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Interdisciplinary Data Resources for Volcanology at IEDA (Interdisciplinary Earth Data Alliance)

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This presentation will provide an overview of relevant resources for data sharing, data publication, data visualization, and interoperability at IEDA (Interdisciplinary Earth Data Alliance, http://www.iedadata.org) that are essential to enable data-driven research for volcanological research. IEDA is a NSF-funded multi-disciplinary data facility for solid earth observational data from the ocean, Earth, and polar sciences that operates data systems and services to ensure the preservation, publication, documentation, and quality of the data, their broad discovery and re-usability as well as their accessibility and interoperability for interdisciplinary research.
IEDA's data services are specifically designed to support individual researchers, especially in disciplines that typically generate and use small, but complex, heterogeneous, and unstructured datasets to help them fulfill the increasing demands of properly managing their data. These services include domain-focused data curation and synthesis, a wide range of tools for data discovery, access, visualization and analysis, as well as investigator support services that include tools for data submission, data publication, and data compliance support. A critical component of IEDA that is particularly relevant to volcanological research are data systems for physical samples collected in the Earth Sciences and for the data acquired on these samples in the field and in the lab. For example, IEDA's System for Earth Sample Registration provides a global catalog of samples that have an International Geo Sample Number (IGSN), a unique identifier for specimens and other sampling features in the Earth Sciences, that is used to unambiguously link samples, digital data, and publications (examples from the literature will be provided), and allows tracking of samples through their analytical history. The EarthChem Library, the PetDB synthesis, and the EarthChem Portal are IEDA data systems that support publication, discovery, access, and analysis of geochemical and petrological data for volcanological samples, including rocks, tephra, and gas.
In order to optimize CI capabilities for samples and sample-based data, especially integration with other data types for interdisciplinary research, databases, software tools, and workflows need to follow community-based standards and best practices for sample metadata, classification, identification, and registration. For example, a new EarthChem database is under development using the ODM2 information model (ODM=Observation Data Model) for spatially discrete, feature-based earth observations that integrates observations from in-situ sensors and environmental samples, aligned with OGC's Observation & Measurements model (Horsburgh et al, AGU FM 2014). Other resources that help interoperability include the IEDA's Thesaurus and the IGSN.