

Jill Ann Marshall

Department of Geosciences

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EDUCATION

- Ph.D. 2015 **University of Oregon**, Geosciences
Dissertation topic: *Lithologic, climatic, and biotic vs. abiotic controls on erosion and landscape evolution*. Research advisor: Dr. Joshua J. Roering
- M.S. 2009 **San Francisco State University**, Geosciences
Thesis title: *Lithologic, topographic and climatic controls on grain size distribution of hillslope sediments*. Research advisor: Dr. Leonard S. Sklar
- B. S. 1995 **California State University Hayward**, Earth and Environmental Sciences
Areas of Concentration: Hydrology, Environmental Geology

RESEARCH AND TEACHING INTERESTS

Quantitative geomorphology, the mechanics of climatic, lithologic, biotic and abiotic controls on geomorphology and Critical Zone processes, paleoclimate influence on modern Critical Zone architecture, periglacial landscapes in a warming world, landscape evolution modeling, lidar analysis, making space for interdisciplinary science conversations and practice, applied watershed science

EMPLOYMENT

- 2017-present Assistant Professor, Department of Geosciences & Environmental Dynamics Program, University of Arkansas, Fayetteville AR
- 2015-2017 National Science Foundation EAR Postdoctoral Fellow, University of CA, Berkeley, CA and University of Colorado, Boulder, CO
- 2010 – 2015 Graduate Teaching & Research Fellow, University of Oregon, Eugene OR
- 2000 - 2009 Geomorphologist/Engineering Geologist, California Water Quality Control Board, Oakland CA, (variable time)
- 2000 - 2005 River Science Coordinator, California Bay Delta Program (CALFED) Science Program (USGS-position), Sacramento CA (variable time)
- 1999 - 2000 Fluvial Geomorphologist, Urban Creeks Council, Berkeley CA
- 1994 - 1999 Engineering Geologist/Environmental Specialist, California Water Quality Control Board, Oakland CA

FELLOWSHIPS

- 2015 National Science Foundation EAR Postdoctoral Research Fellow, 2015-2017

SELECTED HONORS AND AWARDS

- 2020-2021 Robert C. and Sandra Conner Endowed Faculty Fellowship, University of Arkansas
- 2018 American Geophysical Union, Luna B. Leopold Early Career Award
- 2015 Thayer Geomorphology Award, Department of Geological Sciences, University of Oregon
- 2014 Service Award, Department of Geological Sciences, University of Oregon
- 2009 Weiser Scholarship, Department of Geosciences, University of Oregon
- 2008 SFSU Graduate Student Representative to CSU-wide research competition
- 2007 National Center for Airborne Laser Mapping, Graduate Student Seed LiDAR
- 2007 Outstanding Student Presentation Award, American Geophysical Union Fall Meeting

PEER-REVIEWED PUBLICATIONS

13. **Marshall, J.A.**, J.J. Roering, J.J., A. W. Rempel, S.L. Shafer, P.J. Bartlein, (2021). Extensive frost weathering across unglaciated North America during the Last Glacial Maximum. *Geophysical Research Letters*, doi:10.1029/2020GL090305
12. Schachtman, N.S., J.J. Roering, **J.A. Marshall**, D.G. Gavin, and D.E. Granger, (2019), The interplay between physical and chemical erosion over interglacial-glacial cycles, *Geology*, doi:10.1130/G45940.1
11. Brantley, S.L., D.M. Eissenstat, **J.A. Marshall**, S.E. Godsey, Z. Balogh-Brunstad, D.L. Karwan, S.A. Papuga, J. Roering, T.E. Dawson, J. Evaristo, O. Chadwick, J.J. McDonnell, and K.C. Weathers, (2017), On the roles trees play in building and plumbing the Critical Zone, *Biogeosciences*, doi:10.5194/bg-2017-61.
10. Wymore, A. S., N. R. West, K. Maher, P. L. Sullivan, A. Harpold, D. Karwan, **J. A. Marshall**, J. Perdrial, D. M. Rempe and L. Ma, (2017), Growing New Generations of International Critical Zone Scientists, *Earth Surface Processes and Landforms*.
9. **Marshall, J.A.**, J.J. Roering, D. Granger, and D.G. Gavin, (2017), Late Pleistocene climate controls on erosion in western Oregon, *Geological Society of America Bulletin*, doi: 10.1130/B31509.1.
8. Rempel, A.W., **J.A. Marshall**, and J.J. Roering, (2016), Modeling relative frost weathering rates at geomorphic scales, *Earth and Planetary Science Letters*, doi:10.1016/j.epsl.2016.08.019.
7. Sklar, L.S., C.S. Riebe, **J.A. Marshall**, J. Genetti, S. Leclere, C.L. Lukens, V. Merces, (2016), The problem of predicting the particle size distribution of sediment supplied by hillslopes to rivers, *Geomorphology*, 2016 Binghamton Symposium, "Connectivity in Geomorphology", doi: 10.1016/j.geomorph.2016.05.005
6. **Marshall, J.A.**, J.J. Roering, P.J. Bartlein, D.G. Gavin, D.E. Granger, A.W. Rempel, S. Praskievicz, T.C. Hales, (2015), Seeing frost for the trees: Did climate increase erosion in unglaciated landscapes during the Late Pleistocene? *Science Advances*, doi: 10.1126/sciadv.1500715
5. Harpold, A.A., **J.A. Marshall**, S.W. Lyon, T.B. Barnhart, B.A. Fisher, M. Donovan, K. M. Brubaker, . . . N. West. (2015) Laser vision: lidar as a transformative tool to advance critical zone science: *Hydrology and Earth System Sciences*, v. 19, p. 2881–2897, doi: 10.5194/hess-19-2881-2015.
4. **Marshall, J.A.**, and J.J. Roering (2014), Diagenetic variation in the Oregon Coast Range: Implications for rock strength, soil production, hillslope form, and landscape evolution, *Journal of Geophysical Research - Earth Surface*, 119, 1395–1417, doi: 10.1002/2013JF003004.
3. Roering, J.J., B.H. Mackey, **J.A. Marshall**, K. Sweeney, A.M. Booth, N. Deligne, A.M. Handwerger, and C. Cerovski-Darriau, (2013), 'You are HERE': Connecting the dots with airborne lidar for geomorphic fieldwork, *Geomorphology*, 2012 Binghamton Symposium, "The Field Tradition in Geomorphology", doi: 10.10106/j.geomorph.2013.04.009.
2. **Marshall, J.A.** and L.S. Sklar (2012), Mining soil databases for landscape-scale patterns in the abundance and size distribution of hillslope rock fragments, *Earth Surface Processes and Landforms*, 37(3), 287-300, doi: 10.1002/esp.2241.
1. Roering, J., **J. Marshall**, A.M. Booth, M. Mort, and Q. Jin (2010), Evidence for biotic controls on topography and soil production, *Earth and Planetary Science Letters*, v. 298, p. 183-190, doi: 10.1016/j.epsl.2010.07.040.
(Awarded the G.K. Gilbert Award for Excellence in Geomorphic Research, American Assoc. of Geographers, 2011)

IN REVIEW

- Chen, H., J. B. Shaw, G. R. Sharman and **J. A. Marshall**, (in review), Significant Human Modification of the Lower Arkansas River Sediment Budget, *Geology*
- Palucis, M. C., A.M. Morgan, J. V. Strauss, F. Rivera-Hernandez, **J. A. Marshall**, E. Menio*, and R. Miller, (in review), Rates and processes controlling periglacial alluvial fan formation: Implications for martian fans, *Geological Society of America Bulletin*

IN PREP (SUBMIT WITHIN THE NEXT THREE MONTHS)

- Merritts, D. J., **J. A. Marshall**, R. C. Walter, M. A. Rahnis, N. Hertzler, J. Ruck, M. Demitroff, E. Gross, S. Alter, A. Blair, K. Schulte, S. Huot, L. B. Corbett, P. Bierman, M.W. Caffee, (*in prep*), Evidence of permafrost, permafrost thaw, and intense frost action south of the LGM ice margin, eastern US (scheduled for *Geology*, February 2022)
- Marshall, J.A.**, R.S. Anderson, T.E. Dawson, W.E. Dietrich (*in prep*) The wind in the trees and implications for rock damage leading to soil production, (scheduled for *Earth Surface Dynamics*, March 2022)

CHAPTERS IN BOOKS

- Marshall, J. A.**, P. DeVries, and N. Milner (2008), *Spawning habitat remediation as part of national and regional scale programs to recover declining salmonid populations* (pp 275 – 300), in *Salmon spawning habitat in rivers: physical controls, biological responses and approaches to remediation*, edited by P. DeVries and D. Sears, American Fisheries Society, Symposium 65. Bethesda, MD.

OTHER PUBLICATIONS

- Sullivan PL, Wymore AS, McDowell WH, et al. (2017). New Opportunities for Critical Zone Science. 2017 CZO Arlington Meeting White Booklet (one of 51 other contributors.) White paper was based on findings presented at the 2017 national CZO meeting, focusing on cutting-edge research by early career scientists. <http://criticalzone.org/national/publications/pub/sullivan-wymore-mcdowell-et-al-2017-new-opportunities-for-critical-zone-sci/>
- Marshall, J. A.**, Roering, J. J., Shafer, S. L., Bartlein, P. J., Rempel, A. (2020). Modeled values for predicted frost weathering across North America 21 ka based on CMIP5/PMIP climate simulations. https://figshare.com/articles/dataset/Modeled_values_for_predicted_frost_weathering_across_North_America_21_ka_based_on_CMIP5_PMIP_climate_simulations/12786638
- Marshall, J.A.**, C. Cerovski-Darriau, and J.J. Roering (2016), Smoothed lidar-derived bare-earth DEM and gradient geotiffs, Little Lake, OR, USA, doi: 10.6084/m9.figshare.3545114.v2.
- Harpold, A.A., S.W. Lyon, and **J.A. Marshall** (2014), Using lidar to advance critical zone science, *Eos, Transactions American Geophysical Union*, 95(40), 364-364.
- Marshall, J.**, prepared for The California Regional Water Quality Control Board San Francisco Region, (2007) *Basin Plan Amendment, Amending Mercury Water Quality Objectives in Walker Creek and Soulajule Reservoir and their Tributaries and Incorporating a Total Maximum Daily Load and Implementation Plan to Reduce Mercury in the Walker Creek Watershed* (2008, approved by CA office of Administrative Law and adopted by EPA)
- Marshall, J.**, (2007), *Total Maximum Daily Load for Mercury in the Walker Creek Watershed*, Staff Report. California Regional Water Quality Control Board San Francisco Region.
- Marshall J.** (2003), *Moving from the past into the future: a functional approach for protecting California streams*. in P.M. Faber (ed.) *California riparian systems: Processes and floodplain*

management, ecology, and restoration (pp. 158-162). Riparian Habitat and Floodplains Conference Proceedings, Riparian Habitat Joint Venture, Sacramento

Marshall, J. C. Denisoff and D. Hopkins (1993), *Corte Madera Watershed Resource Evaluation and Information Report* (Near Coastal Waters Grant, US Environmental Protection Agency)

GRANTS

Funded proposals

Collaborative Research: Watershed-scale response to climate change in the Aklavik Range, NWT (Canada), **National Science Foundation Arctic Natural Sciences**, 2021-2024, \$256,567 (UARK portion), Co-PI with M. Palucis and J. Strauss (Dartmouth University)

Collaborative Proposal: Beyond lithologic control of bedrock valley width: Investigating the role of persistent valley cover in bedrock valley width development, Buffalo River, AR, **National Science Foundation Geomorphology and Land Dynamics**, 2020, \$160,820 (UARK portion), Co-PI with A. Langston (KSU)

A Seed Grant Linking Transportation Economics to Geology on the Lower Arkansas River, **University of Arkansas Chancellor's Innovation and Collaboration Fund**, 2019, \$118,250, Co-PI with Heather Nachtmann, John Shaw and Glen Sharman

Cracking the Critical Zone: Tree roots in fractures and a proposed mechanistic soil production function, **National Science Foundation Postdoctoral Fellowship Program**, (EAR-1452694), 2015, \$174,000

Considering the imprint of cold climes on modern CZ architecture, **CZO Science Across Virtual Institutes International Scholars Program**, 2017, \$4000

Controls on biotic-bedrock coupling and soil production efficacy, **CZO Science Across Virtual Institutes International Scholars Program**, 2012, \$10,000

SELECTED CONFERENCE ABSTRACTS * denotes 1st author student

*Edwards, M., **J.A. Marshall**, and J. Shaw, (2021), Resolving the Meandering Path of the Lower Arkansas River, USA. American Geophysical Union Fall Meeting, New Orleans, Abstract EP55G-1186.

Marshall, J.A., J. Clyne, M.C. Eppes, and T.E. Dawson, (2021), Barking up the wrong tree? Tree root tapping, subcritical cracking, and potential influence on bedrock porosity, American Geophysical Union Fall Meeting, New Orleans. Abstract EP55G-1186.

*Zhang, M., D.L. Roth, V.J. Sahakian, and J.A. Marshall, (2021), The Seismic Signature of Tree-Captured Wind, American Geophysical Union Fall Meeting, New Orleans. Abstract S55A-0125

* Jimerson, C., Marshall, J. A., Geological Society of America, (2020), Tree roots, water uptake and implications for soil production through time in northwest Arkansas, [251-7], presented at virtual GSA Fall Meeting.

*Jimerson, C., J.A. Marshall, M.D. Covington, K.J. Naithani, (2019), Exploring Hydrological Influences on Tree-Driven Bedrock Physical Weathering at Two Karst Sub-Watersheds, American Geophysical Union Fall Meeting, San Francisco, CA. Abstract EP41C-2355.

Marshall, J.A., M.E. Eppes, and K. Mhate, (2019), Listening for how trees, wind, water, and temperature propagate and amplify near-surface fracturing, [T51-10-2] presented at 2019 Meeting, GSA, Phoenix, AZ, 22-25 Dec.

Marshall, J.A., (2018), Sharp Lecture- From ice to trees, surprising insights into past and present processes that sculpt our earth, American Geophysical Union Fall Meeting, AGU, Washington, D.C., Abstract EP44A-01, (Invited Talk, named lecture)

- *Menio, E. C., **J. A. Marshall**, and J. D. Cothren, (2018), Discerning periglacial drainage evolution using historic satellite-imagery-derived digital elevation models, American Geophysical Union Fall Meeting, Washington D.C. Abstract C51C-1067
- *Clyne, J.B. and **J.A. Marshall**, (2018) Soil Production Mechanisms: Can Tree Roots Significantly Weaken Rock Through Daily Water Uptake?, American Geophysical Union Fall Meeting, Washington D.C. Abstract EP11D-2080
- Marshall, J.A.**, J.J. Roering, N. S., Schachtman, D. G. Gavin, D. E. Gavin, (2017), Late quaternary shifts in climate-controlled soil production and erosion mechanisms in unglaciated western Oregon, American Geophysical Union Fall Meeting, New Orleans, Abstract EP23E-02 (Invited Talk)
- Marshall, J.A.**, R.S. Anderson, T.E. Dawson, W.E Dietrich, J.T. Minear, (2017), Beyond tree throw: Wind, water, rock and the mechanics of tree-driven bedrock physical weathering (Invited) Geophysical Union Fall Meeting, New Orleans, Abstract H23H-1767 (Invited Talk)
- Marshall, J.A.**, R.S. Anderson, S.L. Brantley, Z. Balogh-Brunstad, W.E Dietrich, D.L. Karwan, and J.J. Roering (2017), Considering the role of trees as Critical Zone architects, National Critical Zone Observatory Meeting, Arlington
- Marshall, J.A.**, R.S. Anderson, T.E. Dawson, W.E Dietrich, L. S. Sklar, (2016), Quantifying the role of trees as Critical Zone architects employing crowbars, wedges and other tools of soil production, *Eos*, American Geophysical Union Fall Meeting, San Francisco, Abstract EP43C-0968.
- Marshall, J.A.** (2016) Cracking the Critical Zone: How trees grow their own pot and influence landscape evolution, Geophysical Research Abstracts, European Geosciences Union, v. 18, EGU2016-2406-1. (*Invited Talk*)
- Marshall, J.A.**, J.J. Roering, A.W. Rempel, P. J. Bartlein, (2015), Critical Zone Architecture and the Last Glacial Legacy in Unglaciated North America, *Eos*, American Geophysical Union Fall Meeting, San Francisco, Abstract EP34A-08.
- Marshall, J.A.**, J.J. Roering, P. J. Bartlein, S. Praskievicz, D. C. Gavin, T. C. Hales, D.E. Granger (2014), Does Temperature (Rather Than Precipitation) Dictate the Geomorphic Legacy of Glacial Intervals in Unglaciated Mid-Latitude Terrains?, *Eos*, American Geophysical Union Fall Meeting, San Francisco, Abstract EP14B-08.
- Marshall, J.A.**, J.J. Roering, D.E. Granger, D. C. Gavin (2013), A 50-ky record of climate, ecosystem, and erosion rate change in the Oregon Coast Range, *Eos*, American Geophysical Union Fall Meeting, San Francisco, Abstract EP41C-0807.
- Marshall, J.A.**, J.J. Roering, S. Praskievicz; T. C. Hales, D. C. Gavin, P. J. Bartlein, (2012), Temperature Controls On Sediment Production in The Oregon Coast Range - Abiotic Frost-Cracking Processes Vs. Biotic-Dominated Processes Over The Last 40 Ka, *Eos*, American Geophysical Union Fall Meeting, San Francisco, Abstract EP44C-02
- Cerovski-Darriau, C., **J.A. Marshall**, J. J. Roering, (2012), Shake, rattle and roll - tectonic and lithologic controls on sediment production in the Oregon Coast Range, GeoPRISMS Earthscope Planning Workshop for the Cascadia Primary Site.
- Marshall, J. A.**, J.J. Roering, R.J. Dorsey, (2011), Geomorphic implications of resistant bedrock in the 'uniform' sandstone beds of the Tyee Formation, Oregon Coast Range, *Eos*, American Geophysical Union Fall Meeting, San Francisco, Abstract EP34C-0699.
- Marshall, J. A.** and J.J. Roering, (2010), Erosion rates, stochasticity, and abiotic vs. biotic bedrock to soil production mechanisms in the Oregon Coast Range, *Eos*, American Geophysical Union Fall Meeting, Abstract EP21B-0749.
- Marshall, J. A.**, L.S. Sklar, C.S. Riebe, (2010), Effects of Elevation, climate and erosion on hillslope rock fragment distribution and abundance in diverse settings, Goldschmidt Conference, Abstract 14b/257

- Marshall, J. A.**, M. Attal, L.S. Sklar, C.S. Riebe, M.D. Hurst, S.M. Mudd, K. Yoo, (2009), The effect of erosion rate on hillslope rock fragment production: implications for supply of bedload material to channels, *Eos*, American Geophysical Union Fall Meeting, San Francisco, Abstract EP51B-0594.
- Riebe, C.S., **J.A. Marshall**, L.S. Sklar, D.E. Granger, (2008), Characterizing sediment supply to rivers: effects of lithology, climate, weathering and erosion on rock-fragment abundance in granitic, hillslope soils, *Eos*, American Geophysical Union Fall Meeting, Abstract H43F-1071.
- Marshall, J.A.** and L.S. Sklar, (2007), Mining soil survey databases to explore lithologic, climatic and topographic controls on hillslope production of bedload-sized rock fragments, *Eos*, American Geophysical Union Fall Meeting, San Francisco, Abstract H41D-0758.
- Sklar, L.S., N.J. Finnegan and **J.A. Marshall**, (2007), Climatic, tectonic and lithologic controls on the size distribution of sediments supplied to channels: implications for transient evolution of bedrock river profiles, *Eos*, American Geophysical Union Fall Meeting, San Francisco, Abstract H41D-0757.
- Marshall J.A.**, (2004), Adaptive Management, Interdisciplinary Science and Restoring Large-Scale Riverine Habitats: A California Perspective, *River Management Society 2004 Symposium*, Tahoe City, CA
- Marshall J.A.**, (2003), If you build it, will they come? Lessons learned and a look into the future of restoration design, *American Fisheries Society, Spawning Habitat Symposium*, Quebec City, Canada.

INVITED TALKS

- 2021: Tulane University, UC Santa Cruz
- 2019: Kansas State University, University of Mississippi
- 2018: American Geophysical Union Fall Meeting
- 2018: Pennsylvania State University, University of North Carolina-Charlotte, American Geophysical Union Fall Meeting
- 2017: University of Arkansas, University of Colorado, Colorado State University, University of Calgary, American Geophysical Union, Fall Meeting (2)
- 2016: USGS (Menlo Park, CA), San Francisco State University (Distinguished Alumna Lecture)
- 2015: Oregon State University, NSF Science Across Virtual Institutes Workshop: Exploring Four Critical Puzzles about Trees, Water, and Soil: A Vision for Research (Pennsylvania State University), East Bay Science Café (Albany, CA)
- 2013: Siuslaw Watershed Council (Blachly, OR)
- 2012: Siuslaw Watershed Council (Blachly, OR)

TEACHING

COURSES DESIGNED AND/OR TAUGHT AT THE UNIVERSITY OF **ARKANSAS**

Geomorphology (GEOS 4053/5253) ~10-30 student (undergraduate and graduate) that covers topics and problems in landscape processes and landforms. Laboratory exercises include mapping using remote sensing, slope stability modeling, hydrologic simulation, and computer modeling of landscape evolution. Field projects explore hillslope and river processes and incorporate student-led hypotheses. (Designed course and developed several new laboratory exercises)

Quaternary Environments (ANTH/ENDY/GEOS 5053) ~10 - 20 students (graduate). This semester long interdisciplinary course is team-taught by professors with expertise in climatology, anthropology, and geology and is centered on the Quaternary Period. The course uses a deep time perspective to explore how changes in tectonics, environments, climates, and biota (including anthropogenic changes) shape the earth, its ecosystems and climate, through time. The class is one of four core classes in the interdisciplinary Environmental Dynamics program and is centered around

interdisciplinary field and other data collection and analysis, research methods, and culminates in an independent student-led research project that integrates local data with regional and larger data and models.

Geology Summer Field Camp (GEOS 4686) ~25 students (undergraduate). The six-week course is co-taught by two teams of instructors. Traditionally, the second half of the course focuses on hydrogeology, contaminant transport, and mapping the topographic remnants of glacier activity. In addition, the students hone their observational skills transiting through western National Parks (Glacier, the Tetons, and Yellowstone).

Revised for 2021. Due to pandemic concerns, the entire field camp program was re-imagined by a team of field camp leaders. I and another instructor developed from scratch a two-week course new course centered on Arkansas's Buffalo River that integrated hydrology and geomorphology and approximated a real-world problem students might encounter as environmental geologists. The Buffalo River is America's first National River, and beloved by locals and tourists alike for its dramatic cliffs and generally gentle float conditions. In recent years, there has been growing concern over summertime algae, which sometimes is so severe that the river is unfloatable. Despite years of study by the USGS and the NPS, along with extensive citizen monitoring over concerns over the increase in confined animal facilities in a karst landscape, the algae cause(es) remain unclear. Student teams developed, tested and refined hypotheses as to the role of animal facilities, structural highs and lows that brought rock-derived nutrients into the river, climate change in terms of discharge and warming temperatures, fertilizer from cleared lands in steep tributaries, landslide-derived nutrients etc. using a combination of data collected on river form, water quality parameters, discharge, land use, GIS and watershed-wide observations on a particularly rainy day. The new module was a success and an Arkansas module is scheduled for future summers, with the expansion to earth science and other majors.

Processes and Products of Landscape Evolution (GEOS 510V) ~6-9 students (graduate) Class is co-taught with Dr. Glenn Sharman, a stratigrapher. In this seminar style class the students are introduced to the connections between geomorphology (process) and clastic stratigraphy (products) through a progressive reading of relevant peer-reviewed literature. Students can take the class for additional credits pointed towards developing and implementing a numerical landscape or forward stratigraphic modeling focused on quantifying processes and products.

Geology Field Trip- Spring Break (GEOS 437/537V) ~15 students (undergraduate and graduate). Class is co-taught and consist of weekly lectures on a broad range of geologic topics pertinent to the region the students travel to over spring break. Field days include lectures at the field stops and on instructor-led hikes.

COURSES DESIGNED AND TAUGHT AT THE UNIVERSITY OF OREGON

BioEcoClimoGeo-ology- exploring the interplay between life and physical processes (600-level)
12 graduate student cross-disciplinary seminar course drawing on the combined expertise of upper level graduate students from a broad range of disciplines including ecology, hydrology, paleoclimatology, anthropology and geomorphology. Coordinated and led discussion sections and a weekend retreat designed to progress from understanding the tools and quantitative frameworks within each discipline, to reviewing and identifying cross-discipline critical uncertainties, to developing integrative, tractable research questions.

Hydrogeology (Lab Component) (400-level)

20+ undergraduate course complimenting the lecture component. Developed the complete course curriculum including building both simple and complex physical groundwater models and developing a series of laboratory exercises that alternated between physical and computer simulations with quantitative components covering simple groundwater flow paths, aquifer and aquitard characteristics to more complex contaminant transport.

COURSES AS A TEACHING ASSISTANT AT THE UNIVERSITY OF OREGON

Introduction to Geology, Environmental Geology of Oregon (non-major survey class), Geology of the Pacific Northwest (upper-level non-major class), Hydrogeology (upper-level major class, responsible for developing complete lab component including a mix of physical and computer models), Hillslope Geomorphology (upper- and graduate-level course) Environmental Data Analysis (upper- and graduate-level statistics course)

SHORT COURSES

The Next Generation of LiDAR Analysis for Critical Zone Research – Scaling Approaches (Stockholm University, April 2014)

NSF Community Workshop: The Next Generation of LiDAR Analysis for Critical Zone Research (Boulder, Colorado, May 2014)

STUDENT MENTORING AND COLLABORATING (AT UNIVERSITY OF ARKANSAS)

Graduate Students

Ziona Bates-Norris, M.S. *current*, Rock property controls on valley widening, Buffalo River AR
Chelsea Moran, M.S. *current*, The Spatial and Temporal Distribution of Large Rock Blocks and Control on Landscape Evolution in the Ozarks

Mathew Edwards, M.S, *current*, Arkansas River over millennial time scales- steady state or transitional?

Cole Jimerson, Masters, 2018-2020, Exploring Hydrological Influences on Tree-Driven Bedrock Physical Weathering at Two Karst Sub-Watersheds

Undergraduate thesis and research supervision

Jacob Clyne, B.S., research project, 2017-2018, Physical experiments: Can tree roots significantly weaken rock through daily water uptake?

Josephine Hall B.S., research project, 2019, Using remote sensing to detect the lingering signature of periglacial processes in unglaciated Northwest Arkansas

SELECTED WORKSHOPS and SPECIALIZED COURSES

- 2019 NSFGOLD FIELD Institute (Fieldwork Inspiring Expanded Leadership for Diversity)
- 2016 WyCEHG & CUAHSI Near Surface Geophysics for Hydrology Workshop
- 2015 Sino-US Critical Zone Workshop, China (invited)
- 2013 NCED Summer Institute on Earth-System Dynamics, Minneapolis, MN
- 2013 SoilTrEC Workshop Land-Use Practice And Sustainable Use Of Soil, Iceland
- 2012 GeoPRISMS EarthScope Planning Workshop for the Cascadia Primary Site, Portland, OR
- 2008 SoilCritZone Workshop, a joint NSF/ SoilTrEC Workshop workshop, Crete, Greece
- 2008 Studying Earth Surface Processes with High-Resolution Topographic Data Workshop, Boulder, CO

2008 UNAVCO Short Course Processing and Analysis of GeoEarthscope and Other Community LIDAR Topography Datasets, Tempe, AZ

SERVICE

INSTITUTIONAL (UARK)

Undergraduate advisor, Earth Science Majors, 2018 - present
Scholarship Committee Co-chair, 2019-present
Diversity, Equity, and Inclusion Committee member, 2021-present
URGE pod leader, 2021-present
Co-leader, Geosciences Prospective Graduate Students weekend visit, 2018 - present
Committee member, Hydrogeology faculty search. 2019 - 2020
Committee Member, PhD committee, 2018 - 2019

PROFESSIONAL

Steering Committee: The National Center for Airborne Laser Mapping (NCLAM) (2019-)
Panelist: GSA Quaternary Geology and Geomorphology (QG&G) Division (2021-)
Coordinator, AGU Outstanding Student Speaker Award for the Earth and Planetary Surface Process Section, 2017
Publications reviewed for: Journal of Geophysical Research, Earth Surface Process and Landforms, Earth Surfaces Dynamics, Geological Society of America Bulletin, Geology, Geophysical Research Letters, Cambridge Press
Proposals reviewed for: NSF - Geomorphology and Land-use Dynamics, NSF-Office of Polar Programs, Czech Science Foundation
Convener: Earth and Planetary Surface Processes and Mineral and Rock Physics (co-organized panel session), American Geophysical Union, Fall Meeting, 2021 "Fracture and Surface Processes Under a Bestiary of Scales: Crack Tips, Crack Networks, and the Critical Zone", with P.G. Meredith, M.C.C. Eppes, and T.A. Dewers.
Convener: Hydrology Division, Geological Society of America, Fall Meeting 2021, "The role of chemistry, climate, and geology in controlling subsurface structure and flow", with S. Gingerich, J.J. Kennedy, D. Rempe. 2021.
Convener: Cryosphere Section, American Geophysical Union, Fall Meeting 2018, "Advancing Understanding of Cold Climate Hydrologic and Geomorphic Systems in a Warming Climate", with Marshall, J.A., M. Langer, B. Bolton, C.J. Wilson, and S.G. Evans.
Convener: Earth and Planetary Surface Processes, American Geophysical Union, Fall Meeting, 2015, "Mechanistic Underpinnings of Damage, Disruption, and Downslope Transport of Rock and Regolith", with T.C. Hales, G.M. Stock, and K.R. Barnhart.
Convener: Earth and Planetary Surface Processes, American Geophysical Union, Fall Meeting, 2014, "From Rock to Rolling Regolith: Advances in Hillslope Geomorphology", with K. Ferrier, K., and K. Sweeney.

PROFESSIONAL SOCIETIES

American Geophysical Union
Geological Society of America