Open event

Joint Group on Standards Side Event - Geospatial Standards in Action

Monday August 5th 2019 at 16:00pm – 18:00pm
Venue: Conf. Room 5 (General Assembly Building)
UN Headquarters, New York

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IHO International Hydrographic Organization

ISO International Organization for Standardization TC 211

UN-GGIM | United Nations Initiative on Global Geospatial Information Management

Positioning geospatial information to address global challenges

ggim.un.org

Agenda

This side event is linked to UN-GGIM 9th session agenda item 15 on Thursday

1. Introductory remarks & Welcome
   Ms. Agneta Engberg, ISO/TC 211
2. Overview of standards work supporting the UN-GGIM and SDGs
   Moderator: Mr. Chris Body, Standards Australia & ISO/TC 211
3. Standards work with the United Nations
   Moderator: Mr. Mark Reichardt, Open Geospatial Consortium (OGC)
4. How to engage with the standards community & what important activities are planned for the next 12 months
   Moderator: Dr. Mathias Jonas, International Hydrographic Organization (IHO)

Cooperation

ISO/TC 211, OGC and IHO have been formally – and practically - co-operating since 1994.

They also benefit from a range of people working actively across organizations.

In 2015, the UN-GGIM adopted the Standards Guide, prepared jointly by ISO/TC 211, OGC and IHO

International Organization for Standardization (ISO)

- World's largest developer of standards
  - Network of national standards institutes from 163 countries
  - 19 500 standards published
- Established in 1946-1947; Recognized by the UN
- Principal activity is developing technical standards
- Technical Committees (TCs)
  - From *From food safety* to *computers,* and *agriculture* to *healthcare,* ISO International Standards impact all our lives
  - ISO/TC 211, *Geographic information/ Geomatics*

www.iso.org

https://committee.iso.org/home/tc211

International Organization for Standardization

International Hydrographic Organization (IHO)

- Intergovernmental consultative and technical organization
- Established in 1921
- To support safety of navigation and the protection of the marine environment
- Relevant IHO objectives
  - to bring about the greatest possible uniformity in nautical charts and documents (i.e. standardization)
  - to support Marine Special Data Infrastructure

IHO International Hydrographic Organization

Open Geospatial Consortium

- Industry consortium of over 530 members
- 2000+ implementations of standards and specifications, some certified to be compliant
- Focus
  - Global forum of location expertise and agile processes combining standards, innovation and partnerships
  - Define, document and test implementation standards for use with geospatial content and services
  - Integration of geospatial content and services into applications for the benefit of mankind

www.ogc.org

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UN-GGIM 2018 Decision 8/107
Implementation and adoption of standards

- *…expressed its appreciation to the three standards development organizations (SDO)…*
- *…appreciated the **revision** of the **Standards guide** …*
- *…commended the contributions, incl. the OGC **statistical domain** working group, the ISO **land administration domain model** standard (LADM), the IHO S-100 suite of standards incl. the S-121 (**maritime limits**), the standard on classification systems **for land cover…***
- *…encouraged **UN-GGIM regional committees and thematic groups** to continue to **raise awareness about, and engage in the promotion**…*
- *…encouraged **Member states (MS) to participate**…, and addressed the desire for **broader engagement** in order to facilitate interoperability of new standards and approaches…*

Our report follows this up, and introduces some news

UN-GGIM 2019 Standards report
Points for discussion

The Committee of Experts is invited to take note of

- *the report and express its views*
- *the public release and availability of the **ISO Geodetic Register** and the progress of **geodetic** standards*
- *the revision of ISO **Land Administration Domain Model (LADM)***
- *the **OGC API standards,** and the **IHO S-100 framework***

- *and to encourage Member States to participate in the work*
  - *on standards on **Land cover & Land use***
  - *on the standard on **Good practices for Address assignment***
  - *in the **Statistics Domain** Working Group*
  - *and through **membership** in OGC, ISO/TC 211, and IHO.*

Objective and expected outcome Message

This side event aims to engage participants, member nations, observers, and experts in:

- raising the awareness (use standards and Standards guide)
- identifying the needs and participating in development & implementation (you are the experts)
- assuring that the steps taken support the SDGs
- foster the discussion of the challenges (we can support, but we need to overcome barriers, i.e. need for training)

We will highlight relevant parts of the GGIM9 Standards report.

Overview of Standards work supporting the UN

Areas of SDO support to UNGGIM

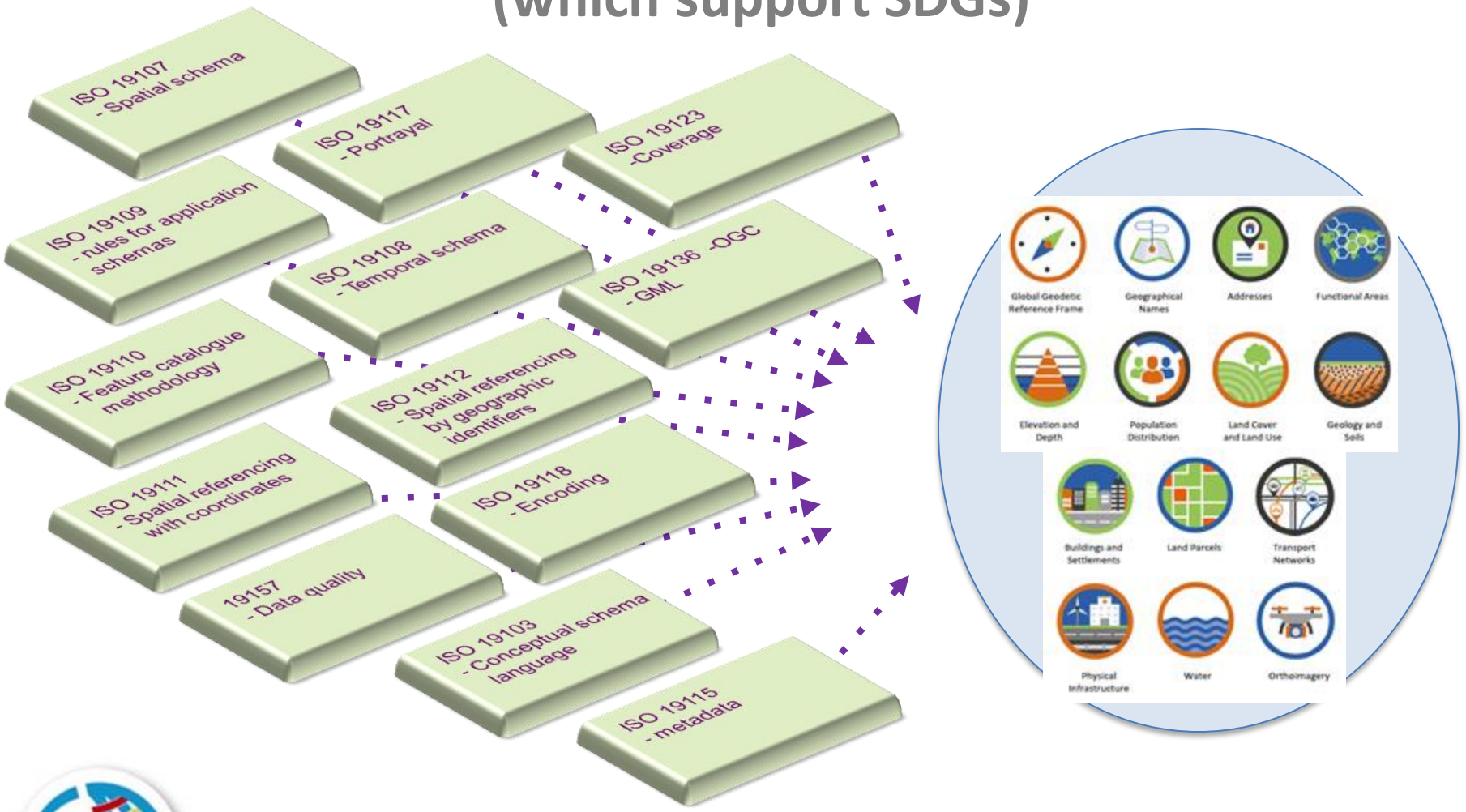
- Integrated Geospatial Information Framework
- Guide to the Role of Standards in Geospatial Information Management
- Integration of Statistical and Geospatial information
- Land Administration
- Marine Geospatial Information
- Sustainable Development Goals
- Geospatial Information and Services for Disasters
- Arctic Spatial Data Infrastructure

Standards are applicable to SDGs

E.g. 957 ISO standards are directly applicable to SDGs
https://www.iso.org/sdgs.html

Standards support Fundamental data

(which support SDGs)



Standards support Integrated Geospatial Information Framework (which support SDGs)

Strategic Pathway 6 – Standards

- Organization
  - Context and Rationale
  - Key Elements ->
  - Principles
  - Recommendations (for implementing a National Framework)
- In work by ISO, OGC, IHO with draft expected by late August 2019.

Strategic Pathway 6

Overview of SDO support to UN-GGIM groups

(which support SDGs)

Regional

UN-GGIM Asia-Pacific | UN-GGIM Americas | UN-GGIM Arab States | UN-GGIM Europe | UN-GGIM Africa

IGIF –
SP6 Standards

Geospatial Societies | Academic Network | Private Sector Network | UN System Network

Chapter in book

Private sector

ISO ITRS
ISO Geodetic register

1. Subcommittee on Geodesy (formerly WG on Global Geodetic Reference Frame)

Expert Groups

ISO DGGS
OGC Statistical DWG

1. Expert Group on the Integration of Statistical and Geospatial Information

ISO LADM
OGC Land Adm DWG

2. Expert Group on Land Administration and Management

Working Groups

ISO Addressing

100+ fundamental and domain standards

1. Working Group on Development of a Statement of Shared Principles for the Manag
2. Working Group on Trends in National Institutional Arrangements in Geospatial I
3. Working Group on Geospatial Information and Services for Disasters
4. Working Group on Global Fundamental Geospatial Data Themes
5. Working Group on Legal and Policy Frameworks for Geospatial Information Manag
6. Working Group on Marine Geospatial Information

Legal & Policy (OGC)

IHO S-100 Marine
OGC Marine
DWG & Pilots

Inter-Agency and Expert Group on Sustainable Development Goals Indicators (IAEG-

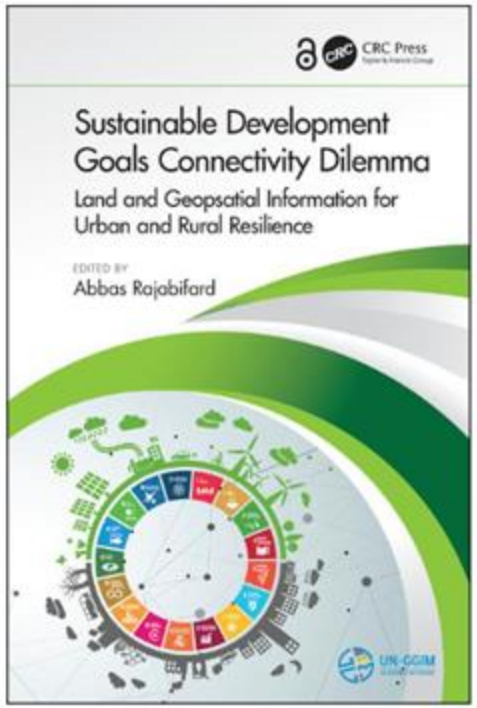
Other contributions

Contribution to Academic Network book

Sustainable Development Goals Connectivity Dilemma (Open Access): Land and Geospatial Information for Urban and Rural Resilience

1st Edition, Abbas Rajabifard

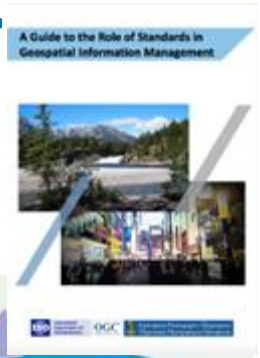
Chapter 14: The Role of Geospatial Information Standards for Sustainable Development



Contribution to World Geospatial Information Congress, Deqing, November 2018

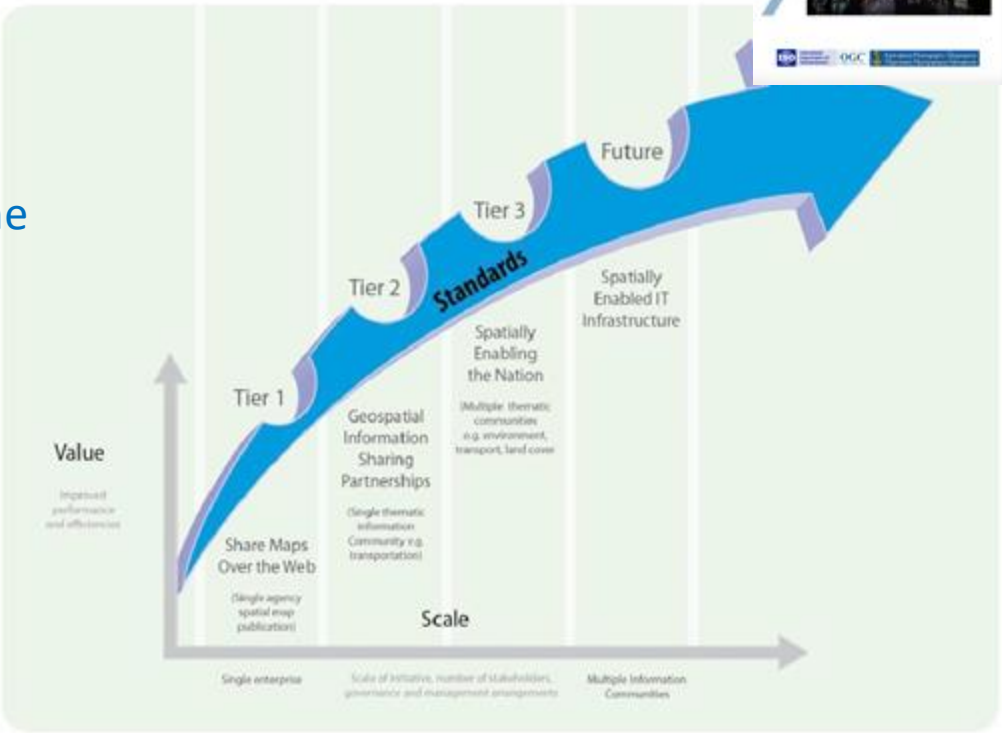
http://ggim.un.org/unwgic/nov20-parallel-Standards-That-Make-Innovation-Possible/

A Guide to the Role of Geospatial Standards & Standards Recommendations by Tier



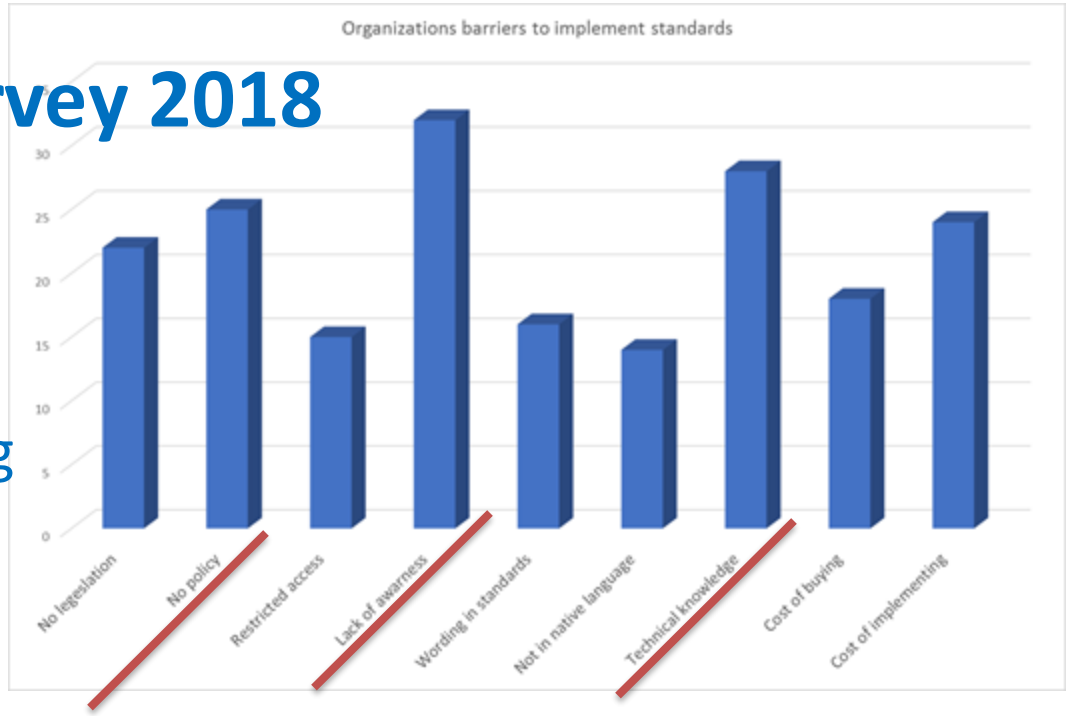
Version 2 (2018) of the Standard guide has been prepared cooperatively by OGC, ISO/TC 211 and IHO.

The guide describes standards and related best practices, introduces a multi-tiered standardization levels of standards use. The companion document details available standards and their applications.



- A Guide to the Role of Standards in Geospatial Information Management
- Companion document on Standards Recommendations by Tier

Survey 2018

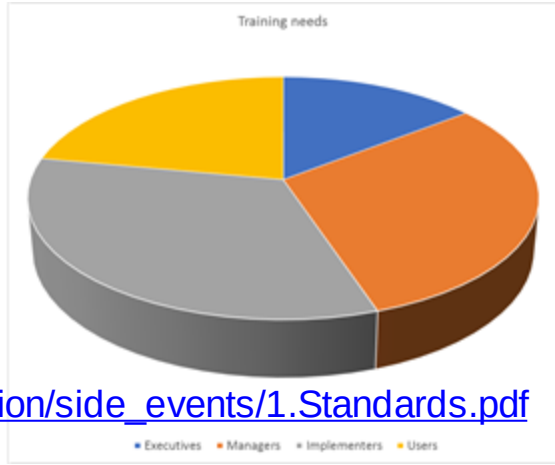


Reported at GGIM8

- Use of the Standards guides
- Barriers for MS in implementing & participating
- Reference to standards in legislation and policy frameworks
- Need for training and outreach

Outcome

- need for training
- need to investigate interaction with supporting policies



http://ggim.un.org/meetings/GGIM-committee/8th-Session/side_events/1.Standards.pdf

Examples of ideas from the survey 2018 concerning training

Target groups, areas of cooperation

- Raising awareness for policy makers
- Working with the UN-GGIM Academic Network (and other WG, Expert groups)
- Cooperation with universities
- Partnerships with private sector for local level workshops

Ways to increase knowledge

- Use cases contributed from Member States
- Training at workshop, courses, webinars
- Discussion forums on the web
- Get-started-guides: “How use standards to solve this problem?”
- Support material for interpretation and implementation
- Translation of standards
- Skills gap evaluation
- Road map for implementation
- Standards free of charge

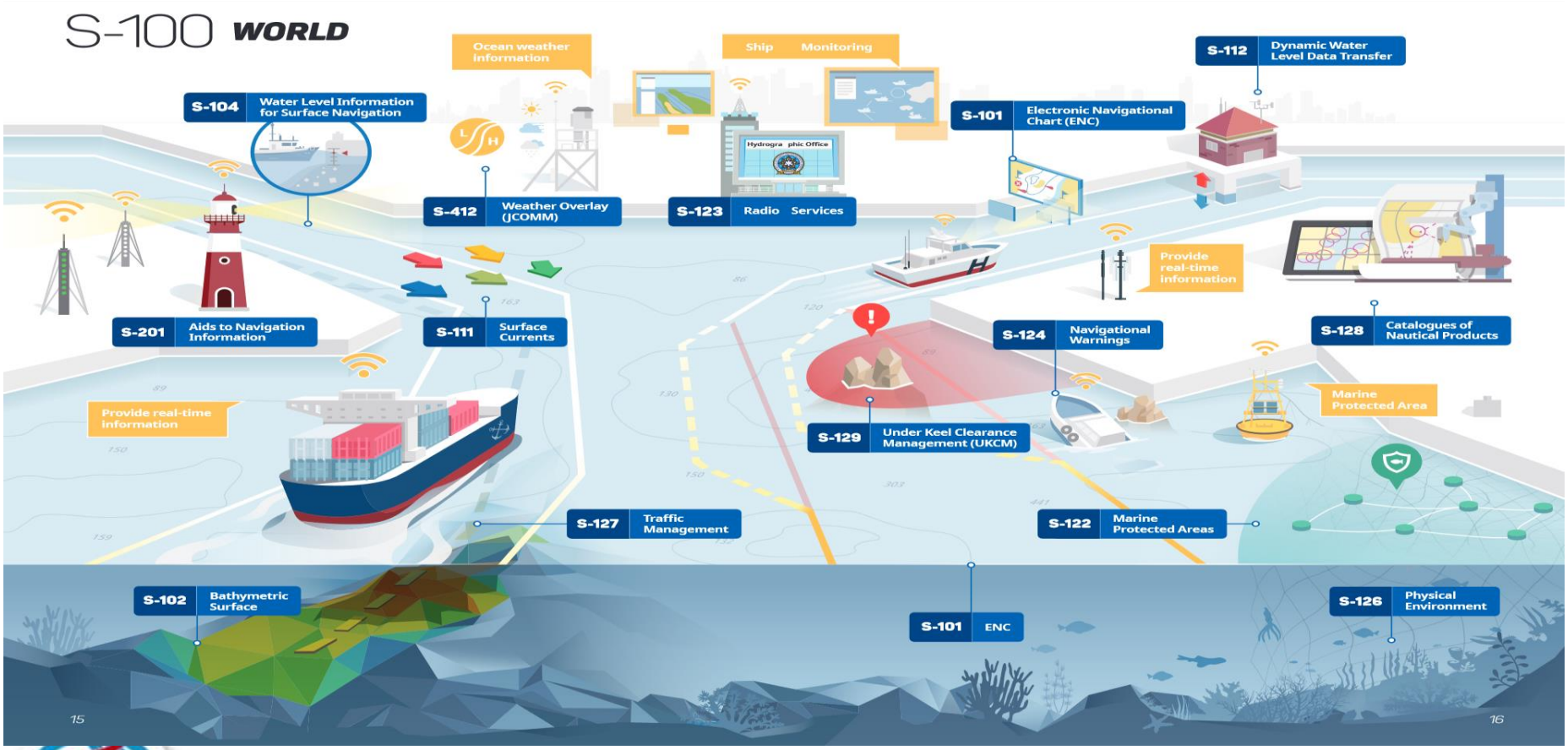
Discussion

*How do you think we can **increase the awareness and knowledge of standards** (e.g. through the Standards guide) for different target groups?*

Standards work with the UN

IHO
OGC
ISO/TC 211

IHO´s S-100 Framework Standard supports the design of interoperable marine data products based on ISO modelling paradigms



IHO offers ISO 19100 compliant tools for creation and maintenance of marine data product specifications

- Management of the S-100 Geospatial Information Registry: registry.iho.int

- Product Specification Developers Guidebook (S-97)
  - template for building product specifications
  - Feature Catalogue Builder, Portrayal Catalogue Builder, Data Encoding and Classification Guide Builder
  - Data Security Scheme for uncorrupted dissemination

IHO tools are open for other marine science, enginereering and administrative domains

S-411 – S-414 Ice, Weather and Wave Information

S-421 Route Plan Exchange

IEC International Electrotechnical Commission

S-201 – S-247 Aids to Navigation Information

IALA

OCEANS & LAW OF THE SEA
UNITED NATIONS

S-121 Maritime Limits and Boundaries

The S-100 family of marine data product specifications allows flexibility in encoding to interface with OGC service standards

Examples of these include OGC standards such as

- Keyhole Markup Language KML,
- Geography Markup Language GML,
- Web Coverage Service,
- Web Feature Service and Web Map Service …

However,

There is a large gap in producing standards / specifications for surveying and ocean mapping.

A best practice example: S-121 Maritime Limits and Boundaries

S-121 absorbs all relevant geospatial and legal information enabling the UN Member States to fulfill their formal deposit obligations for maritime limits and boundaries according to UN Convention of the Law of the Seas.

ISO

Interoperable data model

IHO International Hydrographic Organization

Specification for use cases

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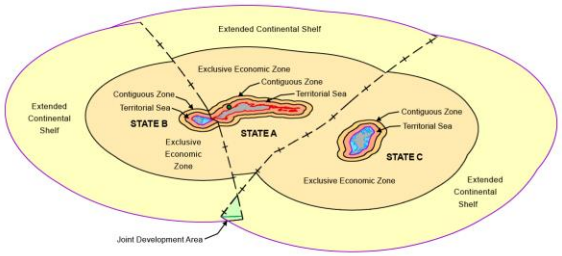
Application



To service national and international SDI

Legal Declaration

Authoritative Public Data

Navigation and Enforcement

An OGC S-121 Pilot Project aims operationalize the S-121 framework and datasets into real world applications using Commercial Off-The-Shelf software.

New OGC Domain Working Groups

- OGC Domain Working Groups - identifying use cases, requirements, issues and opportunities for application of OGC and complementary standards to improve outcomes:
  - Agriculture*
  - Artificial Intelligence in Geomatics
  - Blockchain and Distributed Ledger Technologies
  - Interoperable Modeling & Simulation
  - Land Administration*
  - Marine*
  - Portrayal
  - Smart Cities*
  - Statistical

For the Complete List of OGC DWG's see:
http://www.opengeospatial.org/projects/groups

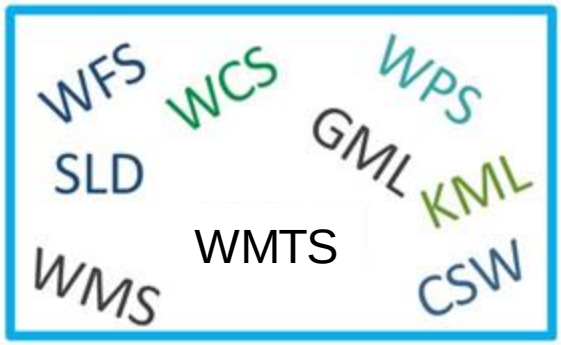
DWGs are Open to all - Participate!

OGC Innovation Initiatives

- Smart City Reference Architecture Pilot
- Disasters Resilience Pilot
- Marine SDI Concept Development Study
- Marine SDI Pilot (Planned)
- Maritime Limits and Boundaries Pilot
- Indoor Mapping and Navigation Pilot
- OGC API - Features Spring (planned)

OGC API - The Next Generation of OGC Standards

- Current: OGC Web Services



  - Supports geospatial information management - geodata publishing, discovery, access, processing, visualization, and application
  - Implemented worldwide
  - Underpins local to international Spatial Data Infrastructure Policy
  - Key components in UNGGIM Guide to Standards for Geospatial Information Management

OGC API - The Next Generation of OGC Standards

- OGC API builds on the success of OGC Web Services (W*S) Standards
  - Leverages Open API
  - Focus on getting content to the web, easing developer effort, expanding reuse in today's app environment
  - Approach established as part of the recent revision of the OGC Web Feature Service, "OGC API – Features" will be first to approval in 2019
- Additional OGC W*S standards will follow the same pattern:
  - OGC Web Services Common OGC API – Common
  - Web Processing Service OGC API – Processing
  - Web Map Tile Service OGC API - Map Tiles
  - Web Coverage Service OGC API – Coverages
  - Catalogue Services for the Web OGC API - Catalogue

OGC API - The Next Generation of OGC Standards

- OGC members are engaging with the developer community via hackathons, sprints and public GitHub to evaluate applicability and utility
- OGC Web Services standards will continue to be supported, but with minimal future revision
- Revisions will be made to UNGGIM ***Guide to Standards for Geospatial Information Management***

http://www.opengeospatial.org/blog/3025

#OGCAPI

OGC Technology Trends / Forecasting

https://github.com/opengeospatial/OGC-Technology-Trends

Breadth

Identify and Characterize Trends

Trends Mindmap

Assessment

Prioritize and Evaluate Trends

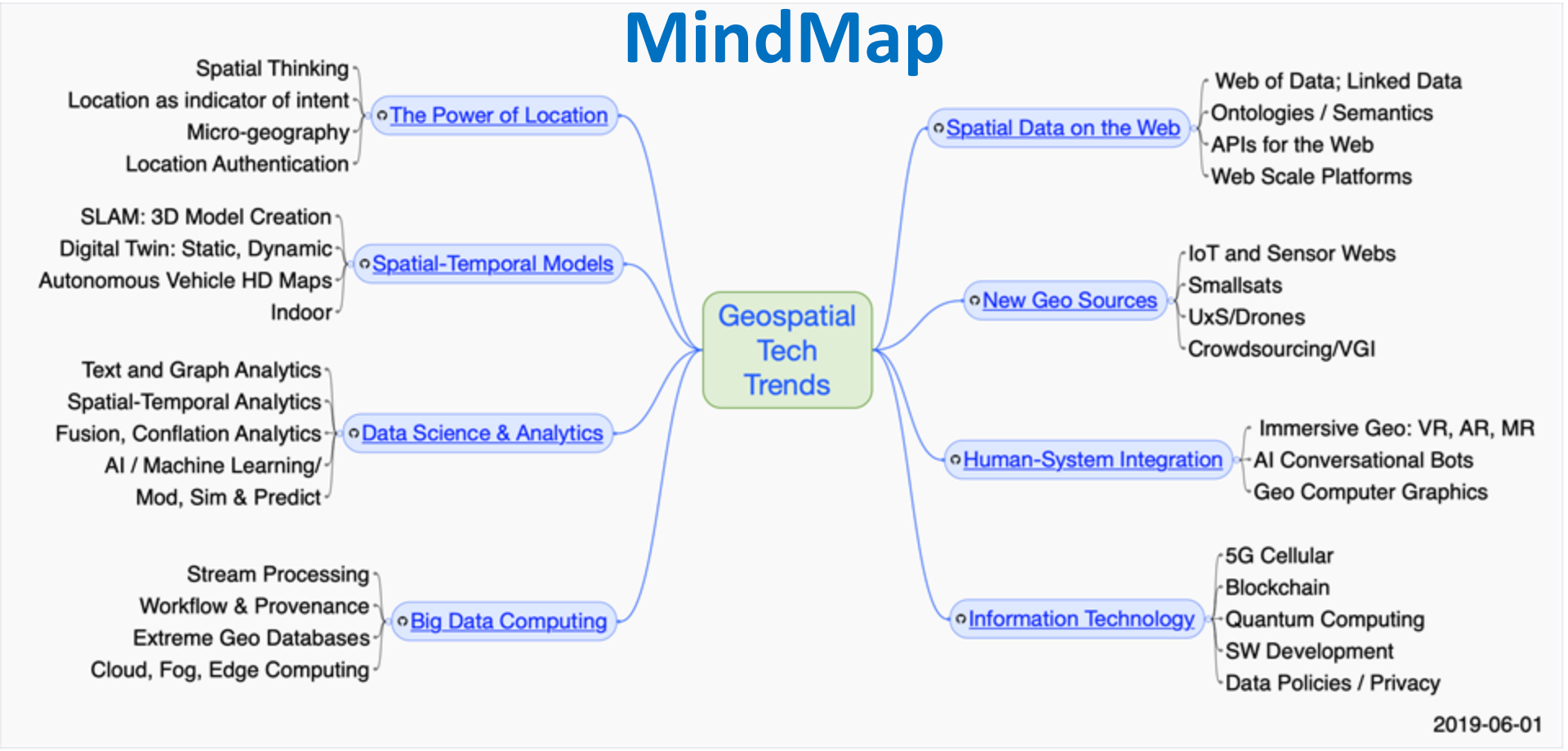
Technology Roadmaps

Focus

Take Action

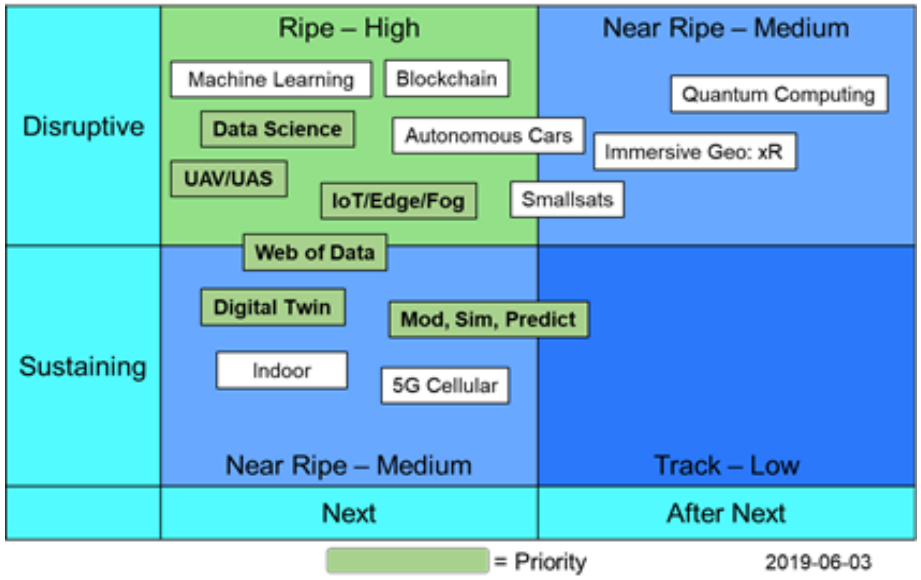
- Innovation Program
  - e.g. planning Testbeds
- Standards Program
  - e.g. Future Directions
- Communications & Outreach
  - e.g. Location Powers
- Member Consultation
  - e.g. NDA Tailored forecasts/discussion

OGC Technology Trends / Forecasting MindMap



Publicly Available at: https://github.com/opengeospatial/OGC-Technology-Trends

OGC Technology Trends / Forecasting



Tech Notes for Priority Trends

- Smart Cities
- Geospatial Big Data
- Edge and Fog Computing

ISO/TC 211 projects to support the UN

- Land Administration Domain Model (LADM)
  - *Supports Land Administration, Fundamental Data*
- Land Cover & Land Use
  - *Supports SDG 2*
- Addressing
  - *Supports Fundamental Data, Land Administration, Disaster Management, and SDG 1,3,6,7,8,9,10,11,16*
- Geodetic reference & grid systems. ISO geodetic registry
  - *Supports SC Geodesy, Fundamental Data, Supports Statistics*

Land Administration Domain model (LADM)

PLANNING STAGE

- Revision of **ISO 19152 LADM** to meet new requirements from different domains, in a multi-part standard as follows:
  1. Land Administration Fundamentals
  2. Land Tenure
  3. Marine Space
  4. Land Valuation
  5. Spatial Planning
  6. Implementations

LADM cont.

- 12 Month gathering of use cases and submissions
- Initial inputs from FIG, OGC, IHO, UN-DOALOS, UNGGIM and Royal Institution of Chartered Surveyors (RICS)
- Update after Maribor, Leuven
  - Participants Industry,
  - Use cases,
  - Testbeds, pilots
- Stage 0 document was issued providing guidance for the LADM Edition II

LADM cont.

- Call for new work items proposals for the various parts will be issued by Oct 19
- Land Administration Fundamentals - Part 1 will provide the overview and scope for the other parts
- Each part will be lead by their community of experts (eg. Marine Space - IHO & UN-DOALOS)

Participate!

Land Cover and Land Use

PLANNING STAGE

- Draft scope for the revision and development of Classifications systems standards:
  - Revision **ISO 19144-2 Land Cover Meta Language**
    - Will also support the EIONET requirements and ensure that the EAGLE model will be a valid profile. Work is expected to start in December 2019
  - New **ISO 19144-3 Land Use Meta Language**
    - Work is expected to start after December 2019
  - New **ISO 19144-4 Registers for Land Cover & Land Use**

Participate!

Food and Agriculture Organization of the United Nations

Addressing

What is an address?
Classes or types: *street address, box address…*
Components: *street number, street name, place name…*

- **ISO 19160-1 Conceptual model**
- **ISO 19160-3 Data Quality** SOON PUBLISHED
- **ISO 19160-4 Rendering on mail items**
- **ISO 19160-6 Profile interchange** IN PROGRESS

Values or names
Street number=392
Street name=Church Street
Place name=Pretoria

PLANNING STAGE

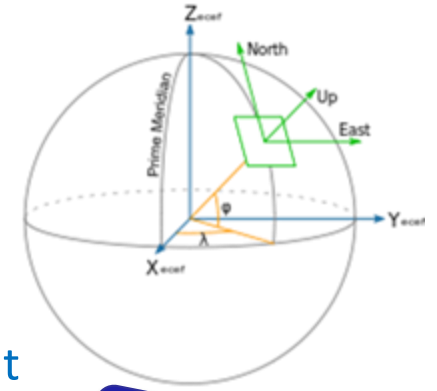
Addressing – How to assign addresses

- **ISO 19160-2 Address Assignment**
  - Similar to ISO 9000, specifies good practice
  - Useful as tender or funding requirement

Participate!

Global Geodetic Reference Frame

Geodesy Standards



- Revision of ISO 6709 Standard representation of geographic point location by coordinates
- ISO 19162 Well-known text representation of coordinate reference systems
  - *The state-of-the-art encoding of coordinate references*

IN PROGRESS

REVISED

- **ISO 19111 Spatial referencing by coordinates**
  - *The state-of-the-art description and model for positions*

REVISED MODERNIZED

- **ISO 19161-1 International Terrestrial Reference System (ITRS)**
  - *Essential for the consistent realization of International Terrestrial Reference Frame (ITRF) and the Global Geodetic Reference Frame (GGRF)*

IN PROGRESS

Ref. to UN General Assembly resolution A/RES/69/266 on GGRF for SDG

Global Geodetic Reference Frame

ISO Geodetic Registry

PUBLICALLY RELEASED 2019

https://registry.isotc211.org

- The Registry is an authorized, quality assured, international register for coordinate reference systems & transformations, and accessible by an on-line system.
  Conforms to **ISO 19127 Geodetic register** and other ISO standards. Control body of geodetic experts.

"Recognizing the development of ISO 19161-1 ITRS, the Sub-Committee urges Member States to record their national reference frame details, and its alignment to the ITRF, in the ISO Geodetic Register" (UN-GGIM SC Geodesy, Nov 2018)

Register - it is free! Use it!

IAG AIG International Association of Geodesy

Global Geodetic Reference Frame

Geodesy Standards

IN PROGRESS

- **ISO 19170 Discrete Global Grid Systems (DGGS)**
  - *Foreseen use for Statistic purposes in various applications, e.g. land use*

OGC Marine Limits & Boundaries Pilot

The pilot will **advance the implementation of the IHO S-121 Maritime Limits and Boundaries Standard,** which is an essential extension of the IHO S-100 Universal Hydrographic Data Model

- Develop supporting data model and architecture (OGC/ISO GML)
- Implement operational prototypes to support the creation, management, integration, dissemination and onward use of official data for maritime baselines, limits, zones and boundaries.

Goal

Focus on demonstrating the ability to support:

- **Country level publication**, as a national obligation, of their maritime baselines, limits and boundaries
- Standards-based geospatial **interoperability between suppliers, users and partners**, within and across governments, public and commercial users
- Facilitating **strategic awareness and operational decision making** in the maritime environment supporting good governance and effective and efficient operations

OGC Maritime Limits & Boundaries

Sponsors:

- Geoscience Australia
- Canadian Hydrographic Service
- Natural Resources Canada
- United Kingdom Hydrographic Office

Main Page

Call for Participation

Schedule

Feb 25 2019	Call for Participation
March 12 2019	Clarifications Webinar
Mar 19 2019	Response due Call for Participation
Mar 23 2019	Selection of Participants and Bidder Notifications
Mar 28 2019	Participation Agreements
May 14-15 2019 (Ottawa)	Kickoff Phase I
Sep 26 2019	End Prototype Development Phase 1
Sep 26 2019	Draft Report Phase 1
October 2019	Virtual Kickoff Meeting Phase 2
Feb 21 2020	Engineering Report
Mar 18 2020	Demonstration
Mar 31 2020	End Prototype Development Phase 2

For More Information

- OGC Innovation Program
- Active Initiatives

Contact:
Luis Bermudez
Executive Director, Innovation Program
lbermudez@ogc.org

How to get involved

- ISO/TC 211
  - National Standards Bodies
  - Liaison
  - Invited experts
- OGC
  - Open Membership (fee)
  - Domain Working Groups (public open)
  - Innovation Programs
- IHO
  - Intergovernmental consultative & technical organisation
  - Liaison

UN-GGIM

UNITED NATIONS INITIATIVE ON
GLOBAL GEOSPATIAL
INFORMATION MANAGEMENT

Thank you

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Positioning geospatial information to address global challenges

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