



Geodetic Initiatives at International Organization for Standardization (ISO)

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- TC 211 statistics and website



International Organization for Standardization (ISO)

- ISO (International Organization for Standardization) is the world's largest developer and publisher of international standards – more than 17,000!
- ISO is a network of the national standards institutes of 157 countries, one member per country, with a Central Secretariat in Geneva, Switzerland, that coordinates the system.
- ISO is a non-governmental organization (NGO) that forms a bridge between the public and private sectors.

<http://www.iso.org/iso/home/about.htm>



ISO/TC 211

Geographic information/Geomatics

- ISO Technical Committee (TC) 211, Geographic information/Geomatics, is one among over 200 ISO technical committees working on development and maintenance of a variety standards.
- TC 211 is developing a **suite of standards for geographic and geospatial information** that forms a basis upon which **geomatics** – the modeling of the Earth – can be performed.
- The ISO process for standardizing provides an **open, consensus based public method for establishing standards**.

Brief history of ISO/TC 211

- Established in 1994
- The first plenary meeting in Oslo, Norway, November 1994
- Initiated a base programme of 20 fundamental standards in parallel
- This base programme was fulfilled
- Ever increasing number of new work items
- As of April 2016, 65 standards





ISO/TC 211 provides ...

... a structure for representing geographic information in a consistent, standardized manner. It includes the **geodetic framework** for identifying where information was collected, modeling, representing, encoding and disseminating the information.

... a **significant focus on metadata** (i.e. data about data) - facilitate the assessment of current and future data, so that user communities can establish its fitness for use.



The goal of ISO/TC 211...

... is to develop a family of international standards that will

- support the understanding and usage of geographic information
- increase the availability, access, integration, and sharing of geographic information, enable inter-operability of geospatially enabled computer systems
- contribute to a unified approach to addressing global ecological and humanitarian problems
- ease the establishment of geospatial infrastructures on local, regional and global level
- contribute to sustainable development



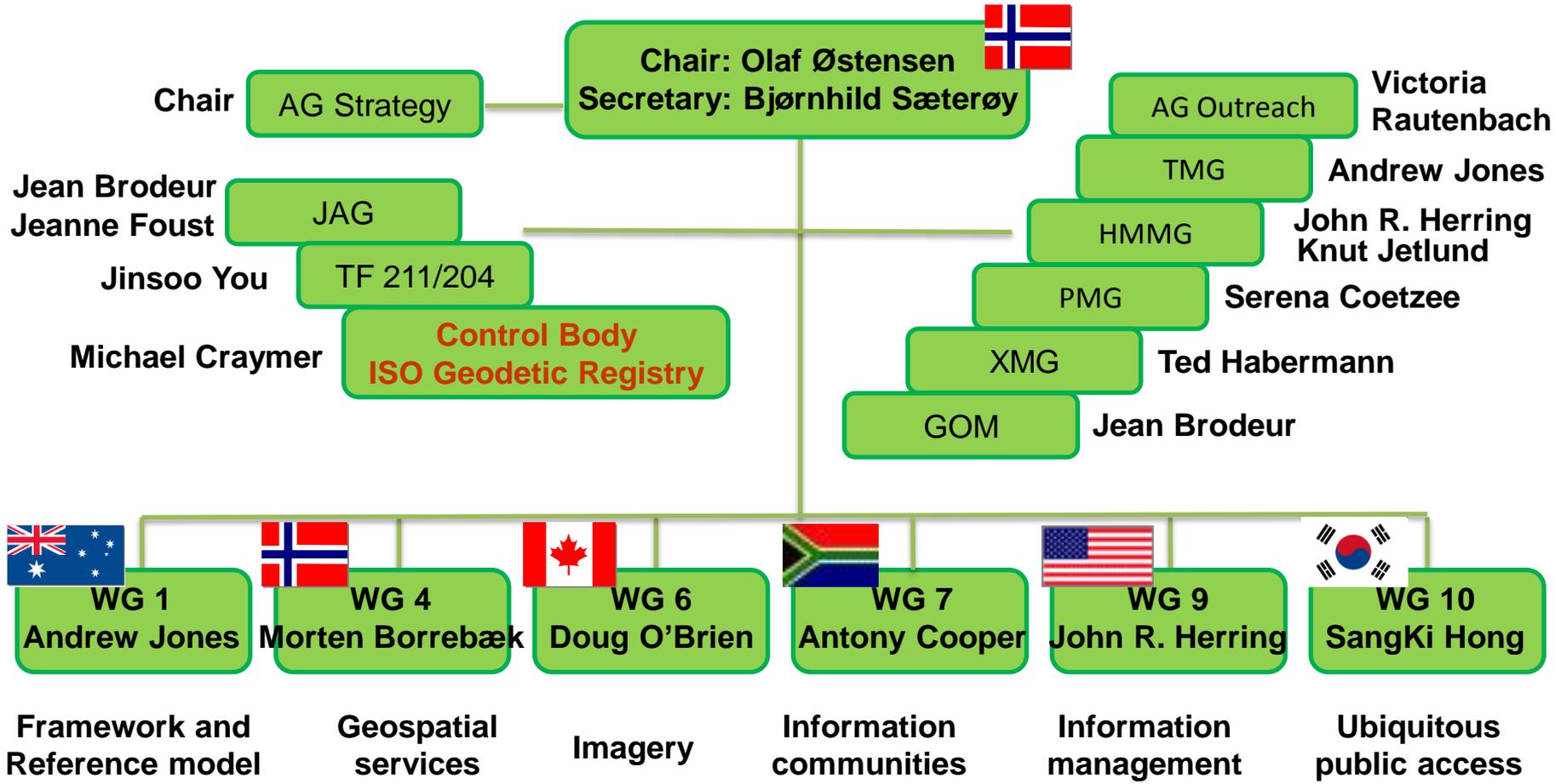


Scope of ISO/TC 211

- Standardization in the field of digital geographic information.
- Establish a structured set of standards for information concerning objects or phenomena that are directly or indirectly associated with a location relative to the Earth.
- Standards may specify, for geographic information, methods, tools and services for data management (including definition and description), acquiring, processing, analyzing, accessing, presenting and transferring such data in digital/electronic form between different users, systems & locations.
- Link to appropriate standards for information technology & data where possible, and provide a framework for the development of sector-specific applications using geographic data.

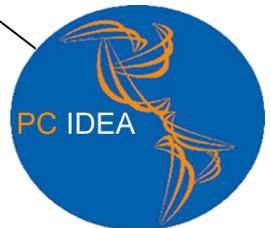


ISO/TC 211 organization





External Liaison ISO/TC 211





GGIM – UN COMMITTEE ON GLOBAL GEOSPATIAL INFORMATION MANAGEMENT



UN Resolution – A global geodetic reference frame (GGRF) for sustainable development – February 2015 (1 of 2)

“*Recognizing* the importance of international cooperation, as no one country can do this alone, to **realize the global geodetic reference frame and services to underpin Global Navigation Satellite Systems (GNSS) technology** and provide the framework for all geospatial activity, as a **key enabler of spatial data interoperability**, disaster mitigation and sustainable development”

http://www.un.org/ga/search/view_doc.asp?symbol=A/69/L.53



GGIM – UN COMMITTEE ON GLOBAL GEOSPATIAL INFORMATION MANAGEMENT



UN Resolution – A global geodetic reference frame (GGRF) for sustainable development – February 2015

(2 of 2)

*“Urges Member States to implement **open sharing of geodetic data, standards and conventions**, on a voluntary basis, to contribute to the global reference frame and regional densifications through relevant national mechanisms and intergovernmental cooperation, and in coordination with the International Association of Geodesy (IAG)”*



ISO/TC 211 support for UN-GGIM – a strategic direction

- **Global geodetic reference frame (19111 and 19161)**
- Determination of global fundamental geospatial data themes
- **Legal and policy frameworks**, including issues related to authoritative data
- **Implementation and adoption of standards** for the global geospatial information community
- **Integration** of geospatial, statistical and other information
- **Application** of geospatial information related **to land administration and management**
- **Knowledge base** for geospatial information management



ISO/TC 211 Geodetic standards

Existing and under revision

- **19111** – Spatial referencing by coordinates
- **19127** – Geodetic register
 - Formerly “Geodetic codes and parameters”

New work in development

- **19161** – Geodetic references – Part 1: The International Terrestrial Reference System (ITRS)





19111 – Spatial referencing by coordinates (1 of 3)

- International standard (IS) maintained by TC 211
- Data model of how coordinates, reference frames and transformations are represented
- Adopted by many countries and organizations –
 - Used by GIS/geomatics industry
- **ISO Geodetic Registry** must conform to this standard
- Problems found with current version: 19111-2007
 - Does not properly representing modern dynamic reference frames & geoid-based vertical datums
 - Issues with entering information into the **ISO Geodetic Registry**



19111 – Spatial referencing by coordinates (2 of 3)

- **Workshop held June 2015 in Southampton, UK to discuss revision of 19111-2007**
- **Identified deficiencies with current standard – it did not:**
 - represent modern dynamic 3D reference frames
 - represent modern geoid-based vertical datums
 - represent reference frames defined as transformations from other reference frames (e.g., from ITRF)
 - use modern terminology (e.g., that are used in the IERS Conventions)



19111 – Spatial referencing by coordinates (3 of 3)

- New work item proposal (NWIP) drafted at June 2015 Workshop
 - Included justification for revision
 - Draft served as starting point for revision work
- TC 211 Revision Project Team
 - Project Team Leader - Roger Lott, UK
 - Experience with creating, revising and managing standards
 - Intimate knowledge of reference systems as manager of the **EPSG geodetic registry**
 - Seeking subject matters experts (SMEs) to work on project
- Project team meeting scheduled June 2016 in Tromsø, Norway



19127 – Geodetic register

- Defines the management and operation of the ISO Geodetic Registry and identifies the required data elements
- Revision work in final stages - pending is action to adopt as a draft international standard (DIS)
 - Project team lead: Patrick Vorster, South Africa



19161-1 – Geodetic references – Part 1: The International Terrestrial Reference System (ITRS)

- **Proposed standard preceded by published technical report (TR)**
 - TR 19161 – Geodetic references
 - Preparation of TR lead by France's national standards body
 - Initiative was outcome of Resolution adopted by IAG at 2007 IUGG Assembly
 - The TR recommended development of standards related to ITRS, vertical references, geodetic terms & definitions, etc.

- **19161-1**
 - New work item proposal (NWIP) submitted by France was approved with work on rough draft to begin at June TC 211 meeting in Tromsø
 - **Project team:** Claude Boucher, Leader and Thierry Gattacceca, Technical Editor - France



Scope of 19161-1

Standard provides the basic information and the requirements related to the:

- International Terrestrial Reference System (ITRS), specifically its definition, realizations and access.

It will:

- endorse the definition(s) and terminology adopted by the International Union of Geodesy and Geophysics (IUGG), the International association of Geodesy (IAG) and the International Astronomical Union (IAU)
- describe the various realizations (such as ITRF, WGS-84, ETRS89, etc.)
- provide the required methods of realizing the ITRS.
- describe the various ways of getting positions expressed in a realization of the ITRS



The ISO Geodetic Registry

➤ A database (register)

- Defining geodetic reference frames
- Transformations between geodetic reference frames
- Must conform to current ISO standards

➤ Control Body (CB)

- Chair, Mike Craymer, Canada; Larry Hothem, Vice-Chair
- CB members representing 14 countries meet monthly by video conference
- CB approves the content of the register
- Validates information using authoritative sources

➤ Current goal - public release later in 2016

➤ Delays in release due to encountering problems entering modern reference frames into the registry

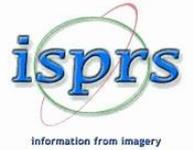
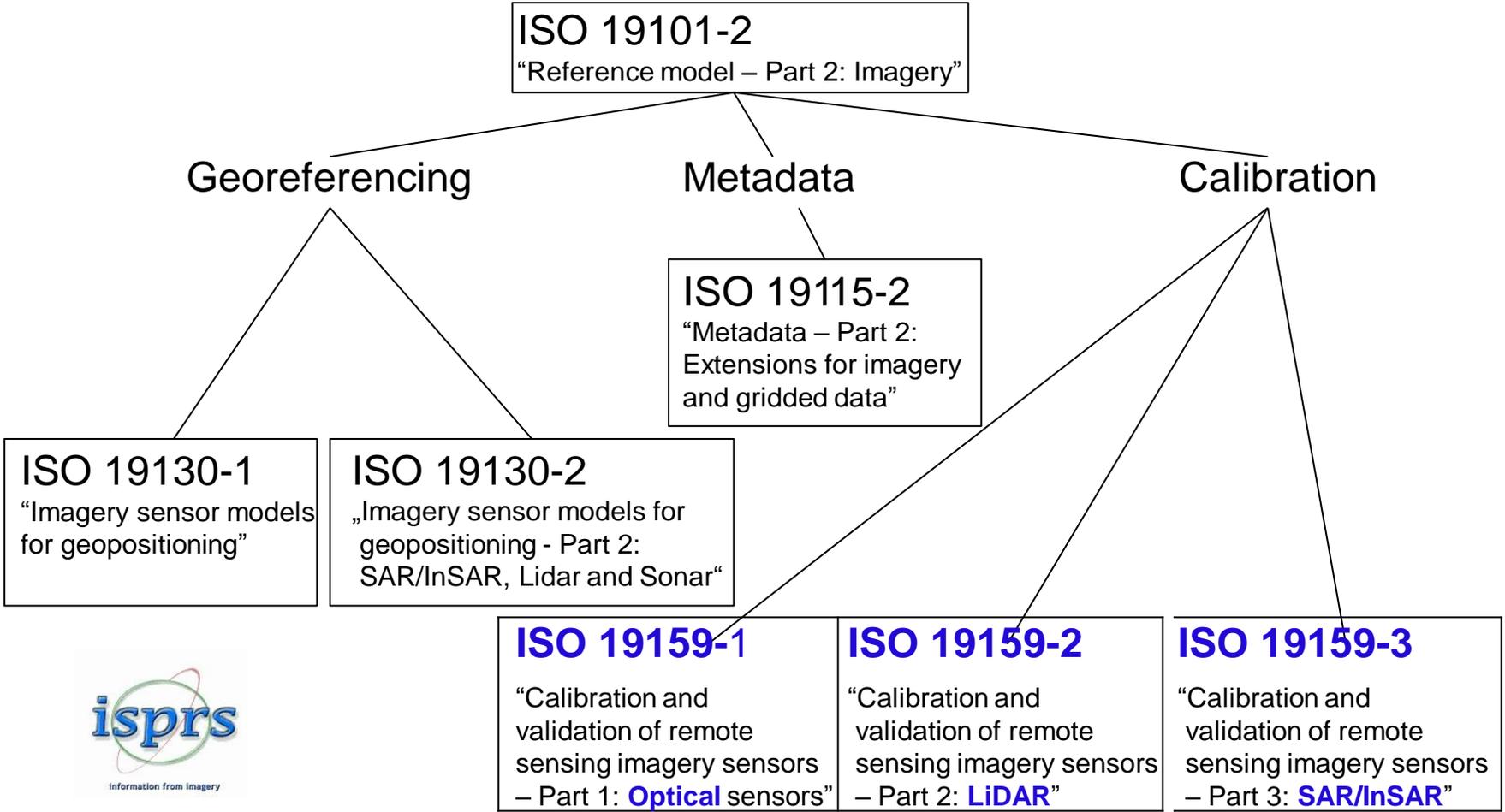
- Full day meeting of CB is scheduled during June TC 211 meeting in Tromsø



Other TC 211 geodetic related or support standards

- **6709:2008** - - Standards representation of geographic point locations by coordinates
- **19104:2015** - - Terminology
- **19115** - - Metadata
- **19116:2004** - - Positioning services (proposed revision is pending)
 - Revision objective recognizes ubiquitous use of integrated positioning technologies with a variety of appliances
- **19130** - - Imagery sensor models for geopositioning – optical, SAR, InSAR, LiDAR and SONAR
- **19135-2** - - Procedures for item registration
- **19159** - - Calibration and validation of remote sensing imagery sensors – optical, LiDAR, SAR/InSAR and SONAR

TC211 Imagery standards





ISO/TC 211 statistics

(2016-01)

- 66 International Standards (IS) or Technical Specifications (TS)/ Reports (TR)
- 23 projects presently under development or revision with about 250 subject matter experts (SMEs) nominated
- 35 Participating (P) members
- 30 Observing (O) members
- 34 External liaison organizations (such as FIG and IAG)
- More than 1700 persons involved internationally since 1994
- More than 1000 have attended one or more plenaries
- 41 plenary meetings have been convened in 21 different countries on 5 continents



Figures are approximate and vary over time

You will find updated information on
ISO/TC 211 at:

<http://www.isotc211.org>

containing:

- Organization
- Scope and work programme
- Resolutions
- Document register
- Calendar
- News and information
- Presentations (slides)
- List of events



Thank you for your attention!

ISO/TC 211 ...

... building the foundation of the geospatial infrastructure, brick by brick ...





Who are we ? ...member list

Active members (P-members), 35 countries

Australia	Hungary	Russian Federation
Austria	India	Saudi Arabia
Belgium	Iran	Serbia
Botswana	Italy	Singapore
Canada	Japan	South Africa
Chile	Rep. of Korea	Spain
China	Lithuania	Sweden
Czech Republic	Malaysia	Switzerland
Denmark	Netherlands	Thailand
Finland	New Zealand	United Kingdom
France	Norway	United States of America
Germany	Peru	





Who are we ? ...member list

Observing members (O-members), 30 countries

Argentina	Hong Kong	Philippines
Azerbaijan	Iceland	Poland
Bahrain	Indonesia	Romania
Brunei Darussalam	Ireland	Slovakia
Colombia	Israel	Slovenia
Croatia	Kenya	Swaziland
Cuba	Mauritius	Tanzania
Cyprus	Morocco	Turkey
Estonia	Oman	Ukraine
Greece	Pakistan	Uruguay



ISO members: http://www.iso.org/iso/home/about/iso_members.htm



New Work Item Proposal (NWIP) Process

- **Before submission**
 - Draft prepared, project leader (PL) and editor identified
- **If entirely new (i.e. not agreed at a plenary or balloted by TC211)**
 - Preliminary NWIP submitted to secretariat (draft attached, PL nominated)
 - Brief review for completeness by TC211 secretary
 - Circulate to TC211 members for **1 month** info/comment/no objection review
 - Any comments addressed by editor / PL, revised draft prepared
- **If preliminary approval by TC211**
 - NWIP submitted to secretariat ([revised] draft attached, PL nominated)
 - Brief review for completeness by TC211 secretary
 - Circulate as CD to TC211 members for **3 month** comment ballot
 - **Successful ballot requires majority agreement and at least 5 members (excluding liaisons) nominating participant(s), who constitute the project team (PT)**
- **If successful ballot**
 - **1 month** notice of Editing Committee (EC) meeting issued by secretariat
 - Members and liaisons invited to nominate additional PT/EC members
 - **Hold EC meeting** (in conjunction with plenary)
 - Useful if editor has prepared draft responses to comments ahead of EC