

Postdoctoral Research Associate in dryland ecosystem mapping with multiscale hyperspectral remote sensing

Job description: We are looking for an amazing Postdoctoral Research Associate to join a NASA Earth Surface Mineral Dust Source Investigation (EMIT) project. This work aims to integrate hyperspectral observations from the EMIT platform and other complementary multi-scale observation records with the goal of mapping of dryland plant and soil community composition and functional diversity across first the Colorado Plateau and, eventually, global drylands. A particular emphasis of the project will be the development of novel maps of biological soil crust cover community composition and function. Biocrusts are photosynthetic soil surface communities of cyanobacteria, mosses, and/or lichens that cover vast expanses of the planet's terrestrial surface and play critical roles in soil stabilization, fertility, water cycling, and carbon exchange with the atmosphere. Biocrusts are found on all continents and coarse global estimates suggest that these photosynthetic soil communities make up 12% of Earth's land surface (which is a lot!). Despite their global extent and critical importance, biocrusts have yet to be accurately mapped using satellite observations, and thus our scalable, quantitative understanding of biocrust community composition, coverage, function, and response to global change remains in its infancy compared to our understanding of vascular plants. The position will be based in [Dr. Bill Smith's](#) lab at the University of Arizona and co-advised by [Dr. Stefanie Herrmann](#) (University of Arizona), [Dr. Miguel Villarreal](#) (the U.S. Geological Survey), and [Dr. Sasha Reed](#) (the U.S. Geological Survey). The successful applicant will also work closely with collaborators from the [NASA EMIT Science and Applications Team](#). Importantly, the collaborative nature of this project provides unique flexibility in work location. The successful candidate will have the option to either relocate to one of multiple existing research locations (with options in Arizona, Utah, and Colorado) or we are also open to the option of remote employment.



Recent field campaign near Moab, Utah with targeted field, drone, aircraft, and satellite data collection.

The selected postdoc will be coming into a mature project with robust opportunities for high impact publications based on a wealth of existing workflows and data, including unpublished hyperspectral datasets at the species, drone, aircraft (GEMx), and satellite (EMIT, EnMAP, PACE) scale from multiple field campaigns carried out in support of this project. Our highly supportive, collaborative, and innovative team is committed to mentoring the postdoctoral scholar in their research and in fostering their development of diverse career skills and a strong professional network.

Responsibilities: The position is full-time and 100% research with the expectation of travel to team field campaigns and/or workshops. The postdoctoral fellow will be responsible for developing novel hypotheses, processing and analyzing large drone-, aircraft-, and satellite-based datasets, integrating these data with ground-based measurements, and developing innovative geospatial and statistical methods.

They will be well-supported and expected to lead high impact manuscripts for publication in top peer-reviewed journals and present research findings at national conferences.

Minimum qualifications:

- Ph.D. in Ecosystem Ecology, Remote Sensing, Biogeochemistry or a closely related field.
- Demonstrated skill in remote sensing and geospatial data analysis.
- A record of publication in peer-reviewed journals.
- Strong oral and written communication skills.

Desired qualifications:

- Interest and/or a research background in dryland ecosystem ecology. A previous research focus on biocrust community composition and their functional role within dryland ecosystems is not required but would be viewed favorably.
- A research background in spatiotemporal analysis using R, Python, and/or comparable computer programming languages. Experience in high performance computing is not required but would be viewed favorably.
- Expertise in working with satellite data over large spatial extents. Experience working with satellite-based hyperspectral observations specifically is not a requirement but would be viewed favorably.
- Experience as a field ecologist and involvement in field campaigns is not required but would be viewed favorably. Experience in proximal remote sensing and/or with drones is not required but would be viewed favorably.

Application:

All application materials must be submitted electronically through the University of Arizona Human Resources 'career' website (req23750):

<https://arizona.csod.com/ux/ats/careersite/4/home/requisition/23750?c=arizona&sq=req23750>

We request a CV, names and e-mail addresses of three (3) references, and a statement of research interests (1-2 page). The position is open until filled, but we will begin reviewing applications on September 15, 2025. Please feel free to email Bill Smith at wksmith@arizona.edu if you have any thoughts or questions.