UN-GGIM : Europe core data and its impact on cadastral themes

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General presentation of UN-GGIM
UN-GGIM (United Nations initiative on Global Geospatial Information Management)

- **Objectives**
  - coordination forum between Member States on geographic information
  - Targeting the Sustainable Development Goals

*Unleashing the power of ‘Where’....*

... to make the world a better place.
UN-GGIM

• Organisation
  – Activities at global level (since 2011)
    • Global Geodetic Reference Framework
    • Land registration
    • Institutional arrangements
    • Fundamental data
    • …..
  – Activities at regional level

Strong involvement of statistical community

Core data (chaired by France)
Data integration + SDG indicators (chaired by Germany)
Core data context and objectives
Objectives of the Working Group on European core data

• Specify **homogeneous core data** to be supplied by geographic Europe Member States

• Define **priorities** for production of new data or for improvement of existing data
  – Specifications = recommendation for politicians and data providers
INSPIRE aims to harmonise existing data

INSPIRE supplies first level of interoperability (common data model)

But INSPIRE data will remain heterogeneous
  - No requirements about levels of detail
  - Most concepts are « voidable »
Objectives of the Working Group on European core data

- Target data ★★★★★
- Select core content from INSPIRE
- Include quality criteria to ensure homogeneous data

Data harmonisation degrees (ELF project)
## Comparison with INSPIRE

<table>
<thead>
<tr>
<th>Driver</th>
<th>INSPIRE</th>
<th>UN-GGIM: Europe  WG core data</th>
</tr>
</thead>
<tbody>
<tr>
<td>(DG ENV, JRC, Eurostat, EEA)</td>
<td>European Commission</td>
<td>United Nations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(UN-GGIM: Europe Executive Committee)</td>
</tr>
<tr>
<td>Geographic scope</td>
<td>European Union</td>
<td>Geographic Europe</td>
</tr>
<tr>
<td></td>
<td>Politic Europe</td>
<td></td>
</tr>
<tr>
<td>Objective</td>
<td>Harmonise existing data,</td>
<td>Ensure common similar content</td>
</tr>
<tr>
<td></td>
<td>ensure common structure</td>
<td></td>
</tr>
<tr>
<td>Expected mean</td>
<td>Data transformation</td>
<td>Data upgrade, production of new data.</td>
</tr>
<tr>
<td>Status</td>
<td>European Directive</td>
<td>UN Recommendation</td>
</tr>
<tr>
<td></td>
<td>Legal obligation for MS</td>
<td>Encouragement to MS</td>
</tr>
</tbody>
</table>

**UN-GGIM: EUROPE**

UNITED NATIONS INITIATIVE ON
GLOBAL GEOSPATIAL INFORMATION MANAGEMENT
Comparison with INSPIRE

The INSPIRE big cheese with lots of holes

Users begin to complain: not so much to eat!

The core data cheese: smaller but compact and really filled
Organisation and calendar

• 15 European countries
  – Austria, Belgium, Finland, France (chair), Germany, Greece, Netherlands, Poland, Spain, Sweden, Switzerland, United Kingdom, Turkey

• Observers
  – JRC, EEA, EuroSDR

• Calendar
  – Theme selection: January 2016
  – Core data specifications: 2016 – 2017
Core data theme selection
(January 2016)
Approach: user requirements

• Sustainable Development Goals
Approach: user requirements

• Selection criteria
  – Pertain to **geospatial data** (with mandatory geometric representation);
  – Be widely used: it should be the most necessary, most common, priority data required to **analyse, monitor and achieve the SDGs**, either directly or indirectly;
  – Meet requirements common to many countries.
# Final list of selected core data themes

## Annex I
- Coordinate Reference Systems
- Geographical Grid Systems
- Geographical Names
- Administrative Units
- Addresses
- Cadastral Parcels
- Transport Networks
- Hydrography
- Protected Sites

## Annex II
- Elevation
- Land Cover
- OrthoImagery
- Geology

## Annex III
- Statistical units
- Buildings
- Soil
- Land use
- Human health and safety
- Utility and governmental services
- Environmental monitoring facilities
- Production and industrial facilities
- Agricultural and aquaculture facilities
- Population distribution - demography
- Area management/restriction/regulation
- Natural risk zones
- Atmospheric conditions
- Meteorological geographical features
- Oceanographic geographical features
- Sea regions
- Bio-geographical regions
- Habitats and biotopes
- Species distribution
- Energy resources
- Mineral resources
Core data content recommendations
Calendar

- On-going work

- 3 themes to be specified before end 2016
  - Cadastral Parcels
  - Geographical Names
  - Addresses

- All themes to be specified before end 2017
Principles

• Use INSPIRE specification and SDG user requirements as starting points

• Define priorities, extract core data:
  – From data model
  – From theme scope

• Decide on levels of detail, quality criteria
Principles

• 3 types of recommendations:
  – **Core recommendation**: highly required, achievable => ideally, short term action
  – **Good practice**: bring added value to core data => to be encouraged
  – **Further considerations**: data for innovative applications => long term
Theme Cadastral Parcels
Answers to questionnaire

Answers from 21 countries
Geographic extent

• **Core recommendation**: have core CP (vector) data on whole territory, according to national law

• Potential impact:
  – Encourage achievement of cadastre under elaboration (Romania ...)
  – Encourage vectorisation of remaining raster CP (France ...)

![UN-GGIM](https://example.com/UN-GGIM-logo.png)
Geographic extent

- **Good practice**: have CP data on whole land territory, including public domain

- Potential impact:
  - Possible change in national legislation
  - Need to survey missing parts
Geographic extent

- **Further consideration**: have marine cadastre

- Present in few countries (6)

- Not yet mature (e.g. what has to be surveyed?)
Data model

Core recommendation: Cadastral Parcel with its geometry and national cadastral reference

class CadastralParcels

«featureType»
CadastralParcel

+ geometry: GM_Object
+ nationalCadastralReference: CharacterString
+ inspireId: Identifier
+ label: CharacterString

«voidable»
+ areaValue: Area [0..1]
+ referencePoint: GM_Point [0..1]
+ validFrom: DateTime [0..1]
+ validTo: DateTime [0..1]

«lifeCycleInfo, voidable»
+ beginLifespanVersion: DateTime
+ endLifespanVersion: DateTime [0..1]
Data model

**Good practice:** encourage temporal management according to INSPIRE mechanism (versioning + life-cycle attributes)

areaValue, validFrom/To more related to the legal parcel (Land Registry) than to the spatial parcel (cadastral map).
Data model

**Good practice:** heterogeneous accuracy to be documented using INSPIRE feature types Cadastral Boundary or Cadastral Zoning
class CadastralParcels

«featureType»
CadastralParcel

+ geometry: GM_Object
+ inspireId: Identifier
+ label: CharacterString
+ nationalCadastralReference: CharacterString

«voidable»
+ areaValue: Area [0..1]
+ referencePoint: GM_Point [0..1]
+ validFrom: DateTime [0..1]
+ validTo: DateTime [0..1]

«lifeCycleInfo, voidable»
+ beginLifespanVersion: DateTime
+ endLifespanVersion: DateTime [0..1]

constraints
{geometryType)
(areaValueUoM)
(validTo)
(endLifespanVersion)

+ parcel «voidable»

1..2

«featureType»
CadastralZoning

+ geometry: GM_MultiSurface
+ inspireId: Identifier [0..1]
+ label: CharacterString
+ nationalCadastralZoningReference: CharacterString

«lifeCycleInfo, voidable»
+ beginLifespanVersion: DateTime
+ endLifespanVersion: DateTime [0..1]

«voidable»
+ estimatedAccuracy: Length [0..1]
+ level: CadastralZoningLevelValue
+ levelName: LocalisedCharacterString [1..*]
+ name: GeographicalName [0..*]
+ originalMapScaleDenominator: Integer [0..1]
+ validFrom: DateTime [0..1]
+ referencePoint: GM_Point [0..1]
+ validTo: DateTime [0..1]

constraints
{zoningLevelHierarchy)
{estimatedAccuracyUoM)
{validTo)
{endLifespanVersion}

+ zoning «voidable»

0..1

«codeList»
CadastralZoningLevelValue

+ 1stOrder
+ 2ndOrder
+ 3rdOrder

class CadastralBoundary

«featureType»
CadastralBoundary

+ geometry: GM_Curve
+ inspireId: Identifier [0..1]

«lifeCycleInfo, voidable»
+ beginLifespanVersion: DateTime
+ endLifespanVersion: DateTime [0..1]

«voidable»
+ estimatedAccuracy: Length [0..1]
+ validFrom: DateTime [0..1]
+ validTo: DateTime [0..1]

constraints
{estimatedAccuracyUoM)
(validTo)
(endLifespanVersion)
## Quality rules: initial proposal

<table>
<thead>
<tr>
<th>Quality</th>
<th>Priority</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completeness = 100%</td>
<td>1</td>
<td>INSPIRE recommendation. Necessary to get reliable information</td>
</tr>
<tr>
<td>CP data consistent with cadastral administrative data</td>
<td>1</td>
<td>Necessary for land market use cases</td>
</tr>
<tr>
<td>=&gt; continuous update</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topological consistency</td>
<td>2</td>
<td>Useful for most use cases</td>
</tr>
<tr>
<td>Accuracy better than 1 m in urban areas and better than 2,5 m in rural areas</td>
<td>2</td>
<td>INSPIRE recommendation</td>
</tr>
</tbody>
</table>

General agreement from questionnaire
Quality rules: questionnaire results

- Consistency between geographic data (cadastral plan) and administrative data (cadastral registry)
  - Generally considered as a requirement
  - But some delay (a few days) can’t always be avoided
  - This delay looks acceptable for users

- **Core recommendation**: continuous update (weekly or better)
Quality rules: questionnaire results

• Accuracy
  – General agreement
  – Should even be better

• **Core recommendation**: keep INSPIRE as general target (1m in urban, 2.5 m in rural) + recommend more accurate data for new surveys (50 cm or better)
Quality rules

• All quality rules to be set as “core recommendations”
Theme Addresses
Scope - Addressable objects

**INSPIRE**
- Land parcels
- Buildings
- Flats
- Street furniture
- Water pumping stations
- Parking lots
- Agricultural barns
- Mooring places

**Core data**
- Buildings to be occupied by people
- Postal addresses
Address position

• INSPIRE allows very approximate position of address

Addresses may be located only at address area level (e.g. village) or even at administrative unit level

In practice, this occurs mainly in rural areas (villages without street names + house numbers)
Address position

• (Potential) good practice: recommend creation of “true” addresses everywhere
  – Street name + house number
  – House name
Theme Buildings
Data model

- “obvious” core attributes
  - (2D) Geometry
  - Height and/or number of floors above ground
  - Current use
  - Date of construction
Data model

- More INSPIRE attributes also quite useful

=> questionnaire
Data management

• Building data may be in a single database or in various databases

• How to provide the additional attributes?
  – By integrating them to core data
  – By linking core data to other databases
    • Official identifiers (e.g. cadastral reference)
    • Other means (address)
• To know more:
  – Selection of core data themes
  – Next data content recommendations

http://un-ggim-europe.org/content/wg-a-core-data