

# SIERRA D. JECH

University of Colorado  
Ecology & Evolutionary Biology  
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## Education

current	<b>University of Colorado Boulder</b> , Department of Ecology & Evolutionary Biology Ph.D. in progress, Ecology and Evolutionary Biology
2019	<b>University of Colorado Boulder</b> , BioFrontiers Institute Certificate in Interdisciplinary Quantitative Biology Program
2018	<b>State University of New York College of Environmental Science and Forestry</b> M.S., Environmental Chemistry
2016	<b>University of Wyoming</b> , Laramie, WY B.S., dual degree in Chemistry and Earth Systems Science & Minor in Queer Studies

## Focal Areas

microbial ecology • soil chemistry • ecological restoration • environmental and social justice

## Statement of Research Interests

As an Earth Systems scientist, I am interested in the chemical interconnectivity of the Earth's soil, waters, and atmosphere. I utilize microbiological tools to investigate the functioning of natural systems as well as developing ways to mitigate human perturbation of those systems. I currently work on soil health and restoration of drylands with many collaborators including the Barger Lab members at CU, the Moab USGS, and the Canyonlands Research Center. Many of my current research projects focus on biological soil crusts from the desert southwestern United States.

## Appointments

2019-present	<b>Doctoral Researcher.</b> Using microbial ecology and soil chemistry to improve dryland restoration outcomes. Advisor: Dr. Nichole Barger. <a href="#">Aridlands Ecology Lab</a> , Department of Ecology and Evolutionary Biology, University of Colorado, Boulder, CO.
2018-2019	<b>IQ Biology Training.</b> A year-long certificate program in <a href="#">Interdisciplinary Quantitative Biology</a> including research rotations, coursework, and community building. Research rotations with Dr. <a href="#">Orit Peleg</a> (Computer Science), Dr. <a href="#">Boswell Wing</a> (Geology), Dr. <a href="#">Daniel Larremore</a> (Computer Science), and a team rotation advised by Dr. <a href="#">Colin Campbell</a> (Chemistry).
2016-2018	<b>Masters Researcher.</b> Hopanoid and lipid biomarker characterization for modern microbialites in a freshwater lake in Central New York and in Great Salt Lake, UT. Advisor: Dr. Mark Teece. <a href="#">Biogeochemistry Lab</a> , Department of Chemistry, State University of New York College of Environmental Science and Forestry, Syracuse, NY.
2011-2016	<b>Undergraduate Research Assistant.</b> Wide variety of undergraduate research experiences with Dr. <a href="#">Craig Benkman</a> (Department of Zoology & Physiology), Dr. <a href="#">Franco Basile</a> (Department of Chemistry), Dr. <a href="#">Melanie Murphy</a> (College of Agriculture and Natural Resources), and Dr. <a href="#">Elise Pendall</a> (Department of Botany).

## Publications & Submitted Papers (Total = 2)

- 2018 Thesing, B.J & **Jech, S.** 2018. *Crotalus viridis* melanism. Herpetological Review: Natural History Notes 49(2): 338-339. <https://ssarherps.org/herpetological-review-pdfs/>
- 2016 Benkman, C. W., **Jech, S.**, Talluto, M.V. 2016. From the ground up: biotic and abiotic features that set the course from genes to ecosystems. *Ecology and Evolution*. 1-7. doi: [10.1002/ece3.2468](https://doi.org/10.1002/ece3.2468)

## Conference Proceedings

- 2016 Watson, R.M., Boggs, C.N., with contributions from Bochanski, K. J., Solvang, S., **Jech, S.**, Wiswell, S., Sulser, A.E., Noren, B. 2016. Climate, competition and curriculum collide: Designing an integrated action-learning course with international competition and environmental sustainability curriculum. Journal of Action Research Network of the Americas. 4th Annual ARNA Conference Proceedings.

## Publications in Preparation (Total = 5)

- Jech, S.**, Antoninka, A., Day, N., Tucker, C., Reed, S., Barger, N.N., Belnap, J. Survival of cyanobacteria and relevant biological soil crust heterotrophs throughout inoculum cultivation and application at restoration sites. (*In Prep for Restoration Ecology*)
- Jech, S.**, Havrilla, C., Barger, N.N. Biological soil crust recovery rates are independent of scraping disturbance size in plot-level study on the Colorado Plateau, USA. (*In Prep for Restoration Ecology*)
- Barger, N.N., **Jech, S.** Buhr, E., Akhtar-Schuster, M. Key policy recommendations for improving global land degradation. (*In Prep for Nature Sustainability*)
- Jech, S.** & Teece, M. Lipid biomarkers of Great Salt Lake microbialites (Utah, USA). (*In Prep for Organic Geochemistry*)
- Jech, S.** & Teece, M. Hopanoid and lipid biomarker composition of freshwater microbialites in Fayetteville Green Lake, New York. (*In Prep for Organic Geochemistry*)

## Fellowships and Awards (Total = \$9,600)

2018	Dr. Scholl Graduate Fellowship through BioFrontiers Institute at CU Boulder	\$2,000
2017	Pathfinder Fellowship from the Consortium of Universities for the Advancement of Hydrologic Science, Inc. for thesis work	\$1,500
2017	SUNY-ESF Chemistry Outstanding Teaching Award	\$100
2017	Sussman Foundation Fellowship & Internship at Green Lakes State Park, NY for thesis work and public outreach	\$6,000
2015	UW Committee on Women and People of Color (CoWPOC) Magnificent Mile Award	
2014-2015	Arts & Sciences Honor Roll for Outstanding Academic Achievement	
2014	UW Dept. of Chemistry Award in Analytical Chemistry	
2014	UW Dept. of Chemistry Superior Student Award	
2014	UW Dept. of Chemistry Walter F. Gasdek and Barry D. Gasdek Scholarship in Chemistry	
2014	Senator Byrd Scholarship at UW	
2013	UW Dept. of Botany Outstanding Junior Award	

2013	UW EPSCoR Grant for undergraduate research with Dr. Murphy
2012	Arts & Sciences Saunders-Walters Study Abroad Scholarship
3 years	Cheney Study Abroad Scholarships for study abroad in New Zealand (2012), Italy (2013), and Slovakia (2015)
4 years	Hathaway Scholarship at the University of Wyoming (2011-2014)
2010	Presidential and McKinley Scholarships at the University of New Hampshire
2010	Salutatorian at Cody High School

#### Research and Travel Grants (Total = \$69,500)

2020	CU EBIO Dept. Summer Research Grant	\$2,000
2020	CU Boulder Paula C. Moore Grant	\$2,000
2020	Canyonlands Research Center Fellowship Grant	\$3,000
2020	Cooperative Ecosystem Studies Unit (CESU) with Moab USGS	\$50,000
2019	CU EBIO Dept. Summer Research Grant	\$2,500
2019	IQ Biology Program Departmental Funding for students	\$10,000
2017	SUNY-ESF Graduate Student Association Travel Grant to Cartagena, Colombia to present Gliding into Action: Integrating Skiing and Climate Change Research	
2015	UW HAUB School Special Projects Grant for Ski Team Research in Slovakia	

#### Presentations

2020	<b>Jech, S.</b> , Havrilla, C., Barger, N.N. Natural recovery patterns of biological soil crusts on the Colorado Plateau. <i>Ecological Society of America (ESA) Annual Meeting</i> , Oral Presentation, virtual format. August 3, 2020.
2019	Watson, R., Boggs, C., <b>Jech, S.</b> Social Network Analysis of the University of Wyoming Learning Actively Mentorship Program (LAMP) Reveals Connectivity in Active Learning Community. <i>Lily Conference on Teaching and Learning</i> . Oxford, OH. November 21, 2019
2019	<b>Jech, S.</b> Quantifying and qualifying team science in graduate education: A case study at the University of Colorado Boulder. Workshop. <i>Action Research Network of the Americas Conference</i> . McGill University, Montreal, Canada. June 26, 2019
2019	Benson, P., Hobbs, E., <b>Jech, S.</b> Reducing Pollinator Decline (parts 1 & 2). IQ Biology Team Research Rotation, Boulder, CO. Advised by Dr. Colin Campbell. Spring 2019
2019	<b>Jech, S.</b> A topic modeling approach to generalist and specialist strategies of productivity in academia. IQ Biology Research Rotation #3, Boulder, CO. Advised by Dr. Dan Larremore. Spring 2019.
2018	<b>Jech, S.</b> Resolving the discrepancy between early origins of C4 photosynthesis and late appearance of the C4 trait in the fossil record. IQ Biology Research Rotation #2, Boulder, CO. Advised by Dr. Boswell Wing. Fall 2018.
2018	<b>Jech, S.</b> A perpetually folding circle of <i>Mimosa pudica</i> , the sensitive fern. IQ Biology Research Rotation #1, Boulder, CO. Advised by Dr. Orit Peleg. Fall 2018

- 2018 **Jech, S.** Hopanoid and lipid biomarkers as indicators of microbial communities in modern microbialites from Fayetteville Green Lake, NY and Great Salt Lake, UT. Master's thesis, Syracuse, NY. Advised by Dr. Mark Teece. May 2018.
- 2017 Bochanski, K., Boggs, C., **Jech, S.**, Noren, B., Watson, R. Gliding into action: Integrating skiing and climate change research. *Action Research Network of the Americas Conference*. Cartagena, Colombia. June, 2017.
- 2017 **Jech, S.** Microbialite biomarkers and the growth of unusual freshwater microbialites in a Central New York Lake. *Spotlight in Graduate Research*, Syracuse, NY. Spring 2017
- 2017 **Jech, S.** Microbialite biomarkers and the growth of unusual freshwater microbialites in a Central New York Lake. *State University of New York Faculty Senate Graduate Research Conference*, Saratoga Springs, NY. Spring 2017.
- 2016 Skiing and Climate Change Panel at SHIFT Conference, Jackson Hole, WY.  
<https://www.youtube.com/watch?v=UcyQmQDLFBI>
- 2015 Bochanski, K., Bogg, C., **Jech, S.**, Noren, B., Schroeder, B., Thomas, Y., Watson, R. Footprint of an International Sporting Event. University of Wyoming, Laramie, WY.  
<https://www.youtube.com/watch?v=UsXzquRuUzo&feature=youtu.be> (50:32)
- 2014 **Jech, S.** Water Quality in the Plains and Prairie Pothole Region. UW Undergraduate Research Days, Laramie, WY. Advised by Dr. Melanie Murphy and Dr. Charlotte Gabrielsen

#### Teaching Experience:

- Fall 2021 Ecology Lab at CU Boulder  
 Spring 2021 Microbiology Lab at CU Boulder  
 Spring 2020 General Biology II Lab at CU Boulder  
 Fall 2019 General Biology I Lab at CU Boulder  
 Spring 2018 General Chemistry II Lab at SUNY-ESF  
 Fall 2017 General Chemistry Lab for non-science majors at SUNY-ESF  
 Spring 2017 General Chemistry II Lab at SUNY-ESF  
 Fall 2016 General Chemistry Lab for non-science majors at SUNY-ESF

#### Research Mentorship (Total = 1)

- 2019-2020 Sallie Tucker (University of Colorado Boulder, MA), research co-mentor

#### Specialized Training

- 2020 R for Microbial Ecologists. Virtual 3-day course with Dr. Pat Schloss
- 2019 Strategies and Techniques for Analyzing Microbial Population Structures (STAMPS) Course. Marine Biological Laboratory at Woods Hole, MA
- 2015-2016 Herpetology field technician. Wyoming Natural Diversity Database. Summer field surveys and 2016 field crew leader. Dr. Wendy Estes-Zumpf, Laramie, WY.

#### Professional Service and Volunteerism

- 2021-2022 Letters to a Pre-Scientist, STEM pen-pal
- 2021-2022 Co-organizer for IQ Biology Program 10-Year Anniversary

2020-2021	Mentor for first year EBIO graduate students at CU Boulder
2019-2022	Co-organizer of Quantitative Exploration and Discussion (QED) Supergroup through BioFrontiers at CU Boulder
2020	Learning Coach for the Microbiology Capstone course at University of Wyoming (taught by Rachel Watson). Preparation of R mapping tutorial and activity for students called <a href="#">World Aid</a>
2019	Co-organizer of IQ Biology Orientation Week for the incoming student cohort. I was specifically in charge of leading a purpose and visioning exercise emphasizing the interdisciplinarity of each student's academic path. I assisted with organization for food, faculty talks, and logistics.
2019	Learning Coach for the Earth as Planet/Planet as Body course at the University of Wyoming (taught by Rachel Watson), which included weekly online course meetings and mentoring student-athletes in their class projects and presentations at the Action Research Network of the Americas Conference (Montreal, Canada)
2018-present	Served as Secretary of Skiers Nordic of Wyoming (SNOW), a non-profit support network for skiing at all ages in and for social & environmental justice in Wyoming and beyond
Fall 2017	Organized 10 SUNY-ESF students for the Post-Landfill Action Network's Students for Zero Waste Conference with support from ESF Sustainability Office
2017	Volunteered with Friends of Recreation, Conservation and Environmental Stewardship in the NY State Parks doing manual invasive species removal
2014-2016	Served on the Shepard Symposium on Social Justice organizing board for three years, volunteered at conferences, served as student club liaison for sustainability for 2016 conference
2015	Co-organizer of University of Wyoming's first solar-powered music festival, participated in fundraising, band selection, obtaining event approval, and organizing volunteers
2012-2015	Initiated the Trash 2 Treasure program at University of Wyoming through the Ski Club, an environmentally conscious fundraiser that also benefits the community. I applied for and received Associated Students of the University of Wyoming Special Projects Grants for a large tent and storage units for this fundraiser
2014, 15	Camp counselor at the Wyoming High School Ski Camp in Centennial, WY
2014-2015	Implemented trash clean up and recycling protocol for clean-up at the football stadium through the Nordic Ski Club. This allowed the club to move away from mundane fundraisers to more meaningful fundraisers that contribute to the community

### Conferences & Workshops Attended

2021	ESA 2020 Virtual Meeting. August 2-6.
2021	Society for Ecological Restoration. Virtual Meeting. June 21-24.
2021	Sustainability Research and Innovation. Virtual Meeting. June 12-15.
2020	ESA 2020 Virtual Meeting. August 3-6.

- 2019 15<sup>th</sup> Biennial Conference of Science and Management on the Colorado Plateau & Southwest Region. September 9-12, 2019. Flagstaff, AZ
- 2019 Original Lilly Conference on College Teaching. November 21-23, 2019. Oxford, OH.
- 2019 Action Research Network of the Americas. June 26-28, 2019. Montreal, Canada.
- 2017 Action Research Network of the Americas. June 12-16, 2017. Cartagena, Colombia.
- 2014 Attended the National Women's Leadership Conference then helped to organize the University of Wyoming Women's Leadership Conference. Served on Women of Distinction, Fundraising, and Entertainment Committees

### Journals Refereed

Soil Biology & Biochemistry

### Technical Skills

R: data management, statistical analyses, data visualization  
 Gas Chromatography and Mass Spectrometry: instrumentation and data analysis  
 DNA extraction, sequencing preparation, and quantitative PCR

### Athletics

- 2021 Boulder Mountain Warriors running coach
- 2021 Cross-country ski coach volunteer with Boulder Nordic Junior Racing Team
- 2017 Athlete at World University Games in Almaty, Kazakhstan for Team USA
- 2015 Athlete at World University Games in Strbske Pleso, Slovakia  
 University of Wyoming Nordic Ski Club President  
 United States Collegiate Ski and Snowboard Association (USCSA) National Board Female Representative  
 (2-year position)  
 Research Projects: <https://www.uwyonordic.com/slovakia.html>
- 2014 Athlete at World University Games in Trentino, Italy  
 USCSA Overall National Champion  
 University of Wyoming Nordic Ski Club President-Elect
- 2013 University of Wyoming Ski Club Secretary
- 2012 USCSA National Sprint Champion
- 2010, 11 University of New Hampshire Nordic Ski Team athlete