	5,7	5,7	5,7	5,7	5,7	11,1	5,7	3	5,7	5,7	11,1	5,7		
Partnerships	3	0	3	3	5,7	3	3	5,7	3	3	5,7	3	3	5,7	3	3	5,7	3		
Capacity and Education	11,1	0	3	8,4	3	5,7	5,7	3	5,7	3	3	3	8,4	3	5,7	5,7	3	3		
Communication and Engagement	11,1	0	3	8,4	3	5,7	11,1	3	8,4	8,4	8,4	3	8,4	3	3	11,1	3	5,7		
	S-122										S-124									
	SE	DE	DK	FI	LT	LV	PL	EE	BSHC	SE	DE	DK	FI	LT	LV	PL	EE	BSHC		
Governance and Institutions	3	11,1	3	3	0	3	5,7	3	3	11,1	11,1	8,4	11,1	0	3	5,7	3	11,1		
Policy and Legal	3	8,4	3	3	0	3	5,7	3	3	3	11,1	5,7	11,1	3	3	3	3	3		
Data	3	8,4	3	3	0	3	5,7	3	3	3	0	5,7	3	0	3	3	3	3		
Financial	3	3	3	3	0	3	0	3	3	3	0	5,7	5,7	0	3	3	3	3		
Innovation	3	11,1	3	3	0	3	0	3	3	3	0	3	3	0	3	3	3	3		
Standards	3	11,1	3	3	0	3	0	3	3	5,7	0	8,4	5,7	0	3	5,7	3	5,7		
Partnerships	3	8,4	3	3	0	3	0	3	3	5,7	0	3	5,7	0	3	3	3	3		
Capacity and Education	3	8,4	3	3	0	3	0	3	3	3	0	3	3	0	3	3	3	3		
Communication and Engagement	3	11,1	3	3	0	3	8,4	3	3	3	0	3	8,4	0	3	11,1	3	3		



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WEND100 IGIF-MATRIX (NOV 2023)



Increased since last year



Decreased since last year

International Hydrographic Organization

	S-104									S-111								
	SE	DE	DK	FI	LT	LV	PL	EE	BSHC	SE	DE	DK	FI	LT	LV	PL	EE	BSHC
Governance and Institutions	3	8,4	5,7	11,1	0	3	5,7	3	5,7	3	8,4	5,7	11,1	0	3	5,7	3	5,7
Policy and Legal	3	8,4	3	11,1	0	3	5,7	3	3	3	8,4	3	11,1	0	3	5,7	3	3
Data	3	3	3	3	0	3	0	3	3	3	3	3	3	0	3	0	3	3
Financial	3	3	3	5,7	0	3	0	3	3	3	3	3	5,7	0	3	0	3	3
Innovation	3	5,7	3	3	0	3	0	3	3	3	5,7	3	3	0	3	0	3	3
Standards	3	5,7	3	5,7	0	3	0	3	3	3	5,7	3	5,7	0	3	0	3	3
Partnerships	3	3	3	3	0	3	0	3	3	3	3	3	3	0	3	0	3	3
Capacity and Education	3	3	3	5,7	0	3	0	3	3	3	5,7	3	5,7	0	3	0	3	3
Communication and Engagement	3	11,1	3	8,4	0	3	8,4	3	8,4	3	11,1	3	8,4	0	3	8,4	3	8,4
	S-128									MSDI								
	SE	DE	DK	FI	LT	LV	PL	EE	BSHC	SE	DE	DK	FI	LT	LV	PL	EE	BSHC
Governance and Institutions	5,7	11,1	5,7	8,4	0	5,7	8,4	3	5,7	8,4	11,1	8,4	8,4	0	5,7	8,4	8,4	8,4
Policy and Legal	5,7	11,1	3	8,4	0	5,7	5,7	3	5,7	11,1	11,1	8,4	11,1	0	5,7	8,4	8,4	8,4
Data	3	3	3	3	0	3	0	3	3	5,7	11,1	8,4	5,7	0	5,7	8,4	5,7	5,7
Financial	5,7	5,7	3	5,7	0	3	5,7	3	5,7	8,4	11,1	5,7	8,4	0	5,7	3	5,7	5,7
Innovation	3	11,1	3	5,7	0	5,7	3	3	3	3	11,1	8,4	8,4	0	3	5,7	8,4	8,4
Standards	3	5,7	3	5,7	0	5,7	0	3	3	3	3	8,4	3	0	3	3	3	5,7
Partnerships	3	5,7	3	5,7	0	5,7	0	3	3	5,7	3	5,7	5,7	0	3	3	3	5,7
Capacity and Education	3	3	3	3	0	3	0	3	3	3	11,1	11,1	5,7	0	3	11,1	3	8,4
Communication and Engagement	3	5,7	3	5,7	0	5,7	8,4	3	5,7	3	11,1	8,4	8,4	0	3	3	8,4	8,4



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READINESS STATUS OF RHCS FOR THE PROVISION OF S-1XX DATASETS BY 2026 (WENDWG CL1/2023)

The survey was answered by 7/9 of Member States.

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Product	Priority 1	Priority 2	Other Priority	2025	2026	2027	2028	2029	2030	No exact data (tbd)
S-101	DE, DK, EE, FI, LT, LV, SE			DK	DE, FI, LT, LV, SE					EE
S-102	DE, DK, EE, FI, SE	LT, LV		DK, EE (2024)	DE, FI, LT, LV, SE					
S-104	FI	DE, EE, SE			DE, FI	SE				DK, EE, LV
S-111	FI	DE, EE			DE, FI		SE			DK, EE, LV
S-124	EE, FI	LT, SE			LT, FI, LV	SE				DE, DK, EE
S-128	DK, FI, SE			DE, DK	FI, SE					
S-129										DK
Other										
S-121			FI		FI					
S-122			SE					SE		
S-123			FI, SE		FI				SE	
S-125			FI		FI					
S-127			FI, SE		FI				SE	
S-131			SE						SE (2032)	
S-201			FI		FI					



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READINESS STATUS OF RHCS FOR THE PROVISION OF S-1XX DATASETS BY 2026 (WENDWG CL1/2023)

The survey was answered by 7/9 of Member States.

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- **Is your organisation following an S-1xx implementation plan (timeline, products)**
 - **YES** (6/7 member states)
- **Is your organisation developing an S-1XX plan (timeline, products)?**
 - **YES** (5/7 member states)
- **Do you need support for S-100 production?**
 - **NO** (4/7 member states)
 - **YES** or maybe (for S-101 (3), S-102 (2), S-104 (3), S-111 (3), S-124 (3))
- **Do you have S-100 trial products that you share or wish to share for testing purposes?**
 - **YES** 2 (S-101, S-102, S-128)
 - **NO** 3
- **Would you like support in sharing S-100 trial products?**
 - **YES** 2
 - **NO** 3



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ACTIONS TO BE CONSIDERED BY THE WENDWG

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WENDWG14 is invited to note the report.

WENDWG14, Norfolk, Virginia, USA, 20 – 22 February 2024