International Organization for Standardization

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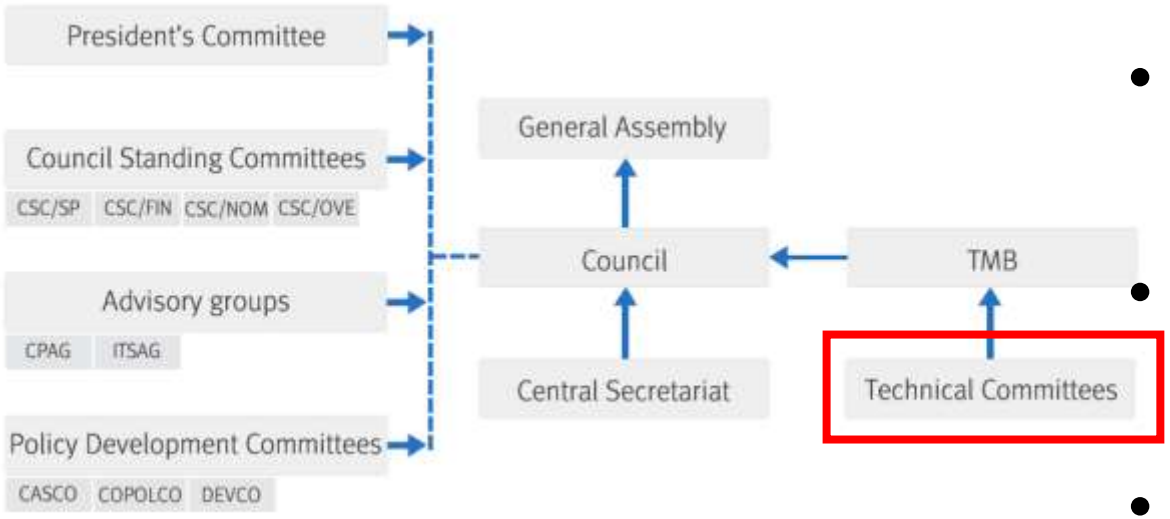
International Organization for Standardization (ISO)

- ISO (International Organization for Standardization) is the world's largest developer and publisher of international standards – more then 17,000!
- ISO is a network of the national standards institutes of 167 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 Governance Structure



- List of Technical Committees
- From Assistive products to Zinc alloys
- TC211 is just one of 258 TC's
- TC211 Geographic information/Geomatics

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.

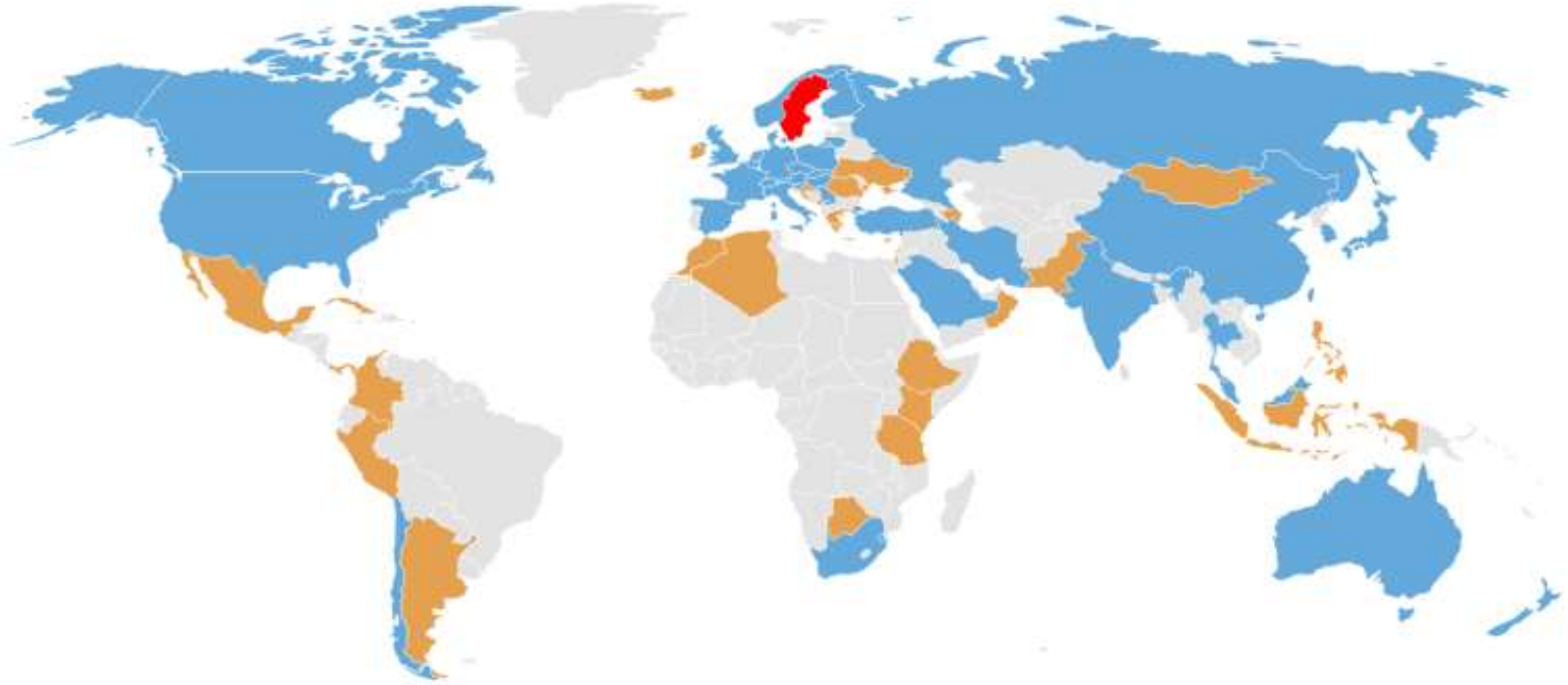
- TC 211 is developing a suite of standards for geographic and geospatial information that forms a basis upon which geomatics – the modeling of the Earth – can be performed.

- 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 TC211 Participation



37 Participating Members 33 Observing Members Secretariat

Reference Frames in Practice

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.

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.

The goal of ISO/TC 211…

… is to develop a family of international standards that will

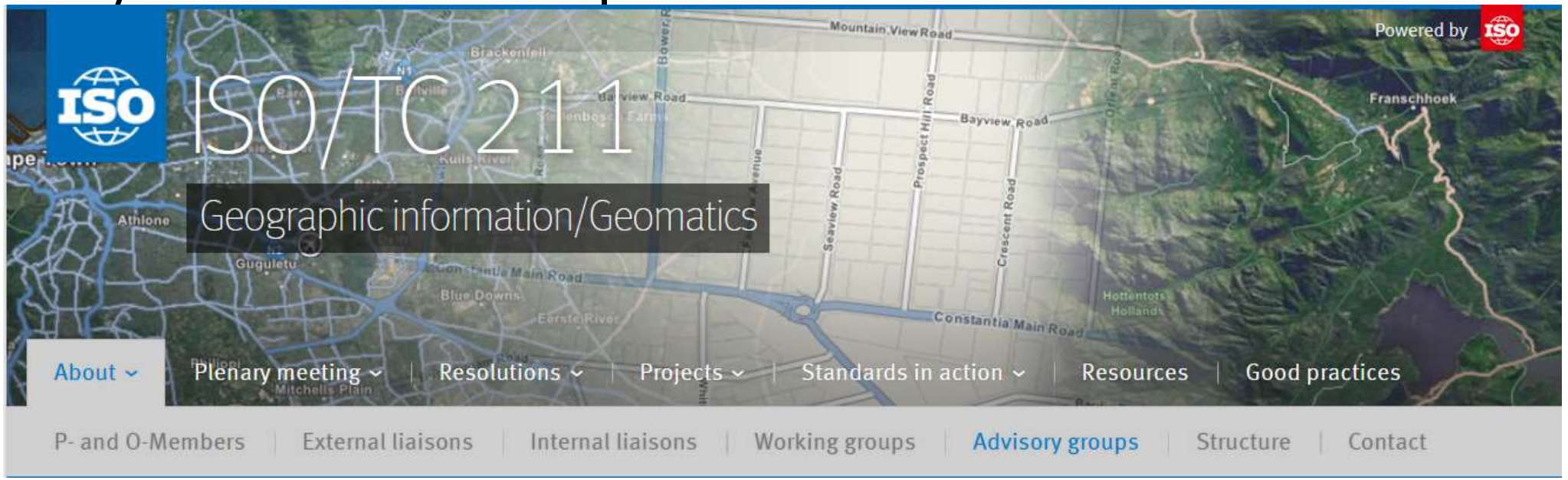
- support the understanding and usage of geographic information
- increase the availability, access, integration, and sharing of geographic information, enable inter-operability of geospatially enabled computer systems
- contribute to a unified approach to addressing global ecological and humanitarian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




ISO TC211 and the UN SDG's

- Contributes over 100 standards in support of 16 of the 17 SDGs
- Webpage highlights these
- Some examples of ISO/TC 211 standards helping towards specific SDG targets:
  - 1.5 reducing vulnerability to climate-related extreme events
  - 2.1 access to safe, nutritious and sufficient food
  - 4.1 access to education
- For more details: https://committee.iso.org/home/tc211

ISO/TC 211 Groups



There are 7 active Working Groups and 14 Advisory Groups

More information on the ISO/TC 211 Groups at:

https://committee.iso.org/sites/tc211/home/about/working-groups.html

https://committee.iso.org/sites/tc211/home/about/advisory-groups.html

ISO/TC 211 statistics

- 67 International Standards or Technical Specifications/ Reports
- 32 projects under development with about 250 experts nominated
- 37 Participating members
- 33 Observing members
- More than 1700 persons involved internationally since start
- More than 1000 have attended one or more plenaries
- 54 plenary meetings have been convened in 21 different countries on 5 continents

NB! Figures are approximate and vary over time

ISO/TC 211 web-site

- 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

ISO / TC 211 Standards

- ISO Technical Committee 211 develops standards for Geomatics

- Geodesy-related standards
  - 19111 Referencing by coordinates
  - 6709 Standard representation of geographic point locations by coordinates (data interchange formats)
  - 19161-1 Geodetic references – Part 1: The International Terrestrial Reference System (ITRS)
  - 19135 Procedures for item registration
  - 19127 Geodetic register (based on 19111 & 19135)

- Other related standards
  - 19115 Metadata
  - 19136 Geography Markup Language (GeodesyML based on it)

- ISO Geodetic Registry

ISO 19111 Referencing by coordinates

- Purpose
  - Defines elements necessary to represent reference frames, coordinate systems, transformations/conversions
  - Used by most GIS software
  - Developed as a joint standard with OGC
- Revised in 2018 to include
  - Modern dynamic reference systems (time varying coords)
  - Geoid-based vertical datums
  - Temporal coordinate reference systems (date/time, temporal count or temporal measures)
  - More modern geodetic terminology
- Published January 2019

ISO 19161-1 Geodetic References – Part 1: ITRS

- Purpose
  - Provides basic information and requirements for the realization of the International Terrestrial Reference System (ITRS)
- First of a set of standards for geodetic references; e.g.,
  - International Terrestrial Reference System
  - Vertical references (IHRS?)
  - Universal identifiers for geodetic stations (e.g., DOMES, DOI?)
- Led by Claude Boucher
- Classifies ITRS realizations as either
  - Primary (ITRF) – defined by the IERS (not covered by standard)
  - Secondary – all other realizations aligned to ITRF

ISO 19161-1 Geodetic References – Part 1: ITRS

- Defines three basic methods of secondary realizations
  - Differential positioning (traditional)
  - Absolute positioning (PPP)
  - Transformations
- Requirements for a secondary realization of ITRS
  - Must be aligned to another primary or secondary ITRS realization
  - A time series of >2.5 yr for kinematic realizations
  - A global set of sites needed for PPP to verify alignment with ITRS
  - Documentation verifying alignment to ITRS
- Present status
  - Reviewed and approved by TC 211 with minor comments
  - Final revision to be submitted for publication

ISO 19127
Geographic information — Geodetic register

- Currently being revised by WG9 to reflect recent changes to 19111 and 19135 – an updated vesion will soon be released
- ISO 19135 covers registers in general; 19127 covers the geodetic registry
- Defines the management and operations of the ISO geodetic register
- Identifies the data elements
- Operating instructions for the Geodetic Registry
- The ISOGR is the actual storage of the data

Control Body Members of the ISOGR (AG12)

P-Members (15)

Australia
Canada
China
France
Finland
Germany
Japan
Republic of Korea
New Zealand
Norway
Saudi Arabia
South Africa
Sweden
United Kingdom
United States of America

External Liaisons (4)

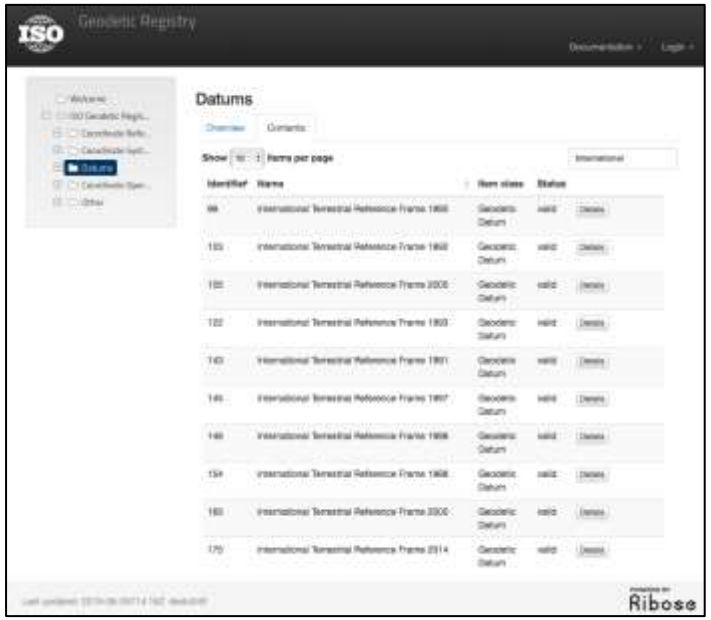
IAG (Chair & Vice-Chair)
FIG
IHO
IOGP
PAIGH

~30 Individual Members

ISO Geodetic Registry

- Online database of definitions and transformations for international reference frames
  - 66 geometric reference frames
  - 21 individual vertical datums
  - 224 transformations among the reference frames
- Only authoritative source available
  - All data entered/validated by agencies defining the frames/transformations
  - Accessible via website and web services
  - Used by GIS software to uniquely identify reference systems and transformations
- Control Body
  - Approves all registry content
  - Chaired by IAG
- Registration Authority (RA)
  - Ribose Group Inc. since January 2019
  - Voluntarily hosts the Registry

http://geodetic.isotc211.org



Thank you !

ISO/TC 211 ...
… building the foundation of the geospatial infrastructure, brick by brick ...