MARINE SPATIAL DATA INFRASTRUCTURES WORKING GROUP

MSDIWG

Report to IRCC12

VTC, 6 - 7 October 2020

By Jens Peter Weiss Hartmann

MSDIWG Chair

International Hydrographic Organization

# The IHO MSDIWG and the relation to UN-GGIM MGWG and OGC MDWG

MSDIWG11 - Rostock-Warnemünde, Germany. 24 to 26am February 2020
A joint IHO-OGC Marine DWG session took place in the morning of 26 February 2020
UN-GGIM WGMGI2 meeting was held from 26pm to 28 February 2020

11th IHO MSDIWG meeting
Link https://iho.int/en/msdiwg11-2020

Marine Spatial Data Infrastructure (MSDI) International
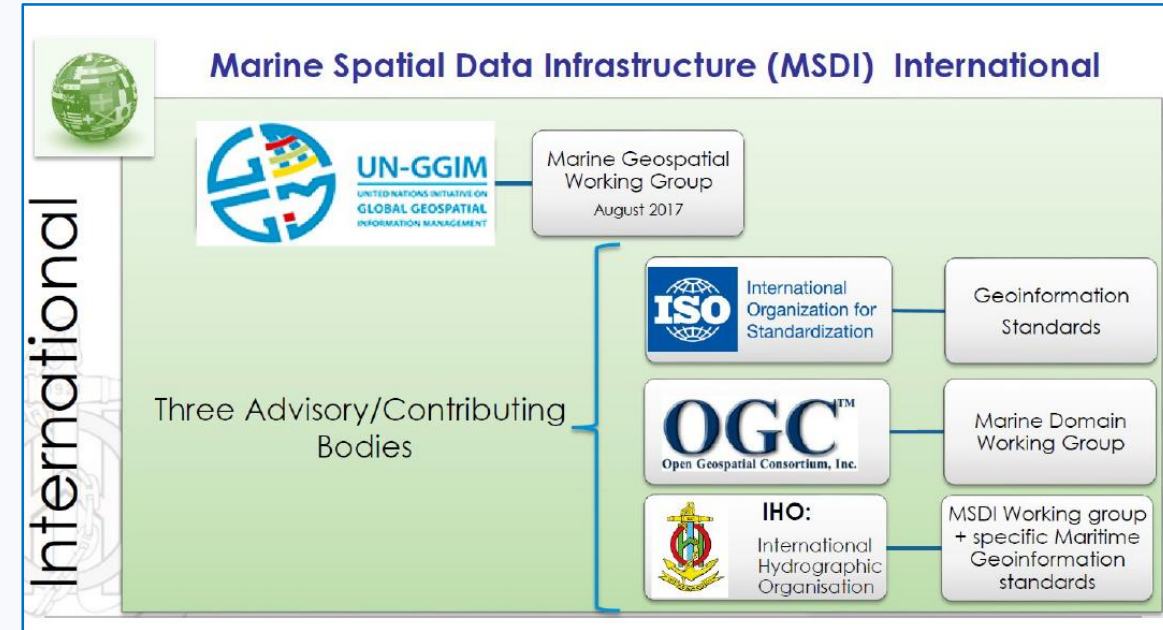
Next planed meeting	Dates in 2021
MSDI Open Forum	12 April (Mon)
12th IHO MSDI WG Meeting, Joint IHO-OGC Marine DWG Meeting	13-14 April (Tues, Wed)
Third Expert Meeting of the UN-GGIM WG MGI	15, 16 and 17 April (Thurs-Sat)

11th IHO Marine Spatial Data Infrastructures Working Group Meeting (MSDIWG11)

At the meeting the MSDIWG11 focused on 8 topics seen as important from a HO and MSDI perspective:

1. MSDI training material, the need for adjustments and updates.
2. Development of use cases for the WGMGI
3. IHO-OGC MSDI Concept Development Study and how to proceed
4. Expectations of the "new" WENDWG from a MSDI perspective
5. Updating of C-17
6. UN Sustainable Development Goals (SDGs) and how a MSDI can support the SDGs
7. MSDI Governances, e.g. Data policies, funding/financial models
8. MSP with relation to MSDI and how to proceed with MSP from a IHO MSDIWG perspective

International Hydrographic Organization

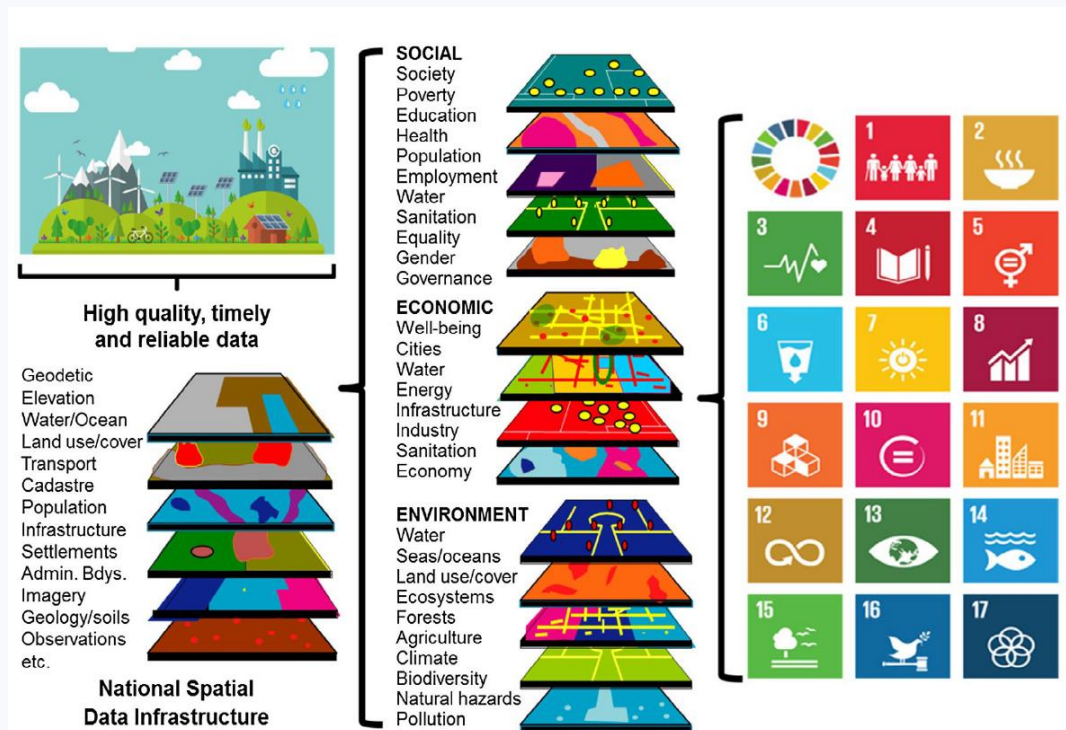# How MSDI could contribute to UN Sustainable Development Goals

Figure 4. Extending fundamental geospatial data themes within the National Spatial Data Infrastructure (NSDI) to accommodate the SDGs and targets by means of the global indicator framework.

Potential contributions

- Sea Level Rise

- Sea Temperature

- Coastal zone mapping data (LiDAR, Earth Observation/Remote Sensing Data)
    - Change detection
    - Erosion
    - Infrastructure development

- …and many more

Example: Sea Level Rise

	1 No Poverty	2 Zero Hunger	3 Good Health and Well-being	4 Quality Education	5 Gender Equality	6 Clean Water and Sanitation	7 Affordable and Clean Energy	8 Decent Work and Economic Growth	9 Industry Innovation and Infrastructure	10 Reduced Inequalities	11 Sustainable Cities and Communities	12 Responsible Consumption and Production	13 Climate Action	14 Life Below Water	15 Life on Land	16 Peace, Justice and Strong Institutions	17 Partnerships for the Goals
Addresses				*		*	*		*		*						
Bldgs and Settlements	*		*	*		* MSDI	*		*		*	*	*	MSDI			
Elevation and depth	*	*	*			*	*				*		*	*	*		
Functional Areas	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Geographical Names	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Geology and Soils		*	*			*	*	*	*		*	*	*	*	*		
Land Cover/Land Use	*	*	*		*	*	*	*	*		*	*	*	*	* MSDI		
Land Parcels	*	*		*					*		*						
Orthoimagery		*				*			*		*			*	*		
Physical infrastructure			*	*		*	*		* MSDI		*				MSDI		
Population distribution	*	*	*	*	*	*	*	*	*	*	*	*	*	*	* MSDI	*	*
Transport Networks		*	*					*	*		*						
Water		*	*			* MSDI	*		*		*	*	*	*	*		
Global Geodetic Reference Framework		*				*	*	*	*	*	*	*	*	*	*	*	*

UN-GGIM - Integrated Geospatial Information Framework (IGIF)

The Integrated Geospatial Information Framework (IGIF) provides a basis and guide for developing, integrating, strengthening and maximizing geospatial information management and related resources in all countries. It will assist countries in bridging the geospatial digital divide, secure socio-economic prosperity, and to leave no one behind.
Link https://ggim.un.org/IGIF/

UN-GGIM
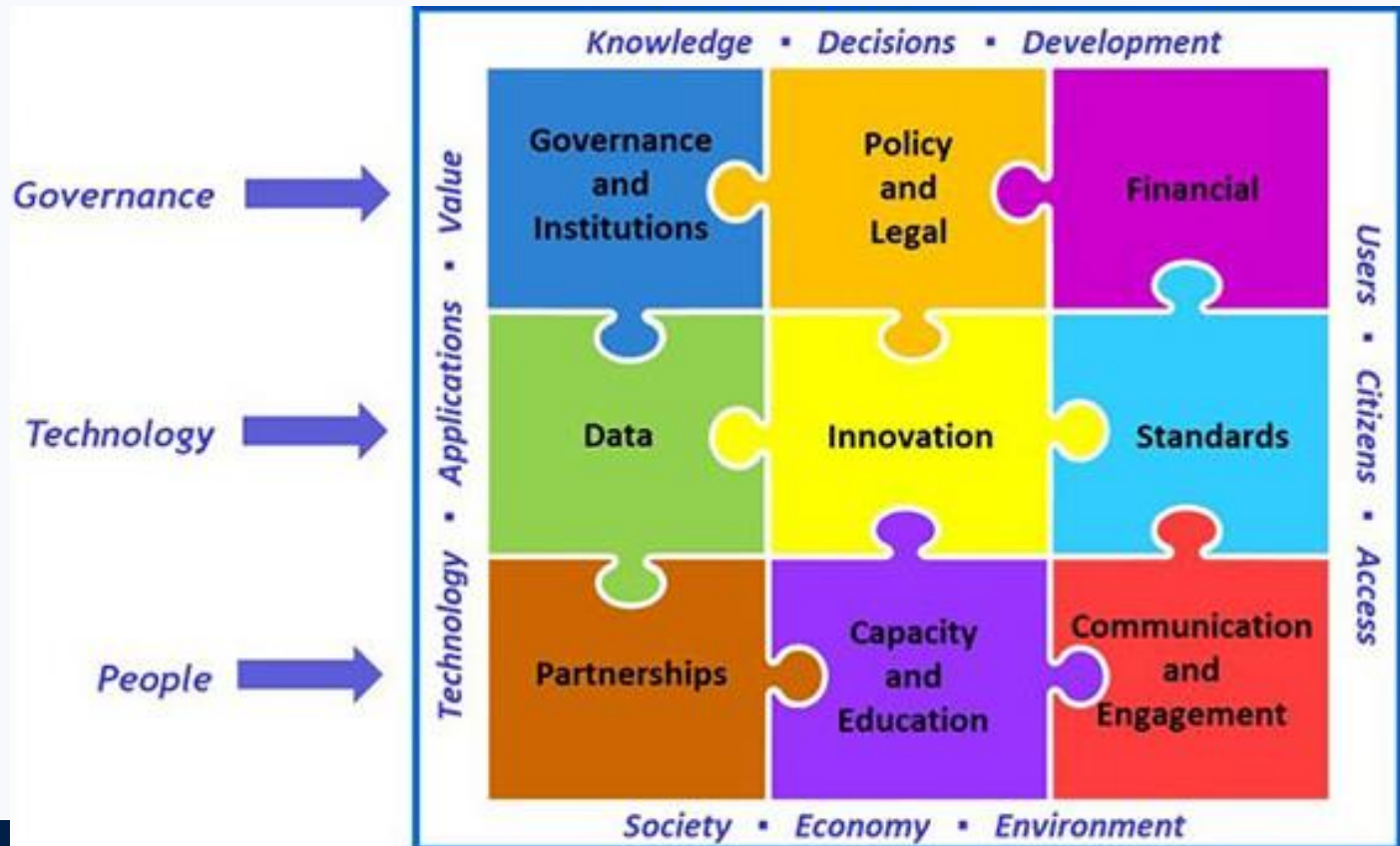
The Four pillars of MSDI
Publication C-17

IHO International Hydrographic Organization
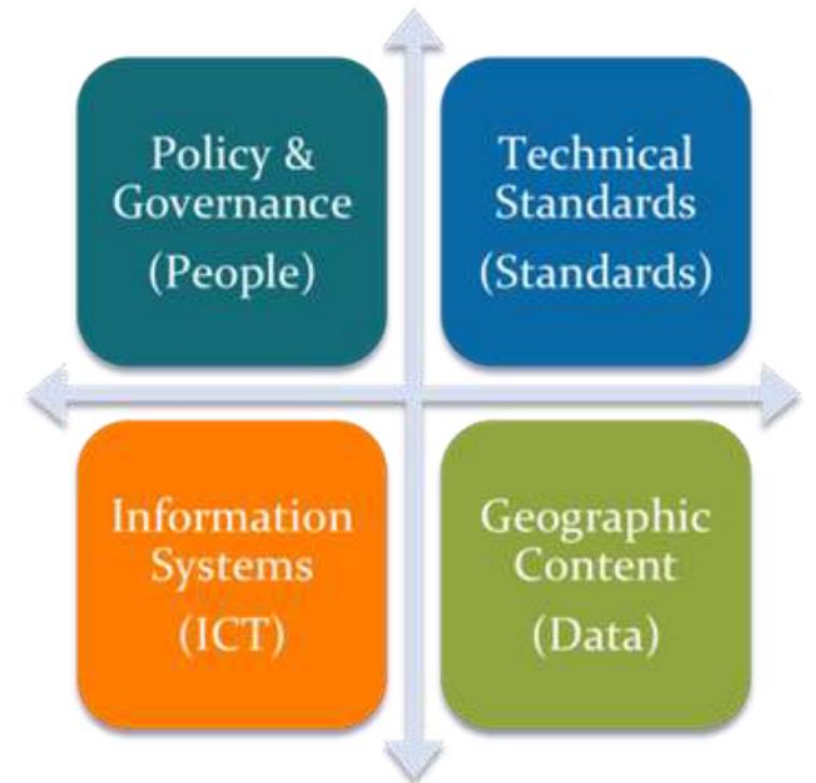
Data security and integrity:

From a MSDI perspective there is a common need for measures to protect both originating data producers and end users from the impacts of misuse and/or data corruption.

The MSDIWG has a focus on the "authoritative" nature of data and UN-GGIM's IGIF recognizes this as an implicit "custodianship" concept.

From a MSDI perspective there is, a need within the IHO community for the ability to define "authoritative" in digital terms as an integral part of data itself rather than something which sits alongside it and which can (potentially) be separated from the data content.

Recent developments in the S-100WG further address the problem and could help by adding data integrity measures to realtime data supply and web services as well as standalone vector datasets. These measures do not wholly address the needs of the MSDI community though and the all-important area of data transformation requires further insights and work to come up with tangible, practical solutions.

The MSDIWG will continue to focus on data security and integrity from a MSDI perspective.

⇒ Main discussion on data, official data, authoritative data and legal binding data / maps
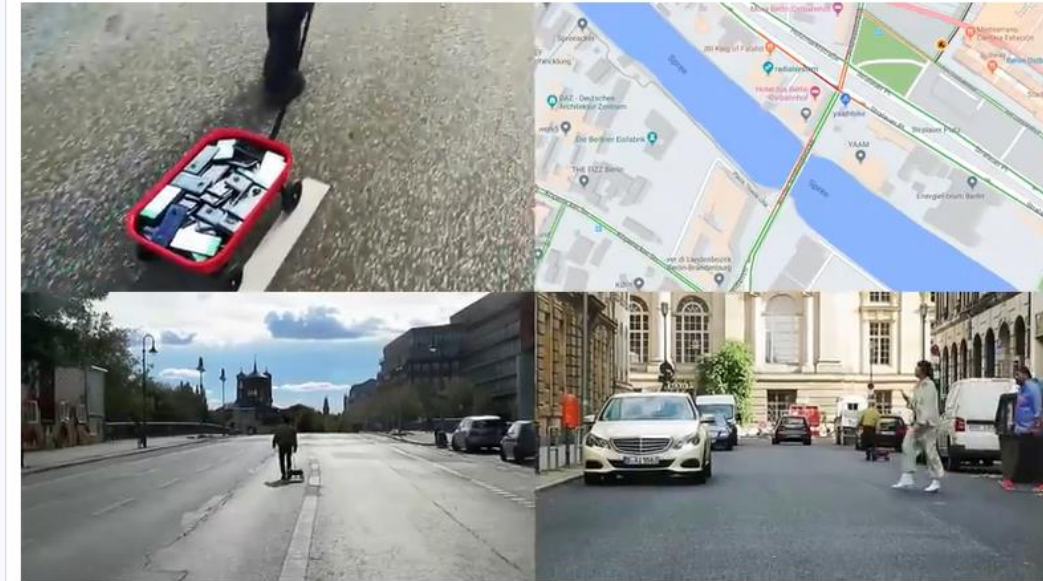

Berlin artist uses 99 phones to trick Google into traffic jam alert

Google Maps diverts road users after mistaking cartload of phones for huge traffic cluster

Google Maps Hacks by Simon Weckert.

A Berlin-based artist managed to create a traffic jam on one of the main bridges across the Spree with nothing but a handcart and 99 second-hand phones. But one other thing was unusual about the jam: it only existed on Google Maps.

Simon Weckert's artwork Google Maps Hacks involved the artist pulling a small red cart at walking pace down some of the main thoroughfares of Berlin. The 99 phones in the cart, all reporting their locations and movement back to Google's servers, gave the search company the impression of a huge cluster of slow-moving traffic, which was duly reported on the company's maps.

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C 17 Recommendations

1. C-17 should be reviewed in depth but this is not urgent and should be aligned with other IHO communications

2. Review the content to reference other related (valuable) information e.g.
   - Training material
   - BoK
   - OGC Concept Study (e.g. Marine Data Themes)
   - UN-GGIM IGIF and IGIF Water
   - IHO Strategic Plan – C17
   - The role of an HO in MSDI

3. Update outdated content or refer to OGC CDS

4. Use IGIF structure - relate the 9 Strategic Pathways to the Marine Domain

5. Review the format to make it easy to update/maintain e.g. wiki

SPATIAL DATA INFRASTRUCTURES "THE MARINE DIMENSION"

Guidance for Hydrographic Offices

Publication C-17
Second Edition
Version 2.0.0 - January 2017

Published by the
International Hydrographic Organization
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Support for a joint OGC/IHO Pilot.

As recommended by the successful OGC-IHO MSDI Concept Development Study (CDS), and as evidenced by the success of the OGC-IHO collaboration in the on-going OGC-IHO Maritime Limits and Boundaries pilot, we are seeking support to initiate a full-scale Pilot to demonstrate a multi-country, federated MSDI under a land/sea boundary use case.

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 <u>the community's ability to find, obtain, utilize, share, interoperate and reuse data</u>.
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** - <u>Practical testing of relevant S-100 based IHO standards</u> 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 <u>and will provide inputs to those groups to enhance the framework and its component standards.</u>

Sponsorship. The rough order of magnitude for sponsorship is <u>USD 400,000</u>, shared across multiple supporting sponsors.

When Would the Pilot Start?
The current plan is for the kick-off of the pilot in the second quarter of 2021, with the full Pilot being completed in 2022, subject to change based on sponsor requirements.

Contact for more Information.
Trevor Taylor (ttaylor@ogc.org) or Scott Simmons (ssimmons@ogc.org)

OGC

OPEN GEOSPATIAL CONSORTIUM (OGC)
Proposed Partnership with

INTERNATIONAL HYDROGRAPHIC ORGANIZATION (IHO)
Member States

OGC – IHO Federated Marine SDI Demonstration Pilot: FMSDI

Land/Sea Interface

Call for Support

Ocean Data Information and Services, - France

Marine Spatial Data Infrastructures (MSDI) questionnaire

CL56/2019

Identification of the Marine Spatial Data Infrastructures (MSDI)

- Question: Is there a MSDI established in your country? Yes/No
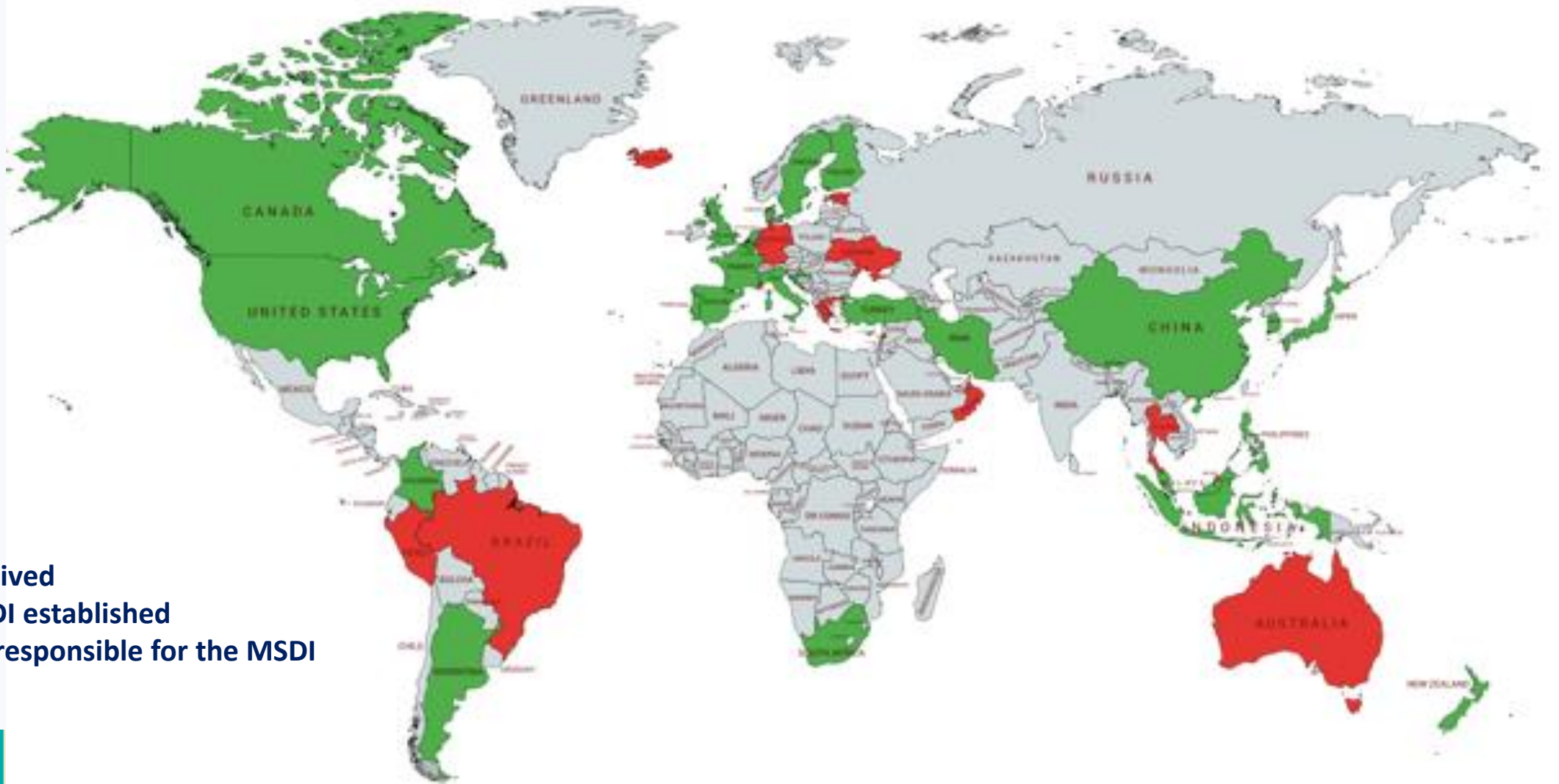
41 answers received
28 national MSDI established
12 national HO responsible for the MSDI

Identification of the Marine Spatial Data Infrastructures (MSDI)

Question: If a MSDI is established, please describe in which way it is established.

Bar chart values:
- By a dedicated law: 7
- Into the national SDI law: 5
- By the tasks of the organization: 9
- Other: 6

Pie chart:
- By a dedicated law: 26%
- Into the national SDI law: 19%
- By the tasks of the organization: 33%
- Other: 22%
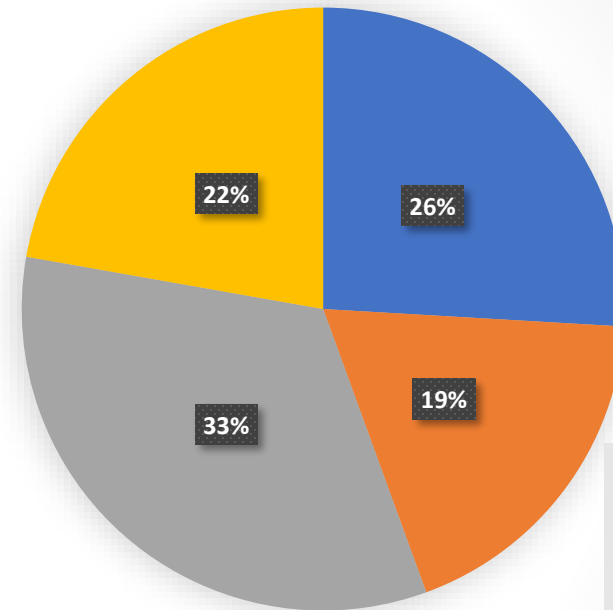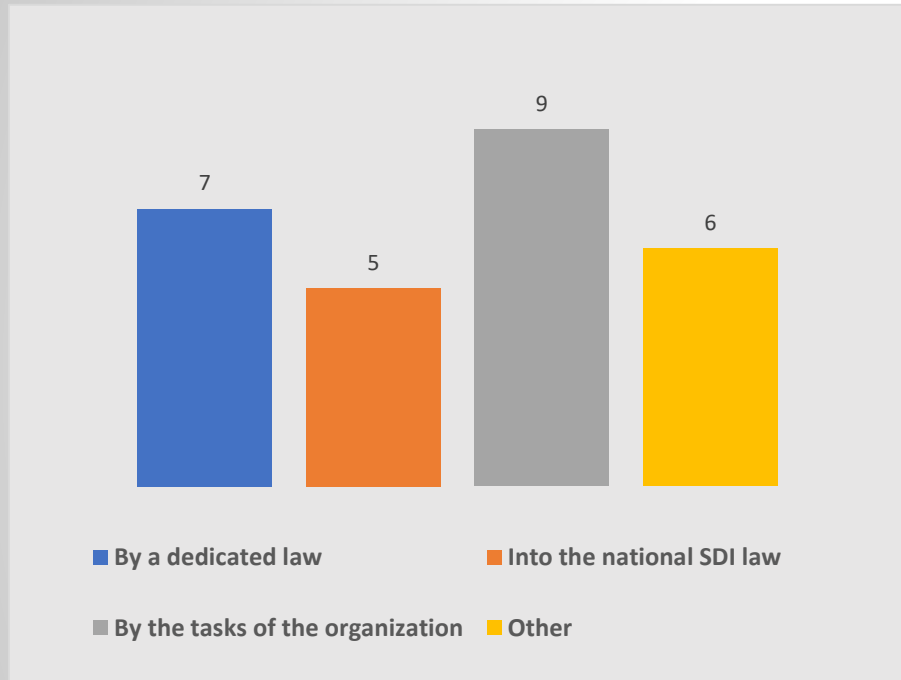
Legend:
- ■ By a dedicated law
- ■ Into the national SDI law
- ■ By the tasks of the organization
- ■ Other

- Finnish MSDI is a part of national SDI
- Cabinet Decision (Basic Plan on Ocean Policy, (May 2018))
- NHC as National MSDI mandated from Malaysia Centre of Geospatial Data Infrastructure
- An MSP coordinating Committee has been established by Cabinet and a Working Group under the committee is tasked to look at data management - MSDI is part of the NSDI, governed by a.o. the national implementation of the INSPIRE Directive.
- New Zealand agencies, led by LINZ, are working in partnership towards an Integrated Geospatial Information Framework (IGIF) for NZ which includes the marine dimension.

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Identification of the Marine Spatial Data Infrastructures (MSDI)

Nature of the funding for the MSDI.
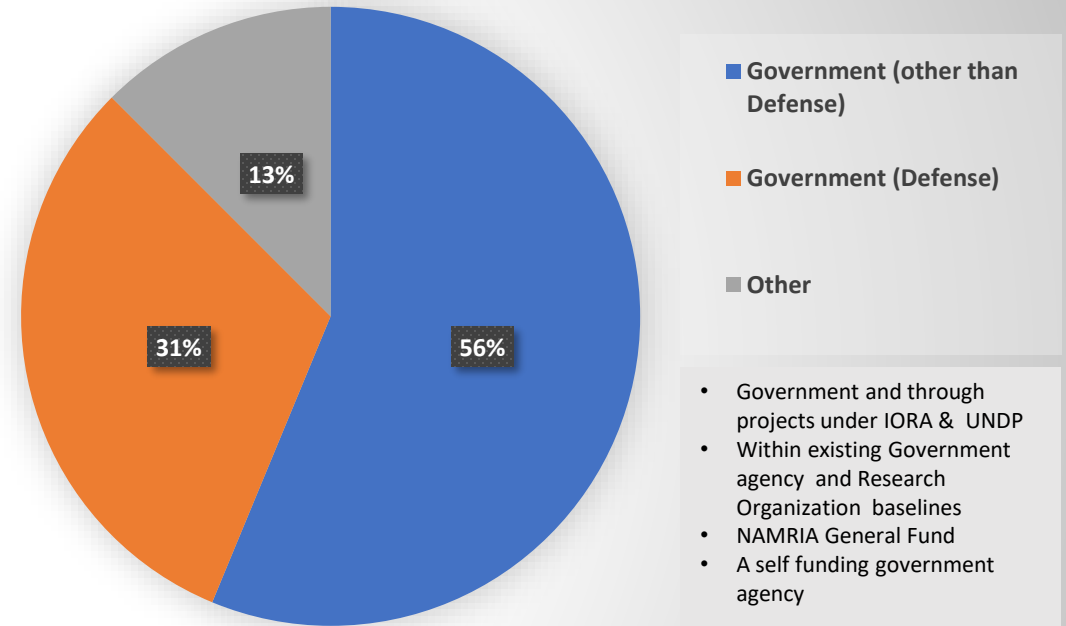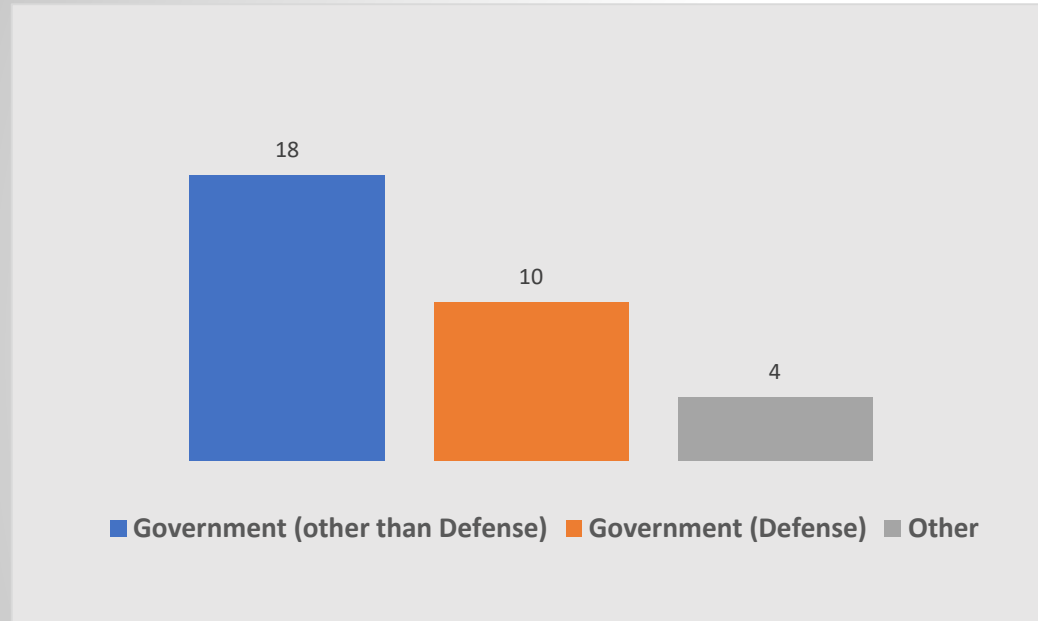
- Government and through projects under IORA & UNDP
- Within existing Government agency and Research Organization baselines
- NAMRIA General Fund
- A self funding government agency

International Hydrographic Organization

Audience

Question: Who are the target users of the MSDI?

Bar chart values:
- Senior Management: 4
- Operational Management: 3
- Public Use: 8
- Academia: 5
- Private Sector: 5
- Specific Users (such as mariners): 3
- All of the above: 25
- (Restricted military used): 5
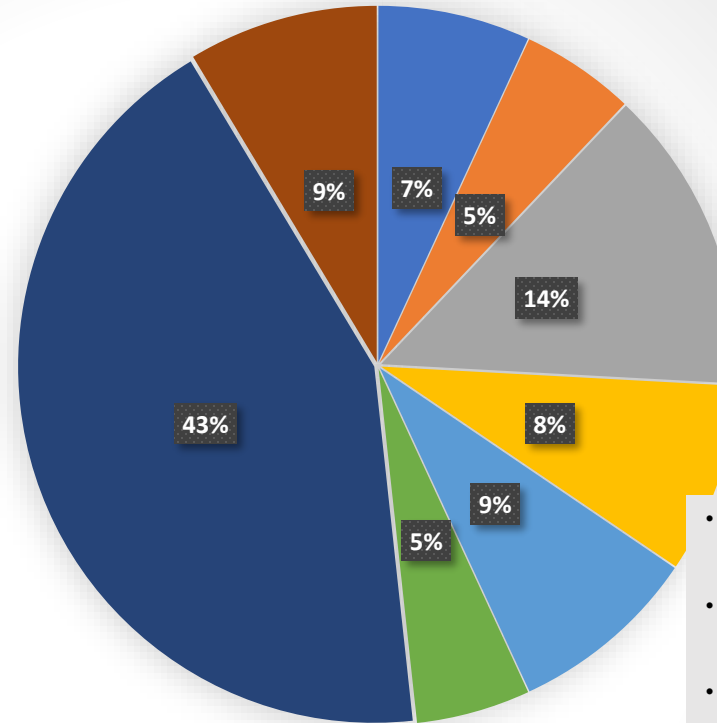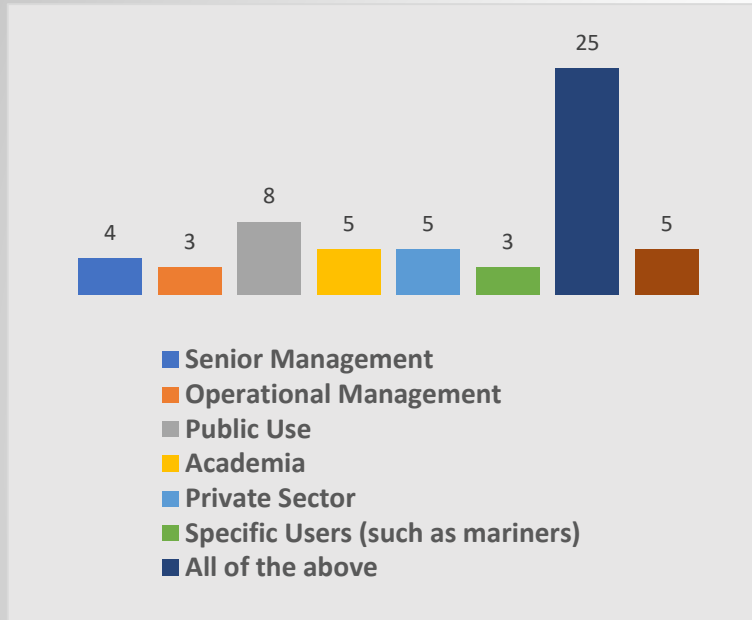
Legend:
- Senior Management
- Operational Management
- Public Use
- Academia
- Private Sector
- Specific Users (such as mariners)
- All of the above

Pie chart percentages:
- Senior Management: 7%
- Operational Management: 5%
- Public Use: 14%
- Academia: 8%
- Private Sector: 9%
- Specific Users (such as mariners): 5%
- All of the above: 43%
- 9%

- National Governmental Organizations, Bodies and Institutions and Regional and Local Authorities
- Currently only acces for agencies which co-fund the MSDI (both senior and operational management)
- Because MSDI has not been established, then also the targeted users have not been recognized. However, our understanding is that once MSDI is established, it should be usable for anyone to whom it generates value.
- Public Use, Academia, Private Sector, Specific Users (such as mariners)
- Resticted military used

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Support Usage

Question: What are the main applications of your MSDI?

Bar chart values:
- Portal: 21
- Web map service: 21
- Web feature service: 11
- Web catalog service: 14
- Web coverage service: 8
- Other: 10

Pie chart percentages:
- Portal: 25%
- Web map service: 25%
- Web feature service: 13%
- Web catalog service: 16%
- Web coverage service: 9%
- Other: 12%
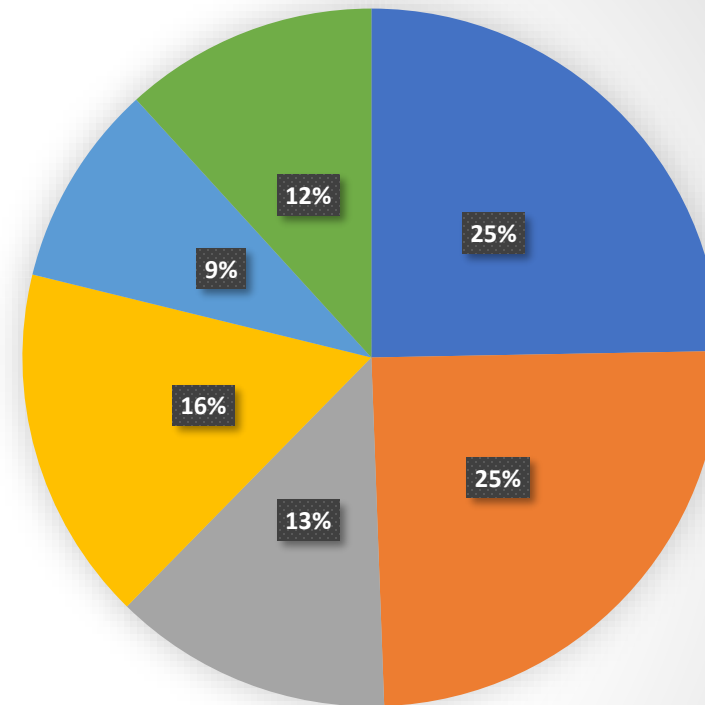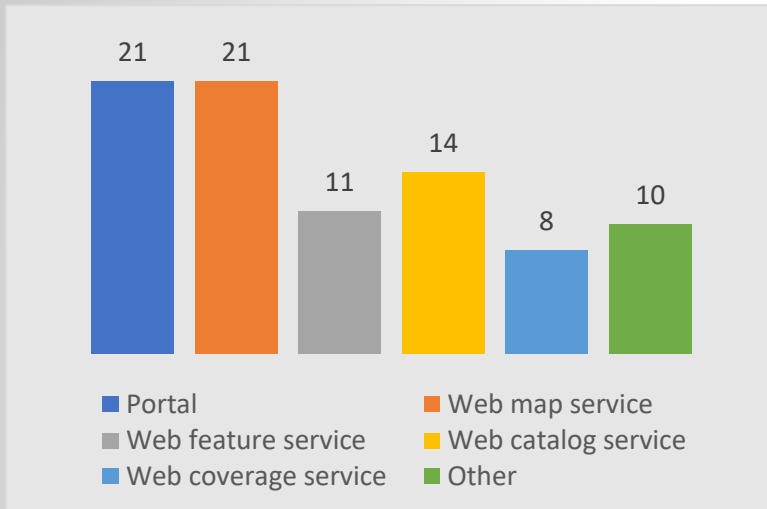
Legend:
- Portal
- Web map service
- Web feature service
- Web catalog service
- Web coverage service
- Other

- Web map tile service, Web processing service, Geoservices REST
- Geoserver and Geonetwork
- The applications for MSDI have not been identified
- A first edition of a geoportal is active, but contains no hydrographic data.
- Data are available for download in shapefile or Geotiff from a web portal which is currently accessible on the Government Intranet System. Documents such as PDF can also be tagged to the layers. However, the uploader can decide whether a dataset can be shared publicly or restricted to allow access to only specific users.
- Portal, 2D and 3D Marine Viewers (search catalogue, geoprocessing services and API, web services (e.g. WMS, WFS, WCS))

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INTER-REGIONAL COORDINATION COMMITTEE

HOME > MSDIWG

MSDIWG

MSDIWG

Basic WG Documents

MSDIWG10 (2019)

MSDIWG11 (2020)

MSDIWG Letters

Body of Knowledge

Inter Regional Coordination Committee

IRCC

RHCs

HCA

WWNWS

MSDIWG

MARINE SPATIAL DATA INFRASTRUCTURES WORKING GROUP (MSDIWG)

Chair:	Mr Jens Peter HARTMANN (Denmark)
Vice-Chair:	Mr Sebastian CARISIO (USA)
Secretary:	Mr Leonel MANTEIGAS (IHO Secretariat)

Objectives

Assess the status of Spatial Data Infrastructures (SDI), Marine Spatial Data Infrastructures (MSDI) and Marine Spatial Planning (MSP) worldwide. Support and promote the activities of the IHO in these fields. The WG develops and maintains the IHO Publication C-17 Spatial Data Infrastructures: "The Marine Dimension" - Guidance for Hydrographic Offices. Members are representatives of Member States, Expert Contributors and Accredited NGIO Observers.

Meeting Documents

Only documents for upcoming, current and previous years meetings are listed left. All earlier meeting documents are available from the _IHO Document Archive._

News

NEWS
IHO releases new standards for hydrographic surveys

NEWS
Audience with HSH Prince Albert II & priorities for the new Directing Committee

NEWS
World Hydrography Day

NEWS ARCHIVE

IHO International Hydrographic Organization

Information from Body of Knowledge

Link https://iho.int/en/body-of-knowledge

Standards

Training

INTERNATIONAL HYDROGRAPHIC ORGANIZATION

Marine Spatial Data Infrastructures Working Group (MSDIWG)

SDI/MSDI Related Standards

Last update: 6 April 2020

Tier 1 Standards

Visualization & Portrayal

OGC/ISO 19128 Web Map Service (WMS)
OGC Web Map Tile Service (WMTS) 1.0
OGC Styled Layer Descriptor 1.1 (SLD)
OGC Web Map Context 1.1 (WMC)
OGC KML 2.2

Catalogue & Discovery

ISO 19115, Geographic information – Metadata
OGC Catalogue Services Specification 2.0.2 (CSW)
ISO Metadata Application Profile
OGC (ISO19115 Metadata) Extension Package of CS-W ebRIM4 Profile 1.0

Tier 2 Standards

Distributed Maintenance & Use (Technology)

OGC/ISO 19136 Geography Markup Language (GML)
OGC/ISO 19142 Web Feature Service 2.0
OGC/ISO 19143 Filter Encoding 2.0
OGC Web Coverage Service (WCS) 2.0

Domain Model standards (Content)

OGC CityGML
ISO 19144, Geographic information -- Classification systems
ISO 19152, Geographic information -- Land Administration Domain Model (LADM)
GeoSciML – Geological structure and bore holes
OGC WaterML 2.0 - Sharing in-situ sensor water observations
S-57/S-100 - IHO Transfer Standard for Digital Hydrographic Data

Tier 3 Standards

Geospatial Processing

OGC Web Processing Service (WPS)

Mobile Devices

OGC Open GeoSMS
OGC GeoPackage
Real Time

Body of Knowledge

MSDI Training material (in-kind contribution from Denmark) >>>> NEW <<<<
- Download from the IHO website
- Download via Dropbox
- Use the interactive material in Youtube

Marine SDI Documents:
- IHO-OGC Marine SDI Concept Development Study (CDS) >>>> NEW <<<<
- White Paper - Realizing the benefits of Spatial Data Infrastructures in the Hydrographic Community
- SDI/MSDI Related Standards
- Frequently Asked Questions on SDI
- SDI Stakeholders
- Hydrographic Data Policy for SDI (Best practices for Hydrographic Offices)
- White Paper - The Hydrographic and Oceanographic Dimension to Marine Spatial Data Infrastructure Development Developing the capability (A contribution from the MSDIWG Experts Contributors)

Miscellaneous:
- Arctic SDI prepared by the Norwegian Hydrographic Service >>>> NEW <<<<
- IHO MSDIWG Case Study Template
- Template for a license agreement embracing rights for the derivation of data
- New Zealand Bathymetry Investigation Report (2015)
- MSP Governance Framework Report (2014)
- Links to the SDI/MSDI portals worldwide (access in the MSDIWG Basic Documents)
- UN-GGIM: A Guide to the Role of Standards in Geospatial Information Management (2015)
- UN-GGIM: A Guide to the Role of Standards in Geospatial Information Management - Companion document
- UN-GGIM: Future trends in geospatial information management: the five to ten year vision (July 2013)
- BLAST [Bringing Land and Sea Together] Project

Marine Spatial Data Infrastructures Training Materials

This page contains links to MSDI training materials created for the MSDIWG by IIC Technologies together with input from DGA and IHO in 2019. Links to PDF copies of training booklets and slides are below as well as an eLearning course for self-study. The materials are designed to be used either individually or in a group or workshop context.

MSDI Orientation. This is a basic short course designed for stakeholders with little or no experience of MSDI. It concentrates on the basic concepts and definitions required along with examples and simple illustrations of MSDI. The links below contain PDF copies of training material slides and a booklet with explanatory notes and background information on the training materials.

MSDI Orientation - Presentation Slides

MSDI Orientation - Training Booklet

Fundamentals of MSDI. These training materials are aimed at professionals with a marine geospatial background but with little direct experience of MSDI implementation. They contains more detailed descriptions and examples drawn from a hydrographic context. Links are given to the training material guides and slides.

MSDI Fundamentals - Presentation Slides

MSDI Fundamentals - Training Booklet

An interactive eLearning course has also been produced. The course takes around 3 hours and is a combination of material from the Orientation and Fundamentals training materials.

MSDI Fundamentals - interactive eLearning Course

MSDI training materials constructed by (IIC) together with input from DGA and IHO

MSDI Case Study Template

International Hydrographic Organization (IHO)
Marine Spatial Data Infrastructures Working Group (MSDIWG)
MSDI Case Study Summary Information Sheet

Version: 03 April 2018

Case Study
Click Here To Enter Case Study Title

Case Study Type: Click here to choose an item.

Summary
Click here to answer: What is the subject/topic/focus of this case study? (approx. 25 words)
Click here to answer: When and why was it produced/what is its purpose or intended use? (approx. 100 words)
Click here to answer: How is it relevant to MSDI (e.g., list details related to specific MSDI components, access best practices, focus: national/regional/international)? (approx. 200 words)
Click here to answer: Are there any limitations (e.g., restricted access, licensing)? (approx. 50 words)
Click here to answer: Who are the users or intended users? (approx. 25 words)
Click here to answer: Identify specific recommendations on how the resource could be used, or how users could benefit from the resource. (approx. 100 words)

Sources: Click here to provide URLs for this case study's source.

Submitted by: Click here to provide name.
Click here to provide title.
Click here to provide affiliation.
Click here to provide contact information (e.g. email address).

Date Submitted: Click here to enter a submission date.

Data Governance & Infrastructure Components Exemplified by Case Study:
(Checked ☑ components apply.)

☐ Access, Data Sharing & Exchange   ☐ Policy & Organization, Strategy
☐ Data Assurance   ☐ Quality Control Procedures
☐ Data Quality   ☐ Standards
☐ Documentation   ☐ Storage
☐ Information Control Technologies   ☐ User Needs & Response
☐ Interoperability

Organization

Template for a license agreement

FAQ's on SDI and MSDI

IHO/HSSC Marine Spatial Data Infrastructure Working Group

SPATIAL DATA INFRASTRUCTURE (SDI)

Frequently Asked Questions (FAQ's)

1. **What is SDI?**

SDI is a term used to summarise a range of activities, processes, relationships and physical entities that, taken together, provide for integrated management of spatial data, information and services. The term:

- covers the processes that integrate technology, policies, criteria, standards and people necessary to promote geospatial data sharing throughout all levels of the public sector;

- embraces the structure of working practices and relationships among data producers and users that facilitates data sharing and use. It covers the set of actions and new ways of accessing, sharing and using geographic data that enable far more comprehensive analysis at all levels of government, the commercial and not-for-profit sectors and academia; and

- describes the hardware, software and system components necessary to support these processes

2. **In what way does SDI affect Hydrographic Offices?**

An Hydrographic Service (HO), through systematic data collection carried out on the coast and at sea, produces and disseminates information in support of maritime navigation safety and marine environment preservation, defence and exploitation.
The development of an SDI is a natural extension in the management and dissemination of such information in an integrated manner.

MSDI Training material

Training Booklet

Presentation slides

MSDI Fundamentals interactive eLearning Course

1. **Download from the IHO website**

2. **Download via Dropbox**

3. **Use the interactive material in Youtube**
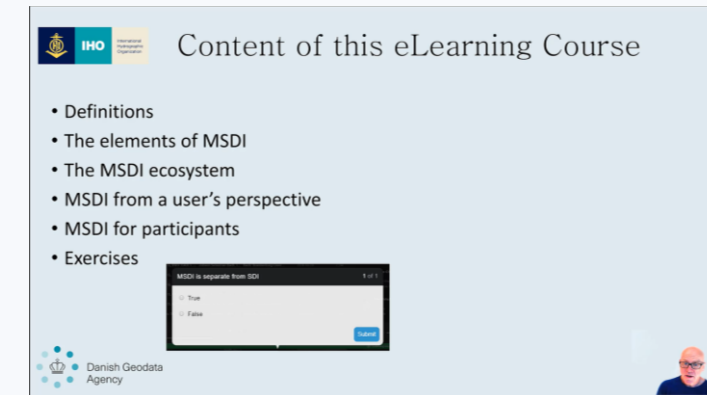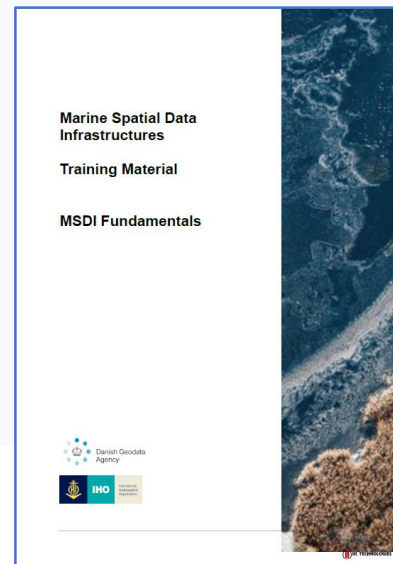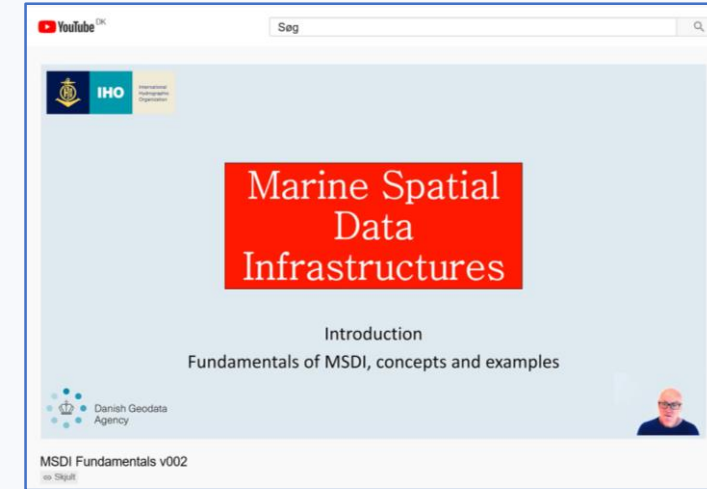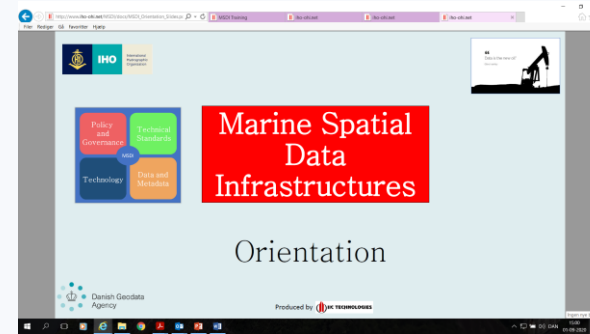
Link https://iho.int/en/body-of-knowledge

Forward-looking focus points:

- The work in the MSDIWG is progressing well and a supporting Action Plan has been established.

- A MSDI e-learning program has now been established. Translation to French and Spanish is now investigated

- The proposed joint OGC/IHO Pilot will promote the use of hydrographic S-100 data for non-navigation use

- The MSDI and MSP questionnaire gives the basis for a IHO MSDI/MSP web based information platform

- Focus on the United Nation's Integrated Geospatial Information Framework (IGIF) and the United Nations Sustainable Development Goals

- Update of C-17 to be aligned with OGC and IGIF from a HO perspective

Action Required of IRCC
The IRCC is invited to:
a. note the report
b. take note of the proposed joint OGC/ IHO Pilot and give guidance on the way ahead
c. discuss any item with relevance to SDI/MSDI/MSP and to take appropriate actions.