Accessible Terrestrial Analogs: Planning the GEOSPACE Planetary Volcanology Field Course J. L. Piatek[1] D. A. Williams[2], Amy J. Williams[3], and A.M.S. Marshall[3] [1]Dept. of Geological Sciences, Central Connecticut State University, New Britain CT 06050 (piatekjel@ccsu.edu), [2]School of Earth and Space Exploration, Arizona State University, Tempe, AZ 85287 (David.Williams@asu.edu), [3]Dept. of Geological Sciences, University of Florida.

What is GEOSPACE? GEOscientists Promoting Accessible Collaborative Experiences (GEOSPACE) is a two-year NSF funded project that has the goal of developing a fully accessible planetary volcanology field module targeted at upper level geoscience undergraduates. The project is currently planning our pilot field season, which will take place in northern Arizona at the end of May 2022 and will include both in-person and virtual attendees. The two-week course will expose students to basic concepts in volcanology, geomorphology, and stratigraphy as well as hands-on experience with career-relevant skills such as field mapping, collection and interpretation of geophysical datasets, and analysis of remote sensing data.

Why is GEOSPACE necessary? Field-based learning remains a core component of geoscience programs, including those with a focus in planetary science. Often this field work is mandatory for completing a degree or obtaining professional certifications: these experiences may be in the form of lab classes, as weekend field trips attached to courses within the academic year, and/or as multiple week immersive summer courses. Traditional weekend field trips and summer field courses, however, can present barriers for students in the form of time away from home (work/family obligations) and additional cost in tuition (for summer programs) and lost salary (if missing out on work hours). In addition, many of these field activities are designed by and for field geologists and not with accessibility in mind, so students with disabilities are often unable to complete them even though they are adept with geoscience concepts and skills in the classroom. When alternatives are available, often these are isolating (activities the student completes on their own, missing the social aspects of working in the field) and perpetuate the mistaken perception that disabled people cannot have meaningful geoscience careers. Excluding these students reduces the diversity of our programs and future workforce, and can have a negative impact on learning and feelings of belonging in the community.

How are we designing an accessible field course?

The general location of our field course will be north-central Arizona, which has a long history of providing terrestrial analog examples for planetary scientists. The location was selected based on previous experience in the field area (several team members have experience with field trips and research projects in this area), ability to locate appropriate accommodations, and proximity to accessible national parks and monuments. Several of our field sites are taken from the "Holey Tour", Arizona State University's introductory planetary geology field trip, and were targeted by the project scouting trip [1,2] Our approach to the design of our field course activities is to consider first the key learning outcomes, and then to select, based on our scouting trip, field sites that both address those outcomes and that will be accessible to all of our students, either through direct or remote methods. Our daily field schedule (see example in Table 1) will be provided to students before we go out into the field so they can better prepare for each day.

In addition to accessibility-focused site selection guided by learning outcomes, we also recognize that many of our participants may have been excluded from field trips in the past and/or never experienced a semi-arid climate, and may not have some of the background knowledge that is often assumed (e.g. proper dress, toilet stops in the field, adequate hydration and sun protection). To ensure that all participants are familiar with field protocols,we will be holding a series of virtual meetings with all participants prior to the field season. These virtual meetings will help to address gaps in knowledge and also to introduce participants to each other so we can begin to develop the social connections that underlie successful field projects.

Upcoming Events: The pilot GEOSPACE field season will be held this summer (end of May - early June): the first cohort of students for the field season were selected this winter. While the majority will attend the course in person, we have several applicants who have opted to attend virtually, providing the opportunity to test a fully-remote option that could provide additional flexibility. Although the course is aimed at undergraduates, a number of planetary science graduate students also applied: we hope to be able to include some of these students as "mentors", but recognize that there is a need for accessible field experiences at the graduate level that is as yet unmet.

For more information and project updates, visit sites.google.com/ufl.edu/geospace-field-program

Acknowledgments: This work is funded under NSF Grant #2023124.

References: [1] Greeley, 2011. GSA Special Paper 483: 377-391. doi: 10.1130/2011.2483(23). [2] Williams et al., 2021. Terrestrial Analogs 2021, abstract #8004.

Table 1: Example template for a field day schedule to be given to students: the schedule addresses learning outcomes, assessments, site accessibility, safety notes, and other logistics. Providing this information ahead of time gives students the opportunity to appropriately prepare for the field day and required activities.

SP Crater: Example Template

Location	SP Crater Arizona (link to satellite image)
Weather Forecast Link	https://www.mountain-forecast.com/peaks/S-P-Crater/forecasts/2035
Objective	Observe structure and deposits associated with cinder cones, and different states of weathering/degradation of cinder cones.
Activity	● Collect field observations of cinder cone and lava flow morphologies ● Identify differences between younger SP Crater and nearby older cones ● Examine contact with lava flow to collect any stratigraphic evidence related to timing of events ● Ground-truth remote sensing data analyzed prior to workshop.
Assessment	Field notebooks to be collected at the end of the field day.
Logistics	Distance from Previous Stop: ~1 hour drive Restrooms / Running water: No Duration: 4 hrs Departure: 5 pm Students will divide into two working groups: 1 group at vans - minimal walking 1 group hikes to summit - intense activity due to steep gradient up unconsolidated basaltic cinders
Safety Notes	● Sun protection is imperative! There is little to no shade in this location and cloud cover is minimal most days. ● Fill your water bottles before we leave! Hydration is also important due to a combination of heat, limited shade, and altitude. Dehydration can occur quickly and may lead to heat exhaustion or heat stroke if left unabated. (We will have some emergency water supplies in the vans.) ● Please ensure your field partner is within line of sight or verbal communication range. Leaving your partner alone in the field increases the chance of injury. Do not rely on walkie-talkies or cell phones, as coverage can be spotty.
Relevant Modules	Earth Systems, Structural Geology, Petrology, Volcanology, Geochemistry
Relevant Readings	[*links to relevant papers and datasets that were provided to participants before workshop*]