Terrestrial Analog Field Guides: Exploring the San Francisco Volcanic Field and the Verde Valley. M. E. Rumpf[1], L. Thompson[2], L. A. Edgar[1], and A. L. Gullikson[1], [1]USGS Astrogeology Science Center, 2255 N. Gemini Dr., Flagstaff, AZ 86001 (mrumpf@usgs.gov). [2]Arizona Geological Survey, 1955 E. 6th St., Tucson, AZ 85721.

Introduction: The U.S. Geological Survey (USGS) Astrogeology Science Center (ASC) Terrestrial Analogs for Research and Geologic Exploration Training (TARGET) program has recognized the need for a standardized collection of field guides representing terrestrial analog locations for the study of planetary science. In response to a 2019 community survey [1], TARGET has addressed this need from two directions: 1) The development of multipurpose field guides for terrestrial analog locations within Northern Arizona [2], and 2) The organization of a community database for the collation of terrestrial analog data, including new and existing field guides [3]. Here, we introduce field guides for the San Francisco Volcanic Field (SFVF) and the Verde Valley, which are currently in development, and outline plans for a community database of terrestrial analog field guides.

Multipurpose Field Guides: Each multipurpose field guide is designed to be accessible to a wide range of audiences. Northern Arizona has long been a training ground for geologists, planetary scientists, astronauts, engineers, and managers. Our field guides are of standardized formats and are customizable to the needs of the groups who will use them. Guides will be made available as PDFs for download and use in the field and as virtual ArcGIS StoryMaps (storymaps.arcgis.com). Virtual access to field locations is a significant aspect of this project, as the ongoing pandemic and the growing awareness of the need for inclusivity in training opportunities has made evident. In addition to the guides described here, we have also developed a field guide for SP Crater (see [2] for details) and plan to expand coverage of widely-used terrestrial analog locations.

San Francisco Volcanic Field. The SFVF is located on the southwestern edge of the Colorado Plateau and contains over 600 volcanic vents within an area of ~5000 km^2. This area is ideal for volcanological studies as deposits range in composition from mafic to intermediate to silicic, in age from >2 Ma to ~1 ka, and in style, including lava flows, cinder cones, silicic domes, and the remnants of a stratovolcano [4]. Our field guide for the area focuses on several features, representing a range of volcanic styles, including San Francisco Mountain, Mount Elden, O'Leary Mountain, Strawberry Crater, Colton Crater, Rattlesnake Crater, Red Mountain, and Sunset Crater. This range of terrestrial volcanic features is representative of the variety of volcanic features observed and inferred on other rocky bodies in our Solar System.

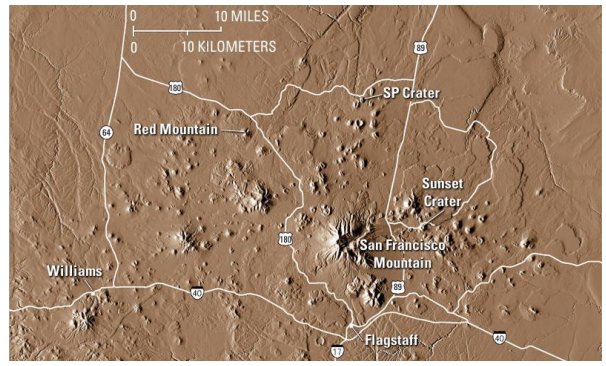

Figure 1: Digital elevation model of the San Francisco Volcanic Field featuring analog sites included in guides described here and in [2]. Source *USGS*.

Verde Valley. The Verde Valley is located in north-central Arizona, mid-way between Phoenix and Flagstaff, in the transition zone between the Colorado Plateau and Basin and Range Province. It spans an area of ~700 km^2 and includes a large variety of sedimentary and volcanic depositional environments present over the last 27 Ma. Most significantly, the Verde Valley has abundant evidence for lava-water interaction, found as deposits such as hyaloclastite, peperite, fossilized hydrothermal systems, and hydraulic fracturing. These features may be similar to some hypothesized to be on the surface of Mars, which has extensive history of both volcanic and aqueous activity [e.g., 5]

Community Database: In addition to the development of field guides, the TARGET team is working with developers at the ASC to create a repository for field guides produced by and for the planetary science community. The field guide database will be an easily accessible resource in which terrestrial analog field guides can be archived using standardized guidance and tools from the USGS, as well as discovered and accessed (see [3] for details). Users will be able to search for field guides in the database with a variety of criteria, including analog location, processes covered, and relevant planetary bodies.

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