

Unlocking the Value of Marine Information MACHC 23

Rafael Ponce, OGC Marine DWG Co-chair



The Open Geospatial Consortium (OGC)

Community – Innovation - Standards



230+ members from industry

120+ government agencies

185+ universities & research orgs

70+ standards

100+ working groups

The Open Geospatial Consortium (OGC)

Collective problem solving – Findable, Accessible, Interoperable and Reusable (FAIR)



https://www.ogc.org/standards

Many Trends – Geospatial is Everywhere



Based on Building Blocks of the Future





Features Approved Standard 👩

OGC API - Features - Part 1: Core and Part 2: Coordinate Reference Systems by Reference are both publicly available.

Common OGC API - Common provides those elements shared by most or all of the OGC API standards to ensure consistency across the family. The candidate standard will soon be released for public review.



Maps OGC API - Maps offers a modern

approach to the OGC Web Map Service (WMS) standard for provision map and raster content.





Tiles





Styles

The OGC API - Styles defines a Web API that enables man servers, clients as well as visual style editors, to manage and fetch styles...

EDR Environmental Data Retrieval (EDR) API provides a family of lightweight interfaces to access Environmental Data resources.

Each resource addressed by an EDR API

maps to a defined query pattern.



https://ogcapi.ogc.org/



Records

OGC API - Records updates OGC's Catalog Services for the Web by building on the simple access to content in OGC API - Features.



Processes

many sources and applied to data in other

OGC API resources though a simple API.

OGC API - Processes allows for processing tools to be called and combined from

Coverages

OGC API - Coverages allows discovery, visualization and query of complex raster stacks and data cubes.



DGGS Enables applications to organise and access data arranged according to a Discrete Global Grid System (DGGS).

Enables applications to request routes in a

manner independent of the underlying routing data set, routing engine or algorithm





*Including the Fundamental Geospatial Data Themes and the Global Statistical Geospatial Framework

https://www.ogc.org/projects/initiatives/fmsdi





Innovation in the Marine Domain



The IHO-OGC FMSDI Pilot

- Demonstrate multi-country/region , Federated Marine Spatial Data Infrastructure (SDI) to:
 - Stakeholders inclusivity!
 - **Delivery** Demonstrate how federated Marine SDI can provide simple, secure access using Modern Standards based approaches (OGC APIS, IHO S-1XX)
 - Areas of interest Baltic and North Sea (Arctic, South-East Asia, others)

Thanks to our Sponsors!







And two new Sponsors...

Digital Arctic

Background:

Coastal erosion at the land – sea interface: Where the land meets the sea

- Demonstrating interoperability between land and marine data to understand coastal erosion (e.g. ocean currents, geology, permafrost characteristics, etc.) in the Arctic.
 - Defining coastline (highest line) and transition zone.
 - Need to connect with national organisations working on the coastal transition zone.

Canada Government du Canada



from https://bodell.mtchs.org/OnlineBio/BIOCD/text/chap ter34/concept34.4.html

Digital Twin Challenge: Integration of Land and Marine data for Coastal Protection Planning, Critical Infrastructure Protection, and Resilience.

LOG

THE STRAITS TIMES

SINGAPORE

Pilot to help Singapore plan for better coastal protection against rising sea levels



As a low-lying island state, Singapore is threatened by rising seas caused by the planet's warming. PHOTO: LIANHE ZAOBAO

https://www.straitstimes.com/singapore/pilot-to-help-singapore-plan-for-better-coastalprotection-against-rising-sea-levels M P A



Outcomes

- Demonstrations Technology demonstration showcasing federated Marine SDI Land/Sea use cases
- Impact on OGC Standards Lessons learned and gaps
- Impact on IHO Standards Practical testing of relevant S-100 based IHO standards to help to inform the work of the IHO HSSC Working Group
- Impact on Next Steps what is next (demonstrating creation and delivery of IHO S.1XX product specs using OGC standards? Data Management – data cubes, Discrete Global Grids) ?
- Advancing FAIR (and increasingly FAIR+) approaches

How do we unlock the ability to share the wealth of nonnavigational marine data collected by the international community ?



Phase 3: Arctic: Land and Sea to Protect the Arctic Environment

- To learn more about current capabilities and gaps of marine data & services offered by various Arctic Marine Spatial Data Infrastructures, Web portals, and directly accessible cloud/native data:
 - Test interoperability of international standards
 - Showcase the value of a data rich environment to stakeholders to further understand and respond to impacts of climate change and human activity
 - Support building a data rich Federated Marine/Arctic SDI
 - Allow for better informed decisions
 - Opportunity to build on past efforts and help advance technology and guide standards to increase interoperability

The Overarching Scenario

- In the last 12 years there have been a significant increase in shipping traffic (as is the risk of accidents)
- A sea-based, transportation, health and safety scenario incorporating the land/sea interface in Alaska
- Expedition ship runs aground in Kotzebue Sound, north of Nome Alaska
- It was on a voyage to Kangerlussuaq, Greenland, with approx. 200 passengers and crew on board
- Interoperability between land and marine data that is necessary to understand coastal erosion
- This area includes national parks and a number of Large Marine Ecosystems (LMEs) with challenging navigation conditions



Map showing activity of all vessels, June to October 2019 Source: Nuka Research and Planning Group LLC, 2020



THE SCIENCE OF WHERE ™

Federated Marine Spatial Data Infrastructure (FMSDI) Pilot Project - Phase 3

Demonstration of FMSDI Client D-100 prepared by Esri Canada

November 2022



FMSDI Client Demonstration Wrap Up



Take Aways

- Web services allow implementers to easily expose GIS functionality and geospatial information over the Internet.
- Common standards for Web services and data models makes interoperability simple and straightforward.
- Web Services underpin the FAIR data principle making GIS data useable and reusable by governments and industry.
- The emergency management application of standardsbased interoperability encourages to investigate geospatial data uses further.





Overall Initiative

- European Coastal Waters (Baltic and North Sea, with a focus on S122 and platform Interoperability – sponsored by Denmark/ and supported by UKHO - complete
- MSDI Maturity Related work (sponsored by UKHO and connected to IHO, OGC and UN-GGIM) complete
- Arctic Ship runs aground in the western Alaskan Arctic multiple OGC and IHO standards - sponsored by NGA – in-progress
- Digital Twins Arctic with a focus on Coastal Erosion likely between Canada / Greenland - under development with the Government of Canada
- Singapore Digital Twin Challenge: Integration of Land and marine data for coastal protection planning, critical infrastructure protection and resilience – commitment received.
- Caribbean Digital Twins Connecting Land and Seas small Island state preliminary discussions
- Very early discussion is expanding to other areas, such as Africa, other small island states



Questions ? rponce@esri.com ttaylor@ogc.org

Thank You

Community

500+ International Members
110+ Member Meetings
60+ Alliance and Liaison partners
50+ Standards Working Groups
45+ Domain Working Groups
25+ Years of Not for Profit Work
10+ Regional and Country Forums

Innovation

120+ Innovation Initiatives380+ Technical reportsQuarterly Tech Trends monitoring

Standards

65+ Adopted Standards 300+ products with 1000+ certified implementations 1,700,000+ Operational Data Sets Using OGC Standards





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