

EMILY FAIRFAX, PhD

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ECOHYDROLOGY

BEAVERS

REMOTE SENSING

EDUCATION

- Ph.D. Geological Sciences**, University of Colorado Boulder (2015 – 2019)
Certificate in Hydrologic Sciences
Certificate in College Teaching
NDSEG Fellow
- B.A. Physics & Chemistry** (*double major*), Carleton College (2010 – 2014)
cum laude

APPOINTMENT HISTORY

- California State University Channel Islands**
Environmental Science and Resource Management
Assistant Professor (2019 – present)
- Utah State University**
Watershed Sciences
Courtesy Adjunct Assistant Professor (2021 – present)
- University of Colorado Boulder**
Geological Sciences
Lecturer (2019)
ASSETT Fellow (2018 – 2019)
NDSEG Fellow (2015 – 2018)
- UNAVCO**
Professional Development Instructor (2019)
RESESS Graduate Fellow (2018)
- Los Alamos National Laboratory**
Systems Engineer (2014 – 2015)

RESEARCH

Peer Reviewed Publications

* = undergraduate student supervised

† = co-first authorship. Both authors contributed equally

In Peer Review Process

9. **Fairfax, E.**, Clinton, N., Zhu, E., Maiman, S., Shaikh, A., Macfarlane, W., Wheaton, J., Ackerstein, D., Corwin, E. (*in review*). EEAGER: a neural network for finding beaver complexes in aerial and satellite imagery.
8. **Fairfax, E.**, Wheaton, J., *Osorio, B., *Miller, J. (*in review*), Evidence of Widespread Beaver-Created Fire Refugia in the American West. GSA Books - Biogeomorphic Responses to Wildfire in Fluvial Systems.
7. **Fairfax, E.** & *Whittle, A. (*in revision*), Calculating Landscape-Scale Surface Water Storage in Beaver Ponds Using Google Earth: a Case Study in Wyoming, USA. Earth and Space Science.

Published

6. Norman, L., Lal, R., Wohl, E., **Fairfax, E.**, Gellis, A., Pollock, M. (2022) [Natural Infrastructure in Dryland Streams Create Wetland Sinks that Mitigate Climate Risk](#). Science of the Total Environment. <https://doi.org/10.1016/j.scitotenv.2022.157738>
5. Jordan, C. E.† & **Fairfax, E.†**. (2022), [Beaver: The North American Freshwater Climate Action Plan](#). WIREs Water. doi: 10.1002/wat2.1592
4. **Fairfax, E.** & *Whittle, A. (2020), [Smokey the Beaver: beaver-dammed riparian corridors stay green during wildfire throughout the western USA](#). Ecological Applications. doi:10.1002/eap.2225
3. **Fairfax, E.** & Brown, M. R. M. (2019), [Increasing Inclusion and Accessibility in Undergraduate Geology Labs Through Scenario-Based TA Training](#). Journal of Geoscience Education. DOI: 10.1080/10899995.2019.1602463
2. **Fairfax, E.** & Small, E. E. (2018), [Using remote sensing to assess the impact of beaver damming on riparian evapotranspiration in an arid landscape](#). Ecohydrology 11(7). doi:10.1002/eco.1993
1. **Fairfax, E.** & Steinzig M. (2016) [A Summary of Failures Caused by Residual Stresses](#). Residual Stress, Thermomechanics & Infrared Imaging, Hybrid Techniques and Inverse Problems, Volume 9. Conference Proceedings of the Society for Experimental Mechanics Series. doi.org/10.1007/978-3-319-21765-9_26

Published Data

* = undergraduate student supervised

2. **Fairfax, E.** & *Whittle, A. (2020): Google Earth Path Files of Beaver Dams and Ponds in Laramie Ranger District, Medicine Bow Routt National Forest, WY. PANGAEA, <https://doi.pangaea.de/10.1594/PANGAEA.913923>
1. **Fairfax, E.** & *Whittle, A. (2019): Normalized Differenced Vegetation Index (NDVI) of riparian areas with and without beaver damming within wildfire perimeters in Western US. PANGAEA, <https://doi.pangaea.de/10.1594/PANGAEA.900944>

Invited Speaking

58. (upcoming) Pacific Trust Forest Council. Beavers in California. November 2022
57. (upcoming) California State University Chico. Biology Seminar Series. October 2022
56. (upcoming) Climatebase Fellowship Program Seminar. Nature-based solutions. September 2022
55. (upcoming) UC Climate Stewards Program: Oakland Zoo. Beavers and Wildfire. September 2022
54. Ventura River Watershed Meeting. Beavers in Coastal California. August 2022.
53. Audubon Canyon Ranch Conservation Science Intensive. Panelist on Careers in Conservation. June 2022.
52. Estes Valley Watershed Coalition. Beavers and Wildfire. June 2022.
51. California Water Quality Monitoring Council. Beavers, fire, and water quality. May 2022.
50. Sierra Club and Corvallis-Benton County Public Library. Beavers and Wildfire. May 2022
49. Audubon Canyon Ranch. Science Webinar Series. Beavers and Climate Change. April 2022
48. Front Range Community College. Careers in Geosciences Panel. April 2022.
47. Utah State University. Watershed Sciences Colloquium. April 2022.
46. Université du Québec à Montréal. Ecology and Evolution Seminar Series. April 2022.
45. Northern Illinois University. Geoscience Department Colloquium. March 2022.
44. Pacific Northwest Aquatic Monitoring Partnership Remote Sensing Forum. Beavers and Remotely Sensed Ecohydrology. March 2022.
43. UC ANR Climate Steward Program for the Oakland Zoo. Beavers in California. March 2022
42. California Native Plant Society Mt. Lassen Chapter. Beavers and Fire. March 2022.
41. American Fisheries Society Colorado and Wyoming Chapter Annual Meeting. Plenary Presentation. Beavers and Megafire in the Rocky Mountains. March 2022.
40. Central Coast Bioneers. Guided Nature Walk and Talk About Beavers. February 2022.
39. Boulder County Audubon Society. [Q&A Beavers and Climate Change](#). February 2022

38. Scott Watershed Informational Forum. Beavers and Wildfire. February 2022.
37. Oklahoma Wildlife Society Annual Meeting. Smokey the Beaver. February 2022.
36. River Restoration Northwest. Remote Sensing of Beaver Dams Workshop. February 2022
35. The Nature Conservancy South Dakota. Annual Fundraiser Keynote. December 2021.
34. Santa Barbara Permaculture Network. Dinner Talk at The Farmer and The Cook. November 2021.
33. Santa Ynez Valley Natural History Society. Beavers in California and the Santa Ynez River. November 2021.
32. ASWM Members Webinar. [Megafires Be Dammed](#). October 2021
31. [Colorado Beaver Summit](#). [Beavers and wildfire](#). October 2021
30. WestFAST (Western States Federal Agency Support Team) Webinar. [Wildfires and Droughts be Dammed](#). October 2021.
29. The Nature Conservancy South Dakota Annual Banquet. October 2021. *Declined due to State of California travel restrictions per AB 1887.*
28. Audubon Canyon Ranch Conservation Science Intensive. Panelist on Careers in Conservation. July 21st, 2021
27. Audubon Canyon Ranch Conservation Science Intensive. Panelist on Careers in Conservation. July 14th, 2021
26. [World Environment Day Webinar](#). [Beavers and Climate Change](#). June 3rd, 2021
25. Earth Day Beaver Trivia and Q&A Panelist. Beaver Believers. April 24th, 2021.
24. [Natural Areas Association](#). [Beaver and Fire Symposium](#). April 22nd, 2021.
23. [California Beaver Summit](#). [Keynote Speaker](#). [Beavers and wildfire](#). April 9th, 2021.
22. Los Padres Forest Watch and Beaver Believers Q&A Panel. April 8th, 2021
21. Fire Ecology and Management. Point Blue Conservation Science. April 8th, 2021
20. Beavers and Fire for the Rogue Riverkeepers. March 30th, 2021.
19. Expert Testimony on HB2844 for the Oregon State Legislature. March 18th, 2021.
18. [California Fire Science Webinar Series](#). [Smokey the Beaver](#). March 16th, 2021
17. [ASWM Beaver Restoration Webinar](#). [Beaver Restoration for Climate Resiliency](#). March 10th, 2021
16. University of Colorado Boulder Gamification Community of Practice Presentation – Gamifying Your Classroom. March 2nd, 2021
15. Beavers and Climate Change Panelist and Presenter for San Luis Obispo Beaver Brigade and Beaver Believers. February 21st, 2021
14. Beavers and Climate Change Panelist and Presenter for Scott River Watershed and Beaver Believers. January 21st, 2021



13. [California Naturalist Program Seminar \(CONES\) – Smokey the Beaver](#). January 19th, 2021
12. [NOAA Monster Seminar Jam – Smokey the Beaver](#). January 14th, 2021
11. [Oxford Real Farming Conference: Farming and Climate Change – How Beavers Can Help](#). January 10th, 2021
10. [University of Nevada Reno Ecology and Evolutionary Biology Colloquium](#). Nov 12th, 2020
9. [CSUCI Mathematics Colloquium](#). October 26th, 2020
8. Beavers and Climate Change Panelist for Friday Harbor Film Festival and Beaver Believers. October 21st, 2020
7. [Bark! Smokey the Beaver](#). October 15th, 2020
6. Beavers and Climate Change Panelist for Beaver Coalition and Beaver Believers. October 5th, 2020
5. [AGU H3S and CUAHSI Panel on Scientific Communication at Conferences](#). June 26th, 2020
4. [Beavers without Borders](#). BeaverCON 2020. March 3rd, 2020
3. [Smokey the Beaver: Can Beaver Dams Help Protect Riparian Vegetation During Wildfire?](#) Webinar for the U.S. Forest Service. January 28th, 2020
2. [Dam Big Data](#). CSUCI Computer Science Colloquium. October 15th, 2019.
1. [Beavers: the other professional engineer](#). AEG (Association of Environmental and Engineering Geologists) Mile High Chapter Meeting. May 14th, 2019.

Conference Presentations

* = *undergraduate student supervised*

24. Rongstad, B., Gold, A., **Fairfax, E.** (*upcoming*) Using Storytelling to Connect Diverse Communities with Science Topics Through Informal Education Experiences. AGU Annual Fall Meeting 2022.
23. **Fairfax, E.**, Clinton, N., Zhu, E., Maiman, S., Shaikh, A., Ackerstein, D., Corwin, E. (*upcoming*). EEAGER: a model that detects beaver-created wetlands in satellite and aerial imagery. AGU Annual Fall Meeting 2022.
22. **Fairfax, E.**, Clinton, N., Zhu, E., Maiman, S., Shaikh, A., Ackerstein, D., Corwin, E. (*upcoming*). EEAGER: a neural network model for finding beaver complexes in satellite and aerial imagery. GSA Annual Fall Meeting 2022.
21. Zhu, E., Clinton, N., **Fairfax, E.**, Maiman, S., Shaikh, A., Ackerstein, D., & Corwin, E. (2022), EEAGER: a neural network for finding beaver complexes in imagery. BeaverCON 2022.
20. Jordan, C. E. *f*, & **Fairfax, E** *f*. (2022), Beaver: The Freshwater Climate Action Plan. BeaverCON 2022.
19. **Fairfax, E.**, *Osorio, B., *Kirksey, K., and *Miller, J. (2022) Megafires Be Dammed: can beaver-created fire refugia persist through extreme wildfire events?, BeaverCON 2022.
18. **Fairfax, E.** Beaver-Supported Drought and Fire Resilience. Arkansas River Basin Water Forum 2022.

17. **Fairfax, E.**, *Osorio, B., and *Kirksey, K. (*upcoming, postponed until 2022 due to COVID-19*) Ribbons of Refugia: beavers create and maintain highly-connected, fire-resistant patches of riparian habitat. Invited Presentation for AFS Annual Meeting. *Session postponed for COVID-19.*
16. Quinlan, K., Brown, M.R.M., **Fairfax, E.** Groundwater dynamics and contributions within the Ashley-Brush Basin, Utah. GSA Annual Fall Meeting 2021
15. *Kirksey, K., and **Fairfax, E.** One year of beaver modifications to a large sandy river: a case study in central California, GSA Annual Fall Meeting 2021
14. **Fairfax, E.**, *Osorio, B., and *Kirksey, K. (2021) Megafires Be Dammed: can beaver-created fire refugia persist through extreme wildfire events?, Invited Presentation for GSA Annual Fall Meeting 2021
13. Jordan, C.E., Bouwes, N., Wheaton, J., and **Fairfax, E.** (2021) Partnering with Beavers in Low-Tech Process-Based Watershed Restoration. National Conference on Ecosystem Restoration 2021.
12. **Fairfax, E.** and *Whittle, A. (2019) Smokey the Beaver: Can Beaver Dams Help Protect Riparian Vegetation During Wildfire?, AGU Annual Fall Meeting 2019
11. **Fairfax, E.** (2019) How Can You Talk About Your Research and Tell a Story Without Saying Any Words? With a Little Bit of Patience and Whole Lot of Felt: Lessons Learned from Creating and Sharing an Elevator Video, AGU Annual Fall Meeting 2019
10. **Fairfax, E.** (2018) Roll a Water Check! Using Games to Teach Hydrology, submitted for Pop-Up Talk at AGU Annual Fall Meeting 2019
9. **Fairfax, E.** and E. E. Small. (2018) Over, Under, or Through: How the leakiness of a beaver dam influences groundwater-surface water interactions, AGU Annual Fall Meeting 2018
8. **Fairfax, E.** and M. R. M. Brown. (2018), Increasing Inclusion and Accessibility in Undergraduate Geology Labs Through Scenario-Based TA Training, AGU Annual Fall Meeting 2018
7. M. R. M. Brown. and **Fairfax, E.** (2018), Assessing Accessibility Climate: What undergraduates think about accessibility in the geoscience classroom, AGU Annual Fall Meeting 2018
6. *Whittle, A., & **Fairfax, E.** (2018), Beaver Ponds are a Major Contributor to Surface Water Storage in the Medicine Bow-Routt National Forest, Laramie Ranger District, WY, USA. AGU Annual Fall Meeting 2018
5. **Fairfax, E.** (2018), Roll a Water Check! Using Game-Based Learning to Correct Common Alternate Conceptions of the Hydrologic Cycle. Center for STEM Education 10th Annual Symposium, Boulder, CO.
4. **Fairfax, E.** and E. E. Small. (2017), The Role of Beaver Ponds in Maintaining Vegetation Health During Droughts: A Case Study at Susie Creek and Maggie Creek, NV, GSA Fall Meeting Abstracts 2017
3. **Fairfax, E.** and E. E. Small. (2016), Hyporheic Exchange in a Stream Dammed by Beaver: A 1D Simulation with Spatial Energy Head Gradients and Heterogeneous Hydraulic Conductivity as Drivers, AGU Fall Meeting Abstracts 2016

2. **Fairfax, E.** and E. E. Small. (2016), 1D Simulation of Hyporheic Exchange in a Stream Dammed by Beaver, GSA Fall Meeting Abstracts
1. **Fairfax, E.**, et al. (2015), PBO H2O: Monitoring the Terrestrial Water Cycle with reflected GPS signals recorded by the Plate Boundary Observatory Network, AGU Fall Meeting Abstracts.

Honors and Awards

Faculty Excellence in Research, Scholarly, and Creative Activities Award. College of Arts and Sciences. California State University Channel Islands. (2021)

Grant Funding

Pending Funds (\$220,330)

- Fairfax, E.** (2022-2023) Water and Carbon Storage Associated with Beaver Activity in the Harney Basin, OR. (\$57,665)
- Fairfax, E.** (2022) Remote Sensing Survey of Beaver Infrastructure in the Black Hills National Forest. The Nature Conservancy South Dakota and South Dakota Fish and Game. (\$47,665)
- Fairfax, E.**, and Wheaton, J. (2022-2027) River Restoration and Beaver-Based Restoration Effects on Fire Behavior, Water Storage, and Carbon Storage in CA and OR. US Fish and Wildlife Service (*via Utah State University*) (\$115,000)

Awarded External Funds (\$347,500)

- Fairfax, E.** (2022) Beavers, Climate Change, and Ecosystem Resilience. Special Project Renewal. Biodiversity First! (\$27,000)
- Fairfax, E.** (2022-2024) Project Mayfield. Assessment of Beaver Relocation Policies and Practices. Ackerstein Sustainability. (\$100,000)
- Fairfax, E.** (2021-2022) Project Beverly: Beavers - A Nature-Based Solution for Climate Change. Ackerstein Sustainability. (\$18,000)
- Fairfax, E.** (2020-2021) Beavers, Climate Change, and Ecosystem Resilience. Special Project. Biodiversity First! (\$18,725)
- Fairfax, E.** (2020). Remote Sensing to Identify Beaver Dams in Priority Ares in Newfoundland and Labrador, Canada. World Wildlife Fund Canada Special Project. (\$5000)
- Fairfax, E.** (2018) AWG (Association for Women Geoscientists) Takken Student Research Presentation Travel Award (\$500)
- Fairfax, E.** (2018) RESESS (Research Experience in Solid Earth Science for Students) Geological Sciences Graduate Fellowship (\$7000)
- Fairfax, E.** (2017) GSA (Geological Society of America) Rocky Mountain Section Travel Grant (\$75)
- Fairfax, E.** (2017) GSA (Geological Society of America) Graduate Student Research Grant, Geological Society of America: Drought Buffering in Riparian Areas Along Susie Creek, Nevada: The Role of Beaver Damming (\$2100)

Fairfax, E. (2015-2018) National Defense Science and Engineering Graduate Fellowship (NDSEG), Army Research Office, Air Force Office of Research, and ASEE (\$169,500)

Awarded Internal Funds (\$140,655)

Fairfax, E. (2022-2023). Modeling How River Restoration Can Influence Wildfire Spread Behavior. (\$6675)

Fairfax, E. (2021-2022) Undergraduate Research Funding via HSI-SMART: STEM Model for Research and Teaching Undergraduate-Intervention Program (*PI David Gillespie, \$2.5M award*) (\$26,200)

Fairfax, E. (2021). Acoustics as a Proxy for River Restoration Status. CSUCI Center for Integrative Studies. (\$1524)

Fairfax, E. (2021). Climate Change Be Dammed – the role of beavers in a warming arctic. CSUCI Summer SURF Student Research Program. (\$14,000)

Fairfax, E. (2020-2021) Undergraduate Research Funding via HSI-SMART: STEM Model for Research and Teaching Undergraduate-intervention Program (*PI David Gillespie, \$2.5M award*) (\$26,200)

Fairfax, E. (2020) Teaching and Learning Innovations Fellowship. CSUCI. (\$19,292)

Fairfax, E. (2020) Your B.S. isn't BS: ESRM Speaker Series (ESRM 496). CSUCI Instructionally Related Activities Fund. (\$6,800)

Fairfax, E. and Patsch, K. (2019). Data without Borders: Establishing a Collaborative Cross-Border Environmental Drone and GIS Research Program in Todos Santos, Baja California Sur, Mexico. CSUCI Faculty Research & Development Mini-grant. 2019-2020. (\$7,979)

Blackwood, E., **Fairfax, E.**, and Patsch, K. (2019). In a Repository Far, Far Away: Using virtual reality to bridge the gap between Santa Rosa Island data and the people who care about it. CSUCI Faculty Research & Development Mini-grant. 2019-2020. (\$7,990)

Fairfax, E. and Patsch, K. (2019). I See CI: Virtual Reality Exploration of Santa Rosa Island. CSUCI Summer SURF Student Research Program. (\$14,000)

Fairfax, E. (2018) Undergraduate Research Mentorship Grant, CU Boulder Department of Geological Sciences: ET Across Beaver-Dammed Landscapes. (\$1000)

Fairfax, E. (2018) United Government of Graduate Students Travel Grant (\$500)

Fairfax, E. (2018) Conference Travel Grant, CU Boulder Department of Geological Sciences (\$800)

Fairfax, E. (2018) Penny E. Patterson Graduate Research Grant, CU Boulder Department of Geological Sciences: Using the Leakiness of Beaver Dams to Assess their Function in a Landscape (\$1095)

Fairfax, E. (2018) Undergraduate Research Mentorship Grant, CU Boulder Department of Geological Sciences: Surface Water Storage in Beaver Ponds (\$1000)

Fairfax, E. (2017) University of Colorado Graduate School Travel Grant (\$300)

Fairfax, E. (2017) Birkeland Graduate Scholarship Research Grant, CU Boulder Department of Geological Sciences: Using Remote Sensing to Evaluate the Role of Beaver Ponds in Buffering the Effects of Drought on Nearby Riparian Vegetation (\$1500)

Fairfax, E. (2016) Conference Travel Grant, CU Boulder Department of Geological Sciences (\$800)

Fairfax, E. (2016) Spetzler Research Grant, CU Boulder Department of Geological Sciences: Beaver Dam Shallow Subsurface Hydrology (\$2000)

Fairfax, E. (2016) Undergraduate Research Mentorship Grant, CU Boulder Department of Geological Sciences: Beaver Dam Catalogue (\$1000)

Student Mentorship and Advising

Graduate Students Supervised

Molly Alves. Utah State University Dept of Wildland Resources (co-advised with Julie Young)

- M.S. - Best Practices in Beaver Relocation: a synthesis of literature, case studies, and practitioner knowledge (2022 – present)

Graduate Thesis Committee Member

Jessica Sikora. Northern Illinois University. Dept. of Biological Sciences

- M.S. - Spatial Analysis of Beaver Impoundment Impacts on Riverscapes in Restored Tallgrass Prairie. (2022 – present)

Devin Baumer. Utah State University. Dept. of Watershed Sciences

- M.S. – Impacts of Beaver on Bridge Creek, OR (2022 – present)

Jeff Anderson. Utah State University. Dept. of Watershed Sciences

- PhD – Can LT-PBR restoration by the people, for the people, overcome limiting factors to sockeye food-fishery declines? (2022 – present)

Undergraduate Research Assistants Supervised

Beaver Dam Hydrology

Ariana Arias. <i>CSUCI.</i>	(2022-present)
Jessie Segnitz. <i>UCLA.</i>	(2022-present)
Connor Murphy. <i>Sonoma State.</i>	(2022-present)
Joe Miller. <i>CSUCI.</i>	(2021-present)
Viviana Celeya. <i>CSUCI.</i>	(2020-present)
Natalie Perez. <i>CSUCI.</i>	(2020-present)
Rhianna Torres. <i>CSUCI</i>	(2020-present)
Brandon Osorio. <i>CSUCI.</i>	(2020-present)
Adrian Castro. <i>CSUCI.</i>	(2021-2022)
Cooper Lienhart. <i>Cal Poly.</i>	(2020-2022)
Keitreice Kirksey. <i>CSUCI.</i>	(2020-2022)
Ramie Klocko. <i>CSUCI.</i>	(2020-2021)
Jocelyn Adao. <i>CSUCI.</i>	(2020-2021)
Sizzinette Hernandez. <i>CSUCI.</i>	(2020-2021)
Kyle Ball. <i>CSUCI.</i>	(2019-2020)
Jaquie Lazeau. <i>CSUCI.</i>	(2019-2020)
Andrew Whittle. <i>CU Boulder.</i>	(2017-2019)
Sean Will. <i>CU Boulder.</i>	(2018)

Alexis Ahlert. *CU Boulder*. (2017)
Danya Abelhameid (2017)
Sage Basiri. *CU Boulder*. (2017)
Connor Jansen. *CU Boulder*. (2017)
Claire Czarnecki. *CU Boulder*. (2016)

Virtual Reality and Field Accessibility

Emily Orsborn. *CSUCI*. (2020)
April Hoberg. *CSUCI*. (2020)
Alyssa Connaughton. *CSUCI*. (2019-2020)
Jenny Shirhall. *CSUCI*. (2019-2020)
Jen Bayes. *CSUCI*. (2019-2020)

Data Visualization

Jenny Shirhall. *CSUCI*. (2019)
Nikollette Dussault-Martin. *CSUCI*. (2019)
Alyssa Connaughton. *CSUCI*. (2019)

REU Program Involvement

CSU Channel Islands Summer SURF (2020, 2021)
Research Experiences in Solid Earth Sciences for Students (RESESS) (2017, 2018, 2019)
Geo-Launch Pad (2018, 2019)
Research Experiences for Community College Students (RECCS) (2018)

TEACHING

Teaching Experience

Portland State University and River Restoration Northwest

Partnering with Beaver (*part of Professional Certificate in River Restoration*); Co-Instructor

California State University Channel Islands

ESRM 100: Introduction to Environmental Science and Resource Management

ESRM 203: Environmental Statistics (including programming in R)

ESRM 303: Data Visualization and Climate Communication

ESRM 328: Introduction to GIS (Geographic Information Systems)

ESRM 331: Geomorphology and Hydrology

ESRM 400: Analytics Studio

ESRM 463: Water Resources Management

ESRM 496: Speaker Series

University of Colorado Boulder

GEOL 1010: Introduction to Geological Sciences

GEOL 2001: Planet Earth (Teaching Assistant)

GEOL 4241: Geomorphology (Teaching Assistant)

UNAVCO RESESS and GeoLaunchPad Internships

Research Skill Development

Professional Communication Skills

Field and Off-Campus Programs

3-Day Field Trip to Santa Rosa Island, CA, USA. For ESRM 328: Introduction to GIS. (2019)

2-Week Program in Todos Santos, Baja California Sur, Mexico. UNIV 392: Data Without Borders. Partnership with Colorado State University. Scheduled January 2021. Postponed due to COVID-19.

3-Day Field Trip to Catalina Island. Geospatial Mapping of Rocks and Resources. Partnership with the University of Washington Dept. of Earth and Space Sciences. Scheduled for Fall 2022.

Technical Workshop Lead

NOAA BWET: Using iNaturalist to Teach About Ecohydrology – a workshop on Santa Cruz Island for Oxnard School District K12 educators. (May 2022)

CSUCI Plot-A-Thon. Using R to Analyze and Visualize Data. (Feb 2022)

River Restoration Northwest Symposium. Remote Sensing of Beaver Complexes. (Feb 2022)

BLM Gunnison, CO Field Office and EcoMetrics. Identifying and Monitoring Riparian Corridors with Remote Sensing for Targeted Beaver-Based Restoration and Fire Resilience. (Dec 2021)

Methow Beaver Project. Monitoring Riparian Condition Around Beaver Complexes and BDAs

Using Remote Sensing. (Sept 2021)

CSUCI Plot-A-Thon. Using R to Analyze and Visualize Data. (March 2021)

Professional Development Participation

Full Courses

T.L.C.: Teaching for Learning Continuity. CSU Channel Islands. (2021)
URGE (Unlearning Racism in Geoscience) CU Boulder Pod. (2021)
THRIVE Online Educator Training. CSU Channel Islands. (2020)
Equity in STEM for All Genders. CIRTL. (2018)
Addressing Implicit Bias in STEM. CIRTL. (2018)
Practicing Scientific Teaching. CU Boulder. (2018)
Evidence-Based Teaching. CIRTL. (2018)
Teaching and Learning in Geoscience. CU Boulder. (2017)
Pedagogy in Environmental Science. CU Boulder. (2017)

Workshops and Short Courses

60+ hours focused primarily on equity, accessibility, and technology in higher education

COMMUNITY ENGAGEMENT

Organization Advising and Working Relationships

[The Beaver Trust](#): Scientific Advisory Board Member. (2020 – present)

[The Beaver Coalition](#): Science and Technical Information Committee (STIC)

- Member (2020 – 2022)
- Chair (2022 – present)

[SLO Beaver Brigade](#): Partner Scientist. (2020 – present)

[Biodiversity First!](#): Project Scientist. (2020 – present)

[California Process-Based Restoration Network](#): Research and Monitoring Group Lead. (2022 – Present)

Public Outreach Presentations

[Guided Beaver Nature Walks](#). Atascadero, CA.

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|---------------------------------|---------------------------------|
| > Three walks on June 27, 2020. | > One walk on March 26, 2021 |
| > One walk on Aug 2, 2020. | > One walk on July 25, 2021 |
| > Two walks on October 23, 2020 | > One walk on October 1, 2021 |
| > One walk on February 26, 2021 | > One walk on February 25, 2022 |

Virtual Presentation for 4H Hiking Club New Jersey. May 2020

[Public research talk for CSUCI Library Lecture Series at Camarillo Public Library](#). Smokey the Beaver: Can Beavers Prevent Wildfires? Scheduled March 2020, cancelled due to COVID-19

[Public research talk for CSUCI Library Lecture Series at Ojai Public Library](#). Smokey the Beaver: Can Beavers Prevent Wildfires? October 2019

[Lens on Climate Change](#) Mentor and Interviewee. 2018, 2019

Creative Pieces

[Finding a Home](#). Digital Art. 87 Beavers Project. (2020)

[What do beavers have to do with wildfire?](#) Stop-Motion Animation. (2019)

[#HaikuYourResearch](#). Poetry. (2018)

Outreach Workshop Lead

Make Your Own Stop-Motion Animation! Workshop Creator and Facilitator for We Are Water / CIRES Education and Outreach (2021, 2022)

Research Inclusion In Museum Displays and Art Galleries

Research and stop-motion featured in High Desert Museum, Bend OR. Exhibit: [Dam it! Beavers and Us](#). Jan 30th – October 3rd, 2021

Research included in Mt. Shasta Sission Museum. Exhibit: Water – Shasta’s Liquid Gold. 2021-2023

Research included in Art Gallery by Suzanne Husky for Frieze Los Angeles 2022. Exhibit: Dam Beverly Hills! Feb 17th – 20th, 2022

MEDIA COVERAGE

Video and Television Media Coverage

10. (in production) ABC10 Sacramento. Title TBD.
9. (in production) CBS News. Title TBD
8. (in production) Mutual of Omaha’s Wild Kingdom. Title TBD.
7. (in production) CBS Morning Show. Title TBD.
6. True Facts. [True Facts About the Beaver](#). (2022)
5. Grist. [How a beaver boom is reshaping floods and fire](#). (2022)
4. PBS Overview. [Want to solve wildfires and droughts? Leave it to BEAVERS!](#). (2021)
3. Oregon Public Broadcasting. [Oregon Field Guide: Beavers and Wildfire](#). (2021)
2. KEYT, CBS LA, affiliate networks. [CSUCI study shows beavers can help prevent wildfires](#). (2020)
1. Yale Climate Connections. [Creative Climate Communication: 4 Scientists, 4 Approaches](#). (2019)

Radio and Podcast Coverage

25. Golden State Naturalist Podcast. [Beavers!](#) (2022)
24. KUNC / KNPR / KUNM / Boise State Public Radio / other local NPRs. [In the face of climate change, beavers are engineering a resistance](#). (2022)
23. KCBX News Update. [Newsom Proposed Beaver Funding](#). (2022)
22. NPR Morning Edition. [Beavers can teach researchers a thing or two about improving wildfire](#)



[resistance](#). (2022)

21. Talk + Water. [The Ecohydrology of Beavers](#). (2022)
20. The Water Table Podcast. [Beavers, BDAs, & Riverscape Restoration for Climate Resilience](#). (2021)
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18. NPR Science Friday. [Beavers Build Ecosystems of Resilience](#). (2021)
17. NPR All Things Considered. [To improve wildfire resistance, researchers look to beavers](#). (2021)
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15. KCLU / NPR Ventura & Santa Barbara. [Four Legged Firefighters? South Coast Researcher Says Beavers Play Role in Creating Fire Breaks for Wildfires](#). (2021)
14. Lodge Cast Podcast via The Beaver Trust. [Fighting Fire With Beavers](#). (2021)
13. Methow Beaver Project Podcast. Beavers and Wildfire. (2021)
12. KCBX / NPR Radio Central Coast. [Beavers aid in climate battle, local experts fight to protect species in California](#). (2021)
11. KCRW / NPR Radio Los Angeles "Press Play". [Beavers to prevent wildfires? Conservationists are enlisting the help of these buck-toothed rodents](#). (2021)
10. KBOO / NPR Radio Portland. [Special program on beavers for Earth Day](#). (2021)
9. KCBX / NPR Radio Central Coast. [Beavers can help fight drought and fire say Central Coast experts at CA Beaver Summit](#). (2021)
8. KQED / NPR Radio Bay Area. Beavers and wildfire. (2021)
7. KVTA Radio. Beavers and wildfire. (2020)
6. Artemis: Hunt to Eat. [Beaver Believers \(!\) with Emily Fairfax](#). (2020)
5. Water Talk. [Beaver Hydrology and Management](#). (2020)
4. Ask a Scientist. [Dr. Emily Fairfax - Beavers](#). (2020)
3. SciPod. [Oh Dam Look, That Beaver Just Put Out A Forest Fire!](#) (2019)
2. Curiosity Hour. [Emily Fairfax, PhD](#). (2019)
1. The Irrelevant Information Podcast. [Beavers](#). (2019)

Written and Online Media Coverage

[Frequent features](#) on Martinez Beavers: Worth a Dam. (2018 – present)

[Frequent features](#) on SLO Beaver Brigade. (2019 – present)

Wikipedia article: "[Environmental Impacts of Beavers](#)"

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101. Science News. [Relocated beavers helped mitigate some effects of climate change](#). (2022)
100. Los Angeles Times / others. [Op-Ed: Want to fight climate change and drought at the same time? Bring back beavers](#). (2022)
99. Vox. [Beavers are heat wave heroes](#). (2022)



98. E&E News / POLITICO / Scientific American. [The beaver emerges as a 'climate-solving hero'](#). (2022)
97. KUNC. [In the face of climate change, beavers are engineering a resistance](#). (2022)
96. KSJD. [Modern-day trappers are using beavers to fight the effects of drought](#). (2022)
95. Grist. [Your New Neighbor Flooded Your Yard – Now What?](#) (2022)
94. KCBX News Update. [Newsom Proposed Beaver Funding](#). (2022)
93. Golden Gate Audubon Society. [The Birds and the Beavers](#). (2022)
92. The Colorado Sun. [Opinion: Give the job of wildfire prevention to nature's architects](#). (2022)
91. Sierra Magazine. [We Don't Deserve Beavers: meddlesome beavers are cleaning up superfund sites](#). (2022)
90. Oregon Public Broadcasting. [Scientists believe beavers can build resilience in Northwest waterways](#). (2022)
89. Calaveras Enterprise. ['Smokey the Beaver' and the role furry aquatic critters play in preventing wildfire spread](#). (2022)
88. United Nations Environment Programme Press Release / various outlets. [Number of wildfires to rise by 50% by 2100 and governments are not prepared, experts warn](#). (2022)
87. Scientific American. [Beaver Dams Help Wildfire-Ravaged Ecosystems Recover Long after Flames Subside](#). (2022)
86. Popular Science / Phys.org / The Conversation / others. [What beavers, nature's engineers, can teach us about managing water](#). (2022)
85. California Sun. [5 Questions With...Jennifer Fearing](#). (2022)
84. Oregon Public Broadcasting. [2021: Must Watch Original Videos](#). (2021)
83. Newsweek (Japan). *(title translated)* [Wildfires in Colorado, USA. Only beaver habitats escaped big fires](#). (2021)
82. Forest News. [Low-Tech Restoration for Forest Health](#). (2021)
81. VC Reporter. ["A big web of water on the landscape" | Are beavers our new firefighters?](#) (2021)
80. Ojai Valley News. [Who ya gonna call? Beavers are drought-busters](#). (2021)
79. Oregon Public Broadcasting. [Could 'Smokey Beaver' help fight wildfires?](#) (2021)
78. California State University News. [In a Dry State Part 3: Opening the Floodgates](#). (2021)
77. California State University News. [In a Dry State Part 2: Tapped Out](#) (2021)
76. Discover Magazine. [Beavers Chip in on Landscape Engineering](#). (2021)
75. Audubon Rockies. [Beavers Offer Help for Western Waters](#). (2021)
74. NPR Science Friday. [Beavers Build Ecosystems of Resilience](#). (2021)
73. NPR All Things Considered. [To improve wildfire resistance, researchers look to beavers](#). (2021)
72. KUNC / NPR Northern Colorado. [Even Colorado's Largest Wildfire Was No Match for Beavers](#). (2021)
71. The Narwhal. [Life In the Heart of B.C.'s Brutal Summer Drought](#). (2021)
70. KCLU. [Four Legged Firefighters? South Coast Researcher Says Beavers Play Role in Creating Fire Breaks for Wildfires](#). (2021)



69. Real Vail. [Colorado Beaver Summit fosters climate, drought solutions.](#) (2021)
68. Kamloops iNFOnews. [Beavers may have untapped wildfire fighting skills.](#) (2021)
67. BBC Future Planet. [The beavers returning to the desert.](#) (2021)
66. The Sacramento Bee. [A dry California creek bed looked like a wildfire risk. Then the beavers went to work.](#) (2021)
65. The Independent. [How a group of beavers prevented a wildfire and saved California a million dollars.](#) (2021)
64. San Francisco Chronicle. [Beaver are nature's firefighters. So why is California killing them?](#) (2021)
63. KCBX. [Beavers aid in climate battle, local experts fight to protect species in California.](#) (2021)
62. Summit Daily News. [Get Wild: Beavers are the answer.](#) (2021)
61. NRDC. [How the Eager Beaver Helps Protect the Planet.](#) (2021)
60. Bay Nature. [An Illustrated Guide to Bay Area Nature.](#) (2021)
59. Channel Magazine. [Fighting wildfires with the help of beavers.](#) (2021)
58. Wildfire Today. [Beavers Can Affect Wildfires.](#) (2021)
57. Sierra Magazine. [Beavers are Firefighters Who Work for Free.](#) (2021)
56. KCBX. [Beavers can help fight drought and fire say Central Coast experts at CA Beaver Summit.](#) (2021)
55. Grist. [It's International Beaver Day – and dam time we celebrate it.](#) (2021)
54. Science News. [Simple hand-built structures can help streams survive wildfires and drought.](#) (2021)
53. The Guardian. [Beaver believers: Native Americans promote resurgence of 'nature's engineers'.](#) (2021)
52. Estuary Magazine. [Beavers Make Good Neighbors.](#) (2021)
51. The Last Word on Nothing. [The Semiaquatic Martyrs of East Foster Creek.](#) (2021)
50. aeon. [Evolution's Engineers.](#) (2021)
49. Bozeman Magazine. [Can beavers help Montana mitigate future wildfires?](#) (2020)
48. BBC Wildlife. [Beavers' activities can create oases and limit spread of US wildfires.](#) (2020)
47. Bark!. [A Tale of Two Streams.](#) (2020)
46. Fire Adapted Network. [If fire were an animal, it would be a beaver.](#) (2020)
45. KEYT. [CSUCI study shows beavers can help prevent wildfires.](#) (2020)
44. New Times SLO. [SLO County Beaver Brigade raises awareness of beavers in the Salinas River.](#) (2020)
43. The Atascadero News & Paso Robles Press. [SLO Beaver Brigade Sets the Stage for Academic Research.](#) (2020)
42. Wildlife Society. [Beavers create fire-resistant forest patches.](#) (2020)
41. The Register-Guard. [Smokey Beaver?](#) (2020)
40. Le Monde. [Les castors font barrage aux feux de forêt.](#) (2020)

39. Nature Daily Briefing. [Why beavers make great firefighters](#). (2020)
38. National Geographic. [How beavers became North America's greatest firefighter](#). (2020)
37. National Association of Science Writers. [Let beaver's do the work: fighting wildfire one dam at a time](#). (2020)
36. Edible Magazine Ojai and Ventura County. [Dammed if They Don't](#). (2020)
35. Edible Magazine Ojai and Ventura County. [Tour a Stream with a Beaver Expert](#). (2020)
34. Popular Science. [Beavers might be making the arctic melt even faster](#). (2020)
33. Natural Resources Defense Council (NRDC): Rockies Dispatch. [The Humble Beaver: troublemaker or climate superhero?](#) (2020)
32. University of California Cooperative Extension Forestry. [From being an engineer to researching nature's engineers](#). (2020)
31. The Confluence. [From being an engineer to researching nature's engineers](#). (2020)
30. Medium. [God Dam: Why Rivers Need Beavers](#). (2020)
29. Climate Ready Missoula. [Ecosystems and Wildfire](#). (2020)
28. Global Weather and Climate Center. [Relationship between beavers and wildfire](#). (2020)
27. San Francisco Estuary Magazine. [Beaver dams may offer wildfire protection to western watersheds, in addition to providing better-known benefits such as groundwater recharge, wetland and habitat creation, and riparian restoration](#). 2020
26. Landscape Architecture Magazine. [Smokey the Beaver](#). (2020)
25. Clark Fork Coalition. [Beaver Habitat Surveys in Western Montana](#). (2020)
24. Eos. [Finding Wildfire's Fingerprint in the Atmosphere](#). (2020)
23. NASA Landsat Science News. [Smokey the Beaver? Beaver Dams and Wildfire](#). (2019)
22. Eos. [Are beavers nature's "little firefighters?"](#). (2019)
21. Colorado Arts and Sciences Magazine. [Instructors improve accessibility of geology](#). (2019)
20. Ojai Valley News. [Wildfire? Drought? Leave it to Beavers](#). (2019)
19. USGS and NPS. [Fire History of the Jemez Mountains](#). (2019)
18. Mountain West News. [Scientists turn to video, art, graphics to convey data](#). (2019)
17. Yale Climate Connections. [Four scientists make creativity a key to communicating their research](#). (2019)
16. The Singing Wilderness. [What do beavers have to do with wildfire?](#) (2019)
15. The Coloradan Magazine. [Emily Fairfax wants you to appreciate beavers](#). (2019)
14. The Verge. ['Dam good' video shows how beavers could fight fires](#). (2019)
13. Edge Effects Magazine. [How a beaver became a twitter star](#). (2019)
12. Cottage Life Magazine. [PhD student's creative video shows how beavers help prevent fires](#). (2019)
11. The Kids Should See This. [Beaver dams and wildfire, a stop motion demonstration](#). (2019)
10. Lake Superior Magazine. [Smokey the Beaver?](#) (2019)
9. ClimateCrocks.com. [What do beavers have to do with wildfire?](#) (2019)



8. cnBeta.com. [A cute video showing how beavers fight wildfires raises attention on twitter.](#) (2019)
7. LangweileDich.net. [Stopmotion zeigt positive Nebeneffekte von Biber-Dämmen.](#) (2019)
6. LetemSvětém Applem. [Twitter válcuje naučné stop-motion video. Mrkněte na něj i v.](#) (2019)
5. Beavers and Brush. Beavers: [California's Missing Keystone to Mitigate Wildfire Risk.](#) (2019)
4. CU Arts and Sciences Magazine. [CU Boulder's geoscientists, ranked world's best, show-case rock-it science.](#) (2019)
3. Eos. [Can you express your science in 17 syllables?](#) (2018)
2. CU Boulder Today: [Drones, beaver dams help community college students get involved in research.](#) (2018)
1. Earth Magazine. [Beavers preserve wetlands in water-stressed areas.](#) (2017)

PROFESSIONAL SERVICE

Campus Leadership

Justice and Equity With an Environmental Lens (JEWEL) Student Club Faculty Advisor. California State University Channel Islands. (2020-present)

Committee Membership

Curriculum Committee. California State University Channel Islands. (2019-present)
 Faculty Librarian Search Committee. California State University Channel Islands. (2021)
 California Beaver Summit Planning Committee. (2021)
 Hydrologic Sciences Committee Member. University of Colorado Boulder. (2018-2019)
 Colloquium Committee Member. University of Colorado Boulder. (2016-2019)

One-Time Events (Workshops, Panels, etc.)

AGU Outstanding Student Presentation Award Judge (2019)
 Building Educational Computer Games – Faculty Workshop: Creator/Facilitator (2019)
 Gamifying Your Class - Faculty Workshop: Workshop Creator and Facilitator. (2019)
 Accessibility & Inclusion Training for Teaching Assistants, Organizer/Facilitator. (2018, 2017)
 Panelist. Professional & Educational Developers Learning Community. CU Boulder (2018)
 Advisory Board Graduate Student Poster Session Organizer (2018)
 Geological Society of American Annual Fall Meeting Student Volunteer (2017)

Peer Reviewer

Alberta Conservation Association
 Ecography
 Ecohydrology
 Ecological Restoration
 Ecosphere
 Hydrologic Processes
 Journal of Geoscience Education Research
 Journal of the American Water Resources

Association
 Legislative-Citizen Commission on
 Minnesota Resources
 NSF Environmental Sustainability Division
 NSF Hydrologic Sciences Division
 Remote Sensing in Ecology and
 Conservation
 River Research and Applications

Scientific Reports
Southwestern Naturalist

Wetlands

Professional Society Membership

American Geophysical Union	(2015 – present)
Geological Society of America	(2015 – present)
Ecological Society of America	(2020 – present)
The International Association for Geoscience Diversity	(2016 – present)
National Association for Geoscience Teachers	(2016 – present)
Association for Women Geoscientists	(2016 – present)
American Fisheries Society	(2021 – present)
Salmonid Restoration Federation	(2022 – present)