Annette Irene Patton, PhD

Postdoctoral Researcher, University of Oregon
(541) 231-8937 • annettep@uoregon.edu • linkedin.com/in/annette-patton

Application Information

Personal Statement	Post-doctoral geomorphologist with experience in hillslope geomorphology, soil science, fluvial processes, and interdisciplinary investigation.
References	Dr. Sara Rathburn, Colorado State University, sara.rathburn@colostate.edu, 970-491-6956 Dr. Josh Roering, University of Oregon, jroering@uoregon.edu, 541-346-5574

Education

2019 **Ph.D. Geosciences, Colorado State University**, Fort Collins, Colorado
Landslide Response to Climate Change in Denali National Park, Alaska, and Other Permafrost Regions.
Evaluated the influence of permafrost thaw and other controls on landslide occurrence.

2016 **M.S. Geosciences, Colorado State University**, Fort Collins, Colorado
Upland Processes and Controls on September 2013 Mass Movements, Rocky Mountain National Park.
Identified geomorphic controls on debris flow initiation and frequency.

2013 **B.A. Geology, Summa Cum Laude, Whitman College**, Walla Walla, Washington
Honors thesis: *Environmental Controls on Manganese (Mn) Bioavailability in Soils of the Boulder Creek Watershed, Colorado.* Quantified post-fire soil response. Minored in Biology.

June 2012 **James Madison University**, Harrisonburg, Virginia
Ireland Field Geology course in geologic mapping, geomorphology, structure, and hydrology.

Professional Experience

2019-present **Postdoctoral Researcher,** University of Oregon
Designing and implementing a novel wireless landslide monitoring system in Sitka, Alaska, in collaboration with Dr. Josh Roering, the USGS, and the Sitka Sound Science Center.

2019 **Scientist in Residency Fellow,** Sitka Sound Science Center
Collaborated with community members to conduct landslide research in Sitka, Alaska, and led geoscience outreach events for schools, local radio and television, and city administrative groups.

2014-2019 **Graduate Research Assistant**, Colorado State University
Conducted research with Dr. Sara Rathburn and collaborated on the FEDMAP project *Mapping Denali Hazards* with Dr. Cal Ruleman, USGS Geologist, and Dr. Denny Capps, Denali National Park Geologist.

2017-2018 **Graduate Teaching Assistant, Geomorphology and Introductory Geology,** Colorado State University
Taught and organized four sections of a laboratory course for students in the geology major.

2017 **Instructor, Geology of the Rocky Mountains,** Colorado State University
Planned and led a field trip course in Utah and western Colorado with co-instructors.

2016 **Teaching Assistant, Field Geology Course,** Colorado State University
Taught mapping techniques and interpretation of geospatial data in New Mexico and Colorado.

2014 **Developer, Glacial Geomorphology Laboratory Exercise,** Colorado State University
Wrote content and exercises for an introductory lab that was implemented with over 400 students.

2013-2014 **Field Assistant**, Washington Department of Natural Resources
Produced a map and report on the surficial geology of Quilcene Quadrangle in the Puget lowlands.

2013-2014 **Teaching Assistant**, **Ireland Field Geology,** James Madison University
Summers 2013 and 2014 in Ireland, incorporating an innovative approach to crowd-sourced mapping.

Service and Outreach

2021 **Guest Teacher**, Sitka High School Physics, Sitka, Alaska
Developed and presented a lecture on the Physics of Landslides to a class of high-achieving seniors.

2021 **Guest Lecturer,** University of Potsdam Dedicated Lecture Series, Potsdam, Germany
Lecture title: Integrating soil moisture, precipitation, and geomorphic assessment for a community-driven landslide warning system in Sitka, Alaska.

2020 **Workshop Co-Leader**, Landslide Warning System in Sitka, Alaska.
Created and implemented educational activities, presented scientific updates, and solicited feedback from community members.

2019 **Scientist in Residency Fellow,** Sitka Sound Science Center. (sitkascience.org/welcome-sirf/)
Led geoscience outreach events for schools, local radio and television, and city administrative groups.

2019 **Guest Speaker,** KIFW Radio "Problem Corner."
Discussed ongoing landslide forecasting research in Sitka, Alaska.

2018 **Invited Speaker**, Denali National Park Murie Science Center Lecture Series.
Presented on ongoing landslide hazards research to park staff, visitors, and residents.

2018 **Guest Speaker**, Denali Discovery Camp, Denali National Park and Preserve, Alaska
Presented on landslides, local geology, and geology field research to ten 8-10-year olds.

2017-2019 **Treasurer**, Graduate Women in Science, Northern Colorado Chapter, Fort Collins, Colorado
Managed finances and organized events to support and empower women in science with other officers.

2017 **Graduate Mentor**, Colorado State University Geosciences Department, Fort Collins, Colorado
Supported, encouraged, and advised an undergraduate student in the department.

2017 **Field Trip Leader,** Harris Elementary, Fort Collins, Colorado
Introduced scientific principles to first graders at a local Natural Area with co-leaders.

2016-2019 **Graduate Mentor**, PROGRESS Women in Geoscience, NSF (http://geosciencewomen.org/)
Mentor for a female undergraduate student in the geosciences to improve retention of women in STEM.

2015-2019 **Graduate Student Representative**, CSU Geosciences Department, Fort Collins, Colorado
Liaison between graduate students and faculty.

2015 **Upland Processes and Controls on September 2013 Mass Movements**,
Media coverage by Rocky Mountain National Park Centennial outreach program.
https://www.nps.gov/rlc/continentaldivide/current-research.htm

Publications

Chu, M., **Patton, A.,** Roering, J., Siebert, C., Selker, J., Walter, C., Udell, C., 2021, SitkaNet: A low-cost, distributed sensor network for landslide monitoring and study, *HardwareX*, 9, 1:24, doi: 10.1016/j.ohx.2021.e00191.

Patton, A., Rathburn, S., Capps, D., Brown, R., Singleton, J., Lithologic, geomorphic, and permafrost controls on recent landsliding in the Alaska Range, 2020, *Geosphere*, 16:10, 1-16.

Patton, A., Rathburn, S., Capps, D., 2019, Landslide response to climate change in permafrost regions, *Geomorphology,* 340, 116-128, doi: 10.1016/j.geomorph.2019.04.029.
Invited Review

Rathburn, S., **Patton, A.**, Bilderback, E., 2019, Historical debris-flow occurrence in Rocky Mountain National Park, Colorado, USA, Proceedings 7th International Conference on Debris-Flow Hazards Mitigation.

Singleton, J., Mavor, S., Seymour, N., Williams, S., **Patton, A.**, Ruthven, R., Johnson, E., Prior, M., 2019, Laramide shortening and the influence of Precambrian basement on uplift of the Black Hills, South Dakota and Wyoming, USA, *Rocky Mountain Geology*, 54, 1-17.

Patton, A., Rathburn, S., Bilderback, E., Lukens, C., 2018, Patterns of debris flow initiation and periglacial sediment sourcing in the Colorado Front Range, *Earth Surface Processes and Landforms*, 43, 2998-3008.
ESPL Editor's Choice 2018

Wohl, E., Rathburn, S., Chignell, S., Garrett, K., Laurel, D., Livers, B., **Patton, A.**, Records, R., Richards, M., Schook, D., Sutfin, N., Wegener, P., 2017, Mapping longitudinal stream connectivity in the North St. Vrain Creek watershed of Colorado, *Geomorphology*, 277, 171-181.

Scott D., Brogan D., Lininger K., Schook., Daugherty E., Sparacino M., **Patton A.**, 2016, Evaluating survey instruments and methods in a steep channel, *Geomorphology*, 273, 236-243.

Contreras, T.; **Patton, A.**, Legorreta-Paulin, G., Hubert, I., Cakir, R.; Carson, R., 2014, Geologic Map of the Quilcene 7.5 Minute Quadrangle, Jefferson County, Washington: Washington Division of Geology and Earth Resources Map Series 2014-03, 1 sheet, scale 1:24,000, 27 p. text.

Polenz, M.; Gordon, H.; Hubert, I.; Contreras, T. A.; **Patton, A.**; Legorreta Paulin, G.; Cakir, R.; 2014, Geologic Map of the Center 7.5-minute Quadrangle, Jefferson County, Washington Division of Geology and Earth Resources Map Series 2014-02, 1 sheet, scale 1:24,000, 35 p. text.

Manuscripts

Patton, A., Rathburn, S., Capps, D., McGrath, D., Brown, R., Landslide development in thawing permafrost, Denali National Park, Alaska (in revision for *Geophysical Research Letters*).

Patton, A., Roering, J., Orland, E., Debris flow initiation and landscape evolution in a post-glacial landscape. (submitted to *Earth Surface Processes and Landforms*).

Patton, A., Luna, L., Roering, J., Improving hazards predictions with multivariate landslide initiation thresholds: Sitka, Southeast Alaska. (in prep for *Landslides*).

Selected Presentations and Proceedings

Patton, A., Roering, J., Lempert, R., Chu, M., Orland, E., Siebert, C., Turner, S., Landslide Warning Systems with Short-Term Observation: Using Available Data for Adaptive Thresholds, Abstract NH031-04, Presented at 2020 Meeting, AGU, https://agu.confex.com/agu/fm20/meetingapp.cgi/Paper/712575, 1-17 December.

Patton, A., Roering, J., Orland, E., Lempert, R., Mirus, B., Cerovski-Darriau, C., Busch, L., Siebert, C., Foss, J., Prussian, K., Chu, M., Udell, C., Selker, J., Walter, C., Hydrologic Monitoring and morphometric analysis to characterize debris flow initiation at multiple temporal scales in Southeast Alaska, Abstract NH43B-05, Presented at 2019 Meeting, AGU, San Francisco, CA, 9-13 December.
Invited Presentation

Patton, A., Rathburn, S., Capps, D., Ruleman, C., Morisawa Award: Landslide Response to Climate Change in Permafrost Regions, Abstract 201-11, Presented at 2018 Meeting, GSA, Indianapolis, Indiana, 4-7 November.

Patton, A., Rathburn, S., Capps, D., Ruleman, C., Preliminary Surficial Mapping of the Denali National Park and Preserve Road Corridor: Implications for Landslide Hazards in a Changing Climate, Abstract 302437, Presented at 2017 Meeting, GSA, Seattle, Washington, 22-25 October.

Contreras, T., Legoretta-Paulin, G., **Patton, A.,** Weeks, S., Stone, K., Spangler, E., Fusso, L., Polenz, M., Finding Faults Along Hood Canal: Field-Based Insights from Five Years of Geologic Mapping, Abstract 303441, Presented at 2017 Meeting, GSA, Seattle, Washington, 22-25 October.

Patton, A., Rathburn, S., Bilderback, E., Lukens, C., 2016, Geochronology of Debris Flows Near Bighorn Ranger Station, Rocky Mountain National Park, Colorado, Abstract 280489, Presented at 2016 Meeting, GSA, Denver, Colorado, 25-28 September.

Patton, A., Rathburn, S., Bilderback, E., 2015, Upland Processes and Controls on September 2013 Debris Flows, Rocky Mountain National Park, Colorado, Abstract EP53A-0954, Presented at 2015 Meeting, AGU, San Francisco, California, 14-18 December.

Patton, A., 2013, Environmental Controls on Manganese (Mn) Bioavailability in Soils of the Boulder Creek Watershed, Colorado, *in* 26th Annual Keck Symposium Volume, Keck Geology Consortium, p. 333-338.

Proposals and Awards

2018 **Patton, A.**, Graduate Student Research Grant, McGill Award, and Morisawa Award, GSA ($5,000)
Mass Movement Response to Climate Change in Denali National Park and Preserve

2018 Rathburn, S.L., **Patton, A.,** USGS EDMAP Grant ($17,481)
Mass Movement Response to Climate Change in Denali National Park and Preserve.

2017 **Patton, A.**, and Rathburn, S., submitted to the National Park Service. ($24,000)
Mass Movement Response to Climate Change in Denali National Park and Preserve

2017 **Patton, A.,** Graduate Student Research Grant, Geological Society of America ($1,375)
Mass Movement Response to Climate Change in Denali National Park and Preserve

2017 **Patton, A.,** Grants-In-Aid of Research, Sigma Xi Research Society ($1,000)
Mass Movement Response to Climate Change in Denali National Park and Preserve

2016 Ware Graduate Research Fellowship, Colorado State University. ($4,800, tuition, and stipend)

2016 **Patton, A.**, Graduate Research Fellowship Program Honorable Mention, NSF
Sediment yield response to vegetation succession in recently deglaciated landscapes

2015 **Patton, A.**, Purdue PRIME Lab Seed Grant for ^{10}Be sample processing ($9,800)
Upland Processes and Controls on 2013 Debris Flows, Rocky Mountain National Park, CO

2015 Tilford Masters Scholar, Association of Environmental and Engineering Geologists. ($1,000)
CSU Scholarship Recipient, Rocky Mountain Association of Geologists. ($4,000)
Memorial Funds Recipient, Colorado Scientific Society. ($1,000)
Herbert Memorial Award, American Water Resources Association. ($1,000)
Harriet Evelyn Wallace Award, American Geosciences Institute. ($5,000)

Skillset

Geomorphic assessments
- Geomorphic mapping
- Soil identification & analysis
- Hydrologic monitoring
- Landslide analysis
- Field work and field safety in hazardous terrain

Project management
- Supervision of employees
- Proposal/grant writing
- Budget management
- Teaching and mentorship
- Scientific communication, outreach, and public speaking

Technical Skills
- Scientific writing and publication
- Programming/data analysis (R)
- Remote image analysis (GIS)
- Landform surveys (RTK-GPS, TLS, GPR)
- Figures (Adobe Illustrator)

Professional Memberships

Geological Society of America
American Geophysical Union
Association for Women Geoscientists
Phi Beta Kappa liberal arts honor society
Sigma Xi scientific research society
Graduate Women in Science