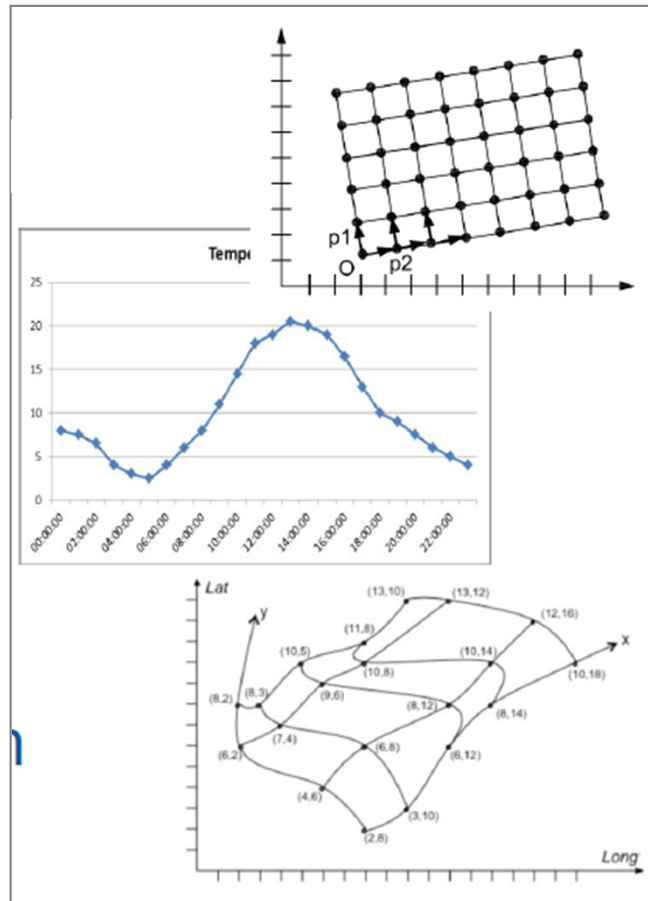


Web Coverage Services (WCS)



Thematic Cluster #3

Jordi Escriu

Facilitator Thematic Cluster #3

Coverages in INSPIRE

- **Coverage:**

Describe characteristics of real-world phenomena that vary over space and/or time (temperature, elevation, land cover, imagery...)

- **Contains** sets of values, associated to a spatial and/or temporal domain

- **Used in several INSPIRE themes:** AC-MF, OF, ER, EL, NZ, OI, LU, LC

Coverages in INSPIRE

- **INSPIRE** reuses the concept of coverage from ISO 19123

spatial object that acts as a function to return values from its range for any direct position within its spatial, temporal or spatiotemporal domain
[Adapted from ISO 19123]

- **Main components**

- **Domain Set:** Spatial domain of the coverage – Locations (points / grids)
- **Range Set:** The values of the phenomenon
- **Coverage Function:** Defines the correspondence between the domain and the range of the coverage, e.g. the rules assigning the phenomenon values to the grid
- **Range Type:** Describes the characteristics of the range values (type of phenomenon)

Encoding of INSPIRE Coverages (EL)

- **Coverage, except Range Set**
 - OGC GML Application Schema for Coverages [OGC 09-146r2]
- **Coverage Range Set**
 - **OPTION 1: Multipart representation**
 - 1st Part: GML Part (gmlcov:RectifiedGridCoverage)
 - 2nd Part: Range Set encoded using a well-known binary format (embedded in 1st Part) – TIFF / GeoTIFF (*)
 - **OPTION 2: External file encoding**
 - 1st Part: GML Part (gmlcov:RectifiedGridCoverage)
 - 2nd Part: Range Set, encoded using an external well-known binary format (gml:File) – TIFF / GeoTIFF (*)
 - **OPTION 3: Inline encoding**
 - Range Set is encoded within the XML inline (DataBlock)

(*) Alternatively, the BAG format for Hydrographic bathymetry data



Web Coverage Service (WCS)

- **A network service providing coverage data**
- **Objective:** Get the original data (or a subset), suitable for further processing
- **OGC WCS 2.0** (Modular, Testable, Scalable)
- **Not currently considered in the TG for download services, just:**
 - **Atom feeds** - For pre-defined dataset download services
 - **WFS 2.0** - For pre-defined dataset and direct access download services



WCS Workshop – JRC/Ispra, 14-15.10.2014

"WCS as a candidate INSPIRE Download Service"

- **Presentations & Minutes**

https://ies-svn.jrc.ec.europa.eu/projects/download-services-tg/wiki/MIG_workshop_on_WCS-based_INSPIRE_download_services

- **Findings / Pending aspects**

- All operations required by the Download Service IRs can be mapped to the WCS 2.0 standard
- Using a WCS for providing coverage data provides a number of benefits and opportunities (depending of the extensions supported).
- Further guidelines or best practices are needed for how to provide harmonized INSPIRE coverage data through the WCS.
- Such guidelines should revisit and, if required, propose updates to the encoding guidelines currently included in the data specifications.



WCS Workshop – JRC/Ispra, 14-15.10.2014

- **Benefits and Opportunities**

- **Provision of raster data** (e.g. surfaces and grids) **directly accessing to the source / original values**
- **Multi-dimensional or multi-variable grids**
- **Advanced download**
 - Queries based on filters that are not trimming and slicing
e.g. corridor selection (air temperature along flight corridor)
 - Advanced analyses (server-side)
e.g. statistical analyses, interpolation between point values, aggregations, time series analyses
- **Visualization** (for mapping purposes)
 - An image coverage as-is
 - Using interpolation of point clouds
 - Using reclassification of range values
 - Using styling as defined by the user
 - Selecting a style provided by the server

MI WP-7b

Extension of Download Service TGs for WCS

- **MIG has decided to set up a temporary sub-group**
- **Main deliverables:**
 - Updated TGs for Download Services to include WCS
 - Technical Guidelines (or updates to existing technical guidelines) for the provision of coverage data in conformance with the INSPIRE data models using a WCS
 - Open Source INSPIRE compliant WCS 2.0 implementation(s) based on existing mature WCS 2.0 software
 - Analysis of the impacts (e.g. costs) of implementing the updated Technical Guidelines
- **Terms of Reference (ToR):**

<https://ies-svn.jrc.ec.europa.eu/issues/2441>



MI WP-7b - Participation

- **Experts, especially on download services & coverages** and related needs / use-cases

- **How to join MI WP-7b:**

Send an **e-mail** to [Jukka Rahkonen \(cc: to Michael Lutz\)](#) with the following information:

Name:

E-mail:

Affiliation:

Expertise: [list the expertise and experience that qualifies you for participation in this sub-group]

Contributions: [describe how you will contribute to the tasks and/or deliverables mentioned in the ToR]

- **Deadline for applications: 2015-05-31.**
- **Virtual kick-off meeting: early June (TBD).**

WCS Discussion topic in TC #3

- **Discussion topic on WCS open within TC #3:**

<https://themes.jrc.ec.europa.eu/discussion/view/22150/web-coverage-service-wcs-a-missing-piece-in-inspire>

- *Do you think that WCS is a missing piece in INSPIRE?*
- *Which benefits / drawbacks do you foresee if WCS is used in the INSPIRE context?*
- *Explain you own experience and best practice with the use of WCS (evaluation, use-cases, software utilized, etc.)*
- *Any additional items to be discussed or treated by this group?*