HIGH LEVEL FORUM ON GLOBAL GEOSPATIAL MANAGEMENT INFORMATION

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Developing Common Frameworks and Methodologies *

* Submitted by: Mr. Olaf Magnus Østensen, Chair of ISO/TC 211, Norwegian Mapping Authority

SESSION 2
Developing Common Frameworks and Methodologies

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ISO International Organization for Standardization

ISO/TC 211

Geographic informations/Geomatics

The GGIM components

- Geospatial Policy Formulation and Institutional Arrangement
- Common Frameworks and Methodologies
- International Coordination and Cooperation in Meeting Global Needs
- Capacity Building and Knowledge Transfer

… they all interact and overlap, as we have experienced through our discussions!

GGIM - Terms of Reference

Objectives and functions

1. The objectives and functions of the Committee of Experts on Global Geospatial Information Management will be:

(a) To provide a forum for coordination and dialogue among Member States, and between

(b) To propose workplans and guidelines with a view to promoting common principles, policies, methods, mechanisms and standards for the interoperability and interchangeability of geospatial data and services;

management models and technical standards, thus contributing to the establishment of spatial data infrastructures, while allowing for flexibility in the development of national geospatial activities;

(e) In performing its functions, the Committee should build upon and make use of the existing work of other forums and mechanisms in the related field.

The broader perspective

"… from managing geospatial information to managing information geospatially …"

Professor Fraser Taylor in the Exchange Forum with Industry on Sunday

Todays SDIs mostly covers a broad variety of sectors in society: health, environment, education, enterprise, industry, transportation, telecommunication, defense, agriculture, natural resources, culture, eGovernment, etc. …. and, traditional mapping.

The mapping agencies, or alike, are often assigned a coordination role, but the broader perspective gives us an enormous responsibility.

e.g. the Norwegian SDI, «Norway digital», encompasses more than 600 public sector institutions signing voluntary agreements.

Aspects where we need frameworks and methodologies

- The global use cases – *why GGIM?*
- Institutional – arrangements *voluntary or enforced, e.g. legally*
- Data sharing – *policy, licensing frameworks, pricing and/or open data policies*
- Data content – *a need for harmonization?*
- Access – *how to put data to work, services*
- Enabling us – *how to enhance capability?*
- Monitoring – *how to evaluate our success?*

Use case - the global challenges








- Environment-climate
- Natural disasters
- Hunger and poverty
- Energy crisis

Use case - the human activities and impact

- Roads and transportation
- Buildings and constructions
- Residential areas
- etc.

… they all means that easy access to and use and re-use of geographic information is more important than ever …

How can standards underpin GGIM?

Not only, - GGIM should use our standards
but more, - which standards does GGIM need –

and, you should all contribute to that development

ISO/TC 211 established in 1994

ISO/TC 211

Geographic informations/Geomatics

Together with the initial national members were 4 “founding” liaison members

- UN ECE
- IHO
- DGIWG
- OGC

And, since then, more than 50 international standards and other deliverables have been published

... developed into more than 60 national members

Australia
Austria
Belgium
Canada
China
Czech Rep.
Denmark
Ecuador
Finland
France
Germany
Hungary
Italy
Japan
Rep. of Korea
Malaysia
Morocco
Netherlands
New Zealand
Norway
Peru
Portugal
Russian Federation
Saudi Arabia
Serbia
South Africa
Spain
Sweden
Switzerland
Thailand
United Kingdom
United States of America

Argentina
Bahrain
Brunei Darussalam
Colombia
Croatia
Cuba
Estonia
Greece
Hong Kong
Iceland
India
Indonesia
Isl. Rep. of Iran
Ireland
Israel
Jamaica
Kenya
Mauritius
Oman
Pakistan
Philippines
Poland
Romania
Slovakia
Slovenia
Swaziland
Tanzania
Turkey
Ukraine
Uruguay
Zimbabwe

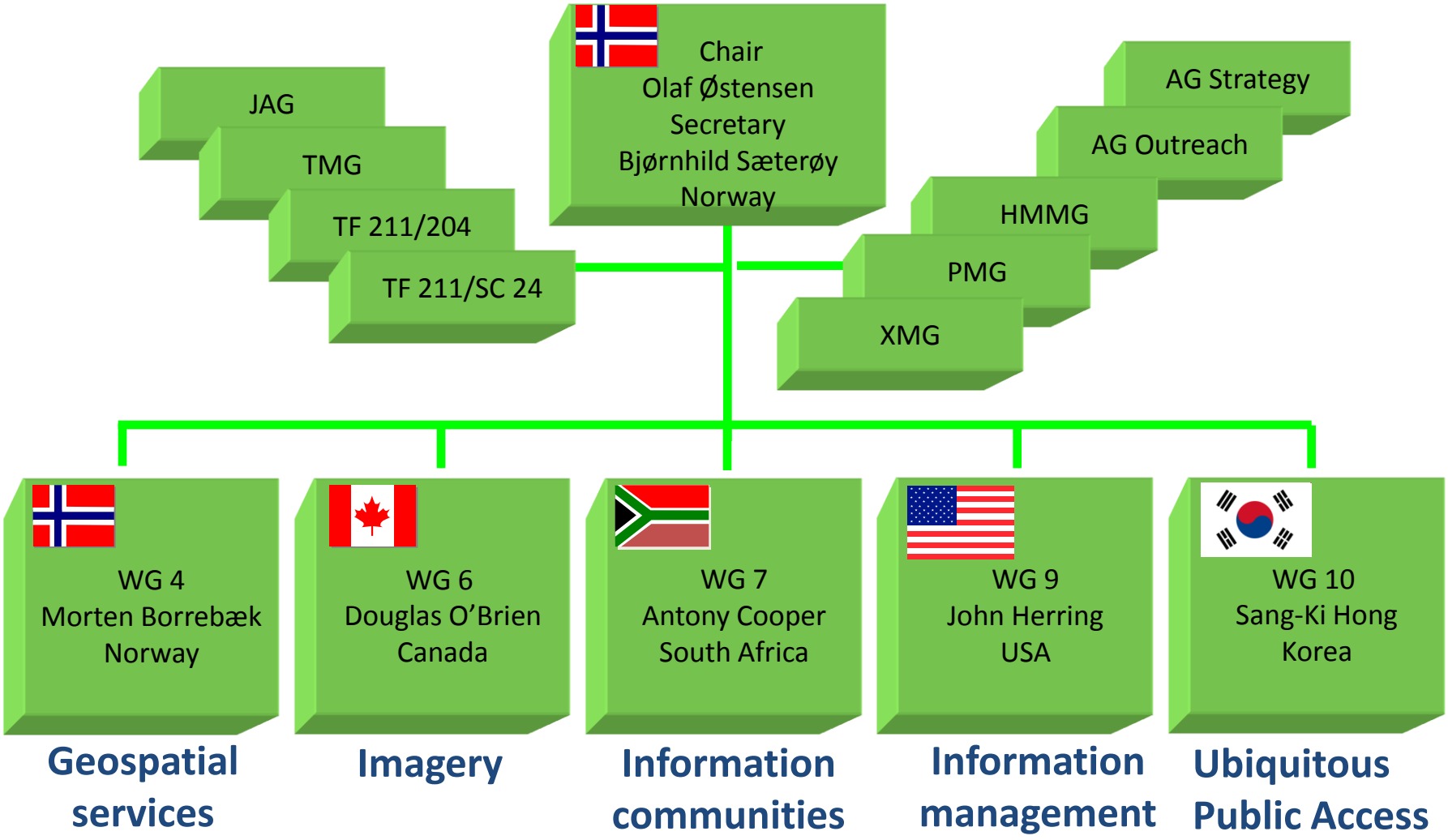
... and more than 30 international liaison organizations

- CEOS, Committee on Earth Observation Satellites
- DGIWG, Defence Geospatial Information Working Group
- Energistics
- EuroGeographics
- EuroSDR, European Spatial Data Research
- ESA, European Space Agency
- FIG, International Federation of Surveyors
- GSDI, Global Spatial Data Infrastructure
- IAG, International Association of Geodesy
- ICA, International Cartographic Association
- ICAO, International Civil Aviation Organization
- IEEE Geoscience and Remote Sensing Society
- IHB, International Hydrographic Bureau
- ISCGM, International Steering Committee for Global Mapping
- ISPRS, International Society for Photogrammetry and Remote Sensing
- JRC, Joint Research Centre, European Commission
- OASIS, Organization for the Advancement of Structured Information Standards

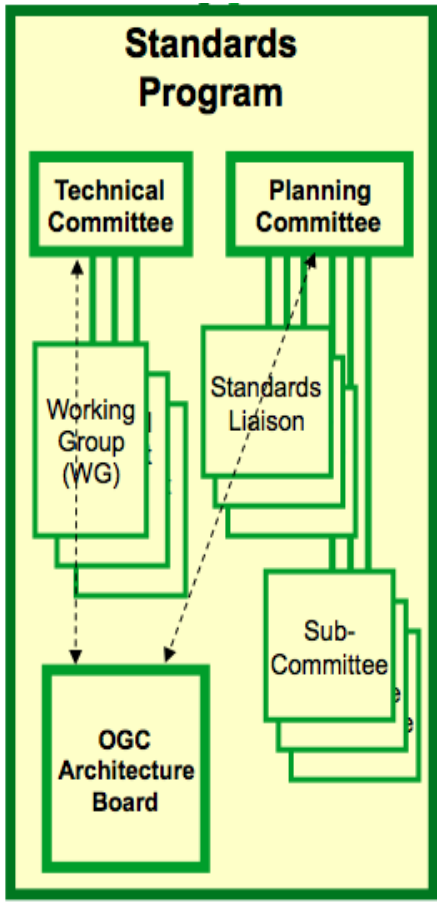
... further liaison organizations

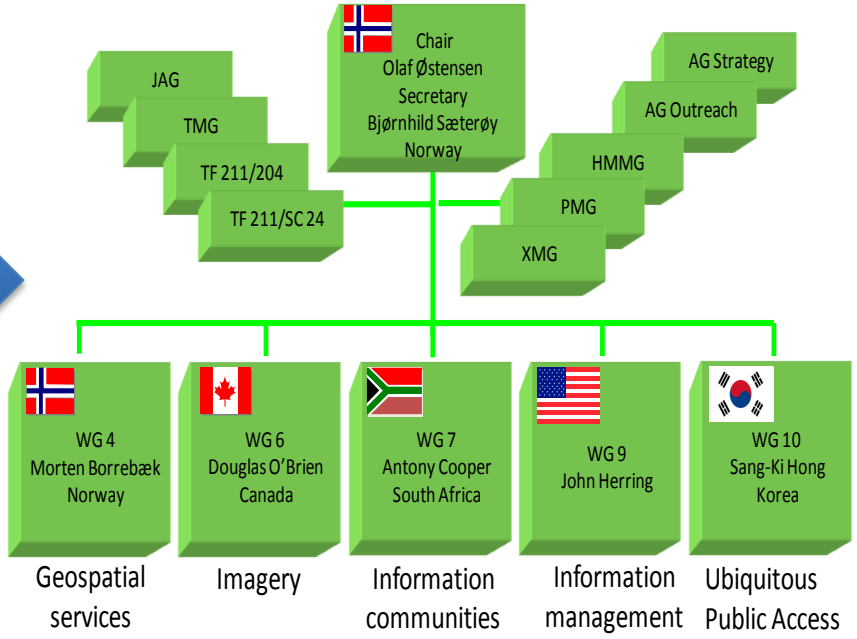
- OGC, Open Geospatial Consortium, Inc.
- OGP, International Association of Oil and Gas Producers
- OMG, Object Management Group
- PAIGH, Panamerican Institute of Geography and History
- PCGIAP, The Permanent Committee on GIS Infrastructure for Asia and the Pacific
- PC IDEA, Permanent Committee on Spatial Data Infrastructure for the Americas
- SCAR, Scientific Committee on Antarctic Research
- UN Economic Commission for Africa
- UN Economic Commission for Europe, Statistical Division
- UNGEGN, United Nations Group of Experts on Geographical Names
- UNGIWG, United Nations Geographic Information Working Group
- UN FAO, Food & Agriculture Organization of the United Nations
- UPU, Universal Postal Union
- WMO, World Meteorological Organization

ISO/TC 211 organization



The ISO-OGC coordination and collaboration





How standards matter, the INSPIRE example

INSPIRE DIRECTIVE

IMPLEMENTING RULES

TECHNICAL GUIDANCE

STANDARDS

Legal regulations, have to be implemented in national regulations

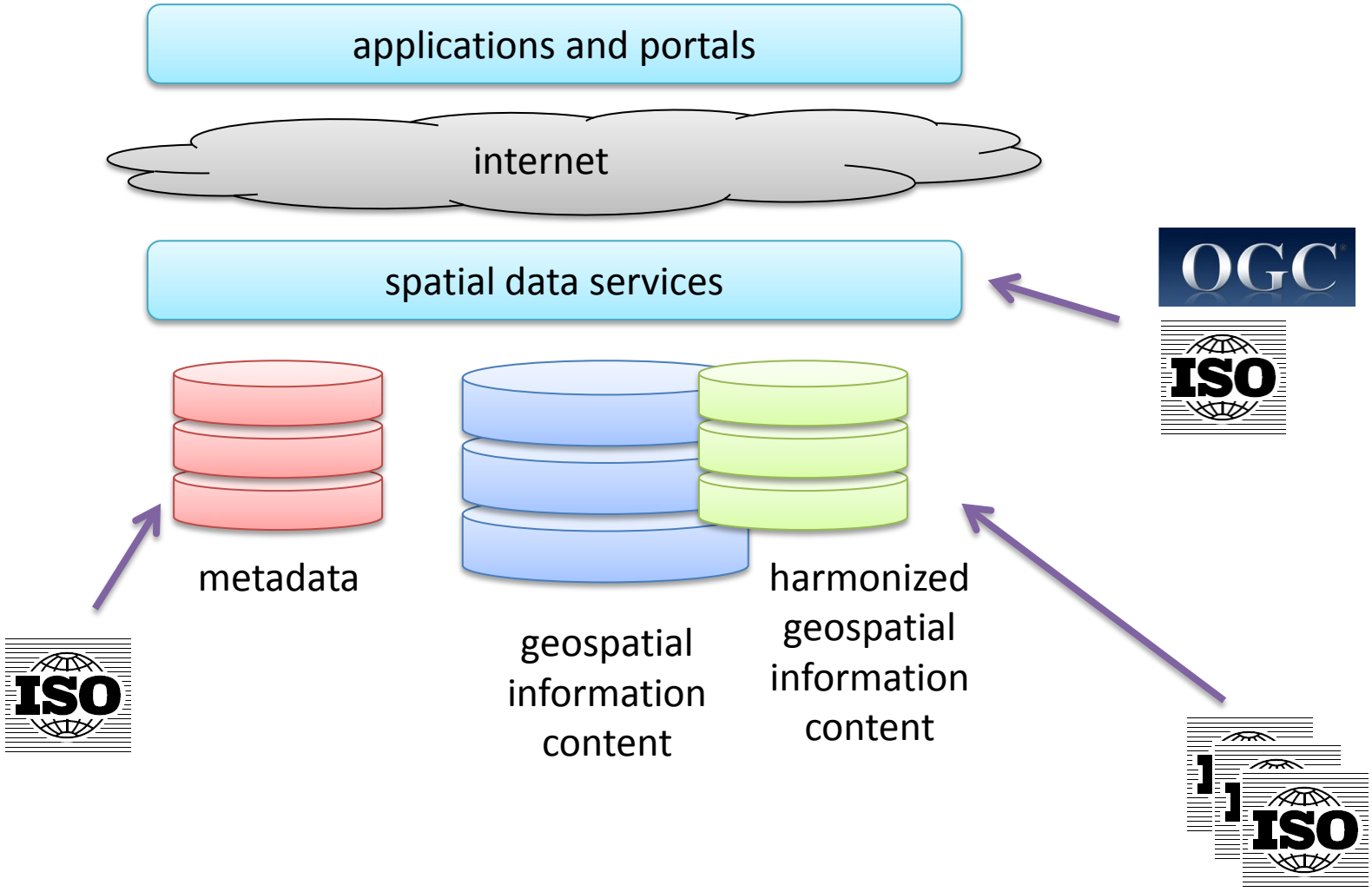
The thematic scope of INSPIRE

emphasizing the variety of sectors involved

- coordinate reference systems
- geographical grid syst.
- geographical names
- administrative units
- addresses
- cadastral parcels
- transport networks
- hydrography
- protected sites
- elevation
- land cover
- orthoimagery
- geology
- statistical units
- buildings
- soils
- land use
- human health and safety
- utility and government services
- environmental monitoring facilities
- production and industrial facilities
- agriculture and aquaculture facilities
- population distribution - demography
- area management/restriction/regulation zone and reporting units
- natural risk zones
- atmospheric conditions
- meteorological geographical features
- oceanographic geographical features
- sea regions
- bio-geographical regions
- habitats and biotops
- species
- energy resources
- mineral resources

Simplified technical architecture

- and where geospatial standards apply



Reference to standards in INSPIRE legal framework

In the Directive itself, reference to international standards: Preambles 16 and 28, Articles 5, 7 and 20

In the Implementing rules:

Metadata	Data interoperability	Network services
ISO 19101 ISO 19115 ISO 639-2 ISO 8601	ISO/TS 19103 ISO 19107 ISO 19108 ISO 19111 ISO 19115 ISO 19118 ISO 19125-1 ISO/TS 19127 ISO 19128 ISO 19135 ISO/TS 1939 ISO 639-3, 639-5, 2533, 15924	ISO 19128

Normative standards in technical guidance

ISO 19101:2005, Geographic information — Reference model
ISO/TS 19103:2005, Geographic Information — Conceptual schema language
ISO 19107:2005, Geographic information — Spatial schema
ISO 19108:2005, Geographic information — Temporal schema
ISO 19109:2006, Geographic Information — Rules for application schemas
ISO 19110:2006, Geographic information — Methodology for feature cataloguing
ISO 19111:2007, Geographic Information – Spatial referencing by coordinates
ISO 19111-2:--3, Geographic Information – Spatial referencing by coordinates – Part 2: Extension for parametric value
ISO 19112:2005, Geographic information — Spatial referencing by geographic identifiers
ISO 19115:2005, Geographic information — Metadata
ISO 19115:2003/Cor 1:2006, Geographic information — Metadata — Technical Corrigendum 1
ISO 19123:2007, Geographic information — Schema for coverage geometry and functions
OGC 06-103r3, Implementation Specification for Geographic Information - Simple feature access - Part 1: Common Architecture v1.2.0
NOTE This is an updated version of "ISO 19125-1:2006, Geographic information – Simple feature access – Part 1: Common architecture". A revision of the ISO standard has been proposed.
ISO 19126, Geographic Information – Feature concept dictionary and registers
ISO 19131:2007, Geographic Information – Data Product Specification
ISO 19135:2007, Geographic information — Procedures for item registration
ISO 19136:2007, Geographic Information – Geography Markup Language
ISO/TS 19139:2007, Geographic Information – Metadata – XML Schema implementation
ISO 19142 , Geographic information — Web feature service
ISO 19143 , Geographic information — Filter encoding
ISO 19156 , Geographic information — Observations and measurement

Authoritative, quality information for the GGIM

Information versus ***Authoritative***, ***Quality Information***

Produced by an authoritative institution, e.g. an NMCA
Documenting our

- Management
- Processes
- Data and services
  - metadata

… meaning standards in a broad sense!

Management standards for geographic information – strengthening the authoritative aspects

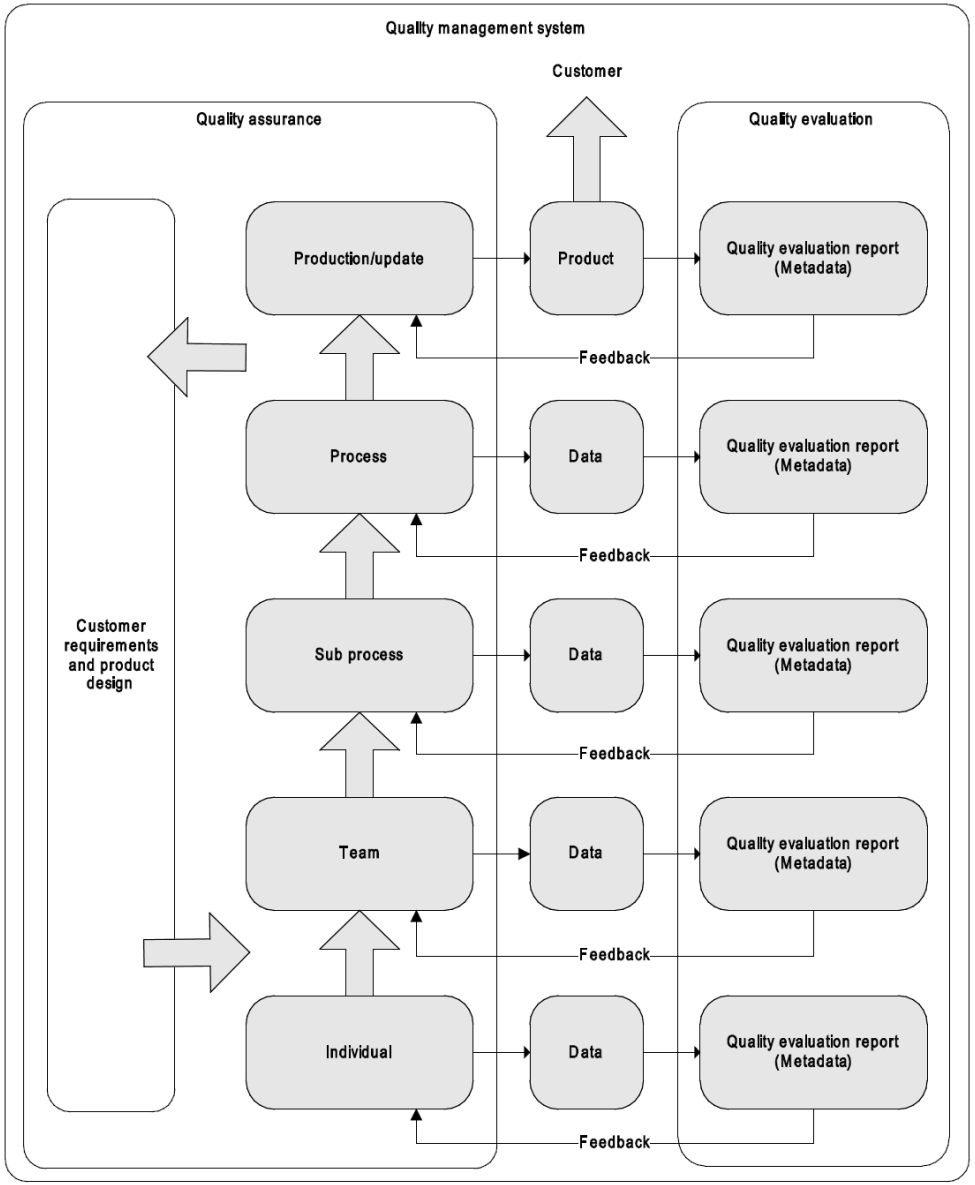
- ISO has a strong emphasis on management standards
  - quality management
  - environmental management
  - risk management
  - social responsibility
  - etc.

- ***ISO/TC 211 is now encouraging this as a new field of work, discussed next month in the Pretoria plenary***

A first example (?) …

ISO/TS 19158:2011(E)
Geographic information — Quality assurance of data supply
Information géographique — Assurance qualité relatif à l'approvisionnement de données

ISO/TS 19158

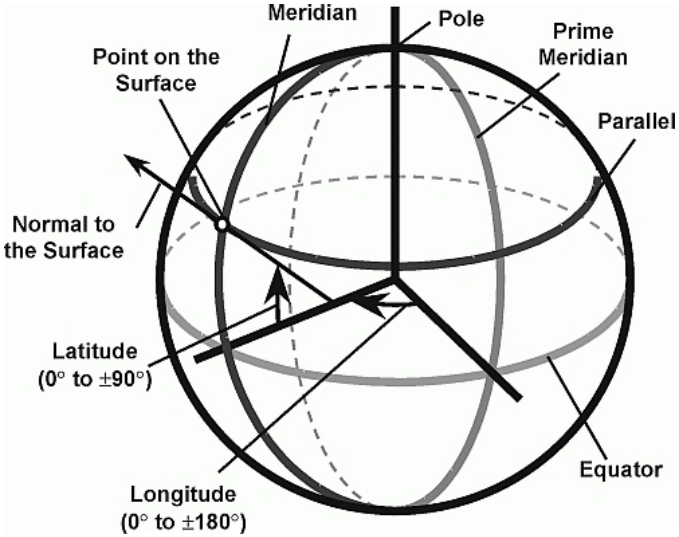


provides a framework for quality assurance specific to geographic information. It is based upon the quality principles and quality evaluation procedures of geographic information identified in ISO 19157 and the general quality management principles defined in ISO 9000.

Quality evaluation and quality assurance in production and update

Harmonising content at the global level

Geodetic reference frame



France is circulating a proposal for a new internasjonal standard regarding geodetic references.

The proposal is based on a recommendation by a WG within IAG.

Scope includes

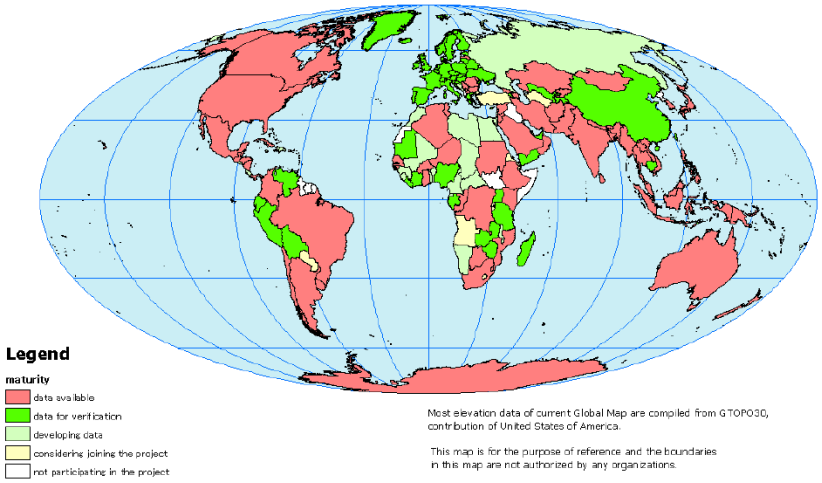
- To develop an ISO standard related to ITRS
- To develop other standards if required, for instance on vertical and gravity references

Global Map

The International Steering Committee for Global Map – a long term ISO/TC 211 member

ISCGM adopted new Global Map Specifications in 2009 with the change of format in vector data from VPF to GML 3.2.1 standardized as ISO 19136, as well as the adoption of ISO 19115 for the metadata profile.

ISCGM is considering to go to ISO to transform a next revision into an International Standard



UN GEGN

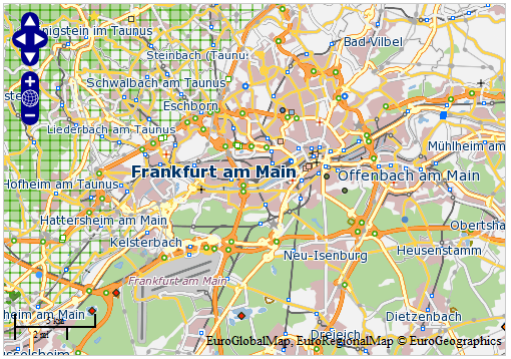
UNGEGN | United Nations Group of Experts on Geographical Names

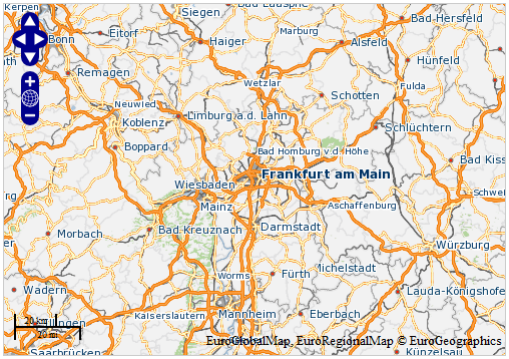
How can the standards bodies support UN GEGN in their achievements?

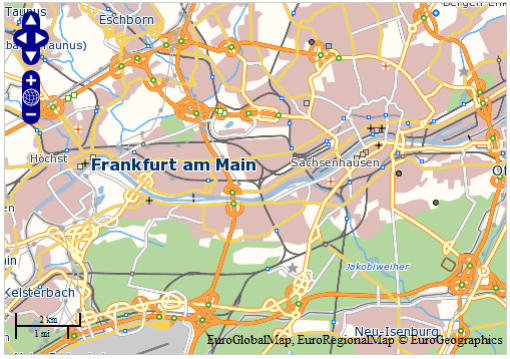
An authoritative, homogeneous, edge-matched dataset of Europe for download and as services

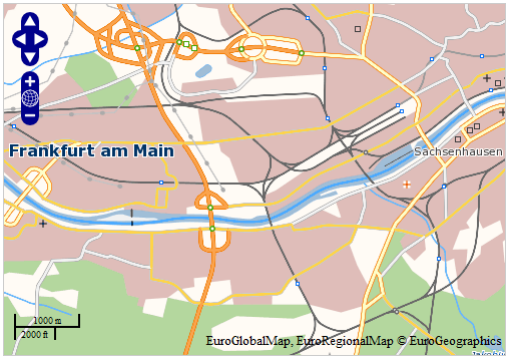
eurogeographics

1st High Level Forum on UN-GGIM
The First High Level Forum on United Nations Global Geospatial Information Management

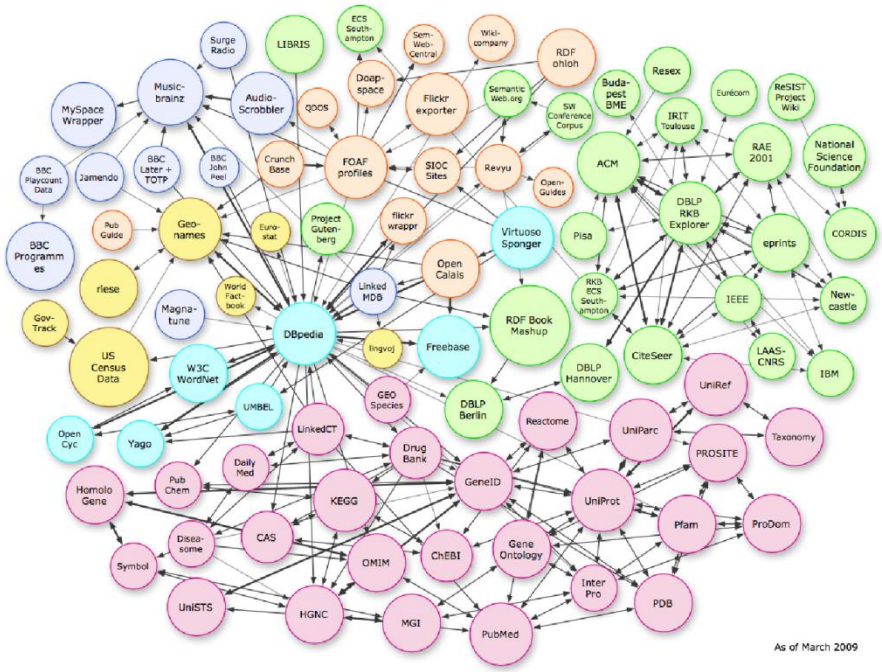








Open Data



ISO/TC 211 has launched a large programme on ontologies and open data

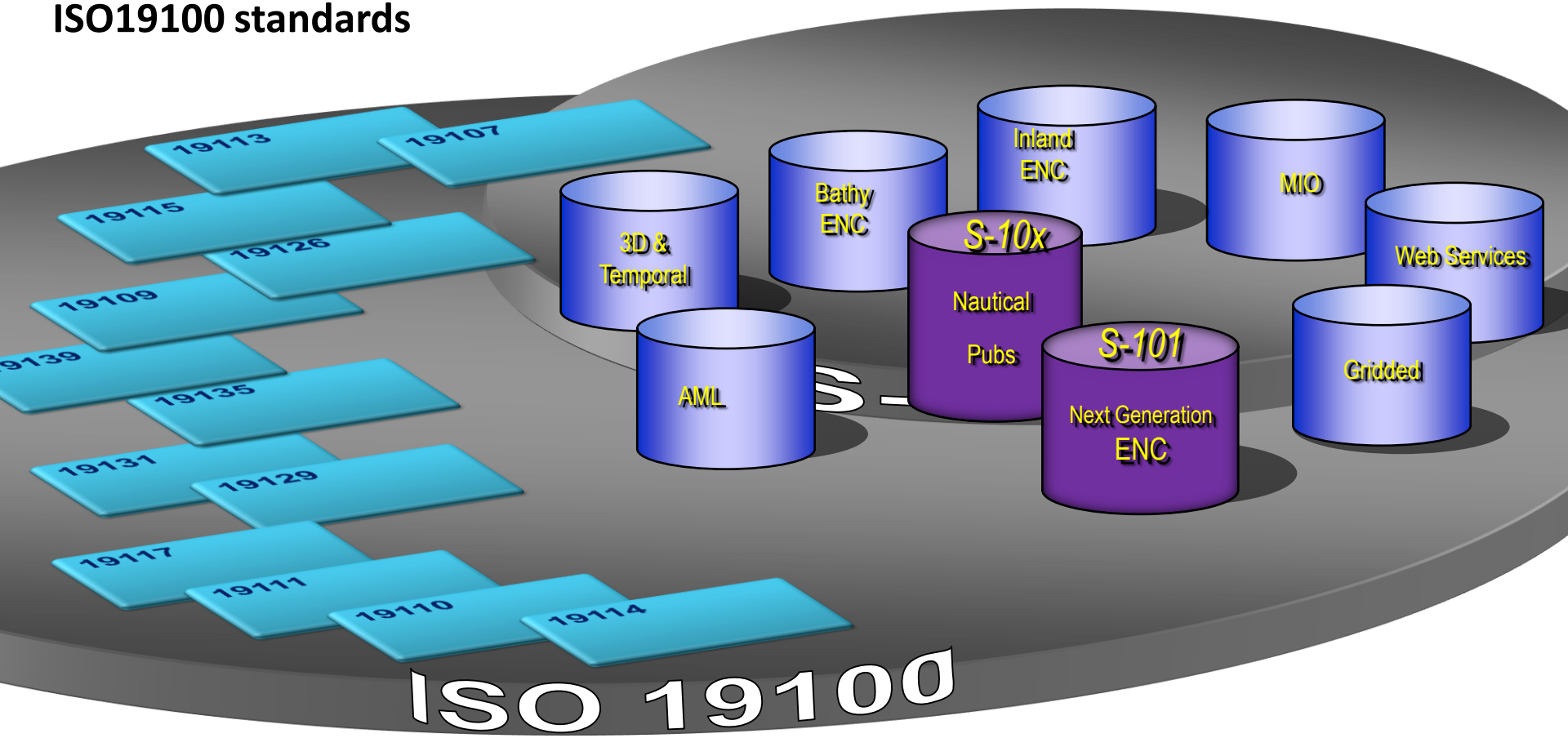
ISO 19150 Part 1 and Part 2

A group to report on further work in linked open data in close cooperation with other communities, e.g. OGC and Ordnance Survey of GB

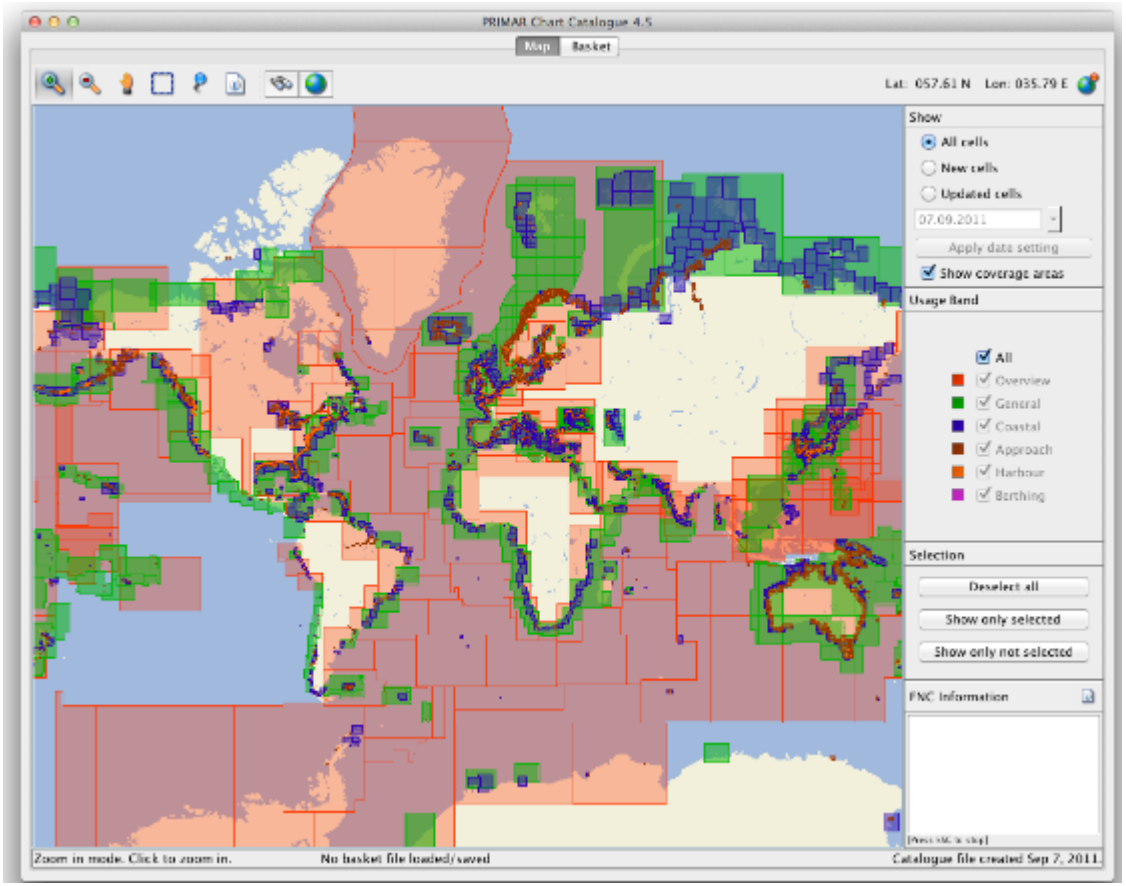
The work is made possible by NRCan

IHO S-100 - built on ISO 19100

IHO S-10*x* standards will depend on several ISO19100 standards



A global coverage of ENCs



A more or less global coverage of electronic nautical charts is available

Advances electronic services, like PRIMAR, makes the ENCs easily accesible

PRIMAR

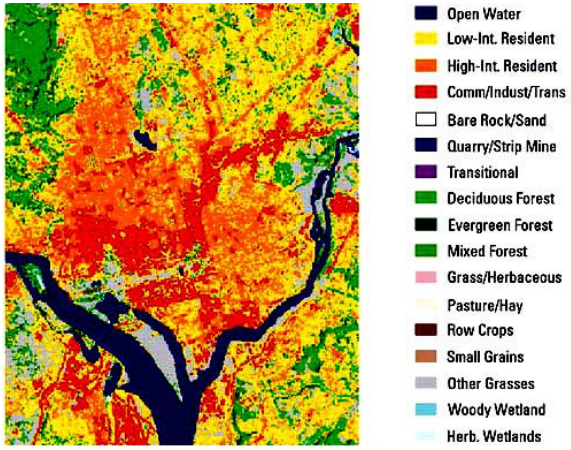
Serving the military community

The Defence Geospatial Information Working Group (DGIWG) has been a liaison since the start and invested heavily in ISO/TC 211 over the years.

Their own standards are now founded on the ISO 19100-series.

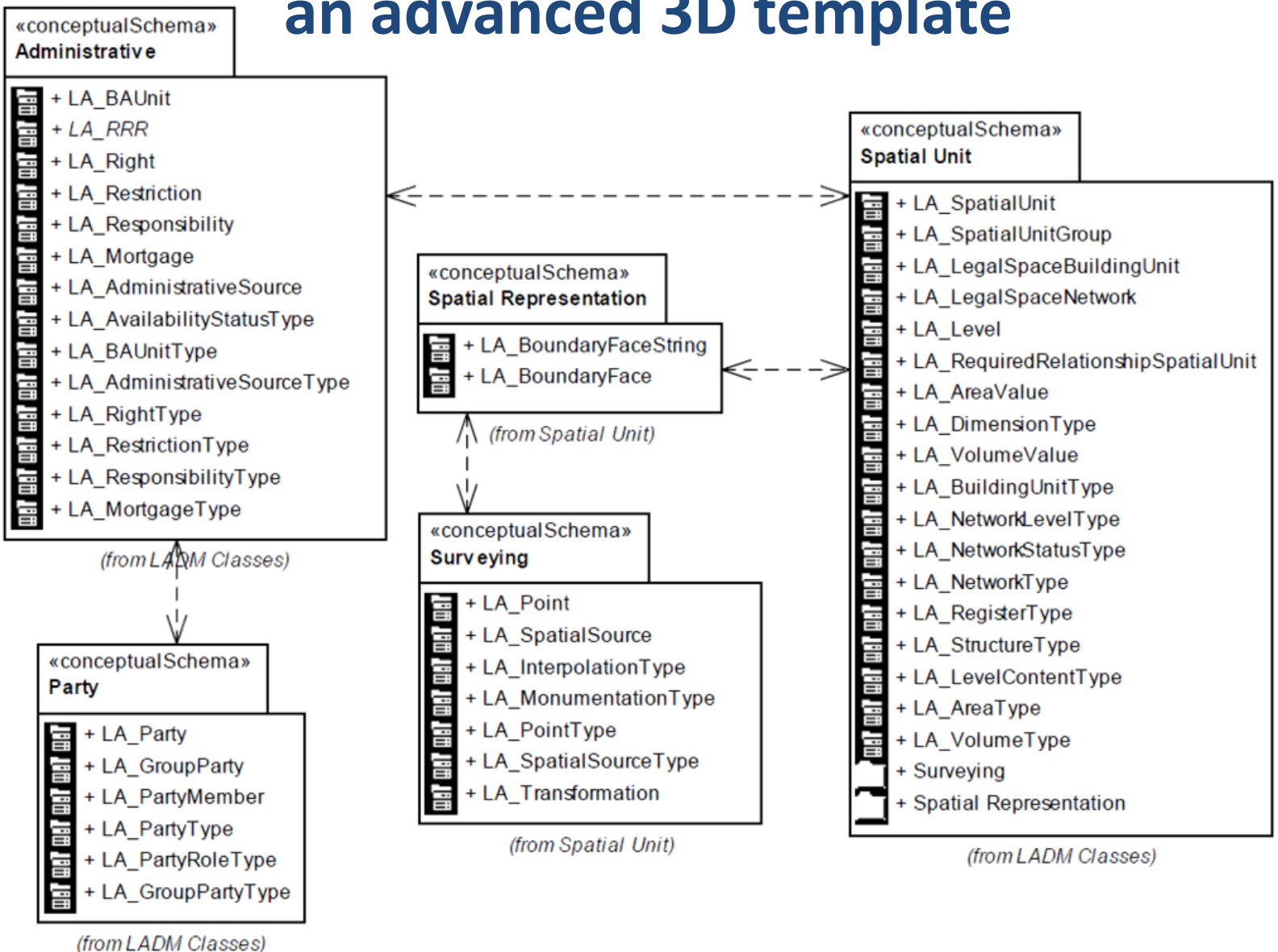
Application domains for GGIM

Classifications systems – ISO 19144 – Part 1 and Part 2



Land Administration Domain Model – ISO 19152

The land administration domain model an advanced 3D template



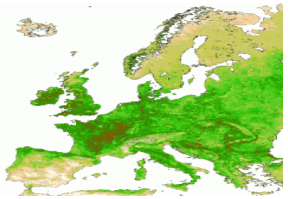
The climate change - ECVs

ECV – Essential Climate Variables

River discharge

Water use

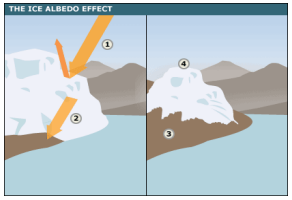
Permafrost



FAPAR

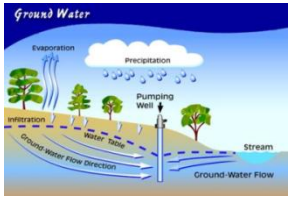
Lake levels

Snow cover



Albedo

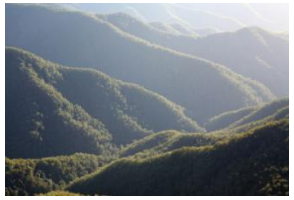
Leaf area index



Ground water

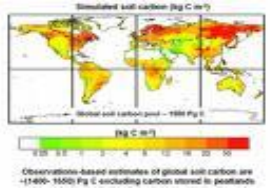
Glaciers and ice caps

Land cover

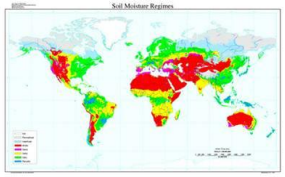


Biomass

Fire disturbance

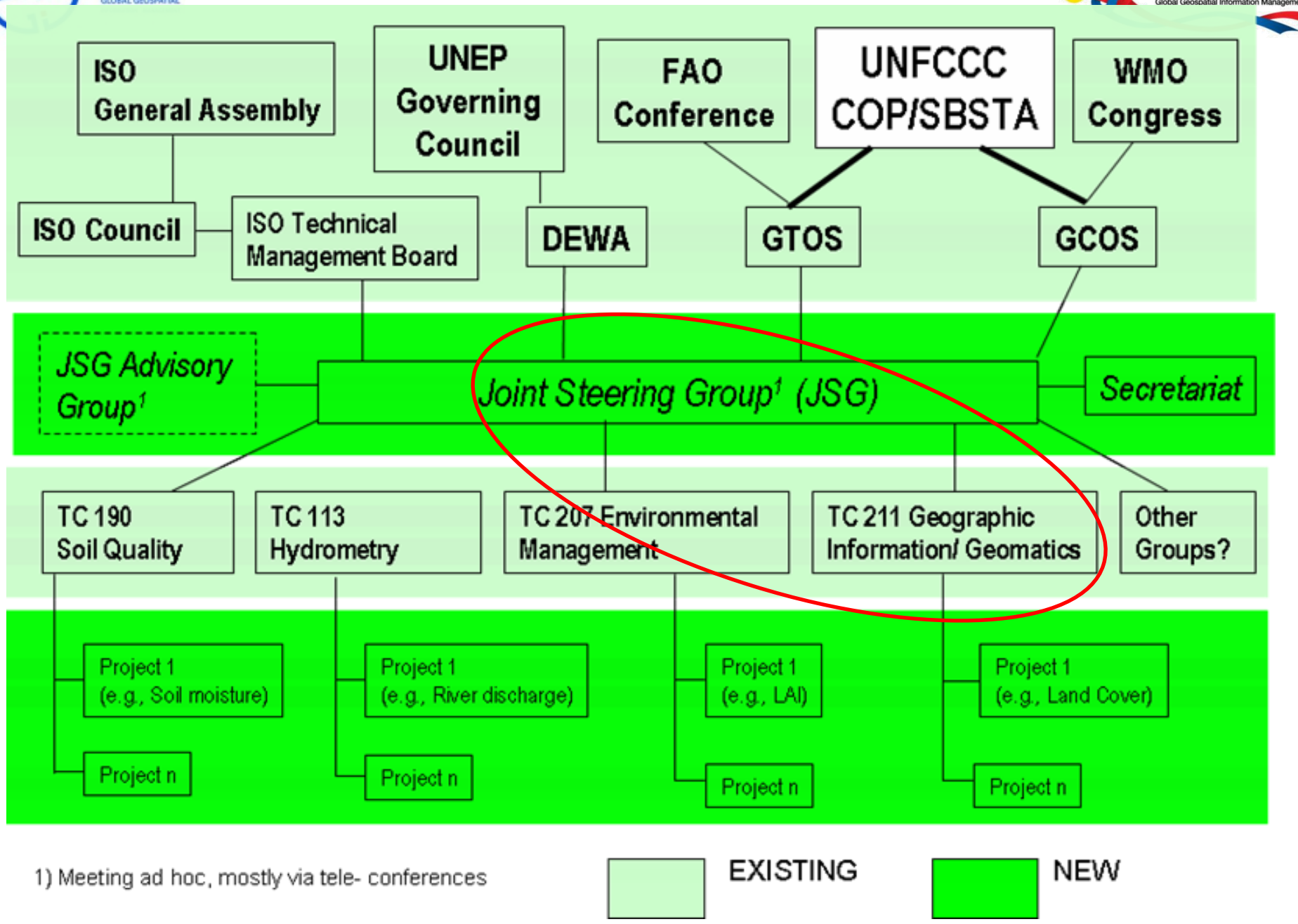


Soil carbon



Soil moisture

Figure A-1. Organizational arrangement for the proposed Framework: existing and new components

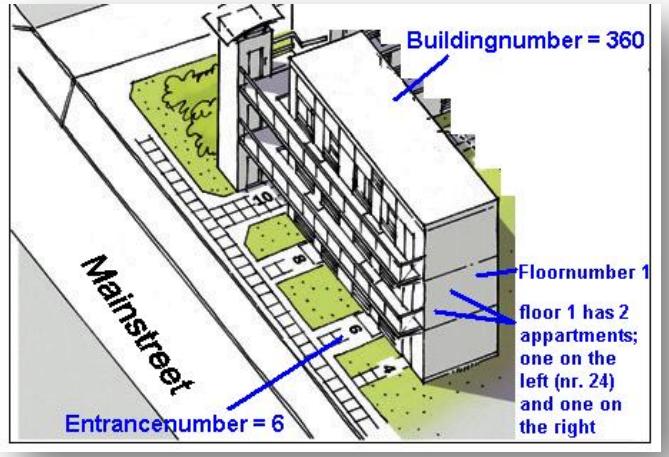


International standards for Addresses

UNIVERSAL POSTAL UNION

- Liaison has been established with the Universal Postal Union

- Initiative is taken to investigate the requirement for a series of international standard for addresses



- ISO 19160-1, Addressing – Terminology and conceptual model
- ISO 19160-2, Addressing – Good practices for address assignment schemes
- ISO 19160-3, Addressing – Quality management for address data
- ISO 19160-4, Addressing – International postal address components and templates
- ISO 19160-5, Addressing – Address rendering for purposes other than mail

Recommendations for UN-GGIM

- There is a need to establish frameworks for data and services sharing policies, including licensing framework, pricing and open data policies
- A general free data and service sharing framework for emergency could be a start, extending existing agreements
- The requirements for harmonized geospatial information and –services should be investigated
- The necessary specifications developed
  – standards development bodies are good candidates

Recommendations for UN-GGIM

- UN-GGIM cannot conquer the world alone, building on existing framework is essential, whether organizations IHO, WMO, or regional efforts around the globe, and
- wherever practicable, unite and integrate these efforts, e.g. metadata catalogues (“global federation”), data access through services, etc.
- Industry should at least play two roles
  - underpin the core activities of UN-GGIM through their product sand services
  - extend and benefit from the GGIM with value adding and innovation
  - ... again bringing the GGIM further

Recommendations for UN-GGIM

- A standards framework is already in place, and fulfils a fundamental role for national, regional and international needs
- Standards are mature and tested – and new and even better generations are under development
- UN member nations and international organizations are encouraged to participate even stronger in the standards development processes – directly or indirectly by providing new requirements

Recommendations for UN-GGIM

- Standards developing bodies strongly support the UN-GGIM initiative and the resulting activities

- ***The UN Committee of Experts on GGIM is invited to become an ISO/TC 211 Category A liaison to fully influence and benefit from the ISO/TC 211 work***
- ***Further, ISO/TC 211 offers to assist UNCE-GGIM in developing a standardization strategy, thus extending the strong relationship between ISO and UN, in general***