EARThD: A compilation of explosive volcanism in East Africa

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Tephra deposits are prolific and widespread across much of the East African Rift. They serve as important chronostratigraphic marker beds in regional sedimentary archives. Typically, tephra are studied in isolation by researchers from different disciplines, in most cases with little cross-disciplinary communication. This limits the use of East African tephra records for constraining the timing, rates, and evolution of rifting, volcanism, climate events, and human origins.

East African Rift Tephra Database (EARThD) is a collaborative data compilation project that aims to maximize the scientific potential of regional tephra records and support and foster new collaborative research avenues. EARThD is digitizing, standardizing, and integrating published geochemical, geochronological, and physical tephra datasets from publications primarily within the East African Rift and making them widely available. We utilize an existing NSF-supported community-based data facility, the Interdisciplinary Earth Data Alliance (IEDA), to store, curate, and provide access to the compiled data.

Over the past two years, thirteen undergraduate students and one graduate student from Salem State University and Pennsylvania State University have led the extensive data mining and archiving efforts. Our team is majority female with international students and members of underrepresented minorities in geoscience.

Students gain valuable skills in literature research, and data mining and archiving - skills that have supported multiple senior thesis projects and a masters degree.

As of November 2020, the EARThD project has reviewed over 850 academic papers and books. Of those, 405 had tephra data that could be entered into the EARThD database. Currently, data from 54 of those publications are publicly available through IEDA, and will ultimately be searchable using EarthChem. The EARThD reference list is available to the public through our website and on Mendeley. The EARThD website (*https://sites.psu.edu/earthd/*) documents project progress, offers a venue for community input, a map for visualizing tephra locations, and provides instructions and direct links for searching, accessing, and downloading datasets. With this effort, we aim to fulfill a crucial data integration role for researchers working in East Africa and the increasingly complex and multidisciplinary research questions being studied in this region. ∎

Google Earth map showing the approximate locations of each of the 400 publications entered into EARThD. Markers are color coded by publication year; red (1932-1962), orange (1963-1973), yellow (1974-1985), green (1986-1996), blue (1997-2008, violet (2009-2020).