

Progress of the transnational cooperation in building up a SDI for European soil data (eContentplus-project GS SOIL)

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Introduction / About GS SOIL

While INSPIRE and its Implementing Rules (IR) provide the framework to establish a European spatial data infrastructure, vital obstacles in reference to harmonization and interoperability of data and services as well as in reference to the organisational structure are not removed yet. The project GS Soil “Assessment and strategic development of INSPIRE compliant Geodata-Services for European Soil Data” aims to make a contribution to remove these obstacles. Within the project 34 partners from 18 European member states are involved; out of which 24 are data providers. The project is co-funded by the European Community programme eContentplus. The project duration is from June 2009 until May 2012.

Based on the INSPIRE directive and its Implementing Rules GS Soil aims at establishing a European network to improve the access to spatial soil data for public sector bodies, private companies and citizens. This network can be seen as example for practical implementation of a European spatial data infrastructure for soil and soil related data. Thereby aspects of data organization, data harmonization as well as semantically and technical interoperability will be taken into account in order to produce seamless geospatial information. InGrid®, the technology of the German Environmental Information Portal PortalU®, is used as technical base to build up a European GS Soil Portal.

The results of the project will be:

1. Consolidated soil-related theme catalogue / framework standards.
2. INSPIRE compatible metadata profile for spatial soil datasets, dataset series and services.
3. Generic application schemes.
4. Web portal (GS Soil Portal) including a view service, discovery and view of the INSPIRE conform metadata, interoperable spatial soil datasets etc..
5. Best practice guidelines for creating and maintaining metadata for soil database, and data harmonisation.

Already in the first year of project implementation, major milestones could be achieved, which will be described in the following sections.

Soil data inventory

The soil and soil related data available in the participating countries and at involved data providers were analyzed according to the kind, format, and intellectual property rights applied. By elaboration of best practice guidelines the provided and specific datasets will be systematically harmonized during the project running time. The improved access to soil information through the GS Soil Portal and the user requirements identification are the main objectives. This is the long-term perspective of the GS Soil Portal.

At the beginning of the project specific and generic requirements for soil information, services and products were identified by a range of user communities and stakeholders in the 18 participating countries. This requirement analysis resulted in a soil inventory and theme catalogue, which documents the current state and ability of data providers to meet the goal of data harmonization.

Data specification and harmonisation

Harmonization requires technically interoperable soil data, clear definitions of the parameters, and type and/or coding of the parameter values and possibly a minimum dataset that comprises any auxiliary information needed for meaningful or valid harmonization procedures. Based on the above described soil data and soil data types, data transfer structures have been developed that address technical interoperability by allowing the unambiguous exchange of soil data and their metadata. In a first step, soil feature types (soil-related object classes that can be described by attributes) have been identified. The second step has been to specify codification in data transfer files.

In the context of data harmonization this provides the framework to link up existing soil datasets from one country to another.

The level of spatial data consistency depends to a large proportion on provider-level harmonization efforts. Technically interoperable data with clear definitions can subsequently be semantically harmonized if harmonization procedures can be developed that transform datasets into a common parameter and codification space (both at the user and data provider level). For analytical data, this would require e. g. comparative studies between analytical methods or techniques. For soil profile descriptions, transformation would need translation of one description language into another.

Examples for such transformations will be thoroughly analyzed in order to identify, to which degree pre-harmonization is needed and how it can be implemented. Exemplary services will be developed with the objective to present homogeneous and meaningful data portrayal. The focus is on soil map legends and soil inventory data, because attribute and property data are crucial for developing evaluation and transformation services. The results will enter in a best practice guideline for soil data specification development under INSPIRE.

Metadata profiles

Information contained in the Implementing Rules for INSPIRE metadata is not sufficient enough to describe all spatial data theme specific aspects. Therefore, it has been planned, that each data specification should contain a metadata profile which is made with respect to those specific aspects of the spatial data theme (i.e. soils). A soil oriented metadata structure profile for soil geographic datasets, series and data services were developed following the INSPIRE IR for metadata, other international, and national standards (like the ISO 19100 series standards), and the needs of the data users.

On the other hand, there has been cooperation with the eContentplus project OneGeology-Europe to ensure that metadata structure for the soils will be tightly connected to the metadata structure for geology since these two themes are tightly connected.

The focus was also on data quality that is necessary for the soil spatial data theme. The results are directly defined in the soil metadata profiles. Additionally, recommendations were defined since this second part is not compliant to the existing ISO structure. Metadata structure developed in this project contains an example of the XML encoding soil specific resource.

GS SOIL Portal

The project GS Soil aims contribute to improve the access to spatial soil data in terms of INSPIRE by establishing a European network for soil information. A central component of this network is and will be the GS Soil Portal, a European web portal for soil data and metadata. As basic technology for the GS Soil Portal, the software of the well established German Environmental Information Portal PortalU®, will be used. Within the project the existing technology has been modified and communication interfaces are and will be added depending on the demands of the network.

In the GS Soil Portal all soil related information from web pages, over data bases to data catalogues will be made available and accessible. Search results will be ranked and listed in shared result lists and spatial soil data from OGC compatible Web Mapping Services (WMS) and Web Feature Services (WFS) will be visualized in a map viewer.

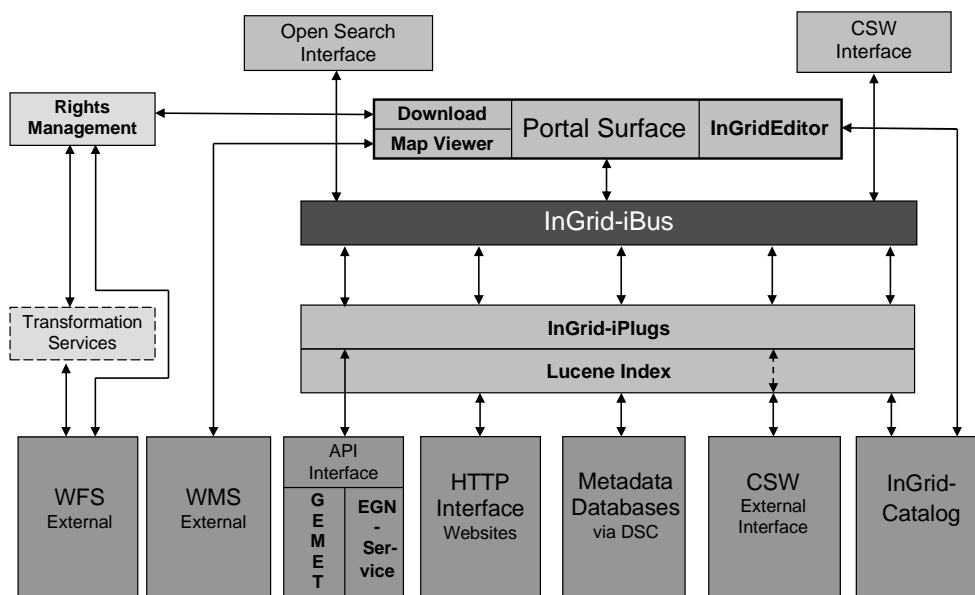


Figure 1: The architecture of the GS Soil portal (GS SOIL consortium, 2009)

The integration of the several soil data providers (metadata and data) in the GS SOIL network will be accomplished by using the GS SOIL portal components and/or a set of elected GEOFOSS Open Tools. These open tools will consider an ISO/INSPIRE CSW metadata catalogue (and corresponding editor) and a map server engine that will publish WMS (INSPIRE View Service) and WFS (INSPIRE Download Service) related data.

An INSPIRE Transformation Service will be also deployed within the GS SOIL framework with the aim of converting existing soil data schemas (from the several soil

data providers) into the GS Soil INSPIRE compliant dataset schema (accessible via Download Services).

Each data provider can use all or part of these GS SOIL components / GEOFOSS tools in order to complement the (already) existing services (or use the complete package if no service infrastructure exists).

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For further information on the project please visit the website: <http://www.gssoil.eu/>.