



## **Design of an UML conceptual model and implementation of a GIS with metadata information for a seismic hazard assessment cooperative project.**

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This work illustrates the advantages of using a Geographic Information System in a cooperative project with researchers of different countries, such as the RESIS II project (financed by the Norwegian Government and managed by CEPREDENAC) for seismic hazard assessment of Central America. As input data present different formats, cover distinct geographical areas and are subjected to different interpretations, data inconsistencies may appear and their management get complicated.

To achieve data homogenization and to integrate them in a GIS, it is required previously to develop a conceptual model. This is accomplished in two phases: requirements analysis and conceptualization. The Unified Modeling Language (UML) is used to compose the conceptual model of the GIS. UML complies with ISO 19100 norms and allows the designer defining model architecture and interoperability.

The GIS provides a frame for the combination of large geographic-based data volumes, with an uniform geographic reference and avoiding duplications. All this information contains its own metadata following ISO 19115 normative. In this work, the integration in the same environment of active faults and subduction slabs geometries, combined with the epicentres location, has facilitated the definition of seismogenetic regions. This is a great support for national specialists of different countries to make easier their teamwork.

The GIS capacity for making queries (by location and by attributes) and geostatistical analyses is used to interpolate discrete data resulting from seismic hazard calculations and to create continuous maps as well as to check and validate partial results of the study. GIS-based products, such as complete, homogenised databases and thematic cartography of the region, are distributed to all researchers, facilitating cross-national communication, the project execution and results dissemination.