



OneGeology; a global exemplar for interoperable subsurface data

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The OneGeology initiative began in 2007 with a shared goal of developing a globally consistent and accessible framework for geology. It has succeeded in improving the web availability and usefulness of global geoscience data that can be used to address sustainability goals, such as, mitigation of hazards, meeting resource requirements and climate change. Initially OneGeology focused on challenges in 2D spatial data where data sets and management ended at national boundaries or hadn't previously existed at all. These parochial issues were addressed through the adoption and promotion of common international data standards, specifically GeoSciML and in 2018, ERML. It has also established of a web service accreditation scheme and community data portal (<http://portal.onegeology.org>), with training workshops and an international buddy system.

Ensuring data accessibility and interoperability in a world of ever increasing data volume, variability and fidelity is increasingly important and complex. The ability to process and analyze high performance data using high performance computing requires a unified approach to the management, manipulation, analysis and visualization of this information. OneGeology is now seeking to build on its past successes in order to address these emerging challenges and contribute with the community to both big data initiatives in North America and China with the International Union of Geosciences, and with standardised 3D workflows to further the understanding of underground space

3D subsurface data is a natural domain for geoscience that is slowly becoming resolved at a national level but lacks interoperability due to an absence of agreed upon conventions for describing data and accepted standards for storing and providing access to the data. Additional complications are generated by the lack of shared platforms for integrating this data and generating models that enable the analysis and interpretation of the associated information. The 3D Loop project funded through the Australian Research Council, Australian state and territory geological surveys and Geoscience Australia with contributions from global surveys through OneGeology aims to address these challenges.