Report on Data Integration into the EU Mineral Intelligence Network System (D4.4 and D5.4)

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DOCUMENT CHANGE LOG

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Contents

1. Introduction

In the framework of the RESEERVE project, the national mineral resources data of five Task Partners from the West Balkan countries (Albania, Bosnia and Herzegovina, Croatia, Serbia and Montenegro) was implemented and harmonized with the INSPIRE directive (the European directive for organizing spatial data). The aim of this task was to integrate the national data into the existing European platforms and present it all on the EGDI platform. This represents the starting point for following the INSPIRE directive and obtaining a strong decision-making tool for the management of mineral resources. The tasks were mostly focused on the workflow of harmonizing the data and spreading IT knowledge about mapping the national data on primary and secondary minerals to the existing European data model and developing national relational databases that fit into the European common database structure. Data harmonization was performed through 8 national training workshops to assist the partners in taking the first step towards implementing the INSPIRE directive.

2. Methodology, Methods and Materials

For the final harmonization of data, the following methodology has been used:

Defining the End-Users' Requirements

The first step was to analyse the end users' needs. The end users are different and thus have different requirements.

Qualitative and Quantitative Research of the Data

To achieve this, a summarized Excel table was designed for the collection of national data on primary and secondary mineral raw materials that are relevant for possible investors. The table with common attributes, using a top-down approach (from general to detailed information), has been completed by all the project partners. This table includes attributes such as basic geographical and ownership information about each site, geometry, volume, technological data such as status, mining methods and reserves, geological data such as stratigraphy and lithology, mineral composition and rock types, waste deposit stability, chemical composition, environmental impacts etc.

Overview of the Existing EU Data Model and Harmonizing the Basic Excel Table Fields with INSPIRE Database Fields

The national data of individual countries has been harmonized with the INSPIRE data model and online services for data on mineral raw materials have been established. To accomplish this, we examined the INSPIRE directive in detail, identified the fields that coincide with the directive and adapted them according to the requirements.

Mapping the Basic Excel Table into INSPIRE Customized Excel Tables / the Harmonization of Existing Data into INSPIRE-Compliant Data

At this stage, it was necessary to consider the specific rules required by the common data model. The data must be entered in a precise sequence and, for this purpose, the instructions for inserting data were also created. It is necessary to follow the provided INSPIRE code lists for interoperability with the existing EGDI platform, use the specific record identifiers and correctly track the relationships between the data.

This stage of work involved carrying out a series of national workshops / training courses with technical support to help the partners with the harmonization of existing data sets into INSPIRE-compliant data and working with relational databases.

Mapping INSPIRE Customized Excel Tables to the Access Relational Database

This phase was relatively simple since the pre-existing Excel tables have been organized in the same way as the relational database and the data provider just needs to copy the tables into it one by one. The Access database is already a relational database and all the errors in the Excel table appear here as well, making it a good control of the entry itself. National workshops have also been carried out for this purpose.

Mapping the Access Database into PostgreSQL

The next step was the migration of the national Access databases to open-source solutions (the PostgreSQL database used by the project).

Harvesting the National Databases into the Common EU Database

To create a system using the updated data, the project adopted a distributed architecture based on a central harvesting database synchronized with a central database. Data harvesting is the process of automatically extracting a large amount of data from web services. GeoZS implemented a harvesting system to collect and validate INSPIRE-compliant spatial European data on mineral resources. On a country level, the national provider distributes their data as a Web Feature Service (WFS), the GeoZS harvesting system retrieves this data, performs data transformation and quality control, and finally stores the validated data in the central database.
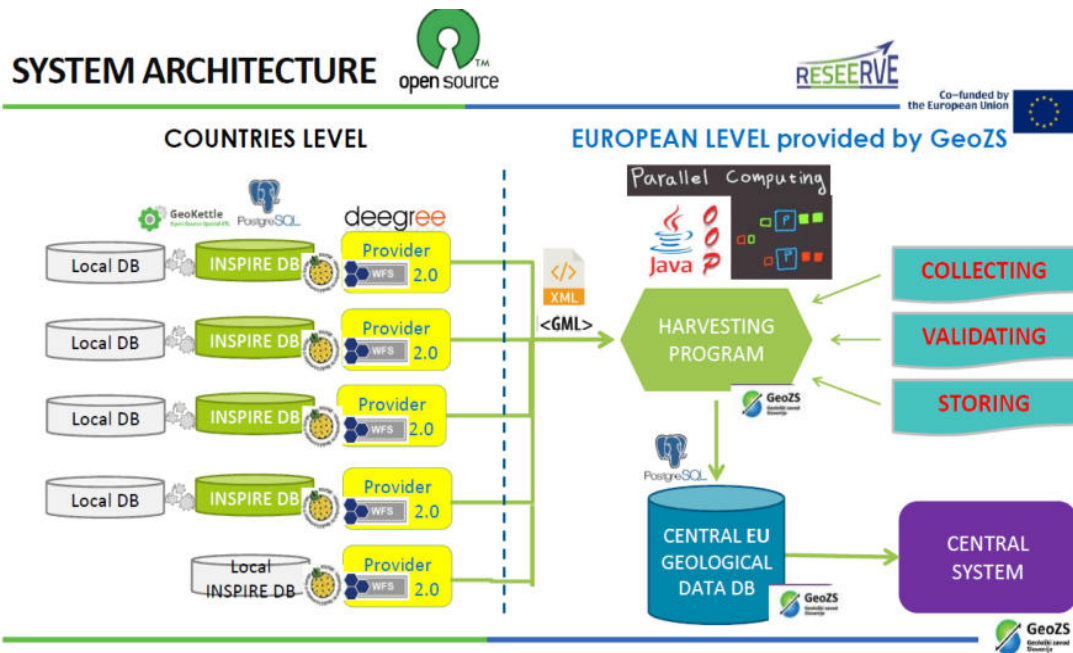
Figure 2.1. Architecture of the harvesting system

Presentation of Data on the EGDI Web Portal

In addition to the map service displaying the mineral deposits and mines in West Balkan countries on the EGDI portal, the portal also provides occurrence-specific documents related to mineral material, enabling users to perform their own analyses using a huge amount of data. This represents a new knowledge base of the primary and secondary resources of the region that is interoperable with the national databases. Based on this, industry can be encouraged to invest in the West Balkan mineral sector.
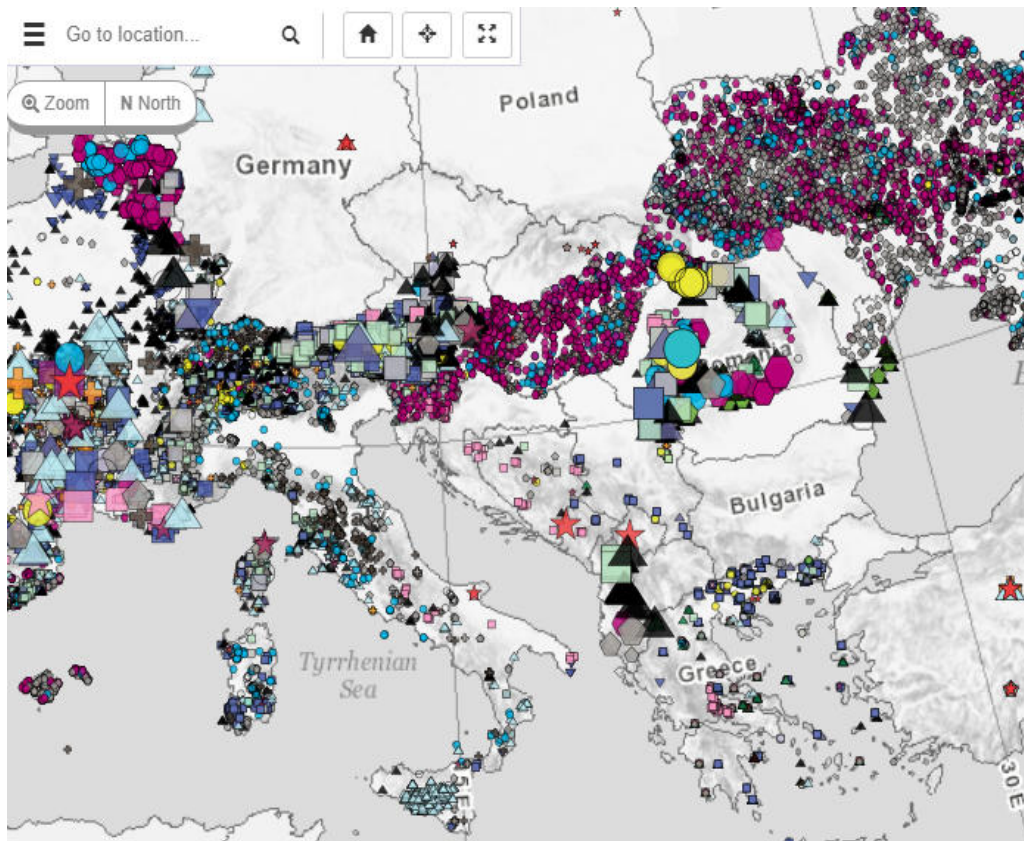
Figure 2.2. EGDI map viewer

The statistics of the data collected and harmonized is as follows: Albania has 134 primary resources altogether (41 mines) and 15 secondary mineral sites, Serbia 55 primary (43 mines) and 28 secondary resources, Croatia 183 primary (all of them are mines) and 46 secondary resources, Montenegro 50 primary (35 mines) and 4 secondary resources, and Bosnia and Herzegovina has a total of 134 primary (81 in Federation and 53 in the Republic of Srpska) and 15 secondary resources (11 in Federation and 4 in the Republic of Srpska).

The register allows the easy combining of information related to primary and secondary mineral resources and to provide the end-users with all the available information. This data platform represents a first step to a future effective and sustainable information system for the region. The technical solutions facilitate updating and maintaining the data and provides full access to information related to the mineral resource's entire life cycle.