

The Future of Marine Geospatial Information

The Baltic- and North sea as a S-100 testbed

Jens Peter Hartmann

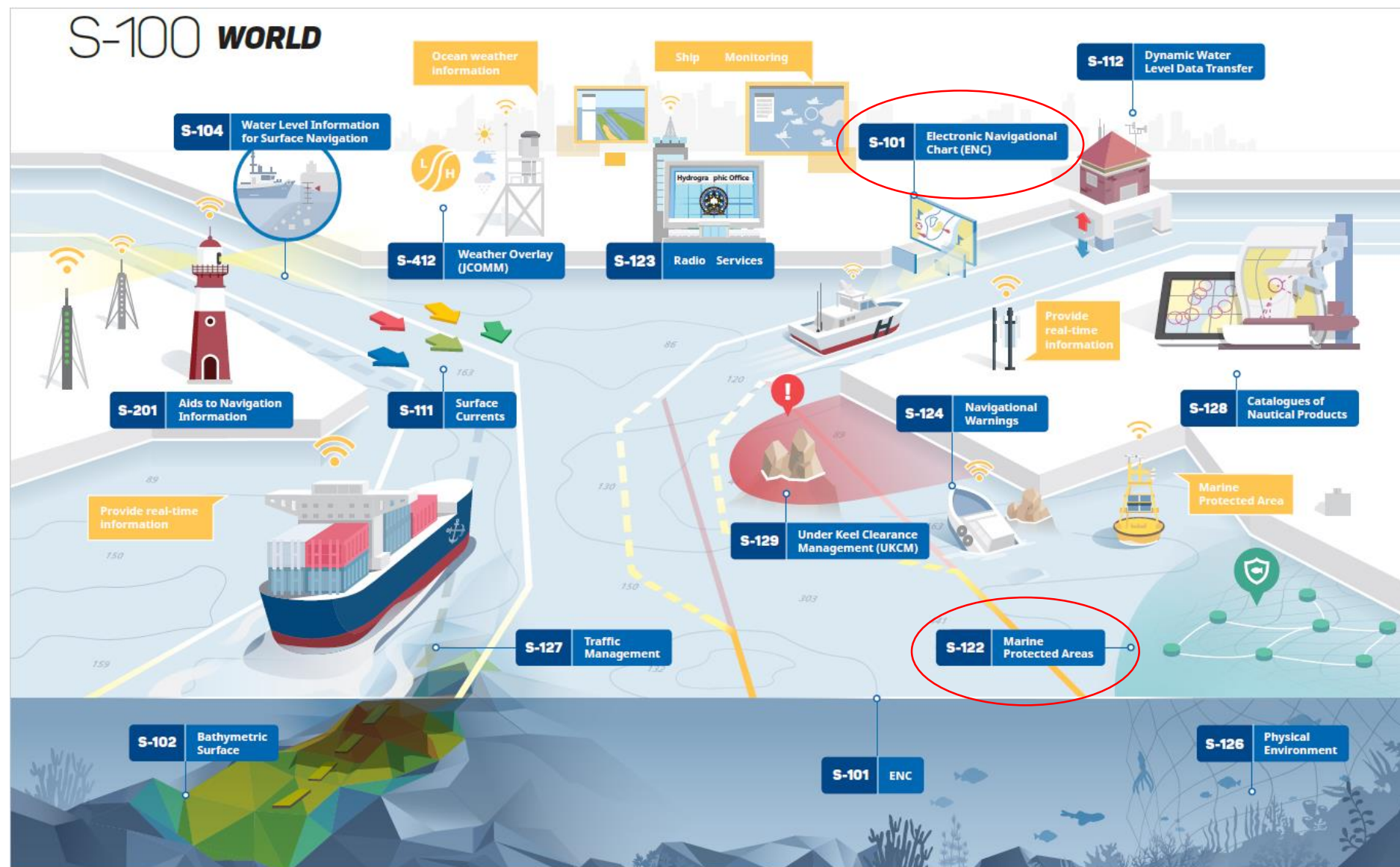
Danish Geodata Agency/Danish Hydrographic Offices

Chair IHO MSDIWG

Chair Baltic- & North Sea MSDIWG

The IHO Universal Hydrographic Data Model

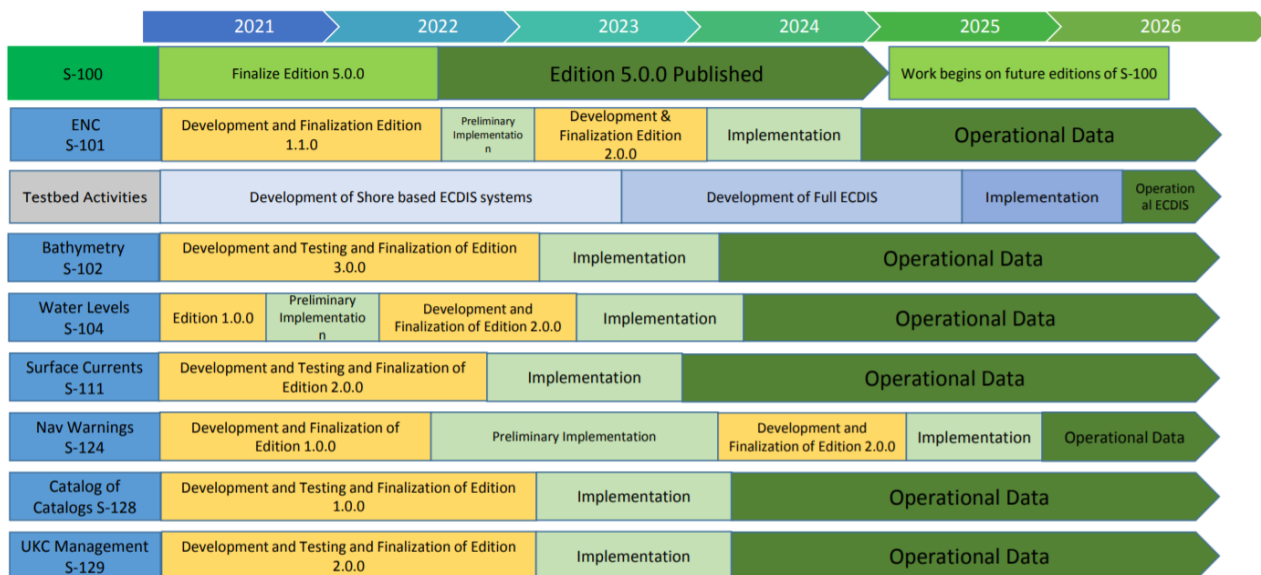
The **S-100 Standard** is a framework document that is intended for the development of digital products and services for hydrographic, maritime and GIS communities.



The challenged from a MSDI perspective

- Primarily a focus on mariners and navigation
- New data providers in addition to the traditional hydrographic offices
- New users and new use cases
- A need for distribution focusing on new users

IHO Timeline – Products of initial focus



S-100 Implementation, S-98 Interoperability Specification The IHO Navigational Package

First step

Next step

Navigational Route Monitoring Mode S-98 Edition 1.0.0

S-101 ENC
S-102 Bathymetry
S-104 Water Level
S-111 Surface Currents
S-124 Navigational Warnings
S-129 UKC Management

Navigational Route Planning Mode Future S-98 Editions

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

+ S-100 Products used in Monitoring Mode

S-122 - Marine protected areas

Product specification

S-122 Marine Protected Areas (MPAs)

Product Specification / S-122 Marine Protected Areas (MPAs)

S-122 Marine Protected Areas (MPAs)

Scope: The S-122 Product Specification is intended to encode Marine Protected Area (MPA) information for use in ECDIS and other information systems. MPAs are protected areas of seas, oceans, estuaries or large lakes. Marine Protected Area information may be considered supplementary additional information that complements the S-101 ENC.

S-122 Edition 1.0.0 (January 2019) [\(English\)](#)

Additional Resources: See [S-122 WIKI](#)

Responsible body: [NIPWG](#) (Nautical Information Provision Working Group)

[S-122_EN_Marine Protected Area Product Specification_Ed1.0.0.pdf](#)

[S-122AppA_EN_Data Classification and Encoding Guide_Ed1.0.0.pdf](#)

[S-122AppB_EN_Application Schema Documentation_Ed1.0.0.pdf](#)

[S-122AppC_EN_FeatureCatalogue_Ed1.0.0.pdf](#)

[S-122AppD-2_EN_GML Data Format Documentation_Ed1.0.0.pdf](#)

[S-122AppE_EN_Data Validation Checks_Ed1.0.0.pdf](#)

INTERNATIONAL HYDROGRAPHIC ORGANIZATION



MARINE PROTECTED AREA PRODUCT SPECIFICATION

IHO Publication S-122

Edition 1.0.0 – January 2019

Published by the
International Hydrographic Organization
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MARINE PROTECTED AREA PRODUCT SPECIFICATION

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Appendix A
Classification and Encoding Guide

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Appendix B
Application Schema Documentation

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Appendix C
Feature Catalogue

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Appendix D-2
GML Data Format Documentation

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Appendix E
Data Validation Checks

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The Baltic Sea and North Sea MSDI WG.





The Baltic- and the North Sea as a S-100 testbed S-122. Marine protected areas

At the BSHC 25 meeting it was agreed that the BS-NSMSDIWG should investigate how the BSHC and NSHC could work with S-122 and if it was possible and desirable to establish a pilot project with the North Sea and Baltic Sea as an S-122 testbed.

Why is this important - MSDI

- A regional MSDI must be built on a foundation of binding legislation within member states and treaties agreeing boundaries between them.
- Many MSDI activities partition human activity in the marine space
 - Marine Spatial Planning
 - Environmental agreements
 - Fishing Zones
 - Marine Cadastre
 - Energy Production
 - Maritime transport routes and traffic flows,
 - Military training areas,
 - Marine protected areas,
 - Scientific research,
 - Submarine cable and pipeline routes,
 - Tourism,
 - Underwater cultural heritage
- These activities ALL use Maritime Limits and Boundaries features as the foundation for their legal and spatial extents.
- S-121 provides a standard to hold and exchange this data

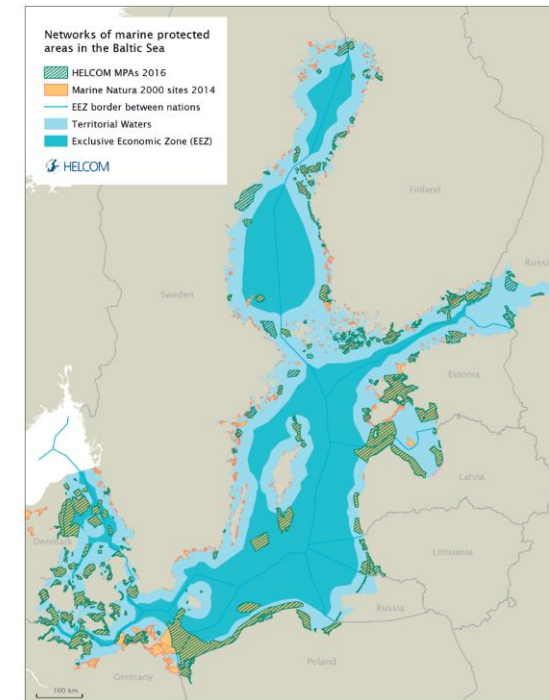
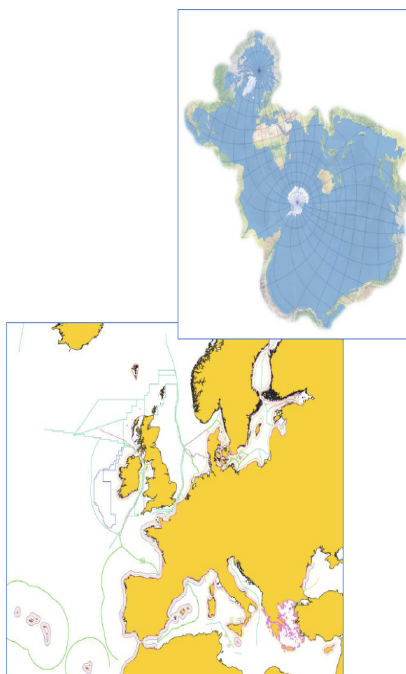


Figure 2. Overlap of the marine Natura 2000 sites and the HELCOM MPAs in the Baltic Sea.
Baltic Sea Environment Proceedings No. 148

OFB Find more about the North East Atlantic Network

OSPAR Regions

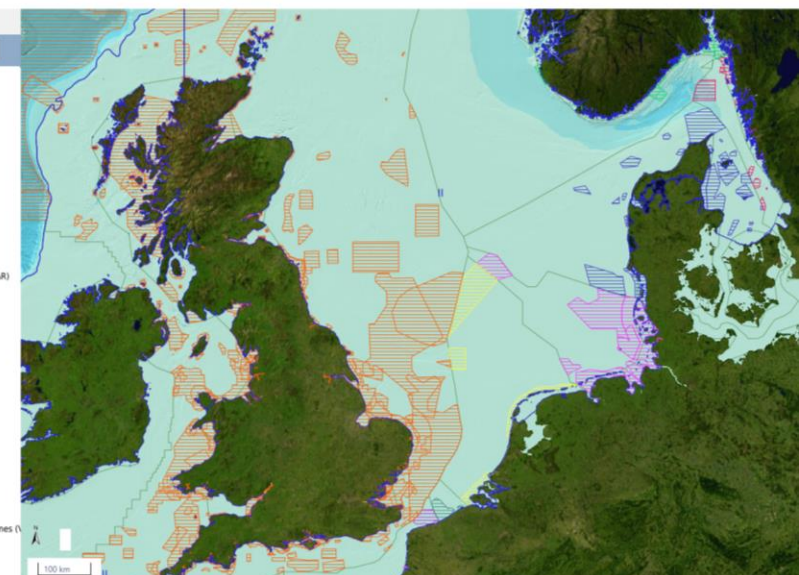
MARINE PROTECTED AREA

- ABNJ : Area beyond national jurisdiction
- NORWAY : marine protected area (OSPAR)
- SWEDEN : marine protected area (OSPAR)
- ICELAND : marine protected area (OSPAR)
- DENMARK : marine protected area (OSPAR)
- UNITED KINGDOM : marine protected area (OSPAR)
- IRELAND : marine protected area (OSPAR)
- NETHERLANDS : marine protected area (OSPAR)
- GERMANY : marine protected area (OSPAR)
- BELGIUM : marine protected area (OSPAR)
- FRANCE : marine protected area (OSPAR)
- SPAIN : marine protected area (OSPAR)
- PORTUGAL : marine protected area (OSPAR)

ADMINISTRATIVE BOUNDARIES

- Maritime Boundaries and Exclusive Economic Zones

BATHYMETRY



Support for a joint OGC/IHO Pilot.

This Pilot will show how the value of MSDI can unlock data and information for use beyond traditional providers and consumers of hydrographic data, across borders, and across domains inclusive of improved connections between the terrestrial and marine foundational communities.

1. **Demonstration** - The demonstration will show how using OGC, IHO and other open standards, enables the community's ability to find, obtain, utilize, share, interoperate and reuse data.
2. **Impact on OGC Standards** - Lessons learned, gaps, and the need for changes to the OGC standards baseline, will be summarized in an Engineering Report which informs the OGC standard program.
3. **Impact on IHO Standards** - Practical testing of relevant S-100 based IHO standards helps accelerate the process for adoption and implementation of IHO standards. The engineering report helps to inform the work of the IHO HSSCs Working Groups and will provide inputs to those groups to enhance the framework and its component standards.



OGC seeks sponsors for a cooperative OGC – IHO Federated Marine SDI Demonstration Pilot

New Pilot will demonstrate a multi-country, federated Marine Spatial Data Infrastructure for land/sea interface use-cases.



Our preliminary ideas about the scope of DGA participation in the OGC – IHO Federated Marine SDI Demonstration Pilot

The Baltic Sea / North Sea as an S-100 test bed

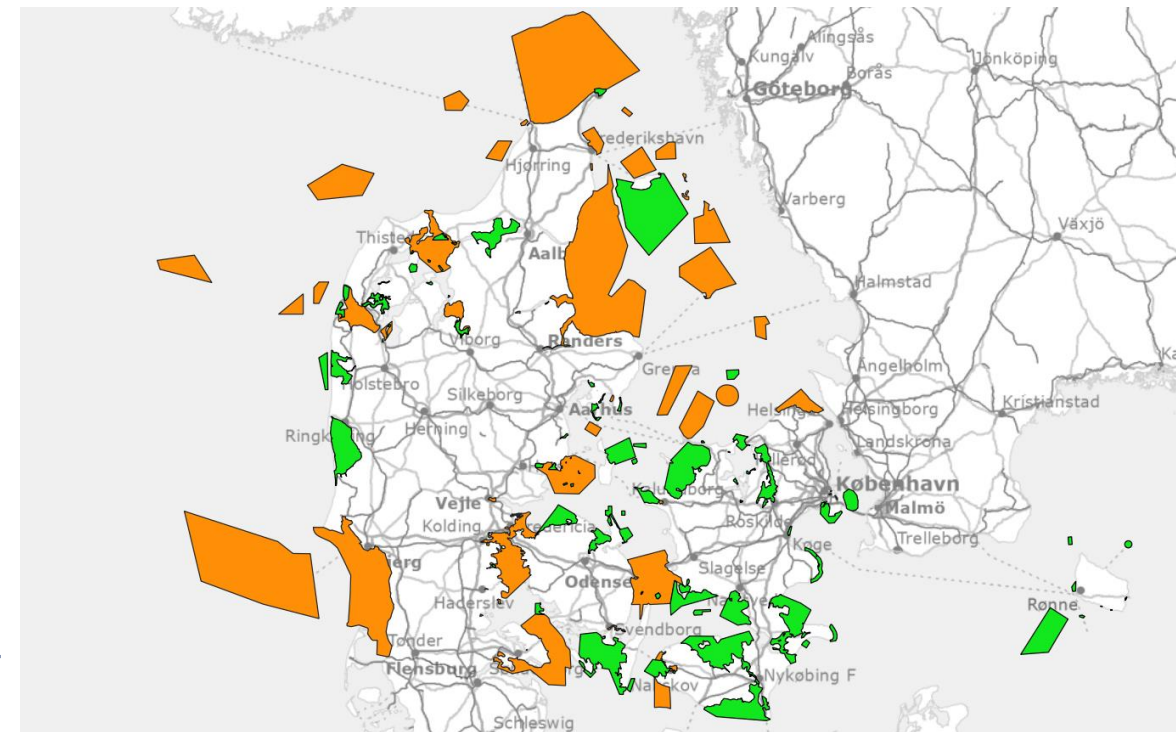
In this part of the project, the DGA focus will be on the following main areas:

Testing of various S-100 data sets relevant to MSDI and MSP, especially of S-122.

It has been decided that BS-NSMSDIWG should establish a pilot project for the Baltic Sea and the North Sea where there will be special focus on testing S-122 data. It will also be relevant here to test other S-100 data sets

Establishment of demonstration project regarding distribution of relevant S-100 data sets for the Baltic Sea and the North Sea for MSDI and MSP.

This part of the project fits well with the above BS-NSMSDIWG project but also with the work in DGA with to establish a future distribution solution.



Definition of Marine Protected Areas:

"A clearly defined geographical space recognized, dedicated, and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values."

Definition of Marine Protected Areas:

Marine Protected Areas (MPAs) involve the protective management of natural areas according to pre-defined [management objectives](#). MPAs can be conserved for a number of reasons including economic resources, biodiversity conservation, and species protection. They are created by delineating zones with permitted and non-permitted uses within that zone.

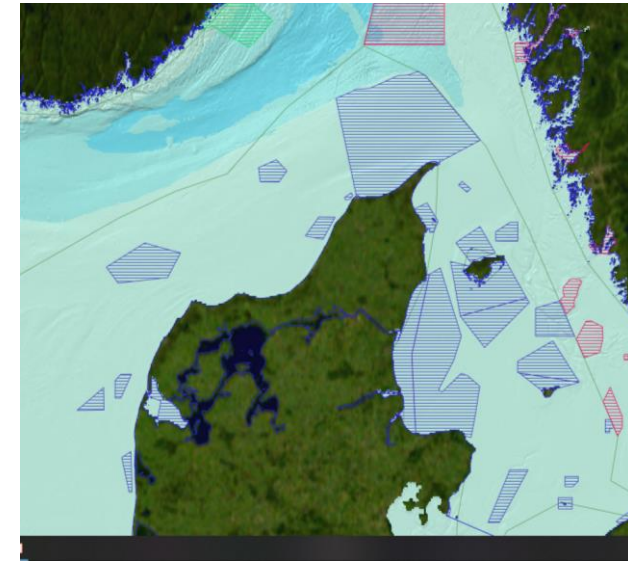
Interoperability & co-operation Baltic sea / North Sea S-122 Pilot

Interoperability

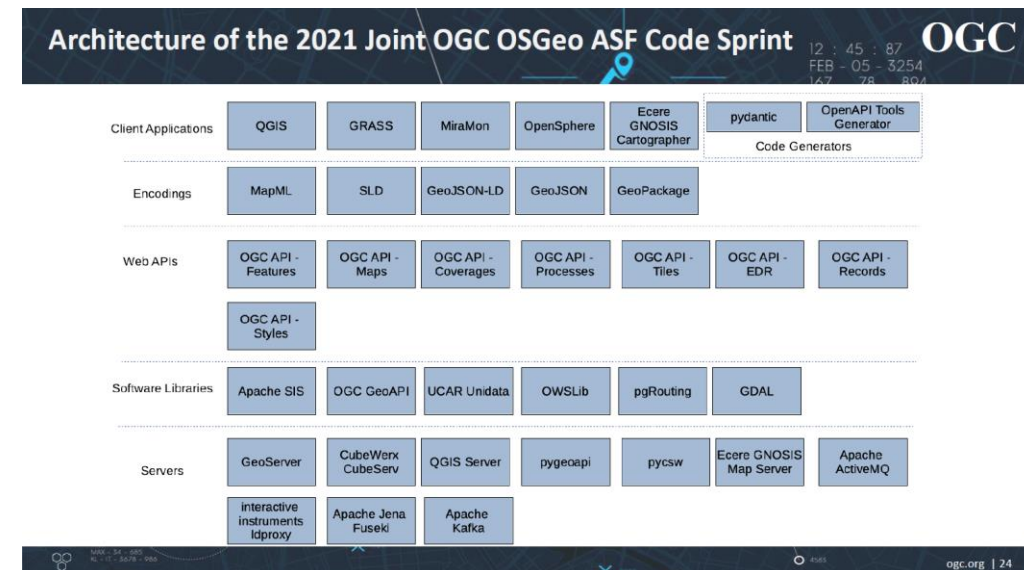
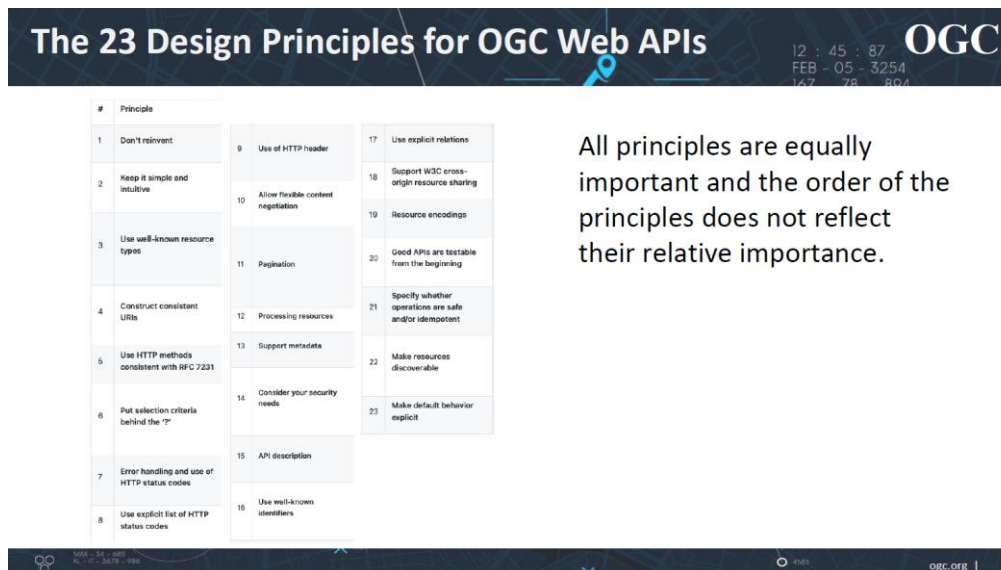
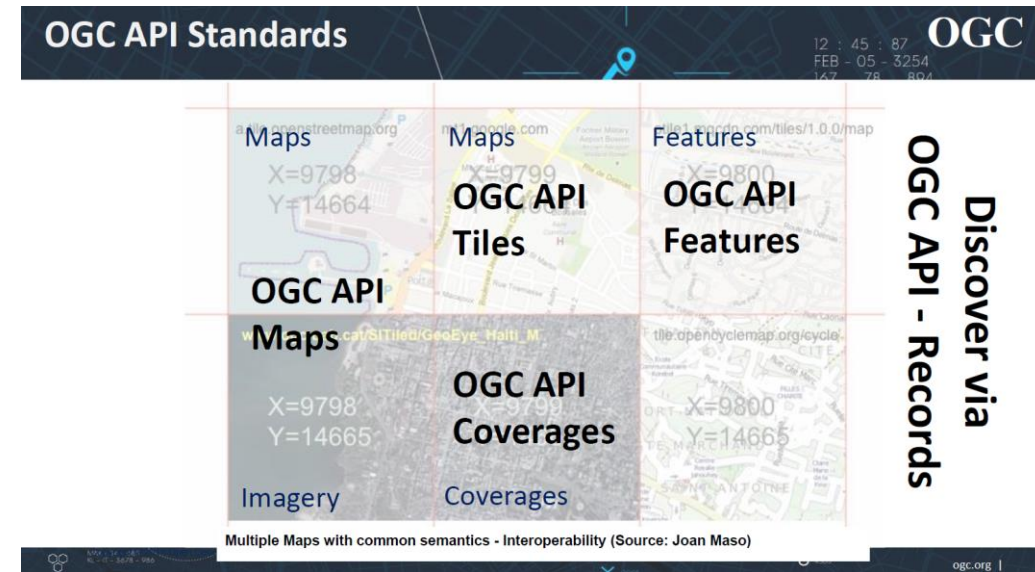
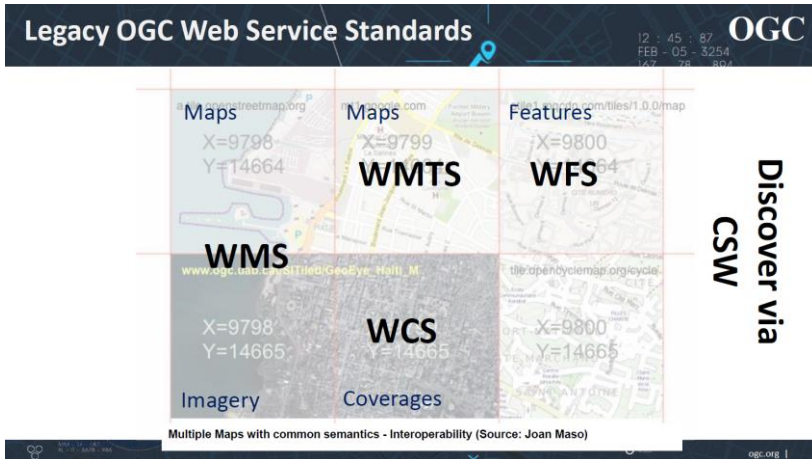
- S-101 will be the base layer – everything needed for safe navigation
=> *must not be made 'less safe' by release of other products, they are supplements*
- How will all these products work together?
=> *not standalone / harmonized*
- How co-ordinate across products/agencies?
=> *Both internally and externally*
- How perform maintenance across products?
=> *different production/QC times & methods*
- How manage distribution?
=> *different routes/speeds for different products*

Co-operation

- To ensure consistency in content and method
- Avoid duplicated work
- National agencies producing S-100 datasets



From OGC Web Services Standards to OGC API standards



Execution of Federated Marine Spatial Data Infrastructure (FMSDI)

Major Steps

This project consists of the following major steps to complete the above tasks:

Phase 1. Marine Data Availability and Accessibility Study

- Develop and launch RFI (Request for Information) (Done)
- Evaluate RFI responses (Ongoing)
- Leverage existing network and invite RFI respondents to workshop
- At workshop, understand research questions/answers
- Summarize information and lessons learned in MDAAS report (Marine Data Availability and Accessibility Study)



Phase 2. Pilot

- Develop and launch CFP (Pilot Call for Participation)
- Evaluate CFP responses and discuss recommended participants with sponsors at Technical Evaluation Meetings
- Develop Baltic/North Sea and Arctic scenarios
- Demonstrate results
- Submit final Engineering Reports to OGC selected Working Groups

