Standards That Make Innovation Possible

Digital Silk Road and International Partnerships

20 November 2018, Deqing, Zhejiang Province, China
ISO is an independent, non-governmental international organization with a membership of 162 national standards bodies. ISO has published 22407 International Standards and related documents, covering almost every industry, from technology, to food safety, to agriculture and healthcare. ISO/TC 211 – the technical committee for geographic information - has published 80 standards.
The session agenda

• Moderator: Mr. Olaf Magnus Østensen, Norwegian Mapping Authority, Norway

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  *ISO in general and Geodesy Standards*

• Mr. Christopher Body, ISO/TC 211 Land administration
  *Land Administration Standards and its revision program*

• Prof., Dr. Serena Coetzee, University of Pretoria
  *International Addressing Standards*

• Mr. Trond Harald Hovland, ITS Norway
  *ITS and GIS Standards to support autonomous driving*
ISO is devoted to support the SDGs

When the world agrees

Contributing to the UN Sustainable Development Goals with ISO standards
957 ISO standards support SDGs

957 ISO standards identified to be directly applicable to the various SDGs
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Standards are stable platforms for innovation, standards save a lot of time and effort, which helps us to advance faster. But more importantly, standards make it easier for products to be compatible with existing technology, and to be introduced and accepted faster into new markets.
Examples of relevance for the SDGs

ISO 19144-1:2009, Geographic information -- Classification systems --
Part 1: Classification system structure
ISO 19144-2:2012, Geographic information - Classification systems --
Part 2: Land Cover Meta Language (LCML)

ISO 19152:2012, Geographic information -- Land Administration
Domain Model (LADM)
ISO 19160-4:2017, Addressing -- Part 4: International postal address
components and template language

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All other ISO/TC 211 standards
'an urgent need for a set of global fundamental geospatial data themes that could be harmonized in order to enable the measurement, monitoring and management of sustainable development in a consistent way over time and to facilitate evidence-based decision-making and policy-making’

• UN-GGIM has identified fundamental datasets
ISO 19100-series – the basis for describing geospatial information

- ISO 19107 - Spatial schema
- ISO 19110 - Rules for application schemas
- ISO 19110 - Feature catalogue methodology
- ISO 19111 - Spatial referencing with coordinates
- ISO 19117 - Portrayal
- ISO 19112 - Spatial referencing by geographic identifiers
- ISO 19118 - Encoding
- ISO 19123 - Coverage
- ISO 19136 - OGC GML
- ISO 19137 - Metadata
- ISO 19157 - Data quality
Geodesy Standards
"A global geodetic reference frame for sustainable development"

UN General Assembly resolution A/RES/69/266

Photo: Kyoung-Soo Eom
«GGRF plays a crucial role in country infrastructure»

Geodetic survey in Mozambique. Photo: Rui Fernandes

«GGRF to measure and deal with climate change»

Flood in Jamaica. Photo: National Spatial Data Management

«GGRF is supporting sustainable development»

Shrinking Aral Sea

«GGRF is needed for hazard mitigation»

Tsunami disaster area in Japan. Photo: Geospatial Information Authority

«Japan would not be sustainable without GGRF»

Earthquake damages in Japan. Photo: Geospatial Information Authority

Standards That Make Innovation Possible - 18 November 2018, Deqing, Zhejiang Province, China

UN-GGIM Sub-committee on Geodesy
Greater need for precise positioning

- Autonomous surface vessels
- Autonomous cars
- ITS in general
- Precision agriculture
- Drone delivery
- Smart and resilient cities
The dynamic world

- Crustal plate movement
- Earthquakes
- Sea rise
- Spinning earth
- ...

ITRF2008 Velocity Field

Major plate boundaries are shown in green

2 cm/y

Zuhair Altamimi
The Geodesy Standards

- ISO 19161 Geographic information -- Geodetic references -- Part 1: The international terrestrial reference system (ITRS)

**ESSENTIAL FOR THE CONSISTENT REALIZATION OF THE ITRF AND GGRF**

- ISO 19111 Geographic information -- Spatial referencing by coordinates

**THE STATE-OF-THE-ART DESCRIPTION AND MODEL FOR POSITIONS**
The Geodesy Standards

- ISO 19127 Geographic information -- Geodetic register

THE AUTHORIZED INTERNATIONAL REGISTER OF GEODE蒂C CODES AND PARAMETERS

- CURRENTLY MORE THAN 2400 ITEMS

https://registry.isotc211.org (soon to be fully launched)
The Geodesy Standards

- ISO 6709 Standard representation of geographic point location by coordinates
- ISO 19162 Geographic information -- Well-known text representation of coordinate reference systems

**THE STATE-OF-THE-ART ENCODING OF COORDINATE REFERENCES**
• **Recommendations**
  • The UN-GGIM Sub-committee on Geodesy agrees that the ITRS, through its numerical realization, the ITRF, be adopted for geospatial and scientific positioning applications. This adoption may be achieved by closely aligning to the ITRF.

Recognizing the development of ISO19161-1 document on the ITRS, currently at the Draft International Standard (DIS) level, the Sub-Committee urges member states to record their national reference frame details, and its alignment to the ITRF, in the ISO Geodetic Register.

systems, the GNSS Providers have aligned their GNSS-specific reference frames to the ITRF, such as WGS84 for GPS, PZ-90 for GLONASS, CGCS2000 for Beidou, the Galileo Terrestrial Reference frame (GTRF) for Galileo, and the Japanese Geodetic System (JGS) for QZSS. Regional entities of UN-GGIM and of the International Association of Geodesy (IAG) rely on and adopt the ITRF for their operational geodesy and geospatial applications, as well as for the alignment of their regional geodetic reference frames.