

CHARLES M. SHOBE

Research Geomorphologist, U.S. Forest Service Rocky Mountain Research Station
Affiliate (courtesy appointment), Colorado State University Department of Geosciences
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PROFESSIONAL EXPERIENCE

Research Geomorphologist, USFS Rocky Mountain Research Station	From July 2023
and Affiliate, Colorado State University Department of Geosciences	From Oct. 2023
Assistant Professor of Geology, West Virginia University	Dec. 2020–Jul. 2023
Marie Skłodowska-Curie postdoctoral fellow, GFZ Potsdam	Sep. 2019–Dec. 2020
Chancellor’s graduate fellow, University of Colorado	Sep. 2017–Aug. 2019
National Defense Science & Engineering graduate fellow, U. of Colorado	Sep. 2014–Aug. 2017
Interpretive park geologist, Grand Canyon National Park	May–Aug. 2014
Summer research fellow, National Oceanic and Atmospheric Administration	May–Aug. 2013
Summer research fellow, College of William & Mary	June–Aug. 2012

EDUCATION

8.25.2014–8.22.2019	Ph.D. in Geological Sciences, certificate in hydrologic sciences University of Colorado, Boulder, Colorado, USA Advisor: Dr. Gregory E. Tucker Committee: Dr. Robert S. Anderson, Dr. Jason W. Kean, Dr. Peter Molnar, and Dr. Kelin X. Whipple Thesis: <i>River erosion in block-controlled landscapes</i>
8.25.2010–5.11.2014	B.S. with high honors in Geology (<i>Magna cum laude</i>) College of William & Mary, Williamsburg, Virginia, USA Advisor: Dr. Gregory S. Hancock Honors thesis: <i>Spatially variable erodibility related to the interaction between erosion rate and weathering in bedrock channels</i>

PUBLICATIONS (25 published, 676 total citations, H-index: 14)

(*italic* is CMS postdoc advisee; **bold** is CMS graduate advisee; * is CMS undergraduate advisee,

§ is graduate student collaborator (not advisee) significantly mentored by CMS)

Published papers (bold number = citations from Google Scholar, or other source if GS misses a paper.)

25. **Colaianne, N.J.**, Shobe, C.M., Moler, J.*, Benison, K.C., and *Chilton, K.D.* (2024) Beyond boundaries: Depositional environment controls on erodibility, process, and form in rivers incising sedimentary bedrock. *Geosphere*, doi: 10.1130/GES02791.1. **0**.
24. Ryan, S.E., Shobe, C.M., Rathburn, S.L., and Dixon, M.K. (2024) Suspended-sediment response to wildfire and a major post-fire flood on the Colorado Front Range. *River Research and Applications*, 40(7), 1256–1272, doi: 10.1002/rra.4286. **2**.
23. Morey, S.M. §, Shobe, C.M., Huntington, K.W., Lang, K., Johnson, G., and Duvall, A.R. (2024) The lasting legacy of megaflood boulder deposition in mountain rivers. *Geophysical Research Letters*, 51(1), doi: 10.1029/2023GL105066. **5**.

22. **Bower, S.J., Shobe, C.M., Maxwell, A.E., and Campforts, B. (2024)** The uncertain future of mountaintop-removal-mined landscapes 2: Modeling the influence of topography and vegetation. *Geomorphology*, 446, doi: 10.1016/j.geomorph.2023.108985. **(Invited article) 0.**
21. **Shobe, C.M., Bower, S.J., Maxwell, A.E., Glade, R.C., and Samassi, N.M. (2024)** The uncertain future of mountaintop-removal-mined landscapes 1: How mining changes erosion processes and variables. *Geomorphology*, 445, doi: 10.1016/j.geomorph.2023.108984. **(Invited article) 2.**
20. Maxwell, A.E., Odom, W.E., Shobe, C.M., Doctor, D.H., Bester, M., and Ore, T. (2023) Exploring the influence of input feature space on CNN-based geomorphic feature extraction from digital terrain data. *Earth and Space Science*, 10(5), doi: 10.1029/2023EA002845. **8.**
19. Shobe, C.M. (2022) How impervious are solar arrays? On the need for geomorphic assessment of energy transition technologies. *Earth Surface Processes and Landforms*, 47(14), doi: 10.1002/esp.5489. **7.**
18. Campforts, B., Shobe, C.M., Overeem, I., and Tucker, G.E. (2022) The art of landslides: How stochastic mass wasting shapes topography and influences landscape dynamics. *Journal of Geophysical Research: Earth Surface*, 127(8), doi: 10.1029/2022JF006745. **32.**
17. Shobe, C.M., Braun, J., Yuan, X.P., Campforts, B., Gailleton, B., Baby, G., Guillocheau, F., and Robin, C. (2022) Inverting passive margin stratigraphy for marine sediment transport dynamics over geologic time. *Basin Research*, 34(6), doi: 10.1111/bre.12698. **4.**
16. Yuan, X.P., Guerit, L., Braun, J., Rouby, D., and Shobe, C.M. (2022) Thickness of fluvial deposits records climate oscillations. *Journal of Geophysical Research: Solid Earth*, 127(4), doi:10.1029/2021JB023510. **11.**
15. Maxwell, A.E. and Shobe, C.M. (2022) Land-surface parameters for spatial predictive mapping and modeling. *Earth-Science Reviews*, 226, doi:10.1016/j.earscirev.2022.103944. **49.**
14. Shobe, C.M., Turowski, J.M., Nativ, R., Glade, R.C., Bennett, G.L., and Dini, B. (2021) The role of infrequently mobile boulders in modulating landscape evolution and geomorphic hazards. *Earth-Science Reviews*, 220, doi:10.1016/j.earscirev.2021.103717. **(Invited review) 48.**
13. Shobe, C.M., Bennett, G.L., Tucker, G.E., Roback, K., Miller, S.R., and Roering, J.J. (2021) Boulders as a lithologic control on river and landscape response to tectonic forcing at the Mendocino triple junction. *Geological Society of America Bulletin*, 133(3–4), 647–662, doi:10.1130/B35385.1. **26.**
12. 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. *Journal of Geophysical Research: Earth Surface*, 125(12), doi:10.1029/2020JF005795. **10.**
11. Campforts, B., Shobe, C.M., Steer, P., Vanmaercke, M., Lague, D., and Braun, J. (2020) HyLands 1.0: a Hybrid Landscape evolution model to simulate the impact of landslides and landslide-derived sediment on landscape evolution. *Geoscientific Model Development*, 13, 3863–3886, doi:10.5194/gmd-13-3863-2020. **47.**
10. 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. *Journal of Geophysical Research: Earth Surface*, 125(11), doi:10.1029/2019JF005287. **24.**

9. 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. *Journal of Geophysical Research: Earth Surface*, 125(7), doi:10.1029/2018JF004963. **Missed by Google Scholar; 15 reported by Wiley.**
8. 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. *Journal of Geophysical Research: Earth Surface*, 125(16), doi:10.1029/2018JF004961. **36.**
7. Glade, R.C.* , Shobe, C.M.*, Tucker, G.E., and Anderson, R.S. (2019) Canyon form and erosion dynamics governed by channel-hillslope feedbacks. *Geology*, 47(7), 650–654, doi:10.1130/G46219.1. *Equal author contributions. **40.**
6. 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*, 12(4), 1267–1297, doi:10.5194/gmd-12-1267-2019. **31.**
5. Shobe, C.M., Tucker, G.E., and Rossi, M.W. (2018) Variable-threshold behavior in rivers arising from hillslope-derived blocks. *Journal of Geophysical Research: Earth Surface*, 123(8), 1931–1957, doi:10.1029/2017JF004575. **35.**
4. Gray, H.J., Shobe, C.M., Hobbey, D.E.J., Tucker, G.E., Duvall, A.R., Harbert, S.A., and Owen, L.A. (2017) Late-Quaternary off-fault deformation-rate of the southern San Andreas Fault inferred from landscape modeling of sheared drainages. *Geology*, 43(1), 59–62, doi:10.1130/G39820.1. **34.**
3. Shobe, C.M., Tucker, G.E., and Barnhart, K.R. (2017) The SPACE 1.0 model: a Landlab component for 2-D calculation of sediment transport, bedrock erosion, and landscape evolution. *Geoscientific Model Development*, 10(12), 4577–4604, doi:10.5194/gmd-10-4577-2017. **74.**
2. Shobe, C.M., Hancock, G.S., Eppes, M.C., and Small, E.E. (2017) Field evidence for the influence of weathering on rock erodibility and channel form in bedrock rivers. *Earth Surface Processes and Landforms*, 42(13), 1997–2012, doi:10.1002/esp.4163. **48.**
1. Shobe, C.M., Tucker, G.E., and Anderson, R.S. (2016) Hillslope-derived blocks retard river incision. *Geophysical Research Letters*, 43(10), 5070–5078, doi:10.1002/2016GL069262. **88.**

TECHNICAL REPORTS AND THESES

4. Martin, J.B. and CCZ-RCN Workshop Participants including Shobe, C.M. (2021) Carbonate Critical Zone Research Coordination Network Workshop Report. Karst Waters Institute Special Publication 20. Link.
3. Shobe, C.M. (2019) River erosion in block-controlled landscapes. *Ph.D. thesis*, University of Colorado. <https://tinyurl.com/ybzbqwewj>.
2. West Valley Erosion Working Group Modeling Team including Shobe, C.M. (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.
1. Shobe, C.M. (2014) Spatially variable rock erodibility related to the interaction between erosion rate and weathering in bedrock channels, Great Falls area, Virginia. *B.S. thesis with high honors*, College of William & Mary. <https://scholarworks.wm.edu/honorstheses/66/>.

POPULAR SCIENCE PUBLICATIONS

7. Shobe, C.M. (2021) “*Saving sand bars in the Grand Canyon*” in *Geobites*, the AGU geoscience communication blog.
6. Shobe, C.M. (2020) “*Building mountains*” in *Geobites*.
5. Shobe, C.M. (2020) “*Rivers underground*” in *Geobites*.
4. Shobe, C.M. (2020) “*Sediment riding on ice to the rescue of vulnerable salt marshes*” in *Geobites*.
3. Shobe, C.M. (2020) “*Do melting glaciers release extra sediment?*” in *Geobites*.
2. Shobe, C.M. (2020) “*What caused the flood that (possibly) gave rise to an empire?*” in *Geobites*.
1. Shobe, C.M. (2018) “*Can Rivers Cause Earthquakes?*” in *Scientific American Blog*.

USFS PROJECT LEADERSHIP

Year	Project title	\$
2023–2025	Lake George dam removal monitoring and analysis	\$500,000

FUNDING OBTAINED POST-PHD AND PRE-USFS

Year	Agency, total award amount (if not sole PI), and title	\$ to Shobe
2022	NSF Geomorphology and Land-use Dynamics (\$501,214) <i>Collaborative Research: Geomorphic legacy of megaflood deposits on river processes and form, Eastern Himalaya</i>	\$57,519 (co-PI)
2022	American Chemical Society Petroleum Research Fund <i>Quantifying physical versus chemical erosional fluxes from a lithologically complex source area</i>	\$110,000 (sole PI)
2022	WVU Research and Scholarship Advancement <i>How does rock strength control the shape of river channels?</i>	\$14,885 (sole PI)
2022	NASA Earth Surface and Interior (\$584,923) <i>Using NASADEM to understand feedbacks among landslides, topographic evolution, and sediment dynamics across tectonic and climatic regimes</i>	\$29,045 (co-PI)
2021	USGS State Water Resources Research Institute program <i>Modeling and measuring drivers of erosion in a sediment-impaired stream</i>	\$19,550 (lead PI)
2021	NASA WV Space Grant Consortium seed grant <i>Modeling how reforestation influences erosion on reclaimed surface mines</i>	\$9,782 (sole PI)
2019	Marie Skłodowska-Curie postdoctoral fellowship, EU Horizon 2020 <i>Modeling and inverting the deep marine sedimentary record to constrain Atlantic Passive Margin landscape evolution</i>	€162,806 (sole PI)

FUNDING OBTAINED BY MENTEES (anonymized)

2023	Geological Society of America Graduate Student Research Grant	\$1,800
2022	Geological Society of America Graduate Student Research Grant	\$1,750
2022	NASA WV Space Grant Consortium Graduate Student Fellowship	\$12,000
2022	WVU Geology Graduate Student Research Grant	\$2,416
2022	NASA WV Space Grant Consortium undergraduate scholarship	\$1,000
2021	NSF EAR Postdoctoral Fellowship	\$174,000

AWARDS TO MENTEES (anonymized)

2022	USGS Pathways graduate student summer internship
2022	Second runner up, WVU Undergraduate Research Symposium

INVITED PRESENTATIONS

- 2024 *Watershed response to mountaintop removal mining*, CO State University Civil and Env. Engineering
2024 *Watershed response to wildfire and a major post-fire flood*, Rocky Mt Hydrol Res Ctr annual meeting
2024 *Watershed response to wildfire and a major post-fire flood*, USFS RMRS Forestry Sciences Lab
2024 *How the geologic past shapes modern rivers*, CO State University Geosciences
2023 *How rivers resist erosion from reach to region*, USFS Rocky Mt Research Station Aquatic Sciences Lab
2023 *The uncertain future of landscapes subjected to mountaintop removal mining*, City College of NY
2023 *The uncertain future of landscapes subjected to mountaintop removal mining*, U. Delaware
2023 *How rivers resist erosion from reach to region*, University of Washington
2023 *Modeling and measuring erosion in a sediment-impaired stream*, WV Water Research Institute
2023 *Mountain channels and hillslopes: From process to prediction*, USFS Rocky Mt Research Station
2022 *Erodibility in bedrock rivers*, GSA fall meeting
2022 *Into the abyss: Passive margin stratigraphy reveals seascape evolution processes*, U. Cincinnati
2022 *Into the abyss: Passive margin stratigraphy reveals seascape evolution processes*, Virginia Tech
2022 *Into the abyss: Passive margin stratigraphy reveals seascape evolution processes*, U. Rochester
2022 *Into the abyss: Passive margin stratigraphy reveals seascape evolution processes*, U. Arkansas
2022 *Into the abyss: Passive margin stratigraphy reveals seascape evolution processes*, Lehigh U.
2022 *Into the abyss: Stratigraphy reveals optimal seascape evolution models*, IAG webinar
2021 *Great big boulders and the persistence of high topography*, University of Pittsburgh
2021 *Great big boulders and the persistence of high topography*, Purdue University
2021 *Panelist, panel on science communication*, AGU EPSP Connects
2020 *Linking landscape and seascape evolution at continental margins*, Old Dominion University
2020 *Boulders, river erosion, and the persistence of high topography*, West Virginia University
2019 *River erosion in block-controlled landscapes*, Université de Rennes 1
2018 *Variable thresholds in rivers: Causes and effects*, AGU fall meeting
2018 *River erosion in block-controlled landscapes*, GFZ Potsdam
2018 *Weathering, rock erodibility, and bedrock channel shape*, GFZ Potsdam
2018 *River erosion in block-controlled landscapes*, California Institute of Technology GeoClub

POSTDOCTORAL RESEARCHERS AND STUDENTS SUPERVISED

Postdoctoral researchers

2021–2023 Dr. Kristin Chilton, NSF EAR Postdoc at VA Tech and WVU

Graduate students

2022–2024 Amelia Zanoni, WVU MS Post-WVU: SC Dept of Health and Environmental Control
2022–2024 Aras Mann, WVU MS
2021–2023 Samuel Bower, WVU MS Post-WVU: Geospatial Coordinator, AtmoFacts
2021–2023 Nicholas Colaianne, WVU MS Post-WVU: PhD, University of Idaho

Graduate students (external/secondary mentor)

2024–2026 Virgil Alfred, University of Colorado MS
2021–2023 Susannah Morey, University of Washington PhD

Undergraduate students

2023 Brooke Watters, West Virginia University Research Apprenticeship program
2022–2023 Joseph Moler, West Virginia University Research Apprenticeship program
2021–2023 Isaac Miller, West Virginia University Research Apprenticeship program
2021–2023 Corey Crowder, West Virginia University Honors EXCEL program
2021–2022 Olga Hawranick, West Virginia University
2016 Taylor E. Schoenfeld, CU Research Experience for Community College Students
2015 Moana M. Sato, CU Research Experience for Community College Students

CONFERENCE SESSIONS AND WORKSHOPS CONVENED

- 2024 Co-convenor: *Science to Understand, Manage, and Restore Floodplains, Watersheds, and Aquatic Habitats* at AGU.
- 2023 Co-convenor: *Surface Processes and Relief Production in Active Orogens* at AGU.
- 2023 Co-convenor: *Integrating Science Communication, Policy, and Outreach Training into the Geoscience Classroom and Beyond* at AGU.
- 2023 Co-convenor: *Natural hazards of the evolving Appalachian mountain belt* at GSA.
- 2023 Co-convenor: *Geomorphic evolution of river corridors in the eastern United States* at GSA southeastern/northeastern section meeting.
- 2022 Co-convenor: *The influence of landslides on sediment dynamics from source to sink* at AGU.
- 2022 Co-convenor: *Reconstructing mountain belts tectonics and climate* at AGU.
- 2021 Co-convenor: *The influence of landslides on sediment dynamics from source to sink* at AGU.
- 2021 Co-convenor: *Reconstructing mountain belts tectonics and climate* at AGU.
- 2021 Co-convenor: *Advances in geomorphology: Understanding how interactions among climatic, tectonic, fluvial, and hillslope processes drive topographic change* at GSA.
- 2020 Co-convenor: *The influence of landslides on sediment dynamics from source to sink*, eLightning session at AGU.
- 2020 Lead convenor: *Closing Earth's sediment mass balance by linking continental erosion and marine deposition*, poster session at AGU.
- 2020 Lead convenor: *The science of science writing*, panel session at AGU.
- 2019 Instructor for scientific programming bootcamp, CSDMS.
- 2017 Co-convenor: *Heterogeneity in landscape evolution: Geomorphic response to spatially and temporally variable forcings*, GSA.
- 2017 Instructor: *Model sensitivity analysis and optimization with Dakota and Landlab*, CSDMS.
- 2016 Lead convenor: *Heterogeneity in geomorphology: Driving forces and landscape response*, GSA.

TEACHING EXPERIENCE

Spring 2023	West Virginia University	Geomorphology
Spring 2023	West Virginia University	Natural Disasters
Fall 2022	West Virginia University	Numerical Modeling in the Earth Sciences– graduate
Spring 2022	West Virginia University	Geomorphology
Spring 2022	West Virginia University	Advanced Fluvial Geomorphology– graduate
Fall 2021	West Virginia University	Numerical Modeling in the Earth Sciences– graduate
Spring 2021	West Virginia University	Geomorphology
Fall 2015	University of Colorado	Fluid earth (lab instructor)
Summer 2015	College of William & Mary	Field geology of California (teaching assistant)
Spring 2015	University of Colorado	Change and the global record (grader)
Summer 2014	Grand Canyon National Park	Interpretive park geologist
Spring 2012	College of William & Mary	Introductory geology lab (teaching assistant)

SERVICE TO THE COMMUNITY

- 2024– Trustee, Rocky Mountain Hydrologic Research Center
- 2024– Reviewer of GSA graduate student grant proposals
- 2023– Member of GSA publications committee
- 2022– Member of scientific steering committee for NSF Track I geohazards center
- 2019– AGU Outstanding student paper award judge
- 2020–2022 Member of Landscapes Live geomorphology seminar planning committee
- 2019–2020 Co-organizer of GFZ section 4.7 weekly seminar series
- 2016 Member of student organizing committee, GSA

REVIEWER SERVICE (65 reviews)

- 2024 *Geology* (1); *JGR Earth Surface* (4); *Communications Earth & Environment* (3); *Earth Surf. Proc. Land.* (1); NSF Geomorphology and Landuse Dynamics (1); NSF Environmental Sustainability (1); *J. Ecohydraulics* (1); *Earth and Space Science* (1); *Earth Surf. Dyn.* (1)
- 2023 *Earth's Future* (1); *Earth Surf. Dyn.* (1); NSF Geomorphology and Landuse Dynamics (2); *J. Hydrology* (1); *Science Advances* (3); *Basin Res.* (2); *Earth Surf. Proc. Land.* (1); USGS internal review (1); U.S. Army Research Office (1); *JGR Earth Surface* (1)
- 2022 *Science Advances* (1); *Earth's Future* (1); Swiss National Science Foundation (1); *JGR Biogeo.* (1); *Aus. J. Earth Sci.* (1); *Earth Surf. Dyn.* (2); *Earth Surf. Proc. Land.* (1); *Int. J. Speleology* (2); *Env. Earth Sci.* (1); *Geology* (1); *J. Hydrology* (1)
- 2021 *Geophys. Res. Lett.* (1); *Env. Earth Sci.* (1); *Water Resour. Res.* (1); *Geology* (1); NSF Geomorphology and Landuse Dynamics (1); *Catena* (1); *JGR Earth Surface* (1); *JGR Biogeo.* (1)
- 2020 *Geomorphology* (1); *Water Resour. Res.* (1); NSF Geomorphology and Landuse Dynamics (1); *Geophys. Res. Lett.* (2); *Earth Surf. Proc. Land.* (1); *Earth Surf. Dyn.* (2); *JGR Earth Surface* (1); *J. Open Source Software* (1)
- 2019 *Earth Surf. Dyn.* (1); *Earth Surf. Proc. Land.* (1)
- 2018 *Water Resour. Res.* (3)
- 2017 *JGR Earth Surface* (1)

OUTREACH

- 2024 Delivered “Lunch and Learn” seminar for congressional staffers
- 2020–2022 Co-editor-in-chief of *Geobites*, the AGU geoscience communication blog
- 2016–2019 Boulder Valley School District high school science fair judge

PRESS AND QUOTATIONS

- 2024 *River habitat thrives following Eleven Mile Canyon dam removal* *Fairplay Flume*
- 2024 *Researchers find dam removal in Eleven Mile Canyon already a boon to fish* *Colorado Springs Gazette*
- 2023 *One surface model to rule them all?* *AGU's EOS*
- 2023 *Posts misleadingly share Ohio River footage after train derailment* *AFP Fact Check*
- 2021 *WVU faculty receive \$125,000 to tap into water research issues* *Morgantown Dominion Post*

PROFESSIONAL MEMBERSHIPS

American Geophysical Union, Geological Society of America, European Geosciences Union, Community Surface Dynamics Modeling System

CONFERENCE PRESENTATIONS (43 first author, 55 co-author)

(*italic* is CMS postdoc advisee; **bold** is CMS graduate advisee; * is CMS undergraduate advisee, § is graduate student collaborator (not advisee) significantly mentored by CMS)

98. Vesper, D.J., **Zanoni, A.J.**, Watters, B.*, and Shobe, C.M. (2025) Water chemistry in small mixed-lithology catchments in the Valley and Ridge province. Abstract to GSA joint Northeastern and North-Central section meeting.
97. *Chilton, K.D.*, Zedan, M., Strom, K., and Shobe, C.M. (2024) Dip angle controls on plucking dynamics and knickpoint evolution in bedrock rivers. Talk at AGU annual meeting.
96. Morey, S.M.§, Huntington, K., Lang, K., and Shobe, C.M. (2024) Beyond erosion: The depositional power of megafloods to shape mountain landscapes. Talk at AGU annual meeting. (**Invited**)

95. Shobe, C.M., Ryan, S.E., Rathburn, S.L., Dixon, M.K., Fegel, T., and Rhoades, C.C. (2024) Suspended-sediment response to wildfire and a major post-fire flood. Poster at AGU annual meeting.
94. Shobe, C.M. and Scott, D. (2024) Modeling how large wood influences bifurcation potential in gravel-bed rivers. Poster at AGU annual meeting.
93. Walker, M.[§], Hessel, A., Shobe, C.M., Andreu-Hayles, L., Nachin B., Suran, B., Dey, L., and Byambasuren, O. (2024) Reconstructing extreme ¹⁴C production events using tree rings: Does tree physiology affect estimates of atmospheric ¹⁴C? Poster at AGU annual meeting.
92. Vesper, D.J., **Zanoni, A.J.**, Watters, B.* , and Shobe, C.M. (2024) Comparison of water chemistry for 30 catchments in the Valley and Ridge province. Poster at Appalachian Karst Symposium.
91. Huntington, K.W., Morey, S.M.[§], Lang, K.A., Shobe, C.M., Turzewski, M., Mangipudi, M., Johnson, A.G., Loreen, C., Nath, S., Montgomery, D.R., and Duvall, A.R. (2024) Geomorphic legacy of megaflood deposition in mountain rivers, eastern Himalaya. Talk at GSA annual meeting.
90. Covington, M., Shobe, C.M., Luhmann, A.J., Abolins, M., Noble, M., Oleson, E., Gao, Y., and Ye, M. (2024) Exploring the controls of karstification by analyzing karst surface drainage across the United States. Talk at GSA annual meeting. **(Invited)**
89. Morey, S.M.[§], Shobe, C.M., Huntington, K.W., Lang, K., Johnson, G., and Duvall, A.R. (2024) The lasting legacy of megaflood boulder deposition in mountain rivers. Poster at CSDMS annual meeting.
88. *Chilton, K.D.*, Strom, K.B., and Shobe, C.M. (2024) The impact of discontinuity orientation on fluvial erosion and evolution: modeling Valley and Ridge bedrock rivers inside a flume. Talk at GSA Southeastern section meeting.
87. Shobe, C.M., **Bower, S.J.**, Maxwell, A.E., Glade, R.C., Samassi, N.M., and Campforts, B. (2023) The uncertain future of mountaintop-removal-mined landscapes. Poster at AGU annual meeting.
86. Nath, S., Lang, K., Morey, S.M.[§], Turzewski, M., Shobe, C.M., Larsen, I.J., and Huntington, K.W. (2023) Observations of outburst flood deposits along the Siang River, eastern Himalaya. Poster at AGU annual meeting.
85. Morey, S.M.[§], Shobe, C.M., Huntington, K.W., Lang, K., Johnson, G., and Duvall, A.R. (2023) The lasting legacy of megaflood boulder deposition: considering the longterm impact of megafloods on mountain rivers. Talk at AGU annual meeting. **(Invited)**.
84. **Zanoni, A.**, Shobe, C.M., Vesper, D.J., and Watters, B.* (2023) Quantifying chemical erosion in the lithologically heterogenous Appalachian Valley and Ridge. Poster at GSA annual meeting.
83. **Mann, A.A.**, Crowder, C.A.* , Miller, I.N.* , Shobe, C.M., and Russoniello, C.R. (2023) (Non-)recovery of an agricultural stream from straightening and dredging. Poster at GSA annual meeting.
82. **Colaianne, N.J.**, Shobe, C.M., Moler, J.* , Benison, K., and *Chilton, K.D.* (2023) Lithologic controls on bedrock channel form from the micron to meter scale. Talk at GSA annual meeting.
81. Shobe, C.M., Morey, S.M.[§], Huntington, K.W., Lang, K., Johnson, G., and Duvall, A.R. (2023) The lasting legacy of megaflood boulder deposition in mountain rivers. Talk at GSA annual meeting.
80. Shobe, C.M., **Bower, S.J.**, Maxwell, A.E., and Campforts, B. (2023) Past and future shaping of mountaintop-removal-mined landscapes by gullying. Poster at GSA annual meeting.

79. Lang, K., Nath, S., Morey, S.M.[§], Turzewski, M., Shobe, C.M., and Huntington, K.W. (2023) Observations of flood deposits along the Siang River, eastern Himalaya. Poster at the megafloods Penrose conference.
78. Morey, S.M.[§], Shobe, C.M., Huntington, K.W., Lang, K., Johnson, G., and Duvall, A.R. (2023) Bould(er) Implications: the geomorphic legacy of megaflood deposition on river processes and form. Poster at the megafloods Penrose conference.
77. Huntington, K.W., Morey, S.[§], Lang, K., Shobe, C.M., Turzewski, M., Mangipudi, M., Johnson, G., Loreen, C., Montgomery, D., Licht, A., and Duvall, A.R. (2023) The legacy of megaflood erosion and deposition from mountain source to sink, Eastern Himalaya. Talk at the megafloods Penrose conference. **(Invited)**.
76. Campforts, B., Duvall, A.R., Shobe, C.M., Tucker, G.E., and Overeem, I. (2023) Are spatial and temporal patterns of landslide triggering events reflected in topography and sediment dynamics? Talk at EGU annual meeting. **(Invited)**.
75. Vrouwenfelder, K.T., Shobe, C.M., Moerchen, M., and Giampoala, M. (2023) Geobites: 3 Years of Science Communication Training in Practice. Talk at EGU annual meeting.
74. Maxwell, A.E., Odom, W.E., Doctor, D.H., and Shobe, C.M. (2023) Feature space considerations for geomorphic deep learning using digital terrain variables. Talk at GSA NE/SE section meeting.
73. Chilton, K.D., Strom, K.B., and Shobe, C.M. (2022) Investigating the impact of discontinuity orientation on fluvial bedrock erodibility and landscape evolution. Poster at American Geophysical Union annual meeting.
72. Shobe, C.M., Braun, J., Yuan, X.P., Campforts, B., Gailleton, B., Baby, G., Guillocheau, F., and Robin, C. (2022) Deciphering passive margin stratigraphy to reveal seascape evolution processes. Poster at American Geophysical Union annual meeting.
71. Morey, S.[§], Shobe, C.M., Huntington, K.W., Lang, K.A., Johnson, G., and Duvall, A.R. (2022) The geomorphic legacy of megaflood derived boulders on river processes and form. Poster at American Geophysical Union annual meeting. **(Invited)**.
70. Campforts, B., Shobe, C.M., Overeem, I., and Tucker, G.E. (2022) Landsliding sustains persistent ridge and valley migration in mountainous terrain. Poster at American Geophysical Union annual meeting.
69. Crowder, C.A.* , Miller, I.N.* , Shobe, C.M., and Russoniello, C.J. (2022) Monitoring erosion in a straightened and dredged agricultural stream. Poster at Geological Society of America annual meeting.
68. Chilton, K.D., Strom, K.B., and Shobe, C.M. (2022) Using flume experiments to test the influence of discontinuity orientation on fluvial bedrock erodibility. Talk at Geological Society of America annual meeting.
67. **Colaianne, N.J.**, Shobe, C.M., and Chilton, K.D. (2022) Comparing modeled and measured channel geometry: Implications for the role of bedrock properties. Poster at Geological Society of America annual meeting.
66. **Bower, S.J.**, Shobe, C.M., Maxwell, A.E., and Campforts, B. (2022) Modeling the influence of vegetation and soil properties on the surface evolution of mined lands. Poster at Geological Society of America annual meeting.

65. Campforts, B., Shobe, C.M., Overeem, I., and Tucker, G.E. (2022) The role of landslides in shaping topography and controlling sediment dynamics. Talk at Geological Society of America annual meeting. **(Invited)**.
64. Shobe, C.M., **Colaianne, N.J.**, and *Chilton, K.D.* (2022) Erodibility in bedrock rivers: A tricky mix of material properties and internal landscape dynamics. Talk at Geological Society of America annual meeting. **(Invited)**.
63. Shobe, C.M., Braun, J., Yuan, X.P., Campforts, B., Gailleton, B., Baby, G., Guillocheau, F., and Robin, C. (2022) Into the abyss: Passive margin stratigraphy reveals seascape evolution processes. Talk at Geological Society of America annual meeting.
62. Shobe, C.M., Braun, J., Yuan, X.P., Campforts, B., Gailleton, B., Baby, G., Guillocheau, F., and Robin, C. (2022) Inverting passive margin stratigraphy for marine sediment transport dynamics over geologic time. Poster at Community Surface Dynamics Modeling System annual meeting.
61. Huntington, K.W., Morey, S.[§], Turzewski, M., Lang, K., Mueller, M., Montgomery, D., Licht, A., Goodbred, S., Pickering, J., Diamond, M., and Shobe, C.M. (2021) Impact of Tibetan lake outburst floods on erosion, morphology, and sedimentary record of the eastern Himalaya from source to sink. Oral presentation at American Geophysical Union annual meeting. **(Invited)**.
60. Campforts, B., Shobe, C.M., Overeem, I., and Tucker, G.E. (2021) How do landslides alter landscape evolution? Insights from numerical experiments and topographic analysis. Oral presentation at American Geophysical Union annual meeting.
59. Glade, R.C., Shobe, C.M., Turowski, J.M., Nativ, R., Bennett, G.L., and Dini, B. (2021) Progress in boulder-mantled landscapes: A Sisyphean challenge. Poster presentation at American Geophysical Union annual meeting.
58. Shobe, C.M., Campforts, B., and **Bower, S.J.** (2021) The uncertain future of landscapes subjected to mountaintop removal mining. Oral presentation at Geological Society of America annual meeting.
57. Shobe, C.M., Turowski, J.M., Nativ, R., Glade, R.C., Bennett, G.L., and Dini, B. (2021) Great big boulders and landscape self-organization. Poster presentation at Geological Society of America annual meeting.
56. Shobe, C.M., Braun, J., Yuan, X.P., Campforts, B., Baby, G., Guillocheau, F., and Robin, C. (2021) Inversion of marine stratigraphy for optimal seascape evolution model structure and parameters. Remote poster at Community Surface Dynamics Modeling System annual meeting.
55. Shobe, C.M., Braun, J., Yuan, X.P., Campforts, B., Baby, G., Guillocheau, F., and Robin, C. (2020) Inverting stratigraphy for marine sediment transport dynamics over geologic time: Examples from the Orange Basin, southern Africa. Remote poster at American Geophysical Union annual meeting.
54. Campforts, B., Shobe, C.M., Overeem, I., Vanmaercke, M., Hutton, E.W.H., Braun, J., and Tucker, G.E. (2020) The impact of landslides on sediment dynamics, fluvial bedrock incision and steady-state topography. Remote poster at American Geophysical Union annual meeting.
53. Yuan, X.P., Guerit, L., Braun, J., Rouby, D., and Shobe, C.M. (2020) Fluvial cut-and-fill terraces record climate oscillations. Remote poster at American Geophysical Union annual meeting.
52. Tucker, G.E., Barnhart, K.R., Doty, S.G., 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. Remote talk at American Geophysical Union annual meeting.

51. Barnhart, K.R., Tucker, G.E., Doty, S.G., Glade, R.C., Shobe, C.M., Rossi, M.W., and Hill, M.C. (2020) Lessons and challenges in reproducible computational research from the development and application of landscape evolution models to waste site remediation. Remote poster at American Geophysical Union annual meeting. **(Invited)**.
50. Shobe, C.M., Vrouwenvelder, K.T., Moerchen, M., and Giampoala, M. (2020) Geobites: Grass-roots training for the next generation of geoscience writers. Remote poster at American Geophysical Union annual meeting.
49. Shobe, C.M., Braun, J., Yuan, X.P., Campforts, B., Baby, G., Guillocheau, F., and Robin, C. (2020) Refining predictive models for passive margin stratigraphy by inverting the sedimentary record. Remote talk at Geological Society of America annual meeting.
48. Shobe, C.M., Bennett, G.L., Tucker, G.E., Roback, K., Miller, S.R., and Roering, J.J. (2020) Disassembling California: Does lithology-dependent boulder delivery to rivers influence landscape response to tectonics? Remote talk at Geological Society of America annual meeting.
47. Campforts, B., Shobe, C.M., Hutton, E.W.H., and Tucker, G.E. (2020) Will it slide? Explicit integration of landslides and sediment dynamics in Landlab. Remote talk at International Environmental Modelling and Software Society annual meeting.
46. Shobe, C.M., Braun, J., Yuan, X.P., Campforts, B., Guillocheau, F., and Robin, C. (2020) Toward a unified model for sediment transport from terrestrial source to abyssal-plain sink. Virtual display at European Geosciences Union annual meeting.
45. Campforts, B., Shobe, C.M., Steer, P., Lague, D., Vanmaercke, M., and Braun, J. (2020) To slide or not to slide: explicit integration of landslides and sediment dynamics in a landscape evolution model. Virtual display at European Geosciences Union annual meeting.
44. Glade, R.C., Shobe, C.M., Anderson, R.S., and Tucker, G.E. (2020) River canyon evolution governed by autogenic channel-hillslope feedbacks. Virtual display at European Geosciences Union annual meeting. **(Invited)**.
43. Shobe, C.M., Vrouwenvelder, K.T., Moerchen, M., and Giampoala, M. (2020) Geobites: Down-to-earth summaries of new geoscience research for a broad audience. Virtual display presented at European Geosciences Union annual meeting.
42. Shobe, C.M., Bennett, G.L., Tucker, G.E., Roback, K., Miller, S.R., and Roering, J.J. (2019) Disassembling California: Boulders as a lithologic control on river and landscape evolution at the Mendocino triple junction. Oral presentation at American Geophysical Union annual meeting.
41. Glade, R.C., Shobe, C.M., Anderson, R.S., and Tucker, G.E. (2019) How do channel-hillslope feedbacks modulate river canyon evolution? Oral presentation at American Geophysical Union annual meeting. **(Invited)**
40. Barnhart, K.R., Tucker, G.E., Doty, S.G., Shobe, C.M., Glade, R.C., Rossi, M.W., and Hill, M.C. (2019) The importance and challenge of thresholds in calibrating landscape evolution models. Oral presentation at American Geophysical Union annual meeting.
39. Bennett, G.L., Shobe, C.M., Tucker, G.E., Roback, K., Miller, S.R., and Roering, J.J. (2019) Boulder prevalence as a basin-scale lithologic control on river and landscape evolution in northern California, USA. Oral presentation at British Society for Geomorphology annual meeting.
38. Tucker, G.E., Barnhart, K.R., Doty, S.G., Glade, R.C., Hill, M.C., Rossi, M.W., and Shobe, C.M. (2019) Testing long-term channel network incision models using a natural experiment in post-glacial landscape evolution. Oral presentation at River, Coastal, and Estuarine Morphodynamics Symposium.

37. Barnhart, K.R., Glade, R.C., Shobe, C.M., and Tucker, G.E. (2019) Multi-model comparison in long-term drainage evolution: Introducing terrainbento 1.0. Oral presentation at River, Coastal, and Estuarine Morphodynamics Symposium.
36. Barnhart, K.R., Tucker, G.E., Doty, S., Glade, R.C., Shobe, C.M., Rossi, M.W., and Hill, M.C. (2019) Projections of erosion for a temperate watershed on a 10,000 year timescale. Oral presentation at the Goldschmidt conference.
35. Shobe, C.M., Bennett, G.L., Tucker, G.E., Roback, K., Miller, S.R., and Roering, J.J. (2019) Assessing basin-scale lithologic controls on river and landscape evolution. Poster presented at Community Surface Dynamics Modeling System annual meeting.
34. Glade, R.C., Shobe, C.M., Anderson, R.S., and Tucker, G.E. (2019) Canyon evolution governed by channel-hillslope feedbacks. Poster presented at Community Surface Dynamics Modeling System annual meeting.
33. Barnhart, K.R., Glade, R.C., Shobe, C.M., and Tucker, G.E. (2019) terrainbento 1.0: a multi-model package for long-term drainage basin evolution. Poster presented at Community Surface Dynamics Modeling System annual meeting.
32. Shobe, C.M., Glade, R.C., Anderson, R.S., and Tucker, G.E. (2019) Chaotic chasms: River canyon evolution governed by channel-hillslope feedbacks. Oral presentation at CU Hydrologic Sciences Symposium.
31. Shobe, C.M., Tucker, G.E., and Rossi, M.W. (2018) Variable thresholds in rivers: Causes and effects. Oral presentation at American Geophysical Union annual meeting. **(Invited)**
30. Shobe, C.M., Glade, R.C., Tucker, G.E., and Anderson, R.S. (2018) Chaotic chasms: Canyon evolution governed by autogenic channel-hillslope feedbacks. Poster to be presented at American Geophysical Union annual meeting.
29. Barnhart, K.R., Tucker, G.E., Doty, S., Hill, M.C., Rossi, M.W., Shobe, C.M., and Glade, R.C. (2018) Inverting topography for landscape evolution model process representation. Oral presentation at American Geophysical Union annual meeting.
28. 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. Oral presentation at International Environmental Modeling and Software Society annual meeting.
27. Shobe, C.M. and Glade, R.C. (2018) Modeling the 2-D evolution of blocky landscapes: Hillslope-channel interactions. Poster presented at Community Surface Dynamics Modeling System annual meeting.
26. Glade, R.C. and Shobe, C.M. (2018) Modeling the 2-D evolution of blocky landscapes: Coupled model design. Poster presented at Community Surface Dynamics Modeling System annual meeting.
25. Bennett, G.L. and Shobe, C.M. (2018) The constant struggle between earthflows and rivers in northern California. Oral presentation at European Geosciences Union annual meeting.
24. Shobe, C.M., Tucker, G.E., and Barnhart, K.R. (2018) Exploring river response to tectonic perturbations with the open source 2-D SPACE model. Poster presented at Coupling of Tectonic and Surface Processes Workshop.
23. Glade, R.C. and Shobe, C.M. (2018) Baselevel signal propagation through a block-controlled landscape. Poster presented at Coupling of Tectonic and Surface Processes Workshop.

22. Shobe, C.M., Tucker, G.E., and Rossi, M.W. (2017) The influence of hillslope-derived blocks on erosion rate-channel steepness scaling: Emergence of variable threshold behavior. Oral presentation at American Geophysical Union annual meeting.
21. Shobe, C.M., Tucker, G.E., and Rossi, M.W. (2017) Variable thresholds in mountain rivers imposed by hillslope-derived blocks. Oral presentation at Geological Society of America annual meeting.
20. Shobe, C.M., Tucker, G.E., and Barnhart, K.R. (2017) Exploring river response to tectonic perturbations with the open source 2-D SPACE model. Poster presented at Geological Society of America annual meeting.
19. Hancock, G.S., Shobe, C.M., Eppes, M.C., and Small, E.E. (2017) Field evidence for the influence of weathering on rock erodibility and channel form in bedrock rivers. Oral presentation given at Geological Society of America annual meeting.
18. Tucker, G.E., Barnhart, K.R., Glade, R.C., Shobe, C.M., Doty, S.G., and Hill, M.C. (2017) Using a natural experiment in post-glacial landscape evolution as a testbed for comparing alternative geomorphic model formulations. Oral presentation at CUAHSI Conference on Hydroinformatics.
17. Shobe, C.M., Tucker, G.E., and Rossi, M.W. (2017) Hillslope-derived blocks, erosion thresholds, and topographic scaling in mountain rivers. Poster presented at Community Surface Dynamics Modeling System annual meeting.
16. Shobe, C.M., and Tucker, G.E. (2016) When hillslope-derived blocks alter river evolution: A sensitivity analysis. Poster presented at American Geophysical Union annual meeting.
15. Hancock, G.S., Huettenmoser, J., Shobe, C.M., and Eppes, M.C. (2016) Rock erodibility as a dynamic variable driven by the interplay between erosion and weathering in bedrock channels: Examples from Great Falls, Virginia, USA. Poster presented at American Geophysical Union annual meeting.
14. Shobe, C.M., and Tucker, G.E. (2016) Experimental study of the influence of large blocks on fluvial response to base level fall. Oral presentation given at Geological Society of America annual meeting.
13. Schoenfeld, T.E.*, Shobe, C.M., and Tucker, G.E. (2016) Processes affecting spatial variability in sediment size at Chalk Creek, Colorado. Poster presented at Geological Society of America annual meeting.
12. Shobe, C.M., Tucker, G.E., and Anderson, R.S. (2016) Dynamic feedbacks between hillslope-derived blocks and transient channel evolution. Poster presented at Binghampton Geomorphology Symposium.
11. Shobe, C.M., Tucker, G.E., and Anderson, R.S. (2016) Boulders and bedrock: Modeling dynamic feedbacks between hillslope-derived blocks and transient channel evolution. Poster presented at CSDMS annual meeting.
10. Shobe, C.M., Tucker, G.E., and Anderson, R.S. (2016) Big blocks and river incision: A numerical modeling perspective. Oral presentation given at CU Hydrologic Sciences Symposium.
9. Shobe, C.M., Tucker, G.E., and Anderson, R.S. (2015) Big blocks and river incision: A numerical modeling perspective. Poster presented at American Geophysical Union annual meeting.
8. Sato, M.M.*, Shobe, C.M., and Tucker, G.E. (2015) The influence of hillslope steepness on sediment supply size distribution along rivers draining the Colorado Front Range. Poster presented at American Geophysical Union annual meeting.

7. Shobe, C.M., Sato, M.M.* , and Tucker, G.E. (2015) Bigger than bedload: Size distribution, residence time, and channel evolution implications for bedrock blocks in rapidly incising rivers. Poster presented in awards session, Geological Society of America annual meeting.
6. Shobe, C.M., and Tucker, G.E. (2015) How might sediment size heterogeneity inhibit river incision? Oral presentation given at Geological Society of America annual meeting.
5. Shobe, C.M., Hancock, G.S., Eppes, M.C., and Small, E.E. (2015) Evaluating the influence of feedbacks between erosion rate and weathering on the distribution of erodibility in bedrock river channels. Poster presented at Geological Society of America annual meeting.
4. Shobe, C.M., Tucker, G.E., and Anderson, R.S. (2015) A new framework for modeling the effects of sediment size distribution on fluvial erosion: Theory and a case study. Poster presented at the Summer Institute for Earth Surface Dynamics.
3. Shobe, C.M., Hancock, G.S., Eppes, M.C., and Small, E.E. (2014) The influence of weathering on the spatial distribution of erodibility in bedrock river channels. Oral presentation given at Geological Society of America annual meeting.
2. Shobe, C.M., Kee, S.C., and Hancock, G.S. (2014) Spatially variable rock erodibility in bedrock channels undergoing transient response to base level change, Great Falls area, Virginia. Poster presented at Geological Society of America southeastern section meeting.
1. Shobe, C.M., Hancock, G.S., and Small, E.E. (2013) Spatially variable rock erodibility related to the interaction between erosion rate and weathering in bedrock-floored channels, Great Falls area, Virginia. Poster presented at Geological Society of America annual meeting.