Rachel C. Glade

rachel.glade@rochester.edu • http://www.rachelglade.com

PROFESSIONAL APPOINTMENTS

University of Rochester
Assistant Professor
Earth and Environmental Sciences; Mechanical Engineering — 2021-present

Los Alamos National Laboratory
Postdoctoral Research Associate, EES-14 — 2019 – 2021
Mentor: Joel Rowland

EDUCATION

University of Colorado, Boulder: Ph.D. in Geology — May 2019
Advisor: Robert S. Anderson
Thesis: "Hillslope evolution in block-controlled landscapes"

University of Pennsylvania: B.A. in Geology — May 2014
Advisor: Douglas J. Jerolmack
Thesis: "Formation and morphology of aeolian coarse-grained ripples in White Sands, NM"

AWARDS & HONORS

Packard Fellow for Science and Engineering	2023
Levinson/Shapiro Faculty Scholar	2022
Marinus Smith Teaching Award	2019
Jai Syvitski Student Modeler Award, 2nd Place	2018
NSF Graduate Research Fellowship, Honorable Mention	2016
Delaware Valley Geo-Institute Scholarship	2013
SEG/Anadarko Scholarship for Geoscience Studies	2010

PUBLICATIONS

* = postdoc
** = graduate student
*** = undergraduate student

Peer-Reviewed

[12] Pouragha, M., Jebeli, Mohammadreza,** Glade, R.C. Failure of Partially Saturated Frozen Soils: a Micromechanical Analysis (2023). *Cold Regions Science and Technology*

[11] Del Vecchio, J.*, Lathrop, E.,**, Dann, J.,** Andresen, C., Collins, A., Fratkin, M.,** Zwieback, S., Glade, R.C. and Rowland, J. (2023) Patterns and rates of soil movement and shallow failures across several small watersheds on the Seward Peninsula, Alaska. *Earth Surface Dynamics*.

[10] Glade, R.C., Fratkin, M.**, Pouragha, M., Seiphoori, A., and Rowland, J. Arctic soil patterns analogous to fluid instabilities (2021) *Proceedings of the National Academy of Sciences*, 118 (21) DOI: 10.1073/pnas.2101255118. *Highlighted by the US Arctic Research Commission; News coverage by Los Alamos National Lab, phys.org*

[9] Shobe, C.M., Turowski, J.M., Nativ, R., Glade, R.C., Bennett, G.L., and Dini, B. The role of large, infrequently mobile boulders in modulating landscape evolution and geomorphic hazards (2021) *Earth-Science Reviews*, vol. 220, DOI: 10.1016/j.earscirev.2021.103717.

[8] Barnhart, K.R., Tucker, G.E., Doty, S., Glade, R.C., Shobe, C.M., Rossi, M.W., and Hill, M.C. (2020) Projections of landscape evolution on a 10,000 year timescale with assessment and partitioning of uncertainty sources. *JGR Earth Surface*. doi: 10.1029/2020JF005795.

[7] Barnhart, K.R., Tucker, G.E., Doty, S., Shobe, C.M., Glade, R.C., Rossi, M.W., and Hill, M.C. (2020) Inverting topography for landscape evolution model process representation: Part 3, Determining parameter ranges for select mature geomorphic transport laws and connecting changes in fluvial erodibility to changes in climate. *JGR Earth Surface*. doi: 10.1029/2019JF005287. *Top-cited article*.

[6] Barnhart, K.R., Tucker, G.E., Doty, S., Shobe, C.M., Glade, R.C., Rossi, M.W., and Hill, M.C. (2020) Inverting topography for landscape evolution model process representation: Part 2, calibration and validation. *JGR Earth Surface*. doi: 10.1029/2018JF004963. *Top-cited article*.

[5] Barnhart, K.R., Tucker, G.E., Doty, S., Shobe, C.M., Glade, R.C., Rossi, M.W., and Hill, M.C. (2020) Inverting topography for landscape evolution model process representation: Part 1, conceptualization and sensitivity analysis. *JGR Earth Surface*. doi: 10.1029/2018JF004961

[4] Glade, R.C.(E), Shobe, C.M.(E) Anderson, R.S., and Tucker, G.E. (2019) Canyon shape and erosion dynamics governed by channel-hillslope feedbacks. *Geology*. (E) = Equal author contributions.

[3] Barnhart, K.R., Glade, R.C., Shobe, C.M., and Tucker, G.E. (2019) terrainbento 1.0: a Python package for multi-model analysis in long-term drainage basin evolution. *Geoscientific Model Development,* doi:10.5194/gmd-2018-204

[2] Glade, R.C., Anderson, R.S. (2018), Quasi-steady evolution of hillslopes in layered landscapes: An analytic approach, *JGR Earth Surface*, v. 123.1, 26-45, doi: 10.1002/2017JF004466. *Featured on journal cover.*

[1] Glade, R.C., Anderson, R.S., and Tucker, G.E., (2017), Block-controlled hillslope form and persistence of topography in rocky lansdcapes, *Geology*, v. 45, p. 311-314, doi:10.1130/G38665.1.

Technical Reports and Theses

Glade, R.C. (2019) Hillslope evolution in block-controlled landscapes. Ph.D. Dissertation, University of Colorado, Boulder.

West Valley Erosion Working Group Modeling Team including Glade, R.C. (2018) Modeling long-term erosion at the West Valley Demonstration Project and Western New York Nuclear Services Center. Report prepared for the U.S. Department of Energy and New York State Energy Research and Development Authority

Foster, M.A., Anderson, R.S., Rindfleisch, P.R., Birkeland, P.W., Redwine, J.R., Pitlick, J., and Glade, R.C., (2016), The 2016 Kirk Bryan field trip: Quaternary landslides, fluvial terraces, and recent geomorphic events along the Colorado Front Range, in Keller, S.M., and Morgan, M.L., eds., Unfolding the Geology of the West: Geological Society of America Field Guide 44, p. 267–289, doi:10.1130/2016.0044(12).

Glade, R.C., Jerolmack, D.J. (2014) Formation and morphology of aeolian coarse-grained ripples at White Sands, New Mexico. University of Pennsylvania Undergraduate Thesis.

Science Writing and Commentary

Furbish, D.J., Jerolmack, D.J., and Glade, R.C. (2020) The Brickyard in 2020. Vanderbilt University Institutional Repository.

GRANTS

Packard Fellowship for Science and Engineering ($875k)	2023-2028
NSF Grant Co-PI ($615k)	2023-present
"Prospecting for critical element deposits: an interdisciplinary approach using experimental geochemistry and field-informed modeling of sediment transport"	
Petroleum Research Fund Doctoral New Investigator Grant ($110k)	2021-2023
"The Probabilistic Physics of Sediment Diffusion in Rivers"	
University of Colorado Geological Sciences Travel Grant	2018
University of Colorado Graduate School Domestic Travel Grant	2018
GSA John T. and Carol G. McGill Research Award	2017
Shell Research Grant	2015

TEACHING

University of Rochester Department of Earth and Environmental Sciences

Sediment Transport in Fluid Flows	Fall 2022
Earth Surface Processes	Spring 2022

University of Colorado, Boulder Department of Geological Sciences

Geomorphology, Instructor of record	Spring 2019
Fluid Earth, Graduate Teaching Assistant	Fall 2018
Intro Geology Lab (4 sections), Graduate Teaching Assistant	2014 – 2015

University of Pennsylvania Department of Earth and Environmental Science

Intro Geology, Teaching Assistant — Fall 2013

MENTORSHIP

Postdocs

Fernando David Cúñez — 2021-2023

PhD Students

JohnPaul Sleiman — 2021-

Nacere Mohamed Samassi — 2021-

Undergraduates

Elisa Yang — 2023-

Div Patel — 2022-

Avi Skolnick — 2023

Yisheng Zhong — 2022-2023

STUDENT COMMITTEES

Esteban Wright, UR Physics — 2022

Joen-Joel Legre, UR Earth and Environmental Science — current

Sarah Williams, Vanderbilt Earth and Environmental Science — current

INVITED TALKS

University of Minnesota Duluth; "Patterns in granular media" Workshop, Unicamp, Brazil — 2023

Vanderbilt; Dartmouth; UR Mechanical Engineering Department; AGU EPSP Lecture; American Physical Society (APS) March Meeting; Princeton University — 2022

University of Delaware; Georgia Tech; University of British Columbia; AGU Fall Meeting; Syracuse University; University of Rochester (Mech E) — 2021

AGU Fall Meeting; EGU Virtual Meeting — 2020

AGU Fall Meeting; Potsdam German Research Centre for Geosciences — 2019

CSDMS-SEN Annual Meeting — 2018

PROFESSIONAL AFFILIATIONS & ACTIVITIES

Reviewer for *Nature Communications*,*Geology*, *EPSL*, *GRL*,*ESurf*, *JGR Earth Surface*, *Holocene*, US NSF

Member: American Physical Society, American Geophysical Union, American Physical Society, Geological Society of America, Association for Women Geoscientists

Session convener: "Granular and Fluid Physics in Geomorphology" at *AGU Fall Meeting* — 2022

Session convener: "Changing Permafrost Landscapes" at *AGU Fall Meeting* — 2022

Session convener: "Centennial Session: Leopoldian, Bagnoldian, and Einsteinian geomorphology today" at *AGU Fall Meeting* — 2019

Session convener: "Heterogeneity in Geomorphic Systems: Driving Forces and Landscape Response" at *Geological Society of America Meeting* — 2016

OUTREACH

Lab tour for local middle and high school students through the Genesee Land Trust — Summer 2022

Talk for Central Connecticut State University Student Geology and Planetary Club — Spring 2022

Talk for the Rochester Academy of Science Mineral Division — Fall 2021

New Mexico Outreach Coordinator for Association for Women Geoscientists (AWG) — 2019 – 2021

Los Alamos Peer Mentoring Network — 2019 – 2021

Pikes Peak Regional Science Fair Judge — Spring 2021

Northern New Mexico Physics Summer Camp for Young Women — Summer 2020

Science Fair Judge for Boulder Valley School District — 2016 – 2019

Nerd Nite Public Outreach Talk — Spring 2018

Research Experience for Community College Students (RECCS) Poster Judge — 2016 – 2017

Research Experiences in Solid Earth Science for Students (RESESS) Poster Judge — 2016 – 2017

RESESS Trip Leader, Mountain Research Station, Colorado — Summer 2017

Portal to the Public 6-week Science Communication Workshop — Fall 2015

"Meet a Scientist" event hands-on demonstration, Boulder, Colorado — Fall 2015

OTHER EXPERIENCE

West Valley Restoration Project: Geomorphic Modeling Specialist — 2016– 2018

NASA Student Airborne Research Program — Summer 2013

PIRE Mongolia Project: Fieldwork and lab work — 2011- 2013

CONFERENCE ABSTRACTS

Samassi, N.**, Cúñez, F.D.*, Glade, R.C. (2022) Experiments on the Role of Sediment Cohesion on Gully Erosion. Presentation at *AGU Fall Meeting.*

Sleiman, J.**, Glade, R.C. (2022) Lobate features on Mars exhibit same scaling as terrestrial solifluction patterns. Presentation at *AGU Fall Meeting*.

Patel, D.***, Cúñez, F.D.*, Glade, R.C. (2022) Segregation of Bidisperse Granular Material in a Circular Tumbler Flow As a Lens into Riverbed Armoring. Presentation at *AGU Fall Meeting*.

Zhong, Y***., Cúñez, F.D.*, Glade, R.C. (2022) Flapping Motion of a Fish-inspired Body and its Impact on Sediment Transport. Presentation at *AGU Fall Meeting*.

Cúñez, F.D.*, Glade, R.C. (2022) Equal-diameter vs equal-volume particles: Which one really matters for shape-induced segregation in sediment transport? Presentation at *AGU Fall Meeting*.

Cúñez, F.D.*, Glade, R.C. (2022) Lateral diffusion and segregation of non-spherical particles in bed-load transport. Presentation at *APS March Meeting*.

Rowland, J., Thaler, E.*, Del Vecchio, J.*, Glade, R.C., Uhlemann, S., Dafflon, B. (2022) Transient Hillslope Responses to Permafrost Loss. Presentation at *AGU Fall Meeting*.

Cúñez, F.D.*, Glade, R.C. (2021) Lateral diffusion and segregation of non-spherical particles in bed-load transport. Presentation at *AGU Fall Meeting*.

Glade, R.C., Sleiman, J.P.*, Fratkin, M.*, Pouragha, M., Seiphoori, A., Rowland, J.C. (2021) The enigma of lobate soil patterns: Bridging scales, materials, and worlds. Invited talk at *AGU Fall Meeting*.

Del Vecchio, J.,* Rowland, J.C., DiBiase, R.A., Zwieback, S., and Glade, R.C. (2021) Signatures of Permafrost Processes in Fluvial Network Morphology and Change on the Seward Peninsula, Western Alaska, USA Presentation at *AGU Fall Meeting.*

Glade, R.C., Shobe, C.M., Turowski, J., Nativ, R., Bennet, G., and Dini, B. (2021) Progress in boulder-mantled landscapes: A Sisyphean challenge. Poster presentation at *AGU Fall Meeting*, New Orleans, LA.

Glade, R.C., Fratkin, M.,* Pouragha, M., Seiphoori, A., Rowland, J.C. (2021) Arctic soil patterns analogous to fluid instabilities. Poster presentation at *DOE ESS PI Meeting*.

Shobe, C.M., Turowski, J., Nativ, R., Glade, R.C., Bennet, G., and Dini, B. (2021) Great big boulders and landscape self-organization. Poster presentation at *GSA Connects 2021*, Portland, Oregon.

Glade, R.C., Fratkin, M., Pouragha, M., Seiphoori, A., Rowland, J. (2021) Solifluction patterns analogous to fluid instabilities. Poster presentation at *CSDMS Annual Meeting*.

Glade, R.C., Fratkin, M., Pouragha, M., Seiphoori, A., Rowland, J. (2020) Soil drips and droplets: Solifluction patterns analogous to fluid instabilities. Invited talk at *American Geophysical Union Fall Meeting*.

Rowland, J., Del Vecchio, J, Glade, R.C., Fratkin, M., Lathrop, E., and Zwieback, S. (2020) Patterns and rates of soil movement and shallow failures across several small watersheds on the Seward Peninsula, Alaska. Poster presentation at *AGU Fall Meeting.*

Barnhart, K.R., Tucker, G.E., Doty, S., Glade, R.C., Shobe, C.M., Rossi, M.W., and Hill, M.C. (2020) Lessons and challenged in reproducible computational research from the development and application of landscape evolution models to waste site remediation. Poster presentation at *AGU Fall Meeting.*

Tucker, G.E., Barnhart, K. R., Doty, S., Glade, R.C., Shobe, C.M., Rossi, M.W., and Hill, M.C. (2020) Ensemble forecasting of long-term erosion at a hazardous waste site. Oral presentation at *AGU Fall Meeting.*

Glade, R.C., Fratkin, M., Rowland, J., and Nutt, M (2020), Solifluction patterns arising from competition between gravity and cohesion. Presentation at *EGU Virtual Meeting*

Glade, R.C., Shobe, C.M., Anderson, R.S., and Tucker, G.E. (2019) How do channel-hillslope feedbacks modulate river canyon evolution? Invited talk at *American Geophysical Union Fall Meeting*.

Glade, R.C., Shobe, C.M., Anderson, R.S., and Tucker, G.E. (2019), Canyon shape and erosion dynamics governed by channel-hillslope feedbacks, Poster Presentation at *CSDMS-SEN Annual Meeting*, Boulder, CO

Glade, R.C. and Anderson, R.S. (2018), From scallops to flatirons: Planview patterns in layered landscapes, Oral Presentation at *American Geophysical Union Fall Meeting*, Washington D.C.

Shobe, C.M., Glade, R.C., Anderson, R.S., and Tucker, G.E. (2018), Chaotic chasms: River canyon evolution governed by channel-hillslope feedbacks, Poster Presentation at *American Geophysical Union Fall Meeting*, Washington D.C.

Barnhart, K.R., Tucker, G.E., Doty, S., Hill, M., Rossi, M., Shobe, C.M., and Glade, R.C. (2018), Inverting topography for landscape evolution model process representation, Oral Presentation at *American Geophyscial Union Fall Meeting*, Washington D.C.

Shobe, C.M., Glade, R.C., Tucker, G.E., and Anderson, R.S. (2018) Modeling the 2-D evolution of blocky landscapes: River canyons, Poster Presentation at *CSDMS-SEN annual meeting*, Boulder, CO.

Glade, R.C., Shobe, C.M., Anderson, R.S., and Tucker, G.E. (2018) Modeling the 2-D evolution of blocky landscapes: Layered hillslopes, Poster Presentation at *CSDMS-SEN annual meeting*, Boulder, CO.

Glade, R.C., Shobe, C.M., Anderson, R.S., and Tucker, G.E. (2018) Baselevel signal propagation through a block-controlled landscape, Poster Presentation at *Coupling of Tectonic and Surface Processes Workshop*, Boulder, CO.

Glade, R.C. and Anderson, R.S. (2018), Drone photogrammetry of solifluction lobes at Niwot Ridge, Colorado, Poster Presentation at *EarthCube Advancing the Analysis of High Resolution Topography Workshop*, Broomfield, CO.

Barnhart, K.R., Tucker, G.E., Doty, S., Hill, M.C., Rossi, M.W., Shobe, C.M., and Glade, R.C. (2018) Uncertainty in the prediction of erosion on geologic time scales, Presentation at *International Environmental Modeling and Software Society annual meeting.*

Glade, R.C., Anderson, R.S. (2017), Steady evolution of hillslopes in layered landscapes: self-organization of a numerical hogback, Oral Presentation at *American Geophysical Union Fall Meeting*, New Orleans, LA.

Glade, R.C., Anderson, R.S. (2017), Legions of lobes: Self-organization of solifluction features at Niwot Ridge LTER, Oral Presentation at *Geological Society of America Meeting*, Seattle, WA.

Glade, R.C. and Anderson, R.S. (2017), Numerical modeling of hillslope evolution: Lithologic and climatic controls, Oral Presentation at *Impacts of a changing cryosphere on lakes and streams in mountain regions: US-China Workshop* Qinghai Lake, China.

Glade, R.C., Anderson, R.S., and Tucker, G.E., (2016), Hillslope evolution in landscapes dominated by layered rocks, Oral Presentation at *American Geophysical Union Fall Meeting*, San Francisco, CA.

Glade, R.C., Anderson, R.S., and Tucker, G.E., (2016), Blocks control hillslope evolution in layered landscapes, Oral Presentation at *GSA Annual Meeting*, Denver, CO.

Glade, R.C., Anderson, R.S., and Tucker, G.E., (2016), Blocks control hillslope evolution in layered landscapes, Poster Presentation at *Community Surface Dynamics Modeling System- Sediment Experimentalists Network Meeting*, Boulder, CO.

Glade, R.C., Anderson, R.S. (2015) Honoring the reality of blocky hillslopes: Case study of a vertical dike at Shiprock, New Mexico, Poster Presentation at *American Geophysical Union Fall Meeting*, San Francisco, CA.

Glade, R.C., Jerolmack, D.J., and Pelletier, J.D., (2014), Formational mechanisms and morphology of windblown coarse-grained sand ripples at White Sands, New Mexico, Poster Presentation at *American Geophysical Union Fall Meeting*, San Francisco, CA.

Glade, R.C., Grigsby, S., and Ustin, S.L., (2013), Relationships between topography and leaf area index in the Sierra Nevada Mountains, California, Poster Presentation at *American Geophysical Union Fall Meeting*, San Francisco, CA.