

SUSAN E. WASHKO

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CURRENT POSITION

Western Colorado University: Course Instructor (undergraduate and graduate), Master's Research Advisor, and Undergraduate Water Studies Emphasis Advisor (joint position between the Clark School of the Environment and Sustainability and the Natural Environmental Sciences Department)

EDUCATION

- 2018-2023 Ph.D. Fisheries Conservation & Management, University of Arizona, Tucson, AZ, USA
Dissertation: *Combining ecological passions: Aquatic invertebrates in Sonoran Desert rock pools and inclusive undergraduate field experiences*
Advisor: Dr. Michael Bogan
Minor: College Teaching
- 2016-2018 M.Sc. Ecology, Utah State University, Logan, UT, USA
Thesis: *Macroinvertebrates and trout of beaver-altered streams in northeastern Utah*
Advisor: Dr. Trisha Atwood
- 2012-2016 B.S. Environmental Science, Allegheny College, Meadville, PA, USA
Thesis: *Additional nitrogen leads to soil carbon retention through decreased decomposition rate*
Advisors: Dr. Rich Bowden & Dr. Scott Wissinger
Minor: Spanish

FELLOWSHIPS AND GRANTS

- 2024 National Science Foundation Biology S-STEM grant to provide scholarships for low-income ecology master's students. Application in progress, estimated \$1,000,000. Lead PI.
- 2023 National Science Foundation Research Opportunity Award from the Rocky Mountain Biological Laboratory, \$3700
- 2022-2023 American Dissertation Fellowship, American Association of University Women. \$20,000
- 2022 Francis Colwell and Sandra Koizumi Director's Award, School of Natural Resources and the Environment, University of Arizona. \$1000

- 2017- 2022 National Science Foundation Graduate Research Fellow. *Do beaver dams alter macroinvertebrate communities and trout foraging and growth?* \$102,000
- 2021 Research and Project Grant, Graduate and Professional Student Council, University of Arizona. *Odontomyia: Surviving pool drying in the Sonoran Desert.* \$1007
- 2020 Graduate Student Conservation Research Award, Society for Freshwater Science. *Conservation of aquatic taxa in rock pools and springs of the western Sonoran Desert.* \$1000
- 2018 Graduate Student Travel Grant, Utah State University. \$900
- 2017 Graduate Research and Creative Opportunities grant (GRCO), Utah State University. *Macroinvertebrates and trout of beaver-altered streams.* \$1000
- 2017 Ecology Center Research Award, Ecology Center, Utah State University. *Macroinvertebrates and trout of beaver-altered streams.* \$2000
- 2015 Harold State Fellowship, Allegheny College. *Quantifying the effects of climate change-induced shifts in caddisfly distributions on ecosystem processes in alpine ponds.* \$3500

ACADEMIC AWARDS AND SCHOLARSHIPS

- 2023 Meritorious Graduate Teaching Award, College of Agriculture and Life Sciences, University of Arizona
- 2023 Steadfast Student Leader Award, School of Natural Resources and the Environment, University of Arizona
- 2022 Pistor-Stanley Alumni Scholarship, College of Agriculture and Life Sciences, University of Arizona
- 2022 Martha I. Grinder Scholarship in Wildlife and Fisheries Resources, College of Agriculture and Life Sciences, University of Arizona
- 2022 Rick F. Seegmiller Memorial Scholarship, College of Agriculture and Life Sciences, University of Arizona
- 2022 Student Leadership Award, School of Natural Resources and the Environment, University of Arizona

- 2021 Carson Scholars Program awardee, Arizona Institutes for Resilience, University of Arizona
- 2021 Diversity and Inclusion Award, School of Natural Resources and the Environment, University of Arizona
- 2020 Outstanding Scholarly Achievement by a Student, School of Natural Resources and the Environment, University of Arizona
- 2019 C. P. Patrick Reid Scholarship, College of Agriculture and Life Sciences, University of Arizona
- 2018 Master's Student Researcher of the Year/Robins Award, Utah State University
- 2018 Master's Student Researcher of the Year, Quinney College of Natural Resources, Utah State University
- 2015 Udall Scholarship Honorable Mention, Morris K. Udall and Stewart L. Udall Foundation, Tucson, AZ
- 2012-2016 Various scholarships and Environmental Science prizes, Allegheny College

PEER-REVIEWED PUBLICATIONS

13. Cox, M.E., ... **S. Washko**... et al. How can academic podcasting change academia and its relationship to society? A conversation and guide. *Frontiers in Communication* 8: 1090112. DOI: 10.3389/fcomm.2023.1090112.
12. Balik, J.A., C. Leitz, **S. Washko**, B. Cleveland, D.M. Krejsa, M.E. Perchik, A. Stogsdill, M. Vlah, L.M. Demi, H.S. Grieg, I.D. Shepard, B.W. Taylor, O.J. Wilmot, S.A. Wissinger. (2022). Species-specific traits predict whole-assemblage detritus processing by pond invertebrates. *Oecologia* 199, 951–963. <https://doi.org/10.1007/s00442-022-05239-z>
11. **Washko, S.**, N. Willby, A. Law. (2022). How beavers affect riverine aquatic macroinvertebrates: a review. *PeerJ* 10: e13180. DOI: <https://doi.org/10.7717/peerj.13180>.
10. **Washko, S.** (2021). Designing an Asynchronous, Self-Led Aquatic Ecology Field Trip. *CourseSource*. <https://doi.org/10.24918/cs.2021.34>
9. Jones, J. & **S. Washko**. (2021). More than fun in the sun: The pedagogy of field trips supports student learning. *Journal of Geoscience Education*. DOI: 10.1080/10899995.2021.1984176.

8. Hopfensperger, K., E. Larson, **S. Washko**, E.K. Moody. (2021). Elevate your work through incorporation of public engagement. *Freshwater Science* 40(1): 221-227. DOI: 10.1086/712607.
7. **Washko, S.**, B. Roper, T.B. Atwood. (2020). Beavers alter stream macroinvertebrate communities in northeastern Utah. *Freshwater Biology* 65: 579-591. DOI: 10.1111/fwb.13455
6. **Washko, S.**, M.T. Bogan. (2019). Global patterns of aquatic macroinvertebrate dispersal and functional feeding traits in aridland rock pools. *Frontiers in Environmental Science (Freshwater Science)* 7: 106. DOI:10.3389/fenvs.2019.00106
5. Bowden, R.D., S.J. Wurzbacher, **S. Washko**, L. Wind, A.M. Rice, A.E. Coble, N. Baldauf, B. Johnson, J. Wang, M. Simpson, K. Lajtha. (2019). Long-term nitrogen addition decreases organic matter decomposition and increases forest soil carbon. *Soil Science Society of America Journal* 83: S82-S95. doi:10.2136/sssaj2018.08.0293
4. Wang, J.J., R. Bowden, K. Lajtha, **S. Washko**, S. Wurzbacher, M.J. Simpson. (2019). Long-term nitrogen addition suppresses microbial degradation, enhances soil carbon storage, and alters the molecular composition of soil organic matter. *Biogeochemistry* 142(2): 299-313. <https://doi.org/10.1007/s10533-018-00535-4>
3. Epperly, J., A. Witt, J. Haight, **S. Washko**, T.B. Atwood, J. Brahney, S. Brothers, E. Hammill. (2018). Relationships between borders, management agencies, and the likelihood of watershed impairment. *PLoS ONE* 13(9): e0204149. <https://doi.org/10.1371/journal.pone.0204149>
2. Balik, J.A., B.W. Taylor, **S. Washko**, S.A. Wissinger. (2018). High interspecific variation in nutrient excretion within a guild of closely related caddisfly species. *Ecosphere* 9(5): e02205. DOI: 10.1002/ecs2.2205
1. **Washko, S.** (2017). Preliminary evaluation of butterfly diversity and rural agriculture in montane Costa Rica. *Entomological News* 127(3): 198-214. <https://doi.org/10.3157/021.127.0304>

MANUSCRIPTS IN REVIEW/PREPARATION

Washko, S. & Michael Bogan. Ability of aquatic *Odontomyia* (Diptera: Stratiomyidae) larvae to survive stream drying using dormancy. *In review at Aquatic Insects*.

Washko, S. & Michael Bogan. How hydroperiod shapes aquatic invertebrate communities in Sonoran Desert rock pools. *In review at Hydrobiologia*.

RESEARCH & RESEARCH ADVISING EXPERIENCE

2023-present Advisor to two Masters of Ecology students at Western Colorado University studying invertebrates in aquatic ecosystems to assess the effectiveness and results of restoration actions. Two systems these students are working in are i) montane streams restored with beaver dam analogues and ii) sagebrush wet meadows restored with erosion control structures.

Advisor to four Masters of Environmental Management students at Western Colorado University. These students partner with outside organizations to complete projects while learning to translate science for management. Students are currently working on i) mapping subalpine fen drying and grass encroachment, ii) predicting aquatic species of concern due to changes in natural flow regime in the Gunnison watershed, iii) reforesting vacant lots in a small midwestern city, and iv) assessing solar energy potential in a small mountain town.

2023 Advised a summer REU student at the Rocky Mountain Biological Laboratory to investigate how beaver pond age affects the aquatic invertebrate community.

2018-2023 PhD Candidate at the University of Arizona characterizing the hydrology and aquatic invertebrate communities of rock pools (tinajas) in Sonoran Desert national parks. This work included mentoring one honors student project.

2016-2018 Master's Student at Utah State University assessing the aquatic invertebrate community and trout diets of beaver-occupied streams in northeastern Utah.

2016 Salamander Migration Research Assistant, Biology Department, Allegheny College.

2014-2016 Pond Caddisfly Research Assistant, Rocky Mountain Biological Laboratory, Gothic, CO.

2013-2016 Forest Soils Research Assistant, Environmental Science Department, Allegheny College.

2015 Independent Butterfly Community Research Student, CIEE Tropical Ecology and Conservation study abroad program in Monteverde, Costa Rica.

2015 Ecology Intern, Woodlake Environmental Field Station, Cuyahoga Valley National Park, Peninsula, OH.

2014 Electrofishing Assistant for Pennsylvania's Unassessed Waters Initiative, Allegheny College Biology Department and PA Fish & Boat Commission.

TEACHING EXPERIENCE

Teaching Positions

- 2024 Instructor, *Quantitative Skills* (ENVS 612) in-person and online, Clark School of Environment and Sustainability, Western Colorado University, 8 students (Spring)
- Instructor, *Biology Senior Seminar: Water Quality* (BIOL 495), Natural Environmental Sciences Dept., Western Colorado University, 4 students (Spring)
- Instructor, *Evolution* (BIOL 362/662), Natural Environmental Sciences Dept., Western Colorado University, 21 students (Spring)
- Instructor, *Diversity and Patterns of Life* (BIOL 151) laboratory sections (n=2), Natural Environmental Sciences Dept., Western Colorado University, ~20 students per section (Spring)
- 2022-24 Undergraduate Research Program Coordinator and Diversity Liaison, Rocky Mountain Biological Laboratory, Gothic, CO (Summer)
- Position Components:*
- Organize program orientation, workshops, and activities
 - Assist students (n = 40) with proposals, research presentations, and research papers, as well as review these assignments
 - Teach RStudio workshops (intro to R, stats, ggplot2)
 - Mentor students and help them navigate relationships with advisors
 - Coordinate and promote inclusion and ethics programming
- 2023 Instructor, *Science for Environmental Management* (ENVS 605) online section, Clark School of Environment and Sustainability, Western Colorado University, 11 students (Fall)
- Instructor, *Rocky Mountain Flora* (BIOL 353/653), Natural Environmental Sciences Dept., Western Colorado University, 24 students (Fall)
- Instructor, *Diversity and Patterns of Life* (BIOL 151) laboratory sections (n=2), Natural Environmental Sciences Dept., Western Colorado University, 24 students per section (Fall)
- Instructor, *Urban Places as Wild Spaces* (WFSC 195), School of Natural Resources and the Environment, University of Arizona, 7 students (Spring)
- 2022 Instructor, *Stream Ecology* (WFSC 471/571), School of Natural Resources and the Environment, University of Arizona, 20 students (Fall)

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Workshop Instructor, Data Carpentry for Ecology, University of Arizona. Taught segments on *Intro to RStudio* and *Data Visualization with ggplot2*.

2019 Graduate Teaching Assistant, *Wildlife Conservation and American Culture* (RNR 160), University of Arizona. 230 students (Fall)

Teaching Training

2022 Instructor & Curriculum Professional Development Program, River Field Studies Network

Program Components:

- Field-Specific Pedagogy
- Lesson Development & Publication
- Teaching in the Field
- Increasing DEI in Field Settings
- River Safety

Program Outcome:

- Washko, S.** & Elizabeth Waring. Exploring detritus-based food webs. *A lesson plan published on QubesHub through the River Field Studies Network.*
- invited to be part of the PI team for the following years

2022 Certified Instructor for the Carpentries, focus on R for Ecological Data

Certification Components:

- Evidence-based teaching practices
- Creating a positive environment for learners in workshops
- Practice teaching / live coding

2019-2021 College Teaching Certificate, Office of Instruction and Assessment, University of Arizona

Coursework:

- College Teaching Practice
- Diversity and Inclusion in the Classroom
- Learner-Centered Teaching
- Survival Skills and Ethics
- Using Technology in Teaching

Extra Certifications:

- Building Communities in Online Courses
- Building Intentional Learning Relationships
- Responsible Conduct in Research

Guest Lectures

-*Ecological Restoration* (WFSC 374), UArizona, 20 students, 2023

-*Aquatic Entomology* (WFSC 405/505), UArizona, 24 students, 2020, 2022 & 2024

-*Watershed Hydrology* (HWRS 460/560), UArizona, 15 students, 2019, 2020 & 2022

-*Sustainable Earth* (RNR 150), UArizona, 150 students, 2021

-*Stream Ecology* (WFSC 471/571), UArizona, 15-25 students, 2019-2021,

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-*Wildlife Conservation and American Culture* (RNR 160), UArizona, 100-250 students, 2019 & 2021

-*Ecological Field Sampling* (RNR 321), UArizona, 24 students, 2020

-*Natural and Human Impacts on Arid Lands* (ARL 641), UArizona, 15 students, 2019

Mentoring

Mentored two high school students and more than twenty college students in a variety of programs including the Liverman Scholars (<https://carson.arizona.edu/liverman-scholars>), the Bogan Aquatic Ecology Lab at UArizona, the Klemmer/Grieg/Whiteman Labs at RMBL, the GALs program (<https://gals.arizona.edu>), and the Atwood Global Change Lab at Utah State.

LEADERSHIP EXPERIENCE

- 2020-2023 Co-chair & Department Representative, College of Agriculture and Life Sciences Graduate Student Council, University of Arizona
- 2018-2023 President / Social Chair, Natural Resources Graduate Student Organization, School of Natural Resources and the Environment, University of Arizona
- 2019-2023 Committee Chair / Departmental Member, Earth Week symposium planning committee, University of Arizona
- 2018-2022 Public Information and Publicity (PIP) Committee member, Society for Freshwater Science
- 2018-2021 Student Resources Committee member, Society for Freshwater Science
- 2017-2018 Ecology Center Seminar Committee member, Ecology Center, Utah State
- 2017-2018 Undergrad-Grad Mentoring Program, Quinney College of Natural Resources, Utah State
- 2017-2018 American Fisheries Society USU Chapter Meeting volunteer.
- 2016-2018 Social Event Chair & Member, Graduate Student Council, Quinney College of Natural Resources, Utah State
- 2017 Watershed Sciences Graduate Student Field Course Co-Leader, Watershed Sciences Department, Utah State
- 2013-2016 President & Action Coordinator, Students for Environmental Action club member, Allegheny College
- 2013-2016 President & Member, Edible Campus Initiative, Allegheny College.

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2013-2015 DeHart Local Foods Dinner coordination team member, Allegheny College

2013-2015 Near-Peer Mentor, Conservation of Natural Resources Freshman Seminar course, Environmental Science Department, Allegheny College

ACADEMIC SERVICE

My peer-review experience spans multiple ecological and aquatic journals, and the articles I reviewed encompassed many subjects related to my own work: *Aquatic Sciences*, *Biodiversity and Conservation*, *BioScience*, *Ecosphere* (x2), *Freshwater Biology* (x2), *Freshwater Science*, *Hydrobiologia* (x3), *International Review of Hydrobiology*, *Science of the Total Environment*, *Southwest Naturalist*, *Wetlands*.

PRESENTATIONS

Washko, S. & M. Bogan. (Nov. 2023). *Stratiomystery: Assessing the limits of drought dormancy in soldier fly larvae*. Desert Fishes Council Annual Meeting, Bishop, CA.

Washko, S. & M. Bogan. (Jun. 2023). *Stratiomystery: Assessing the limits of drought dormancy in soldier fly larvae*. Society for Freshwater Science Annual Meeting, Brisbane, QLD, AUS.

Washko, S. & M. Bogan. (Nov. 2022). *Hydroperiod shapes aquatic invertebrate communities of Sonoran Desert rock pools*. Desert Fishes Council Annual Meeting, St. George, UT.

Geraty, S. & S. Washko. (Aug. 2022). *Evaluating Rock Pool Hydroperiod Fluctuation using Climate Variables to Inform Habitat Monitoring and Protection in the Western Sonoran Desert*. NASA Earth Science Applications Week. [Virtual](#).

Washko, S. (Jun. 2022). *Let me tell you about an experiment that didn't work*. Grad Student Symposium, Rocky Mountain Biological Laboratory, Gothic, CO.

Washko, S. (Mar. 2022). *Aquatic invertebrates of Organ Pipe Cactus National Monument's tinajas*. Seventh Tri-National Symposium. International Sonoran Desert Alliance biennial meeting, Ajo, AZ.

Washko, S. (Jun. 2021). *Designing safe, inclusive asynchronous ecology field trips*. Grad Student Symposium, Rocky Mountain Biological Laboratory, Gothic, CO.

Washko, S. (Sept. 2020). *Tinajas: An introduction to the hidden waters of the desert*. Speaker for 'Current wildlife and natural resource conservation topics' seminar, Osher Lifelong Learning Institute, Tucson, AZ.

Washko, S., M.T. Bogan, M. Grageda. (Mar. 2020). *Rock pools of the western Sonoran Desert: a preliminary overview of hydrology and aquatic invertebrates*. Sixth Tri-National Symposium:

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Celebrating the Sonoran Desert. International Sonoran Desert Alliance biennial meeting, Ajo, AZ.

Washko, S. (Nov. 2019). *Global patterns of aquatic macroinvertebrate functional composition in aridland rock pools*. Desert Fishes Council Annual Meeting, Alpine, TX.

Washko, S. (Oct. 2019). *Tinajas: An introduction to the hidden waters of the desert*. Speaker for 'Wild Arizona: current topics on wildlife and natural resource conservation and management at the University of Arizona' seminar, Osher Lifelong Learning Institute, Green Valley, AZ.

Washko, S. (Jun. 2019). *Global patterns of aquatic macroinvertebrate dispersal and functional feeding traits in aridland rock pools*. Grad Student Symposium, Rocky Mountain Biological Laboratory, Gothic, CO.

Washko, S. & M.T. Bogan. (May 2019). *Global trends of macroinvertebrate functional group dominance in arid rock pools and future projections*. Society for Freshwater Science Annual Meeting, Salt Lake City, UT.

Washko, S., T.B. Atwood, P. Budy, B. Roper. (Nov. 2018). *A comparison of riffle and beaver pond-dwelling trout in northeastern Utah*. Desert Fishes Council Annual Meeting, Death Valley National Park, CA.

Washko, S. (Oct. 2018). *The macroinvertebrate and fish communities of in-stream beaver ponds in northeastern Utah*. Speaker for 'Wild Arizona: current topics on wildlife and natural resource conservation and management at the University of Arizona' seminar, Osher Lifelong Learning Institute, Green Valley, AZ.

Washko, S. (Oct. 2018). *The macroinvertebrate and fish communities of in-stream beaver ponds in northeastern Utah*. Environmental Science Department invited seminar speaker, Allegheny College, Meadville, PA.

Washko, S., T.B. Atwood. (May 2018). *Macroinvertebrates of beaver-altered streams in northeastern Utah*. Society for Freshwater Science Annual Meeting, Detroit, MI.

Washko, S., T.B. Atwood, P. Budy, B. Roper. (Mar. 2018). *Preliminary evaluation of trout in beaver-altered streams*. Utah Chapter American Fisheries Society Meeting, Ogden, UT.

Washko, S. *Additional nitrogen deposition leads to soil carbon retention through decreased decomposition rate*. (Apr. 2016). Sigma Xi Conference Poster Session, Penn State Erie / Behrend College, Erie, PA.