

SCOTT HOTALING

School of Biological Sciences
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EDUCATION and TRAINING

2017 – present	Postdoctoral Researcher , School of Biological Sciences, Washington State University, Pullman, WA Advisor: Joanna L. Kelley
2017	Ph.D. , Department of Biology, University of Kentucky, Lexington, KY Advisor: David W. Weisrock
2010	B.S. , Zoology, North Carolina State University, Raleigh, NC Advisor: Nicholas M. Haddad

GRANTS and AWARDS (Total = \$77,348)

2018	Association for the Sciences of Limnology and Oceanography Early Career Travel Grant (\$500)
2018	Society for the Study of Evolution Outreach Grant for Promoting the Understanding of Evolutionary Biology (\$1,000)
2017, 2018	Travel Award, NSF Polar Genomics Workshop at the Society for Integrative and Comparative Biology Annual Meeting (\$1,600)
2016	Wyoming Governor's Office (\$11,000)
2015	University of Kentucky Gertrude Flora Ribble Research Fellowship (\$23,249)
2015	Teton Conservation District Research Grant (\$5,149)
2015 – 2018	University of Wyoming-National Park Service Research Grant (\$20,000)
2013	Society for Freshwater Science General Endowment Award (\$1,000)
2013	Society for the Study of Evolution Rosemary Grant Award (\$2,250)
2012 – 2017	University of Kentucky Graduate School Travel Award (\$2,400)
2012 – 2017	University of Kentucky Department of Biology Ribble Travel Award (\$3,000)
2012 – 2014	University of Kentucky Department of Biology Ribble Mini-Grant (\$1,900)
2012	American Alpine Club Graduate Student Research Grant (\$300)
2012, 2013	Glacier Park Fund Discretionary Research Grant (\$1,000)
2011	University of Kentucky Ribble Summer Fellowship (\$2,000)
2010	Undergraduate Research Award. North Carolina State University (\$1,000)

HONORS, DISTINCTIONS, and SERVICE

2016	Runner-up, Best Oral Presentation in Applied Research, Society for Freshwater Science Annual Meeting
2016	President, University of Kentucky Biology Graduate Student Association
2016	Member, University of Kentucky Department of Biology Chair Re-Appointment Committee
2016	Session Organizer, Society for Freshwater Science Annual Meeting
2015	Session Chair, Society for Freshwater Science Annual Meeting

2014 – present	Reviewer: <i>Biological Journal of the Linnean Society</i> , <i>Freshwater Biology</i> , <i>Freshwater Science</i> , <i>Molecular Ecology</i> , <i>Molecular Ecology Resources</i> , <i>Systematic Biology</i>
2013	University of Kentucky College of Arts & Sciences Outstanding Teaching Assistant Award
2013	3 rd Place Oral Presentation, Kentucky Academy of Sciences Annual Meeting
2012	People's Choice Award, Appalachian Mountain Photography Competition
2010	Sigma Xi Outstanding Undergraduate Research Award
2010	Dean's List, North Carolina State University
2007 – 2012	Multiple 1 st place awards, NC Wildlife Magazine Nature Photography Competition
2007 – present	Numerous photographs donated to conservation and outreach causes

PUBLICATIONS

Google Scholar (citations: >100; h-index: 6): <https://scholar.google.com/citations?user=r0-QHokAAAAJ&hl=en>

ResearchGate: https://www.researchgate.net/profile/Scott_Hotaling

¹Undergraduate co-author

Pre-prints (in revision, review, or submission as noted; PDFs available upon request)

Hotaling S, Quackenbush CR, Bennett-Ponsford J, New DD, Rodriguez LA, Tobler M, Kelley JL. Microbial diversity in replicated hydrogen-sulfide rich springs. In revision at *Microbial Ecology*.

Hotaling S, Giersch JJ, Finn DS, Tronstad LM, Jordan SP, Serpa LE, Call RG, Muhlfeld CC, Weisrock DW. Congruent population genetic patterns but differing depths of divergence for three alpine stoneflies with similar ecology, geographic distributions, and climate change threats. In revision at *Freshwater Biology*.

Hotaling S. Publishing papers without losing your mind: practical advice for a well-balanced, productive graduate school experience. In review at *Ideas in Ecology & Evolution*.

Hotaling S, Foley ME, Zeglin L, Finn DS, Tronstad LM, Giersch JJ, Muhlfeld CC, Weisrock DW. Microbial assemblages reflect environmental heterogeneity in alpine streams. In submission to *Global Change Biology*.

Jordan S, Hand BK, **Hotaling S**, DelVecchia A, Hayssen L, Nissley C, Stanford J, Luikart G. Genomic data reveal similar differentiation between invertebrates living under and on a riverine floodplain. In submission to *Biology Letters*.

2018

12. **Hotaling S**, Muhlfeld CC, Giersch JJ, Miller MR, Ali OA, Jordan SP, Luikart G, Weisrock DW (2018) Demographic modeling reveals a history of divergence with gene flow for a glacially-tied stonefly in a changing post-Pleistocene landscape. *Journal of Biogeography*. DOI: 10.1111/jbi.13125

11. Weisrock DW, Hime PM, Nunziata SO, Jones KS, Murphy MO, **Hotaling S**, Kratovil JD (2018) Surmounting the large-genome problem for genomic data generation in salamanders. In: Population Genomics: Wildlife, Editors: Hohenlohe P, Rajara O. Springer, New York

2017

10. **Hotaling S**, Tronstad LM, Bish JC (2017) Macroinvertebrate diversity is lower in high-elevation lakes versus nearby streams: evidence from Grand Teton National Park, Wyoming. *Journal of Natural History*, 51, 1657-1669.
9. **Hotaling S***, Slabach BS*, Weisrock DW (2017) Next-generation teaching: a template for bringing genomic and bioinformatic tools into the classroom. *Journal of Biological Education*. 1, 1-13. *contributed equally
8. Tronstad LM, **Hotaling S** (2017) Long-term trends in aquatic insect bioassessment metrics are not influenced by sampling method: empirical evidence from the Niobrara River. *Knowledge and Management of Aquatic Ecosystems*. 418, 12.
7. **Hotaling S**, Hood E, Hamilton TL (2017) Microbial ecology of mountain glacier ecosystems: biodiversity, ecological connections, and implications of a warming climate. *Environmental Microbiology*. Invited Review. 19, 2935-2948.
6. **Hotaling S***, Finn DS*, Giersch JJ, Weisrock DW, Jacobsen D. (2017) Climate change and alpine stream biology: progress, challenges, and opportunities for the future. *Biological Reviews*. 92, 2024-2045. *contributed equally
5. Giersch JJ, **Hotaling S**, Kovach RP, Jones LA, Muhlfeld CC (2017) Climate-induced glacier and snow loss imperils alpine stream insects. *Global Change Biology*. 23, 2577-2589.

2016

4. Hime PM*, **Hotaling S***, Shaffer HB, Voss SR, O'Neill EM, Weisrock DW (2016) The influence of locus number and information content on species delimitation: an empirical test case in an endangered Mexican salamander. *Molecular Ecology*, 25, 5959-5974. *contributed equally
3. **Hotaling S**, Foley M¹, Lawrence NM¹, Bocanegra J¹, Kappeler P, Yoder A, Weisrock DW (2016) Species discovery and validation in a cryptic radiation of endangered primates: coalescent-based species delimitation in Madagascar's mouse lemurs. *Molecular Ecology*, 25, 2029-2045.

Altmetric score = 250; #4 all-time for *Molecular Ecology* (of 3,473 studies).

Highlighted in *Popular Science*, *The Times of India*, *National Geographic España*.

2. Tronstad LM, **Hotaling S**, Bish JC (2016) Longitudinal change in stream invertebrate assemblages of Grand Teton National Park, Wyoming. *Insect Conservation and Diversity*, 9, 320-331.
1. Jordan S, Giersch JJ, Muhlfeld CC, **Hotaling S**, Fanning L¹, Luikart G (2016) Low genetic diversity and strong subdivision in an endemic alpine stonefly threatened by climate change. *PLOS ONE*, 11, e0157386.

In Preparation (to be submitted within ~6 months)

Hotaling S, Shain DS, Lang SA, Tronstad LM, Weisrock DW, Kelley JL. Population genomics of the glacier ice worm, *Mesenchytraeus solifugus*. To be submitted to *Biology Letters*.

Tronstad LM, **Hotaling S**, Giersch JJ, Wilmot OJ, Finn DS. Macroinvertebrate assemblages of alpine streams in the Teton Range, Wyoming. To be submitted to *Freshwater Science*.

Tronstad LM, **Hotaling S**, Giersch JJ, Wilmot OJ, Finn DS. Icy seeps: a potential refugia for cold-adapted alpine stream insects in a changing climate. To be submitted to *Limnology and Oceanography*.

POPULAR PRESS ARTICLES

2016 *Melting Mountains: Glaciers, Climate Change, and Biodiversity in the Teton Range*. Drive: The Magazine from Subaru. Online exclusive.

2013 *This Is Our Mountain*. Drive: The Magazine from Subaru.

TECHNICAL REPORTS

2017 **Hotaling S**, Tronstad LM, Giersch JJ, Muhlfeld CC, Finn DS, Weisrock DW. Comparative population genetics confirms range-specific lineages of alpine stoneflies imperiled by climate change. United States Fish & Wildlife Service.

2016 Giersch JJ, **Hotaling S**, Kovach RP, Jones LA, Muhlfeld CC. Climate-change-induced glacier and snow loss threatens two endemic mountaintop invertebrates. United States Fish & Wildlife Service.

2016 Tronstad LM, **Hotaling S**. Comparing quantitative sampling techniques for aquatic invertebrates at Agate Fossil Beds National Monument. Natural Resource Data Series. National Park Service, Fort Collins, Colorado.

2015 Tronstad LM, **Hotaling S**, Giersch JJ, Finn DS, Wilmot OJ, Anderson MD. Characterizing biodiversity of alpine streams in Grand Teton National Park, Wyoming. University of Wyoming National Park Service Research Center Annual Report.

INVITED SEMINARS

2018 A century of alpine stream research: where are we now? Association for the Sciences of Limnology & Oceanography Annual Meeting. Vancouver, BC. *Planned for June 2018*.

2018 “Cold genomes: Evolutionary perspectives on biodiversity at high-elevations.” Western Washington University, Department of Biology, Bellingham, WA. *Planned for June 2018*.

2018 “Evolutionary and ecological perspectives on biodiversity at high-elevations and latitudes.” Oregon State University, Department of Integrative Biology, Corvallis, OR. *Planned for April 2018*.

2018 “Next-generation teaching: bringing genomic and bioinformatic tools into the classroom.” Oregon State University, Department of Integrative Biology, Corvallis, OR. *Planned for April 2018*.

2018 “Evolutionary and ecological perspectives on biodiversity at high-elevations and latitudes.” Palouse Ecology, Evolutionary, and Systematics Group, Moscow, ID.

2017 “Genetic perspectives on biodiversity from North American alpine streams.” Washington State University, Department of Entomology, Pullman, WA.

2017 “Humans and the Planet: An Unnatural History.” IdeaFestival. Louisville, KY.

NPR interview: <https://wfpl.org/why-study-stoneflies-climate-change-biologist-scott-hotaling-explains/>

- 2017 “Genes in mountain streams: Perspectives on biodiversity from mostly North American headwaters.” University of Kentucky, Department of Entomology, Lexington, KY.
- 2017 “Conservation: Biodiversity in a rapidly changing world.” Wildlands Social Club, Lexington, KY.
- 2017 “Genes in mountain streams: Perspectives on biodiversity from mostly North American headwaters.” Missouri State University, Department of Biology, Springfield, MO.
- 2014 “Climate change in the Crown of the Continent: Glacier recession, genomics, and the fate of alpine species.” EcoLunch Seminar Series, University of Kentucky Department of Biology, Lexington, KY
- 2013 “Climate change, glacier recession, and the fate of alpine species.” Glacier National Park ‘Brown Bag’ Lecture Series, Glacier National Park, West Glacier, MT
- 2013 “Climate change in mountain systems.” Paradise Inn, Mount Rainier National Park, Paradise WA.
- 2013 “Climate change in mountain systems.” Cougar Rock Campground, Mount Rainier National Park, WA.
- 2013 “Landscape Photography, Finding Your Career Path, and the Impacts of Climate Change on High-Altitude Habitats.” Freshman Honors College Speaker Series, North Carolina State University, Raleigh, NC.

CONTRIBUTED PRESENTATIONS

- 2018 Finn DS, Acosta R, Hampel H, Vázquez R, Tronstad LM, **Hotaling S**, Giersch JJ, Encalada AC. Vulnerability of high-altitude macroinvertebrates to climate change in tropical and temperate zones. *Congreso Ecosistemas Acuáticos Tropicales en al Anthropoceno*. Planned for July 2018.
- 2018 Finn DS, Tronstad LM, **Hotaling S**, Giersch JJ, Bixby RJ, Zeglin L. Alpine streams fed by subterranean ice as potential climate refugia for temperature-sensitive taxa. *Society for Freshwater Science*. Planned for June 2018.
- 2018 Lins LSF, Helou L, **Hotaling S**, Fiston-Lavier AS, Kelley JL. Evolutionary dynamics of the Type III antifreeze protein gene cluster in polar fish. *EVO-WIBO*.
- 2018 **Hotaling S**, Shain DH, Lang SA, Tronstad LM, Weisrock DW, Kelley JL. Population genomics of the glacier ice worm, *Mesenchytraeus solifugus*. *EVO-WIBO*.
- 2018 Lins LSF, Helou L, **Hotaling S**, Fiston-Lavier AS, Kelley JL. Evolutionary dynamics of the Type III antifreeze protein gene cluster in polar fish. *Washington State University Showcase*.
- 2018 **Hotaling S**, Shain DH, Lang SA, Tronstad LM, Weisrock DW, Kelley JL. Population genomics of the glacier ice worm, *Mesenchytraeus solifugus*. *Washington State University Showcase*.
- 2018 Tronstad LM, **Hotaling S**, Giersch JJ, Finn DS, Wilmot O. Aquatic invertebrate assemblages living in three alpine stream types in the Teton Range, Wyoming *American Fisheries Society*.
- 2018 **Hotaling S**, Giersch JJ, Finn DS, Tronstad LM, Muhlfeld CC, Weisrock DW. Conservation genomics of an alpine stonefly threatened by climate change. *Society for Integrative & Comparative Biology*.

- 2017 Finn DS, **Hotaling S**, Tronstad LM, Giersch JJ, Zeglin L. Tetons alpine streams: unsung heroes of diversity and vulnerability. AMK Research Station Summer Seminar Series, Grand Teton National Park, Wyoming.
- 2017 **Hotaling S**, Finn DS, Giersch JJ, Tronstad LM, Muhlfeld CC, Weisrock DW. Conservation genomics of an alpine stonefly threatened by climate change. *Society for Freshwater Science*.
- 2016 **Hotaling S**, Giersch JJ, Muhlfeld CC, Ali OA, Jordan S, Miller MR, Luikart G, Weisrock DW. Demographic model testing reveals a history of divergence with gene flow for a glacially-tied stonefly in a changing post-Pleistocene landscape. *Society for Freshwater Science*.
- 2016 Foley ME, **Hotaling S**, Foley ME, Zeglin L, Giersch JJ, Finn DS, Tronstad LM, Muhlfeld CC, Weisrock DW. Microbial diversity of alpine streams: a North American perspective. *Evolution*.
- 2016 Lawrence N, **Hotaling S**, Weisrock DW. Coalescent-based species delimitation using Bayesian statistical analysis in Madagascar's mouse lemurs. *University of Kentucky Showcase of Undergraduate Scholars*.
- 2016 Dapore Z, Elder T, Pina J, Redden C, Grau E, Foley M, **Hotaling S**, Weisrock W. A comparative assessment of prokaryotic diversity among alpine stream environments within Grand Teton National Park, Wyoming. *University of Kentucky Showcase of Undergraduate Scholars*.
- 2016 Price K, Shen C, Davis-Peterson I, Watts A, Grau E, Foley M, **Hotaling S**, Weisrock W. A comparative assessment of prokaryotic diversity among alpine stream environments within Glacier National Park, Montana. *University of Kentucky Showcase of Undergraduate Scholars*.
- 2016 **Hotaling S**. Genomic perspectives on biodiversity in alpine streams. *University of Kentucky Department of Biology Doctoral Candidate Symposium*
- 2015 Yoder AD, **Hotaling S**, Foley M, Blanco M, Campbell CR, Larsen PA, Weisrock DW. Finding the trees in the forest: an integrative approach for exploring mouse lemur species diversity. *Mouse Lemur Working Group*.
- 2015 **Hotaling S**, Muhlfeld CC, Giersch JJ, Ali OA, Miller MR, Luikart G, Weisrock DW. Demographic model testing for a glacially-tied stonefly reveals a history of divergence with gene flow linked to a changing post-Pleistocene landscape. *Society for Freshwater Science*.
- 2015 Tronstad LM, **Hotaling S**, Bish JC. An assessment of longitudinal change in stream invertebrate assemblages of Grand Teton National Park, Wyoming. *Society for Freshwater Science*.
- 2014 **Hotaling S**, Muhlfeld CC, Giersch JJ, Ali OA, Miller MR, Luikart G, Weisrock DW. Using RAD sequencing to illuminate demographic history of the meltwater stonefly (*Lednia tumana*) in Glacier National Park, MT. *Joint Aquatic Sciences Meeting*.
- 2014 **Hotaling S**, Muhlfeld CC, Giersch JJ, Ali OA, Miller MR, Luikart G, Weisrock DW. Using RAD sequencing to illuminate population genomic structure of the meltwater stonefly (*Lednia tumana*) in Glacier National Park, MT. *Midwest Ecology and Evolution Conference*.

- 2013 **Hotaling S**, Muhlfeld CC, Giersch JJ, Ali OA, Miller MR, Luikart G, Weisrock DW. Using RAD-sequencing to illuminate population genomic structure of the meltwater stonefly (*Lednia tumana*) in Glacier National Park, MT. *Kentucky Academy of Science*.
- 2013 **Hotaling S**, Muhlfeld CC, Giersch JJ, Ali OA, Miller MR, Luikart G, Weisrock DW. Illuminating population genetic structure of the meltwater stonefly (*Lednia tumana*) in Glacier National Park, Montana. *UK CEEB Symposium*.
- 2013 **Hotaling S**, Muhlfeld CC, Giersch JJ, Ali OA, Miller MR, Luikart G, Weisrock DW. Using RAD sequencing to illuminate demographic history of the meltwater stonefly (*Lednia tumana*) in Glacier National Park, MT. *Joint Aquatic Sciences Meeting*.
- 2013 Foley M, Bocanegra J, **Hotaling S**, Blanco M, Weisrock DW. Using genetic markers to resolve the identity of a newly-discovered mouse lemur population in Madagascar. *University of Kentucky Undergraduate Research Symposium*.
- 2013 **Hotaling S**, Muhlfeld CC, Giersch JJ, Ali OA, Miller MR, Luikart G, Weisrock DW. Using RAD sequencing to illuminate demographic history of the meltwater stonefly (*Lednia tumana*) in Glacier National Park, MT. *Evolution*
- 2013 Hime PM, **Hotaling S**, Shaffer HB, Voss SR, Weisrock DW. Coalescent species delimitation using NGS-scale data: a test case in Ambystomatid salamanders. *Evolution*.
- 2010 **Hotaling S**, Fields WR, Haddad NH. Using individual photographs and multivariate analysis to identify individual Eastern tiger salamanders. *North Carolina State University Undergraduate Research Symposium*.

TEACHING EXPERIENCE and INNOVATION

Innovation: In collaboration with Dr. David Weisrock and Brittany Slabach, we developed a course-based undergraduate research experience in microbial ecology, genomics, and bioinformatics. We implemented this in 2013 in BIO 198, and it's still in use through Fall 2017. Complete details can be found in Hotaling *et al.*, (2017) *Journal of Biological Education*.

- 2017 Evolution (TA: spring semester). BIO 303. University of Kentucky. I aided the course coordinator (Dr. Madhu Srinivisan) in revising existing materials and developing new teaching modules.
- 2016 Honors Introductory Biology (TA: fall semester). BIO 198. University of Kentucky.
- 2016 Scholars Biology Research (co-instructor). BIO 199. University of Kentucky. Guided students in an undergraduate research experience studying microbial diversity of alpine streams.
- 2015 Principles of Genetics (TA: spring semester). BIO 304. University of Kentucky.
- 2014 Honors Introductory Biology (TA: fall semester). BIO 198. University of Kentucky.
- 2014 Principles of Genetics (TA: spring semester). BIO 304. University of Kentucky.
- 2013 Principles of Genetics (TA: fall semester). BIO 304. University of Kentucky.
- 2013 Introduction to Biology (TA: spring semester). BIO 155. University of Kentucky.
- 2012 Introduction to Biology (TA: fall semester). BIO 155. University of Kentucky.
- 2012 Introduction to Biology (TA: spring semester). BIO 155. University of Kentucky.
- 2011 Introduction to Biology (TA: fall semester). BIO 155. University of Kentucky.

2009 – 2016 Led half-day and full-day nature photography tours with a maximum of four participants. Workshops included extensive backcountry travel in harsh conditions and photographic instruction.

OUTREACH PRESENTATIONS

- 2013 Off The Beaten Path: Wilderness Photography. WNC Foto Fest, Brevard, NC.
- 2013 The Challenge of Poor Weather and Difficult Conditions. WNC Foto Fest, Brevard, NC.
- 2011 Landscape Photography in the Appalachian Mountains. REI, Charlotte, NC.
- 2011 The Wilderness Landscape. Carolina Nature Photographers' Association – Midlands SC Chapter. Columbia, SC.
- 2011 The Wild Landscape. REI. Asheville, NC.
- 2010 Mountain climbing and global warming. 1st grade class. Scurlock Elementary School (Hoke County, N.C.).
- 2010 Landscape Photography. Franklin Camera Club, Franklin, NC.
- 2008 Landscape Photography. RACL Photography Club, Raleigh, NC.
- 2008 Landscape Photography. Sandhills Photography Club, Sandhills, NC.
- 2008 Nature Photography. Carolina Nature Photographers' Association – Raleigh NC Chapter.
- 2008 Landscape Photography. Capital City Camera Club, Raleigh, NC.
- 2007 Camping Across North America. Capital City Camera Club, Raleigh, NC.

SELECTED PHOTOGRAPHY CREDITS

- 2018 Cover image. *The Appalachian Voice*. Winter.
- 2017 Two-page spread. *WNC Magazine*. November/December.
- 2017 Artist portrait, contributed multiple images and text. *Portfolio Magazine*. February.
- 2016 Cover image. *North Carolina Wildlife Magazine*. October/November.
- 2016 Accompanying photographs for written article. *Drive: The Magazine from Subaru*. Spring.
- 2014 Cover image. *The Appalachian Voice*. Fall.
- 2014 Cover image. *Our State Magazine*. January.
- 2013 Cover image. *WNC Magazine*. November/December.
- 2013 Accompanying photographs for written article. *Drive: The Magazine from Subaru*. Winter.
- 2013 Cover image. *Appalachian Trail Journeys*. January/February.
- 2013 Cover image. *The Appalachian Voice*. Spring.
- 2012 Cover image. *The Appalachian Voice*. Spring
- 2011 Cover image. *The Appalachian Voice*. Fall.
- 2008 Co-contributing artist to a special issue. *Across the Mountains*, published by *The Sylva Herald*. Summer.
- 2007 Co-contributing artist to a special issue. *Across the Mountains*, published by *The Sylva Herald*. Summer.