

GEOROC and EarthChem: Synchronizing Services on the Road to Global Geochemical Data Exchange

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GEOROC and EarthChem are leading, open-access resources for geochemical and isotopic data of igneous and metamorphic rocks and minerals. The databases have collaborated for nearly 25 years to provide researchers with access to large volumes of curated and harmonized data collections. Both EarthChem and GEOROC have recently embarked on major new developments and upgrades to improve the FAIRness of their data services and the interoperability of their data systems. EarthChem has been developing an API-driven architecture to align with growing demands for machine-readable, Analysis Ready Data (ARD). The new Digital Geochemical Data Infrastructure (DIGIS) initiative for GEOROC 2.0 has launched a complete overhaul of the database architecture and its systems for data ingest and access. EarthChem and DIGIS have committed to cooperation on system architecture design, data models, data curation, methodologies, best practices and standards for their geochemical data infrastructures. As a first step, regular data exchange was re-established, so that all current GEOROC data holdings can be accessed via the EarthChem Portal (ECP). The ECP was developed as a global open data service to the geochemical, petrological, mineralogical, and related communities. It provides a single point of access to >45 million analytical values for >1 million samples, aggregated from independently operated databases (PetDB, NAVDAT, GEOROC, USGS, MetPetDB, DARWIN). One critical element for operating such a global data service is the use of a common vocabulary: GEOROC and PetDB have re-evaluated the concepts employed by each database and are developing a common vocabulary within the Observations Data Model 2 (ODM2) ecosystem. This common vocabulary will later be expanded to include other geochemical data types related to EarthChem. The long-term goal is to define a “golden standard” for geochemical data reporting through the international OneGeochemistry initiative. This standard is part of OneGeochemistry’s vision to create a global geochemical data network that facilitates and promotes discovery and access of geochemical data through coordination and collaboration among international geochemical