

## Geologic Information System of Serbia

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# GEOLOGIC INFORMATION SYSTEM OF SERBIA

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## Abstract

**Keywords:** Geologic information system, Conceptual model, Logical model, Implementation, Geodatabase.

Geologic information system of Serbia (GeolISS) represents repository for digital archiving, query, retrieving, analysis and geologic data visualization. The GeolISS is implemented through ESRI ArcGIS technology, and is designed to operate as a personal geodatabase (MS Jet 4.0 Engine) and SDE enterprise geodatabase in MS SQL Server. The objective of GeolISS implementation is integration of existing geologic archives, data from published maps at different scales, newly acquired field data, as well as Web publishing of geologic information.

Physical implementation of GeolISS has been guided with conceptual and logical model in those specified the basic kinds of geologic entities of interest and how they are described.

The attempt has been influenced by NADM-C1 implementation from USGS and CGS, by GeoSciML interchange scheme from CGI, IUGS ([www.seegrid.csiro.au](http://www.seegrid.csiro.au)), by different geologic models of European geologic surveys (BGS, BRGM, CGZ, etc.), and various models proposed as part of the International Organization for Standardization Geographic Information/Geomatics project (ISO TC211, <http://www.isotc211.org>). The design was also significantly influenced by the Ontology Web Language (OWL).

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Logical framework of GeolISS implementation is based on five elements: Concept, Observation, Description, Spatial entity – Features and Metadata, mutually linked with relationships.

Concept represent the core of GeolISS that is implemented as compilation of geologic vocabularies such as petrologic and mineralogic classification, geologic time scale, stratigraphic lexicon etc. The terms in the vocabularies are used to classify observations/interpretations, or to specify attribute values.

Observations implement field data records and measurements i.e. the basis for classified features, interpretations and models. Any observed property can be expressed as a text, number, picture and geometry (location).

Spatial entities are treated as observation localities and mapped/interpreted geologic entities (occurrences). In the ESRI geodatabase they are implemented as a *Feature Classes*, geometrically adjusted to points, lines and polygons. Each of them is linked to one or more description objects that specify property values.

Description is implemented as an instance of observation and interpretation. Any instance is collection of properties with assigned values (e.g. attributes) that characterize some geologic occurrence.

Metadata implemented in the GeolISS allows the recording of data source, links to the bibliographical references and persons involved and responsible for data acquisition. Metadata also include essential information's about project, for which the data are to be collected.

For data entry in GeolISS database designed special ArcGIS extension was designed and implemented in MS Visual Studio and ArcObject.NET API to support data entry in both; personal and enterprise geodatabase.