

**Katherine R. Hayes**  
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Updated: 10/6/20

## EDUCATION

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<b>Doctorate Degree in Integrative and Systems Biology</b> University of Colorado, Denver	<b>August 2018 - Present</b> Advisor: Dr. Brian Buma
<b>Master of Science in Geography</b> University of Oregon	<b>June 2018</b> Advisor: Dr. Dan Gavin
<b>Bachelor of Science in Environmental Studies, Spanish, and Geography (Honors)</b> University of Wisconsin, Madison Minor in European Studies	<b>May 2016</b> Advisor: Dr. Jack Williams

## RESEARCH APPOINTMENTS

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<b>Graduate Researcher</b> Buma Lab, Department of Integrative and Systems Biology, University of Colorado Denver	<b>August 2018 - Present</b>
<ul style="list-style-type: none"><li>Studying the effect of shortening fire intervals and reburns in boreal systems on succession, carbon storage and permafrost in Interior Alaska.</li><li>Guiding undergraduate researchers in field data collection, laboratory analysis &amp; data organization.</li><li><b>Working Thesis title:</b> <i>"The implications of increasing fire frequency in boreal forests of Interior Alaska"</i></li></ul>	
<b>Graduate Field Assistant</b> Buma Lab, Landslide Task Force, Sitka Sound Science Center	<b>June 2019 – July 2019</b>
<ul style="list-style-type: none"><li>Conducted vegetation and soil surveys as part of a team of landslide-researchers in Sitka, Alaska.</li></ul>	
<b>Research Lead Technician</b> Buma Lab, Department of Natural Resources, University of Alaska Fairbanks/Southeast	<b>May 2018 – August 2018</b>
<ul style="list-style-type: none"><li>Lead a team of field assistants on fieldwork in Interior Alaska.</li><li>Coordinated field sampling efforts with a team of researchers from multiple institutions.</li><li>Trained undergraduate interns in field sampling methods and laboratory procedures.</li></ul>	
<b>Graduate Researcher</b> Environmental Change Research Group, Department of Geography, University of Oregon	<b>August 2016 – June 2018</b>
<ul style="list-style-type: none"><li>Coordinated and conducted fieldwork in North California and Eastern Oregon.</li><li>Served as a field assistant on several multidisciplinary research teams.</li><li>Recruited and trained undergraduate research assistants.</li><li>Coordinated the establishment of several new laboratory procedures.</li><li><b>Thesis title:</b> <i>"Fire History and Soil Carbon in Old Growth Coast Redwood forests across the Late Holocene"</i></li></ul>	
<b>Undergraduate Researcher</b> Williams Paleoecology Lab, Department of Geography, University of Wisconsin	<b>May 2015 – May 2016</b>
<ul style="list-style-type: none"><li>Collaborated with research teams on field work and laboratory analysis.</li><li>Entered and organized data, maintained lab and conducted original research.</li><li><b>Thesis title:</b> <i>"A continuous charcoal record of Bonnett Lake, Ohio since the Last Glacial Maximum"</i></li></ul>	

## GRANTS

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- **Hayes K**, Buma B. Joint Fire Science Program Graduate Research Innovation Award. “*Evaluating Flammability across Reburns in Interior Alaska*”. 2019, **\$24,717**.
- Association of Fire Ecology TREE Graduate Travel Grant. 2019, **\$330**.
- UC Denver Department of Integrative Biology Travel Grant. 2019, **\$500**.
- UC Denver College of Liberal Arts and Sciences Travel Grant. 2019, **\$500**.
- UC Denver Graduate School Travel Grant. 2019, **\$500**.
- Association of Pacific Coast Geographer’s Travel Grant. 2017, **\$200**.

## PUBLICATIONS

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- **Hayes K**, B Buma. “Effects of short-interval disturbances continue to accumulate, overwhelming variability in local resilience”. *Ecosphere*. [In Press]
- Jensen A, Fastovich D, Watson B, Gill J, Jackson S, Russel J, Bevington J, **Hayes K**, Lininger K, Rubbelke C, Schellinger G, Williams J. 2020. “More than one way to kill a spruce forest: The role of fire and climate in the late-glacial termination of spruce woodlands across the southern Great Lakes”. *Journal of Ecology*. <https://doi.org/10.1111/1365-2745.13517>
- Buma B, Weiss S, **Hayes K**, Lucash M. 2020. “Wildland fire reburning trends across the US West suggest only short-term negative feedback and differing climatic effects”. *Environmental Research Letters*. <https://doi.org/10.1088/1748-9326/ab6c70>

## OTHER PUBLICATIONS

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- Kulakowski D, Buma B, Guz J, **Hayes K**. 2019. “The ecology of forest disturbances”. Reference Module in *Earth Systems and Environmental Science*. <https://doi.org/10.1016/B978-0-12-409548-9.11878-0>

## ORAL PRESENTATIONS

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- **Hayes K**, Buma B. “*Interacting Effects of Herbivory and Short-Interval Reburns on Successional trajectories in Boreal Interior Alaska*”, International Association of Landscape Ecology: North American Chapter. Remote. May 2020.
- **Hayes K**, Buma B. “*The role of spatial heterogeneity in mediating the effect of shortening fire intervals in boreal systems*”, American Association of Geographers. Denver, CO. April 2020. [Cancelled due to COVID-19].
- Buma B, **Hayes K**, Weiss S, Lucash M. “*Overlapping and interacting fires, a double whammy: Short-interval burns are becoming more frequent across the US West but pace suggests negative feedbacks and spatial patterning*”, AGU. San Francisco, CA. December 2019.
- **Hayes K**, Buma B. “*Continued short-interval fires overwhelm serotinous resilience regardless of topographic variation*”, Association for Fire Ecology Annual Meeting. Tucson, AZ. November 2019.
- Buma B, **Hayes K**, Weiss S, Lucash M. “*Rates of short-interval fires increasing across the US West*”, Association for Fire Ecology Annual Meeting. Tucson, AZ. November 2019
- **Hayes K**. “*Repeat short-interval fires in boreal cause continued ecosystem change*”, UC Denver Integrative Biology Graduate Student Seminar Series. Denver, CO. October 2019.
- **Hayes K**. “*Using NEON data to identify ecological tipping points across spatial/temporal scales*”, NEON Science Summit. Boulder, CO. October 2019.
- **Hayes K**, Buma B. “*Landscape Context mediates the effect of shortening fire intervals in boreal systems*”, International Association of Landscape Ecology – North American Chapter. Fort Collins, CO. April 2019.
- Buma B, Lucash M, **Hayes K**, Weiss S. “*The Predictable, and not so Predictable, Spatial distribution of Short Interval Fires across the US West*”, International Association of Landscape Ecology – North American Chapter. Fort Collins, CO. April 2019.

- **Hayes K**, Buma B. “*Landscape Context mediates the effect of shortening fire intervals in boreal systems*”, UC Denver Integrative Biology Graduate Student Seminar Series. Denver, CO. April 2019.
- **Hayes K**, Gavin D. “*Reconstructing Paleofire in Old Growth Coast Redwood Forests in Northern California Using Pyrogenic Charcoal and Soil Carbon*”. Association of Pacific Coast Geographers. Chico, California. October 2017. [**Christopherson Award Winner**]
- **Hayes K**, Gavin D. “*Reconstructing a fire history in the Coast Redwood (*Sequoia Sempervirens*) forests of Northern California*”. Ecological Society of America. Portland, OR. August 2017.
- **Hayes K**, Saban C, Reis S, Johnson G, Hendricks L. “*A synthesis of Coastal Systems Hydrology in the Pacific Northwest*”. University of Oregon Graduate Research Forum: Symposia on Hydrology of the Pacific Northwest. Eugene, OR. April 2017. [**Panel Session Award Winner**]
- **Hayes K**, Gavin D. “*Marine Fog, Climate Change and Coast Redwood Forests: Past, Present and Future*”. UO Climate Change Research Symposium, Eugene, OR. April 2017.
- **Hayes K**, Williams J. “*Fire History of Bonnett Lake, Ohio since the Last Glacial Maximum*”. Midwest Undergraduate Geography Symposium, Minneapolis, MN. April 2016.
- **Hayes K**, Williams J. “*Compiling a continuous charcoal record of Bonnett Lake, Ohio since the Last Glacial Maximum*”. University of Wisconsin Undergraduate Symposium, Madison, WI. April 2016.

#### SELECT POSTER PRESENTATIONS

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- **Hayes K**, Buma B. “*Effects of Spatial Heterogeneity on successional trajectories following repeat disturbances in Boreal Interior Alaska*”, AGU. San Francisco, CA. December 2019.
- Weiss S, **Hayes K**, Lucash M. “*Modeling Post-fire Successional trajectories under Climate Change in Black Spruce forests in Interior Alaska*”, AGU. San Francisco, CA. December 2019.
- Olson K, Buma B, **Hayes K**. “*Fine-scale Observations of Permafrost after Repeat Fires in Interior Alaska*”, AGU. San Francisco, CA. December 2019.
- Kodicherla V, Shabaga J, Vogel J, Buma B, **Hayes K**. “*Soil Respiration in very high frequency Boreal Wildfires as a function of Species*”, AGU. San Francisco, CA. December 2019.
- **Hayes K**, Buma B. “*The Implications of increasing fire frequency in boreal forests in Interior Alaska*”, University of Colorado Denver Research and Creative Activities Symposium. Denver, CO. April 2019.
- **Hayes K**, Buma B. “*The Future of the Boreal Forest*”, University of Colorado Denver Applied Spatial Statistics Poster Presentation. Denver, CO. December 2018.
- Jensen A, Rubbelke C, **Hayes K**, Bevington J, Fastovich D, Watson B, Jackson S, Russel J, Williams J. “*The role of fire in the late-glacial decline of spruce forests across the midwestern US*”, AGU. December 2018.
- **Hayes K**, Gavin D. “*Fire and Carbon Cycling in Old Growth Coast Redwood*”. University of Oregon Graduate Research Forum. Eugene, OR. May 2018.
- **Hayes K**, Hendricks L, Gavin D. “*Forests with naturally infrequent fire: their resilience and susceptibility to impacts by people and climate change*”. Joint Campus Conference. Eugene, OR. May 2017.
- **Hayes K**, Gavin D. “*Marine fog and Climate change in Coast redwood (*Sequoia sempervirens*) forests: Implications for management & research*”. American Association of Geography. Boston, MA. April 2017.

#### Invited Talks

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- Buma B, **Hayes K**. “*Evaluating flammability of reburns in the boreal forests of Interior Alaska*”. Alaska Fire Science Consortium. Webinar. April 2020.
- **Hayes K**. “*Climate Change: How the Arctic is Changing and Why it Matters*”. First Unitarian Society Sunday Forum. Milwaukee, WI. November 2019.

## HONORS & AWARDS

<b>Polanki Graduate Achievement Award</b>	<b>Spring 2020</b>
<b>University of Colorado Graduate Research Fellowship</b>	<b>Fall 2018</b>
<b>Nominated for University of Oregon Dean's Award</b>	<b>Spring 2018</b>
<b>Robert J. Leonard Memorial Award</b>	<b>Spring 2018</b>
<b>Christopherson Geosystems Award for Excellence in Applied Geography/Earth Systems Science</b>	<b>Fall 2017</b>
<b>UO Graduate Research Forum Panel Session Winner</b>	<b>Spring 2017</b>
<b>University of Oregon Graduate Teaching Fellowship</b>	<b>2016 – 2018</b>
<b>Polanki College Achievement Award</b>	<b>Spring 2014</b>
<b>Polish National Alliance Scholarship</b>	<b>2013 – 2015</b>
<b>UW-Madison Initiative Grant</b>	<b>2014 – 2015</b>

## TEACHING AND MENTORING EXPERIENCE

### **Graduate Teaching Assistant** **Spring 2019**

Department of Integrative and Systems Biology, University of Colorado Denver

- Taught recitation sections for upper-level biology and statistics courses (Biostatistics, General Biology).
- **Guest Lecturer:** Biology 3411: Principles of Ecology, Spring 2019.  
Biology 7050: Disturbance Ecology, Spring 2020.

### **Applied Ecology Graduate Seminar Coordinator** **Spring 2019**

Department of Integrative and Systems Biology, University of Colorado Denver

- Orchestrated weekly seminar class focused on readings on current topics in applied ecology and peer review of grants, proposals and other materials.

### **Graduate Teaching Fellow** **Sept. 2016 – June 2018**

Department of Geography, University of Oregon

- Taught laboratory sections for upper-level science courses (Biogeography, Quantitative Data Analysis, Climatology).
- Planned lessons and assignments, wrote exam questions, held office hours, graded papers and exams, and organized and led review sessions for midterms and exams.
- **Guest Lecturer:** Geography 323: Biogeography, Fall 2017.  
Geography 419: The Professional Geographer, Spring 2018.

### **Graduate Seminar Coordinator** **Spring 2018**

Department of Geography, University of Oregon

- Organized and facilitated weekly seminar discussions on professionalism, graduate student well-being and life after graduate school.
- Coordinated guest speakers from outside departments and organizations.

### **Graduate Mentor** **2016 - 2018**

Environmental Change Research Group, University of Oregon

- Counseled and supervised undergraduate research assistants on laboratory protocols, applying to graduate programs and the research process.

## SERVICE AND ENGAGEMENT

- **Graduate Student Representative** **Fall 2020 - Present**  
Graduate Student Advisory Group, College of Letters & Science
- **Graduate Student Representative & Executive Committee Member** **Spring 2019 - Present**  
North American Chapter, International Association of Landscape Ecology

- **Graduate Student Representative, Graduate Advisory Committee** **Fall 2019 – Summer 2020**  
Department of Biology, University of Colorado Denver
- **Journal Article Reviewer** **Spring 2018 - Present**  
*Plant and Soil, Global Change Biology*
- **Volunteer Moderator** **Spring 2018**  
Oregon State Geography Bee, National Geographic Society
- **Abstract Reviewer** **Spring 2018**  
Undergraduate Research Forum, University of Oregon
- **Graduate Union Steward** **2016 – 2018**  
Department of Geography, University of Oregon

#### MEMBERSHIPS

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- American Geophysical Union
- International Association of Landscape Ecology
- Ecological Society of America
- American Association of Geography
- Guild of Rocky Mountain Ecologists
- University of Oregon Humanitarian Mappers
- UO Graduate Women in Science
- UO Graduate Teaching Fellows Federation
- Women in Geography (UW-Madison Chapter)
- Wisconsin Fire Ecology

#### PROFESSIONAL EXPERIENCE

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- Waterway Intake Specialist** **Sept. 2014 – June 2015**  
Waterway Permit Central Intake Office, Wisconsin Department of Natural Resources
- Received and reviewed general waterway permit applications for completion.
  - Utilized DNR databases to critically assess applications for potential disturbance to endangered species, archeological sites and historical monuments.