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Ontology of geological units

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Geological units are fundamental features in the geological maps and they can impact many societal and industrial activities including environments, oil and gas exploration and production, aquifer management, and assessing some natural hazards. Ontologies constitute one of the most important and enabling components of the semantic web, allowing geoscientists to explicitly and formally model their knowledge base for sharing and reuse over a global network. Therefore, an ontology which organizes the concepts of geological units (GeologicalUnitsOntology) could help facilitate a sound education within, and communication among, the highly diverse professional and academic community interested in the problems cited above. We developed a process based ontology that makes explicit specifications about geological units, their properties, and the deformation and metamorphism mechanisms. We discuss the ontology development process and identify a set of useful steps and activities that enhance and facilitate the development of geosciences ontology. Our ontology emphasizes the relationships among concepts such as formations, rock units, and maximum and minimum ages. GeologicalUnitsOntology is a valuable resource with a potential to applications in a number of fields utilizing recent advances in information technology, specifically for digital data and information in computers, grids, and Web services.

Keywords: Ontology, Geological units, Geological maps, Formations, Rock units, Geological age.