

# INSPIRE Download Service profile of OGC Web Coverage Service (WCS)

Workshop: Choosing the Right INSPIRE Download Service  
Technologies [I]

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# Agenda

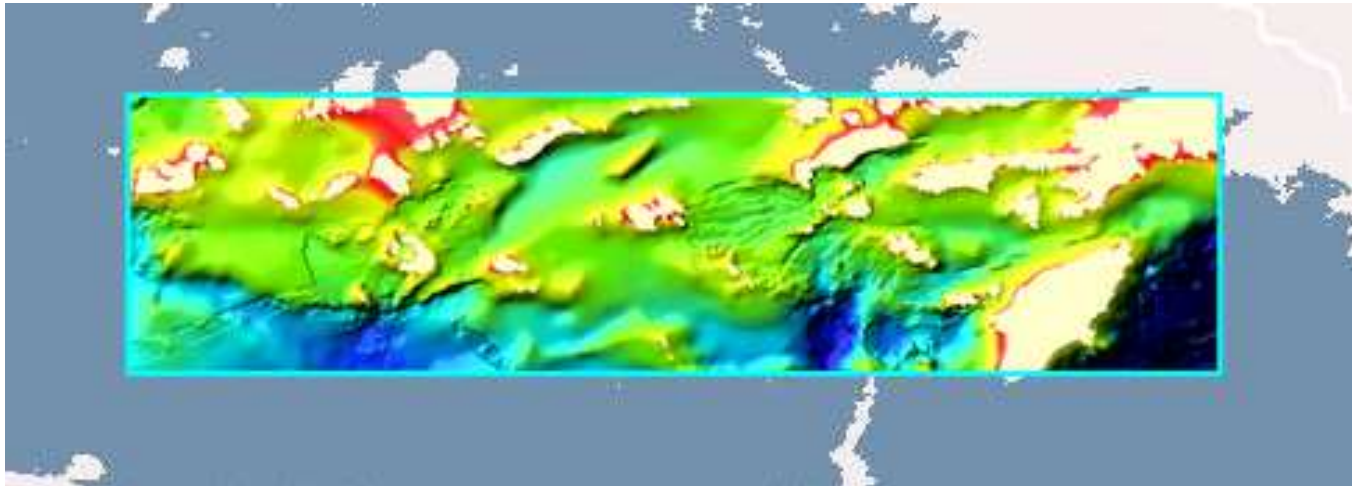
- What is coverage?
- Examples
- Implementing Rules (IR) mapping to Technical Guidelines (TG)
- Roadmap

# What is coverage?

- Digital geospatial information representing space-varying phenomena, characteristics of real-world phenomena that vary over space and/or time
  - E.g. elevation or temperature
- WMS can return similar formats, but a WCS is able to return more information -> the raster source of a geospatial image
- Coverage can be used for complex modeling and analysis
- Clients can extract just part of the coverage that they need
- Some formats
  - Orthoimagery: JPEG2000, GeoTIFF
  - DEM: GeoTIFF, ASCII GRID
  - Met+Ocean: GRIB, NetCDF, HDF

# Examples

- <http://ogcdev.bgs.ac.uk/MIWP-7bSample.html>
- [http://ogcdev.bgs.ac.uk/ogcclient/WCS/GetCoverage\\_v2\\_0\\_1.html](http://ogcdev.bgs.ac.uk/ogcclient/WCS/GetCoverage_v2_0_1.html) subset by area



# Example of time-space slicing

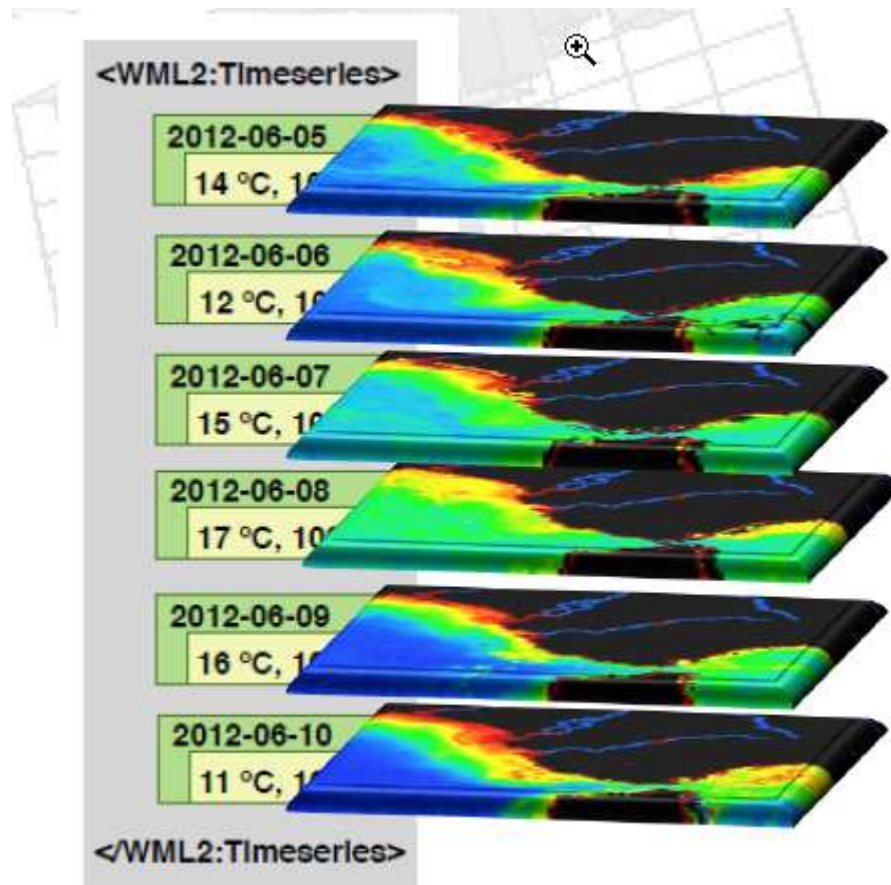
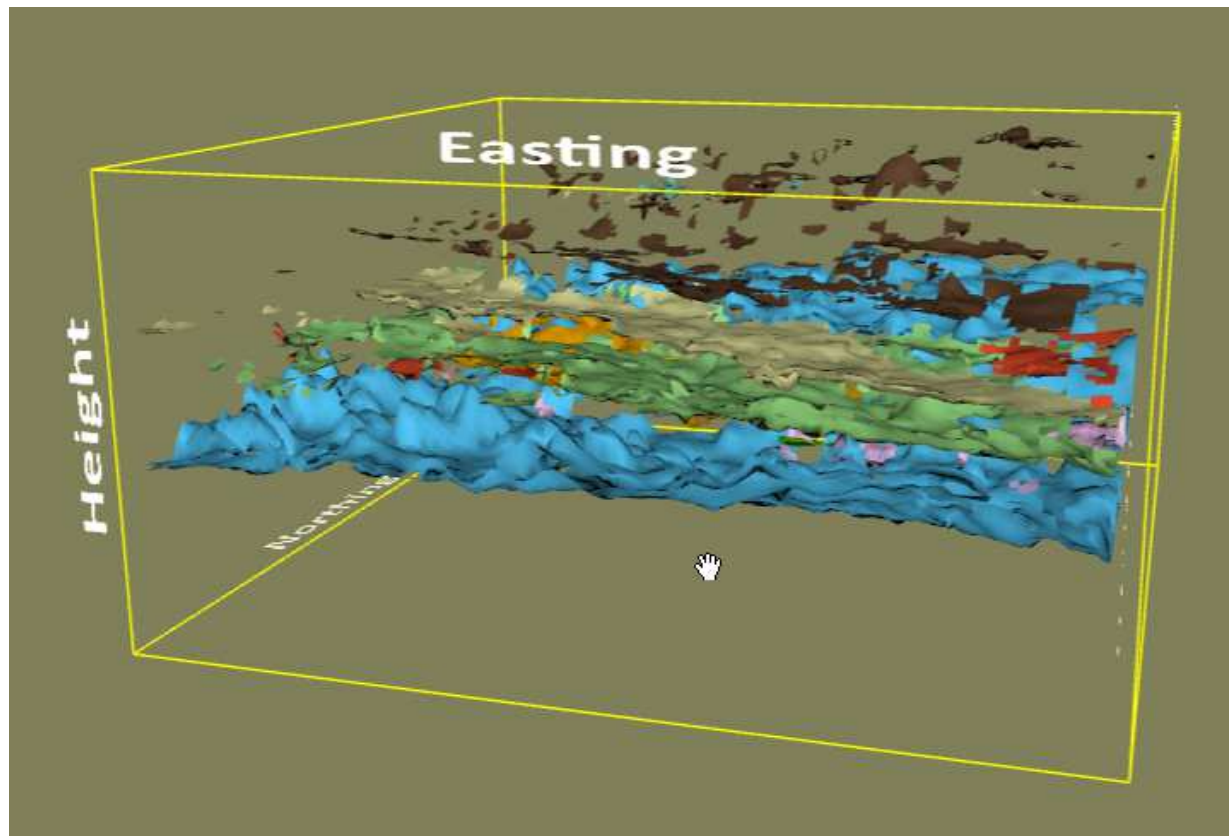


Image by  
Peter Bauman

# Screenshot

Multidimensional example from live demo

[http://earthserver.bgs.ac.uk/clients/3d/glasgow\\_geology.html](http://earthserver.bgs.ac.uk/clients/3d/glasgow_geology.html)





- Image: Met Office

# Why the INSPIRE WCS profile is considered important?

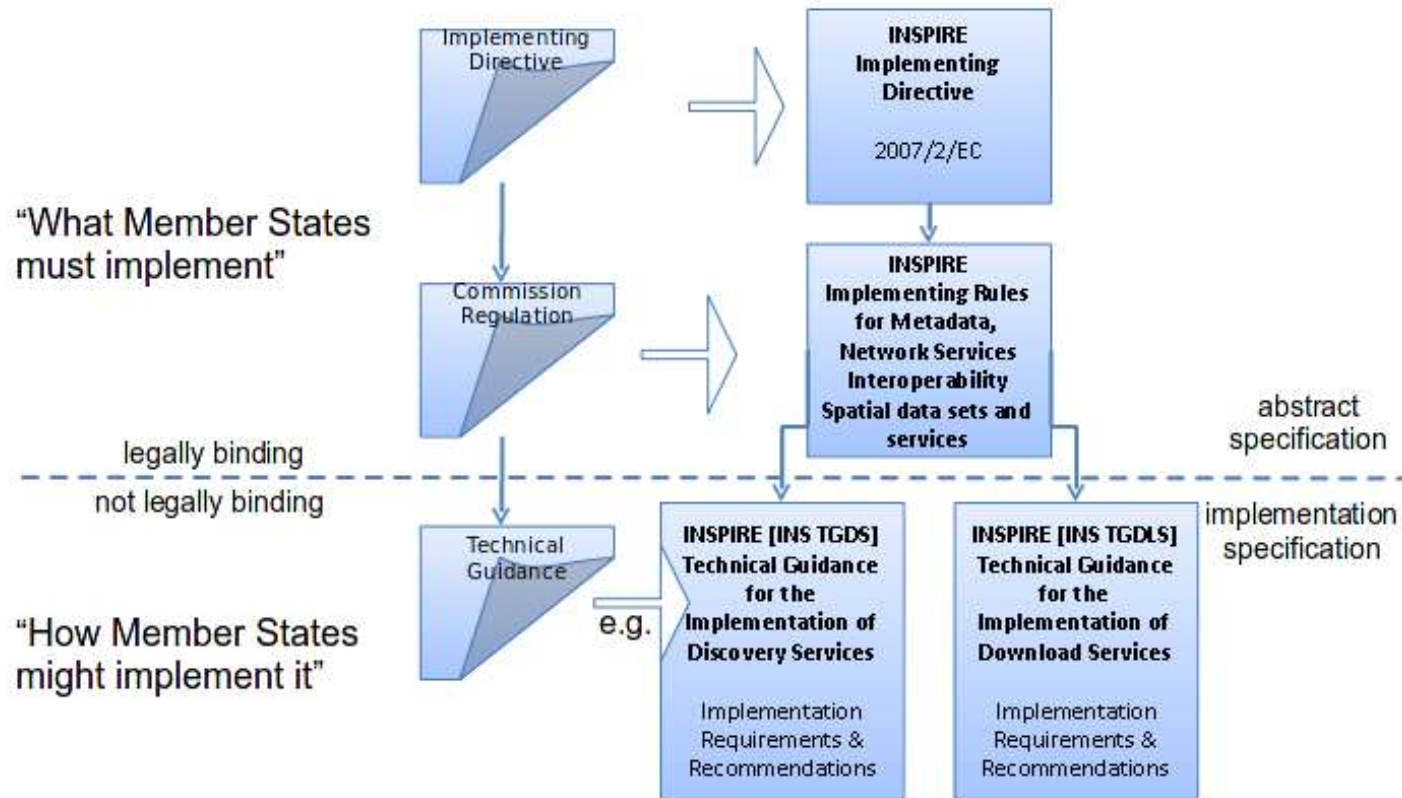
- Main reason: Some of the INSPIRE themes are clearly coverages (orthophotos, DEM, Meteorological data).
- Without WCS the only possible download service is ATOM
- Some themes can be modelled to WFS, but also to WCS which may be more reasonable for end users
  
- Main advantage for users: direct access to small subsets of big data, optionally some basic processing (projection, format, resolution...)
- Throw away area, time range, bands etc. that you are not interested in.



# Why the INSPIRE WCS profile is considered important?

- Possible themes
  - Elevation (EL), Geology (GE), Land cover (LC), Orthoimagery (OI), Soil (SO), Land use (LU), Environmental monitoring facilities (EF). Energy resources (ER)
  - Etc.

# IR vs. TG



# INSPIRE download services -WCS

- Technical Guidance for the implementation of technical service interfaces for INSPIRE Download Services using WCS
- Network Services Regulation describes the following four *mandatory* download operations
  - Get Download Service Metadata
  - Get Spatial Data Set
  - Describe Spatial Data Set
  - Link Download Service

# Download operations (1)

- Get Download Service Metadata
  - Provides all necessary information about the service, the available Spatial Data Sets, and describes the service capabilities
  - GetCapabilities request to the WCS indicated in the metadata record
  - Additional metadata for the coverage data provided by the service can be retrieved in a WCS DescribeCoverage response document.

# Download operations (2)

- Get Spatial Data Set
  - Operation allows the retrieval of a Spatial Data Set
  - Spatial data sets (coverages) and subsets of these data sets in different CRS/Language combinations can be requested through a WCS GetCoverage request
- Describe Spatial Data Set
  - The description of all the types of Spatial Objects contained in the Spatial Data Set
  - DescribeCoverage

# Download operations (3)

- Link Download Service
  - To be implemented by uploading the Download Service INSPIRE metadata and the INSPIRE dataset or data series metadata for coverages provided by the service, to the INSPIRE network as referred to in Article 11 using the PublishMetadata function of an INSPIRE compliant discovery service
  - The resource locator metadata element of the Download service metadata record shall contain a link to the service end point of the WCS to which appropriate GetCapabilities request parameters can be appended or where practicable to which GetCoverage request parameters can be appended

# INSPIRE download services – conditional operations

- The conditional download operations that are required when you provision a direct access download services using the OGC Web Coverage Service core interface standard
- Direct access download service is provided the following two operations *shall* be implemented:
  - Get Spatial Object
  - Describe Spatial Object Type

# Get Spatial Object

- These capabilities include the ability to search by
  - Unique identifier of the Spatial Data Set
  - Key attributes of spatial objects, and temporal dimensions including the date of update
  - Bounding Box
  - Spatial data theme
  - Combinations of the above



# Describe Spatial Object Type

- Can a WCS DescribeCoverage operation satisfy ***all the requirements*** for a Describe Spatial Object Type operation?
- Recommendation: An INSPIRE WCS download service should have only one representation of a Spatial Object Type per service

# Additional requirements

- Language
  - Download Service metadata response shall contain a list of the natural languages supported by the service. This list shall contain one or more languages that are supported.
  - A client may specify a specific language in a request. If the requested language is contained in the list of supported languages, the natural language fields of the service response shall be in the requested language.
- Performance
  - DescribeCoverage request shall take no longer than 10 seconds to start to respond, in normal operation
  - If a WCS is used as a view service, using a GetCoverage request with an image output format to provide a map, a request for an image of 470 KB shall take no more than 5 seconds to start to respond, in normal operation.

# Roadmap and way ahead

- Draft resolutions for comments received and processed
- On-going work on v1.0rc2 for MIG-P review and endorsement
- Sample coverage data sets from several INSPIRE themes
  - [BGS demo services](#)
  - [Elevation data from PDOK](#)
  - [NLS demo service with DEM coverage of Finland at 10 m resolution](#)
- Thematic clusters
  - Guidelines for providing INSPIRE coverage data by using WCS
- Please – use and test...



# INSPIRE Thematic Clusters

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## ▼ About the INSPIRE Thematic Clusters Platform

### Welcome to the INSPIRE Thematic Clusters Platform

The **INSPIRE Thematic Clusters Platform** is a European Commission initiative, linked to the INSPIRE Maintenance and Implementation Framework, with the objective of supporting INSPIRE implementation in the Member States.

All infrastructures, and INSPIRE is no exception, require maintenance and evolution. The experience gained during the development of the Technical Guidelines as well as lessons learned by implementing the infrastructure, **especially in thematic domains**, need to be shared to optimise performance of the infrastructure to meet policy objectives and to increase its usability within thematic domains. To aid this further evolution of INSPIRE and to help embed it in technical practices within a range of communities, **on-line collaboration thematic platforms** have been set up for sharing theme-specific experiences.

This platform that builds upon the relevant INSPIRE Forum content and software, **is a single entry point** for INSPIRE implementers and users to share experiences, best practices, raise questions and resolve issues **in their thematic domains**.

Each of the nine INSPIRE Thematic Clusters has a **facilitator** who will lead and participate in discussions, identify and facilitate sharing of best practice and key issues, identify relevant projects and software solutions.

# Thank You!

- More information:
  - Send e-mail [jari.reini@nls.fi](mailto:jari.reini@nls.fi)
  - National Land Survey of Finland <http://www.nls.fi>
  - <https://themes.jrc.ec.europa.eu/>
- Any questions?