Goldschmidt 2025 Abstract
https://doi.org/10.7185/gold2025.31858

# Navigating Uncertain Times to Deliver Trusted Geochemical Data Services

**KERSTIN A. LEHNERT**
Lamont-Doherty Earth Observatory, Columbia University

Research in geochemistry today increasingly relies on access to curated, trustworthy data and depends on an openly accessible, reliable, and persistent infrastructure of data systems that ensure geochemical data are accessible and reusable and preserved for future use. Data repositories such as the EarthChem Library provide persistent open access to datasets and ensure that these datasets are properly documented and formatted to optimize reusability. More advanced capabilities are provided by synthesis databases such as GEOROC and PetDB that harmonize and integrate thousands of datasets published in scientific articles or in data repositories into large-volume data stores for advanced data mining and data analysis by humans and machines.

So far, most data repositories and synthesis databases have not reached the level of sustainability that makes them true 'infrastructure'. They depend mostly on federal funding that is provided through awards that need to be re-competed every 3 to 5 years. Sustainability is primarily attained through the quality and value of services that sustains the ongoing support by the community who favorably reviews their proposals. EarthChem has received federal funding for its data services for now 20 years because 1) the EarthChem Portal is an essential service to the community as a single point of access to globally distributed data systems; 2) the EarthChem Library allows researchers to deposit their data in a trusted repository that specializes in geochemical, petrological, mineralogical, and geochronological data; and 3) the PetDB database with now approximately 7 million analytical values is a critical resource of igneous and metamorphic rock data for research and teaching. Thousands of users have benefited from EarthChem services.

The current uncertainty in research funding emphasizes the critical role of sustainability planning for data facilities in geochemistry. EarthChem is operated as part of the IEDA2 data facility, which provided a Project Management, Engagement, and Sustainability Plan to the US National Science Foundation in 2022 and is now testing its implementation. Crucial aspects of this plan are international collaboration among geochemical data systems and the community's willingness to participate and take responsibility in defining and implementing governance and new business models for data infrastructure.