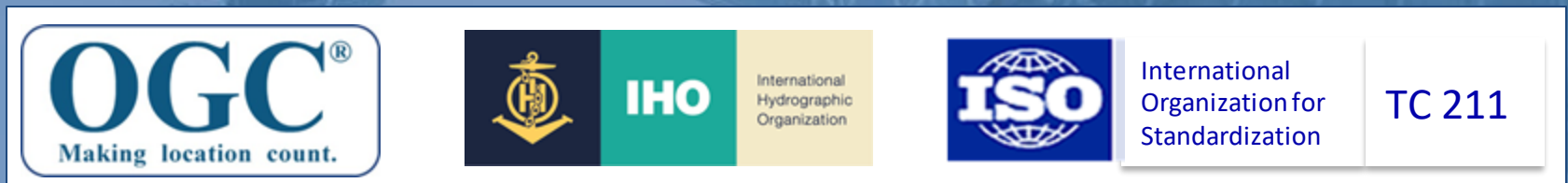


Open Standards as an Underpinning Component for Geospatial Information Management Law and Policy

Mark Reichardt
Open Geospatial Consortium
mreichardt@ogc.org



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A Major Goal

National Spatial Information Architectures that are fit for purpose with National / Country geospatial information policy and law

Stefan Schweinfest

Director, United Nations Statistics Division

6 August 2019



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Comprehensive global community-driven forward-looking expertise in location



- Hydrology
- Meteorology
- Oceanography
- Aviation
- Energy and Utilities
- Emergency & Disaster
- Defense & Intelligence
- Earth Systems Science
- Security
- Data Quality
- Big Data



Communities-
Tech &
Domain



Partnerships
& Alliances



Process for
Standards &
Innovation

- 3D Information Mgt
- Mass Market
- Public Safety & Law Enforcement
- Geosemantics
- Health
- Agriculture
- Urban Planning
- Land Administration
- Mobile Location Services
- Point Cloud
- Smart Cities

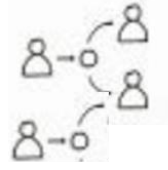
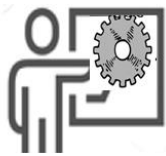


Emphasis on Rapid Prototyping and Engineering

Requirements

Pull of sponsors

Funding



Organizations



World experts

Bring Challenges

Agile prototyping

OGC Innovation Program

User/Industry
Rapid Prototyping

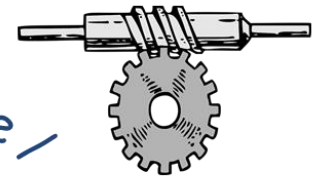
Testing
Acceptance



Open standards

Reduce technology risks

Help Mobilize / Fast Track



New technologies



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Standards and Policy

ARCTIC SDI Arctic Spatial Data Infrastructure

GEOSPATIAL DATA AND SERVICES - A TOOL FOR BETTER INFORMED DECISIONS AND MORE EFFICIENT ADMINISTRATION IN THE ARTIC

Home Arctic SDI Services Map Gallery Documents Calendar About us Organization

OGC Arctic Spatial Data Pilot Value of Standards ARCTIC

We drive our work based on key policy and operations issues to drive useful standards based outcomes



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National Geospatial Information Management Policy

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INSPIRE

Infrastructure for Spatial Information in the European Community

European Commission > INSPIRE >

About

- Home
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- INSPIRE library
- INSPIRE Conferences

Implementation

- Roadmap
- Monitoring and Reporting
- IOC
- INSPIRE GeoPortal
- Maintenance and Implementation

Adoption

- Roadmap
- Implementing Rules
- Monitoring and Reporting
- Metadata
- Data Specifications

INSPIRE DIRECTIVE

In Europe a major recent development has been the entering into force of the INSPIRE Directive in May 2007, establishing an infrastructure for spatial information in Europe to support Community environmental policies, and policies or activities which may have an impact on the environment.

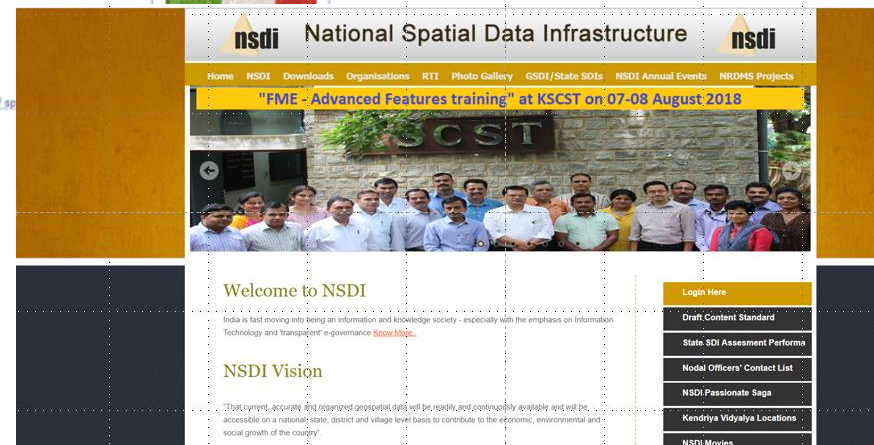
INSPIRE is based on the infrastructures for spatial information established and operated by the 27 Member States of the European Union. The Directive addresses 34 spatial data themes needed for environmental applications, with key components specified through technical implementing rules. This makes INSPIRE a unique example of a legislative "regional" approach.

Legislation

Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) was published in the official Journal on the 25th April 2007. The INSPIRE Directive entered into force on the 15th May 2007

To ensure that the spatial data infrastructures of the Member States are compatible and usable in a Community and transboundary context, the Directive requires that common Implementing Rules (IR) are adopted in a number of specific areas (Metadata, Data Specifications, Network Services, Data and Service Sharing and Monitoring and Reporting). These IRs are adopted as Commission Decisions or Regulations, and are binding in their entirety. The Commission is assisted in the process of adopting such rule by a regulatory committee composed of representatives of the Member States and chaired by a representative of the Commission (this is known as the Comitology procedure).

- Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) 14.03.2007
- INSPIRE Metadata Regulation 03.12.2008
- Commission Decision regarding INSPIRE monitoring and reporting 05.06.2009
- Commission Regulation (EC) No 976/2009 of 19 October 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the Network Services 19.10.2009
- Corrigendum to INSPIRE Metadata Regulation 15.12.2009
- Regulation on INSPIRE Data and Service Sharing 29.03.2010
- Commission Regulation (EU) No 1089/2010 as regards interoperability of spatial data sets and services 08.12.2010
- Commission Regulation amending Regulation (EC) No 976/2009 as regards download services and transformation service 10.12.2010
- COMMISSION REGULATION implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of geospatial services 10.12.2010
- COMMISSION REGULATION amending Regulation 1089/2010 as regards interoperability of spatial data sets and services 05.02.2011



nsdi National Spatial Data Infrastructure nsdi

Home | NSDI | Downloads | Organisations | RTI | Photo Gallery | GSDI/State SDIs | NSDI Annual Events | NRDMs Projects

"FME - Advanced Features training" at KSCST on 07-08 August 2018

Welcome to NSDI

India is fast moving into being an information and knowledge society - especially with the emphasis on Information Technology and transparent e-governance [E-Governance Model](#).

NSDI Vision

"To set up, acquire and reprocess geospatial data will be readily and continuously available and will be accessible on a national, state, district and village level basis to contribute to the economic, environmental and social growth of the country."

Login Here

- Draft Content Standard
- State SDI Assessment Performa
- Nodal Officers' Contact List
- NSDI Passionate Saga
- Kendriya Vidyalaya Locations
- NSDI Movies



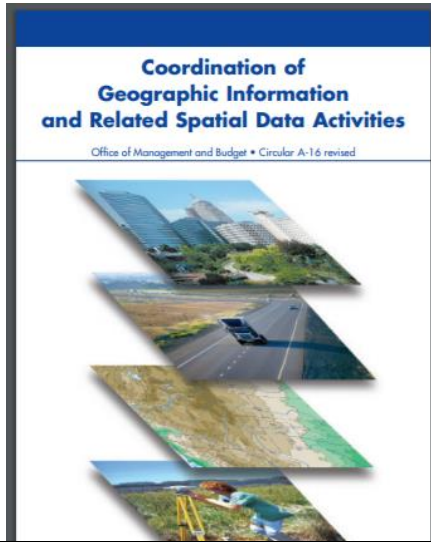
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US Geospatial Data Act of 2018



FGDC.GOV
FEDERAL GEOGRAPHIC DATA COMMITTEE

Geospatial Data Act of 2018

What is it?
The Geospatial Data Act of 2018 (GDA) became law on October 5, 2018. The GDA was included as a component of the FAA Reauthorization Act (P.L. 115-254, Subtitle F). The GDA codifies the committees, processes, and tools used to develop, drive, and manage the National Spatial Data Infrastructure (NSDI) and recognizes responsibilities beyond the Federal government for its development. The GDA reflects growing recognition of the essential role of geospatial data and technology in understanding and managing our world and highlights the need to support their continuing development as critical investments for the Nation.

EXECUTIVE OFFICE OF THE PRESIDENT
Office of Management and Budget

OMB Circular A-119: Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities

AGENCY: Office of Management and Budget, Executive Office of the President

ACTION: Final Revision of OMB Circular A-119

SUMMARY: The Office of Management and Budget (OMB) has revised Circular A-119, "Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities" (hereinafter, Circular A-119, or, the Circular) in light of developments in regulation, standards, and conformity assessment since the Circular was last revised in 1998.

What does it do?

The GDA formalizes governance processes related to geospatial data, provides policy and guidance to govern the use of geospatial data and technology, and facilitates broad cooperation between the public and private sector. Specifically, the GDA:

- Clarifies the role and authorities of the Federal Geographic Data Committee (FGDC)
- Directs the FGDC to lead the development and management of the NSDI Strategic Plan
- Establishes the National Geospatial Advisory Committee (NGAC) as a statutory advisory committee
- Provides policy and guidance to empower the use of geospatial data and technology
- Establishes Federal agency responsibilities
- Recognizes the NSDI as the framework to ensure geospatial data from multiple sources are available, accessible, and easily integrated
- Recognizes the GeoPlatform (www.geoplatform.gov) as an important tool for processing and managing geospatial data
- Establishes requirements for stewardship of geospatial assets
- Identifies budgeting and reporting requirements



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on International Geographical Names and Material

Why is it important?

This legislation fosters efficient management of geospatial data, technologies, and infrastructure by enabling better coordination among Federal, state, local, tribal governments, the private sector, and institutions of higher education. The GDA reduces duplicative efforts and facilitates the efficient procurement of geospatial expertise, technology, services, and data from the rapidly growing geographic community in the United States. The GDA:

- Aligns business strategies and technology
- Ensures that resources are managed in accordance with the Nation's needs and priorities
- Ensures that all technology resources and employees are utilized in a manner that provides the best value for the Nation

Geospatial Standards Policy Alignment Defense and Intelligence



Geospatial Intelligence Standards Working Group

GWG Home

NSG Standards Registry

Standards and Registries

Focus Groups

Explore the GWG

- GWG Charter
- GWG Members List
- GWG Activities
- Meeting Information
- Guide to GEOINT Standards
- Related Links

Home > GWG Member Agencies

GWG Member Agencies

GWG CORE MEMBERS

National Geospatial-Intelligence Agency (NGA)
 Central Intelligence Agency (CIA)
 National Reconnaissance Office (NRO)
 National Security Agency (NSA)
 U.S. Air Force
 U.S. Army
 U.S. Navy
 U.S. Marine Corps
 Office of the Director of National Intelligence (ODNI)
 Office of the Secretary of Defense (OSD - NII & AT&L)
 U.S. Central Command (CENTCOM)
 U.S. European Command (EUCOM)
 U.S. Joint Forces Command (JFCOM)
 U.S. Northern Command (NORTHCOM)
 U.S. Pacific Command (PACOM)
 U.S. Special Operations Command (SOCOM)
 U.S. Strategic Command (STRATCOM)
 Joint Staff J2
 Department of Homeland Security (DHS)
 U.S. Department of Energy (DOE)
 Defense Information Systems Agency (DISA)
 Defense Intelligence Agency (DIA)
 Defense Logistics Agency (DLA)
 Defense Advanced Research Projects Agency (DARPA)
 Federal Bureau of Investigation (FBI)
 Federal Geographic Data Committee (FGDC)
 National Aeronautics and Space Administration (NASA)

GWG ASSOCIATE MEMBERS

Defence Geospatial Information Working Group (DGIWG)
 Open Geospatial Consortium (OGC)
 U.S. Geospatial Intelligence Foundation (USGIF)
 NATO Joint Capability Group on Intelligence Surveillance & Reconnaissance (JCGISR)
 Australia
 United Kingdom
 Canada
 International Organization for Standardization (ISO) / Chair, TC 211
 InterNational Committee for Information Technology Standards (INCITS) / LI [ANSI Accredited]



Geospatial Intelligence Standards Working Group

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Request Member Login

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- Guide to GEOINT Standards
- How to Participate
- Related Links
- Subscribe to E-mail List

About The GWG

The GWG is Chartered under the Department of Defense (DoD) Information Technology Standards Committee (ITSC), the governing group responsible for developing and promoting standards interoperability in support of net-centricity within the Department of Defense (DoD). The GWG provides the forum for the coordination of GEOINT standards for the National System for Geospatial-Intelligence (NSG). The GWG is led and chaired by the NGA's National Center for Geospatial Intelligence Standards (NCGIS).

The GWG serves as the GEOINT community advocate for information Technology (IT) standardization activities related to GEOINT and assists the Director of the NGA in carrying out Functional Manager responsibilities for GEOINT standards.

The primary responsibilities of the GWG are to 1) coordinate population of the DoD IT Standards Registry (DISR) with GEOINT standards and 2) serve as the NSG community forum for all standardization activities and functions related to GEOINT.

As NSG functional manager for GEOINT, the NGA recently endorsed a suite of web services and other standards developed by the Open Geospatial Consortium (OGC®). This suite of OGC® standards, along with other standards adopted into the DoD IT Standards Registry (DISR), comprise the current NSG GEOINT Standards Baseline. Standards are added to the baseline as they are matured, approved, and implemented across the NSG. Key standards that compose the NSG GEOINT Standards Baseline are shown in Figure 2.

Key Standards in the NSG GEOINT Standards Baseline

OGC® Standards

- Web Features Service (WFS)
- Web Map Service (WMS)
- Web Map Context (WMC)
- Web Coverage Service (WCS)
- Geography Markup language (GML)
- Styled Layer Descriptor (SLD)
- Catalog Services (CS-W)
- Filter Encoding Specification (FE)

Other Standards

- ISO 19115 Geographic Information – Metadata
- ISO 19119 Geographic Information – Services
- ISO/IEC 15444-1:2004 Information Technology – JPEG 2000 image coding system: Core coding system
- NSG Feature Data Dictionary (NFDD)
- NSG Entity Catalog (NEC)

Figure 2. GEOINT Standards Baseline

Source: Guide to GEOINT Standards

NEWS

Call for review of symbology standard for Local Topographic Data Store (LTD5) Data. See Portrayal Focus Group on members site for details. [Click to view](#)

GWG 2010 Awards - Call for Nominations [Click to view](#)

Upcoming Events

GWG Plenary
 16 June 2010

GWG Core Member Polling Meeting – DISR/SR 10-2.9
 16 June 2010
 Reston, VA

Portrayal Focus Group Meeting
 16 June 2010

NTB Session
 17 June 2010

CSIRWG Meeting
 18-17 June 2010
 San Diego, CA



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Innovation Approaches to Law and Policy

UN Law of the Sea Convention

United Nations Law of the Sea Convention (UNCLOS)



The United Nations has long been at the forefront of efforts to ensure the peaceful, cooperative, legally defined uses of the seas and oceans for the individual and common benefit of humankind. Urgent calls for an effective international regime over the seabed and the ocean floor beyond a clearly defined national jurisdiction set in motion a process that spanned 15 years and saw the

creation of the United Nations Seabed Committee, the signing of a treaty banning nuclear weapons on the seabed, the adoption of the declaration by the General Assembly that all resources of the seabed beyond the limits of national jurisdiction are the common heritage of mankind and the convening of the [Stockholm Conference on the Human Environment](#).

The UN's groundbreaking work in adopting the 1982 [Law of the Sea Convention](#) stands as a defining moment in the extension of international law to the vast, shared water resources of our planet. The convention has resolved a number of important issues related to ocean usage and sovereignty, such as:

- Established freedom-of-navigation rights
- Set territorial sea boundaries 12 miles offshore
- Set exclusive economic zones up to 200 miles offshore
- Set rules for extending continental shelf rights up to 350 miles offshore
- Created the International Seabed Authority
- Created other conflict-resolution mechanisms (e.g., the UN Commission on the Limits of the Continental Shelf)

<https://www.un.org/en/sections/issues-depth/oceans-and-law-sea/>



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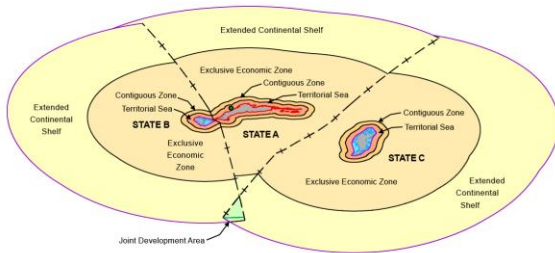
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A best practice example: S-121 Maritime Limits and Boundaries

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.



Interoperable data model



To service national and international SDI



Specification for
use cases

Legal Declaration

Authoritative Public
Data

Navigation and
Enforcement



Application

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

Source: M. Jonas, International Hydrographic Organization



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OGC Marine Limits & Boundaries Interoperability Pilot

The pilot **advances 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.



OGC Marine Limits & Boundaries Pilot Goals

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](#)



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Standards, Innovation and Policy

- Geospatial Information and technology challenges being addressed:
 - Digital Rights Management
 - Security
 - Uncertainty
 - Data Quality
 - Data Preservation
- Longer term -- Technical standards for legal and policy interoperability
 - Parsing law and policy into machine actionable components



Example Trustmark Concept – NIST USA

Trustmark Framework for Public Safety



What is the Trustmark Framework?

The Trustmark Framework, currently in use by many law enforcement organizations around the country, establishes a mechanism for codifying and reusing components of different identity, credential, and access management (ICAM) solutions.

What role does the Trustmark Framework play in ICAM?

The Trustmark Framework can help achieve interoperability between various communities of interest (COI) and identity federations without requiring explicit bilateral agreements. While different COIs often have their own specific rules to enable trust, there are also certain requirements that are consistent across communities. Trustmarks are a means to codify those rules in a machine-readable format.

What are the benefits of the Trustmark Framework?

A significant barrier to ICAM adoption is the difficulty in enabling trust and interoperability across multiple COIs and trust frameworks. By codifying and reusing components of different trust frameworks, the Trustmark Framework promotes mutual trust and interoperability in a manner that is scalable, standardized, reliable, modular, decentralized, secure, affordable, and sustainable.

Trustmark Framework Terms

Trust Framework – any structure that builds trust among organizations or users for the purpose of sharing information and reusing identities.

Trustmark – a set of machine-readable trust and/or interoperability criteria that can be used by one or more federations.

Trustmark Provider – an organization authorized to develop and issue trustmarks.

Trustmark Relying Party – a service, site or entity that relies on a third-party identity provider to authenticate users.

Trustmark Framework Concept Map

ICAM p... are ide... Definit... these d... used by... Frame... enablin... organiz...



What role does the Trustmark Framework play in ICAM?

The Trustmark Framework can help achieve interoperability between various communities of interest (COI) and identity federations without requiring explicit bilateral agreements. While different COIs often have their own specific rules to enable trust, there are also certain requirements that are consistent across communities. Trustmarks are a means to codify those rules in a machine-readable format.

What are the benefits of the

Source: [US Department of Homeland Security](https://www.dhs.gov)



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Parting Thoughts

- We are making initial progress as a community in aligning policy based on non-binding, and increasingly binding policy and legal measures
- Continued involvement of the standards community ISO, IHO, OGC and our broader SDO partners will be useful to prototype, test, validate the agility of standards to support:
 - Changing policy and law
 - Emerging technologies and location information sources
- More engagement of lawyers, regulators and policymakers is essential to validation our concepts and recommendations





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Thank you



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