Definition of a common INSPIRE-driven elevation model and its

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Current situation of spatial information community in Europe is characterized by a lack of harmonization between geographical datasets provided in multiple languages, at different geographical scales, quality, fragmented datasets and sources, gaps in availability and duplication of information collection.

In this context, the principal objective of GIS4EU European project (shared by 22 partners) is to enable the access to consistent and homogeneous reference data provided by cartographic authorities from different countries and levels (national, regional and local) without building one central database and service. The project's approach is based on development of common data model, rules and guidelines for harmonization, aggregation, and visualization of geographic data. These guidelines and procedures are defined with respect to existing International Standards, European legal acts and INSPIRE Implementing Rules, and these are operationally verified for selected scenarios and representative data samples

The scope of this paper is to analyze the state of the art about the elevation theme shared by different data providers and to propose from it a common elevation model that could be used by all the GIS4EU users, and then any future users. The data specifications include coverage catalogues and input elevation features, like contour lines, elevation points, breaklines. The main topics are dealing with the common elevation model, the input data, the common reference system, the common exchange format, the definitions for DTM, DEM and DSM, and the interpolation model.

The workflow for the carrying out of the Common Elevation GSI4EU model, according with the INSPIRE specifications, was the one represented by: Use Case Analysis, As Is Analysis, Gap Analysis, Modelling and Testing.

In addition, experiences of aggregating multiple elevation datasets are presented together with guidelines for subsequent aggregations, namely for cross-scale aggregation and portrayal rules. In particular, we deal with the recommended common scales, different simplification algorithms, and thematic segmentation of vector elevation elements. Furthermore, guidelines for cross-border aggregation will be rapidly sketched: after introducing touching datasets, an analysis for each pair of data providers is carried on; at the end a list of rules helpful for solving inconsistencies is resumed.

This paper is an excerpt of several deliverables of the GIS4EU European project (www.gis4eu.eu), namely:
• D.3.5: Common Data Model Design: Elevation Theme, 184 pages,
• D.5.4: Guidelines for data aggregation: Elevation theme, 54 pages.