

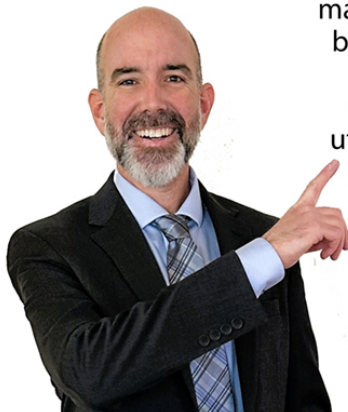


Science
Societies

President's pick: SSSA Research October 2026

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| September 17, 2026



What lives
in regolith
simulants
and why it
matters for
biological
in-situ
resource
utilization
research



Pedogeomorphology
of semiarid
soils of
Ulu Peninsula,
James Ross
Island,
Antarctica

Exciting new research is shared every day among the scientific community in our journals. SSSA is the sole publisher of the *Soil Science Society of America Journal* and *Vadose Zone Journal* and co-publisher of the *Journal of Environmental Quality* and *Agricultural & Environmental Letters* with CSSA and ASA.

Each month, I will pick one or two articles among our journals that represent some of the most exciting, creative, and innovative research in our field of soil science. This month, I have chosen the following two articles from the *Soil Science Society of America Journal*. Congratulations to the authors and thank you for sharing your excellent work!

What lives in regolith simulants and why it matters for biological in-situ resource utilization research

Regolith simulants substitute for lunar and martian material in space biology research, and because they are made and handled on Earth, they carry biosignatures of their own. The authors evaluated the microbiomes of several widely used lunar and martian simulants from three laboratories, the effectiveness of common sterilization methods, and the effects those methods have on the material. Culturable non-fastidious and mesophilic bacteria and fungi were present in every simulant, at loads the authors report as a real challenge to using these materials in biological research. Autoclaving and dry heat eliminated viable colony-forming units (CFUs) in small containers, but packed 5-L autoclave bins retained roughly 1,000 to 60,000 CFUs in their centers where compaction limited steam penetration. The treatments changed the simulants that contained hydrated phases as well, with X-ray diffraction showing smectite collapse and gypsum dehydration to anhydrite under furnace heating. Adding a concentrated phosphate buffer solution at the lysing step produced the highest concentrations and quality of extracted DNA. The authors call for guidelines and best

practices on the selection, storage, and handling of simulant materials applied to biological research.

Journal: *Soil Science Society of America Journal*

Authors: L.E. Fackrell, A.G. Palmer, R. Loureiro, P.A. Schroeder, A.C. Simpson, D. Cheek, M. Taylor, H. Murphy, J.M. Long-Fox, N.K. Singh, K.J. Venkateswaran, H.J. Mills, O.G. Holzhaus, and K. Lynch

Article link: <https://doi.org/10.1002/saj2.70299>

Pedogeomorphology of semiarid soils of Ulu Peninsula, James Ross Island, Antarctica

James Ross Island sits in the transition between maritime and continental Antarctica, where cold and aridity leave soils weakly weathered and salt-rich, which the authors note may serve as a terrestrial analog for Martian regolith. Along a single toposequence on the Ulu Peninsula, they described five profiles spanning about 360 meters of elevation, three on volcanic tuffs of the Terrapin Hill Formation and two on Cretaceous sedimentary rocks of the Whisky Bay Formation. Four were classified as Cryosols and one as a Regosol, and all were alkaline with high exchangeable sodium. Sodium accumulated most in the two upper-slope profiles despite lower marine aerosol deposition there, which the authors attribute to limited leaching under cold and dry conditions. Those same profiles showed field evidence of possible dry permafrost, ground that stays below freezing most of the year without ice, a feature not previously reported on the island. Pyroxene and zeolites in the lower sedimentary profiles indicate downslope volcanic input, and quartz in the tuff-derived sands suggests aeolian delivery from outside the site. Because sodium enrichment in the clay fraction depresses the Chemical Index of Alteration, the authors caution against reading classic

weathering indices at face value in coastal Antarctic soils.

Journal: *Soil Science Society of America Journal*

Authors: H.P. Palma, J. Holuša, R.G. Siqueira, D.N. Krum, F.N.J. Villela, C.E. Lana, R.R.C. Ramos, D. Všianský, D. Nývlt, C.E.G.R. Schaefer, and M.R. Francelino

Article link: <https://doi.org/10.1002/saj2.70317>

Soil Science Society of America Journal

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