

The Terrestrial Analogs Data Portal: A Resource for Archiving and Discovering Data. M. E. Rumpf and M. A. Hunter, U.S. Geological Survey, Astrogeology Science Center, Flagstaff, AZ 86001 (mrumpf@usgs.gov).

Introduction: Recent conversations within the planetary science community have revealed the need for comprehensive archiving standards for data related to locations used for terrestrial analog research. Through the implementation of the NASA Planetary Data System (PDS) the planetary science community has already developed and maintained high standards for the archiving of planetary mission data. Entries to the PDS are peer-reviewed and held to well-defined data and metadata standards. Until recently, similar formal archives have not been created for other types of data related to planetary science, despite demonstrated needs for this resource [1].

Community Input: A 2019 planetary science community survey administered by the U.S. Geological Survey (USGS) [2] found that most respondents are willing to share their data and samples with the broader community and would use an archive to find existing data and samples. However, respondents also shared that they lack the knowledge needed to properly archive data and, in general, do not know how to find existing data. In addition, respondents noted that a lack of time and funding remains a significant barrier in their ability to archive data. Conversations during a 2021 Terrestrial Analogs for Planetary Exploration Workshop breakout session [2] found that participants did not know what it takes to create a good repository or proper entries into a repository, including the time needed to create entries. Participants expressed that for a repository to be effective, the data within it needs to be usable and trustworthy, while maintaining a low barrier to access and use with clear metadata standards.

To address these concerns, the Terrestrial Analogs for Research and Geologic Exploration Training (TARGET) program at the USGS Astrogeology Science Center (ASC) has begun development of the Terrestrial Analogs Data Portal (TADP). The goal of the TADP is to leverage the work already done by the USGS to archive its own data, as well as to provide standards and tools for researchers to efficiently archive and access planetary analog data [4].

The Terrestrial Analogs Data Portal: The TADP is based on the USGS ScienceBase platform, which was developed to fully comply with new federal data management requirements that aim to improve publicly funded data access and usefulness [4,5]. The substance of ScienceBase includes the following: 1) a data cataloging and collaborative data management platform; 2) central search and discovery application;

3) web services facilitating other applications; and 4) research community catalogs.

When fully functional, the TADP will allow users to archive their data according to community best practices through two primary mechanisms: 1) hosting data directly in ScienceBase, and 2) connecting data hosted in other trusted repositories to the TADP.

Balancing high standards and ease of use. Data and metadata standards are the heart of the TADP. However, a repository will only be useful if users can contribute and locate data effectively and efficiently. Metadata requirements must be sufficiently robust to support usability of data, while not creating an excessive barrier by requiring unreasonable time and specialized knowledge to submit data for archiving [6]. TADP uses open metadata standards and provides a set of requirements for the contribution of data into the repository. Ingestion of data through ScienceBase allows users to utilize a metadata wizard that facilitates formatting and validation of Federal Geospatial Data Committee (FGDC) Content Standard for Digital Geospatial Metadata (CSDGM) compliant metadata files.

Current Use Cases. As an initial use case, the TADP has been working with NASA's SSERVI (Solar System Exploration Research Virtual Institute) GEODES (Geophysical Exploration of the Dynamics and Evolution of the Solar System) team and the NASA Goddard Instrument Field Team (GIFT) to test end-to-end organization, description, review, and approval within USGS systems [6,7].

The GEODES and GIFT teams have collected a variety of data types including LiDAR, hXRF, UAS, GPR, dGPS, seismic, magnetic, and gravity data. Each data type has specific documentation requirements (e.g., instrument settings and output) as well as common requirements, such as geospatial and temporal data. To date, most of the data collected by the teams have been stored and characterized in Google Drives or placed in a data repository at the University of South Florida. We are currently working to house this data in the TADP through the use of ScienceBase.

Next Steps: From a technical standpoint, the TADP development team has multiple software sprints scheduled in 2022 to improve the functionality of the website (Figure 1). In addition, TARGET Team continues to push forward the implementation of the TADP and is looking for community input on needed improvements. To this end, the ASC invites research teams to submit data sets as use cases to explore the

functionality of the TADP as we continue its development. Please contact the authors if you are interested in exploring options for archiving your data.

In addition to the TADP the ASC is also exploring the feasibility and technical requirements for collecting and hosting terrestrial analog field guides [8], as well as expanding our ability to host and share physical sample collections through the Terrestrial Analog Sample Collection (TASC) [9,10]. The TARGET program has been addressing the need for a standardized collection of field guides representing terrestrial analog locations for the study of planetary science through the development of multipurpose field guides for terrestrial analog locations within Northern Arizona. TARGET is also taking steps to organize a community database of existing physical and virtual field guides [8]. TASC currently hosts three individual sample collections (Meteor Crater, Flynn Creek crater, and Shoemaker collections) and is looking to grow through the assimilation of other NASA-funded sample collections [9,10].

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References: [1] Final Report of the Planetary Data Ecosystem Independent Review Board (2021). [2] Edgar, L.A. et al. (in review), *USGS OFR*. [3] Rumpf, M. E. et al (2021) *NASA Exploration Science Forum*. [4] Hunter, M.A. et al. (2021) *Terrestrial Analogs Workshop*. [5] Frame, M. et al. (2019) *AGU Fall Meeting*, <https://www.essoar.org/pdfjs/10.1002/essoar.10500729.1>. [6] Baker, D.M.H. et al. (2021) *Planetary Data Workshop #7046*. [7] Whelley, P.L. et al. (2021) *Terrestrial Analogs Workshop #8041*. [8] Rumpf, M.E. et al. (2021) *Terrestrial Analogs Workshop #8090*. [9] Gaither, T. et al (2021) *Terrestrial Analogs Workshop*. [10] Gullikson, A.L. et. al (2022) *LPSC #1599*.

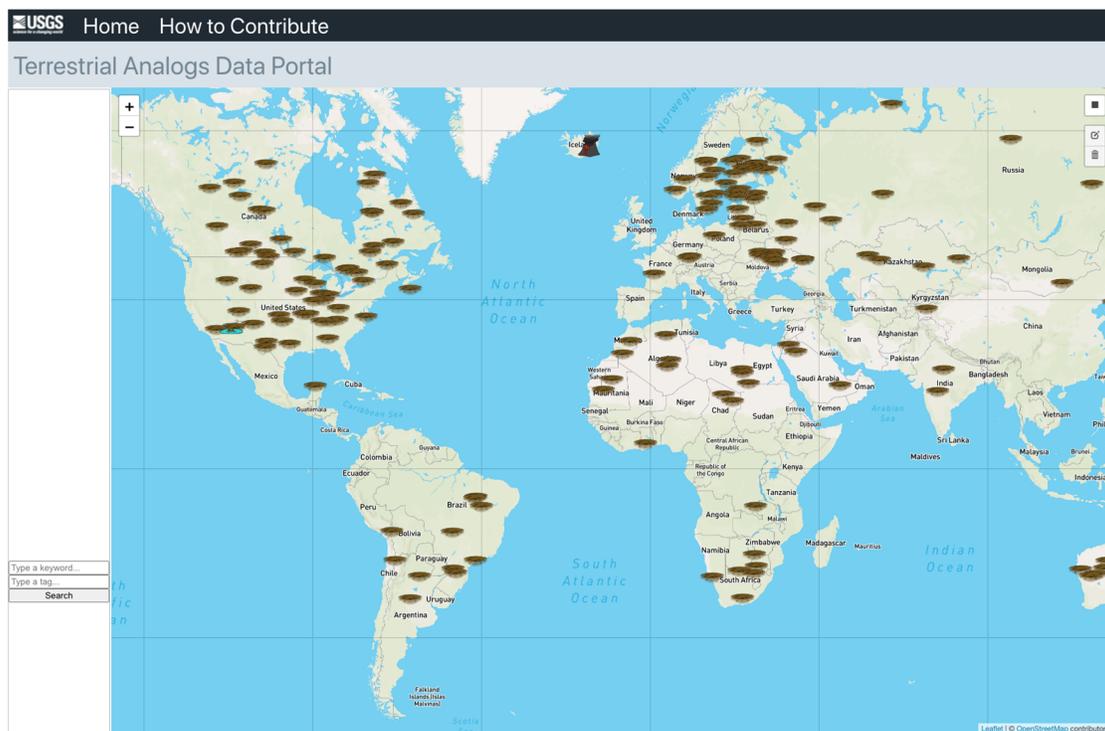


Figure 1. Front page of the current (as of submission) format of the Terrestrial Analogs Data Portal (TADP) webpage. This beta-version allows visitors to search the ScienceBase repository for terrestrial analog data by keyword or location. The page also contains instructions for contributing data to the TADP. Visit the TADP at <https://astroservices.usgs.gov/terrestrial-analogs>.