

Jessica A. Badgeley

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Curriculum Vitae

CURRENT POSITION

PhD Candidate, Earth and Space Sciences, University of Washington

anticipated Ph.D. completion in June 2022

advised by Dr. Eric Steig and Dr. Gregory Hakim

funded by an NSF Graduate Research Fellowship (DGE 1256082) and NSF-ARCSS Grant (1503281)

EDUCATION

B.A. in Geology, Colorado College, 2016

distinction in Geology, minor in Mathematics, *magna cum laude*

senior thesis advised by Dr. Erin Pettit and Dr. Eric Leonard

PUBLICATIONS

Shapero, D., **Badgeley, J. A.**, Hoffman, A., Joughin, I. (in review, 2021). *icepack*: a new glacier flow modeling package in Python, version 1.0. *Geoscientific Model Development Discussions*, [preprint], doi: 10.5194/gmd-2020-419

Young, N. E., Lesnek, A. J., Cuzzone, J. K., Briner, J. P., **Badgeley, J. A.**, et al. (2021). In situ cosmogenic ^{10}Be – ^{14}C – ^{26}Al measurements from recently deglaciated bedrock as a new tool to decipher changes in Greenland Ice Sheet size. *Climate of the Past*, 17, 419–450, doi: 10.5194/cp-17-419-2021

Briner, J. P., Cuzzone, J. K., **Badgeley, J. A.**, et al. (2020). Greenland Ice Sheet mass loss rate will exceed Holocene values this century. *Nature*, 586, 70–74 doi:10.1038/s41586-020-2742-6

Badgeley, J. A., Steig, E. J., Hakim, G. J., & Fudge, T. J. (2020). Greenland temperature and precipitation over the last 20,000 years using data assimilation. *Climate of the Past*, 16, 1325–1346, doi:10.5194/cp-16-1325-2020

Osterberg, E., **Badgeley, J. A.**, Buizert, C., et al. (2020). IDP Ice Core Working Group (IDP-ICWG): Ice Core Research Priorities in Greenland. *Ice Drilling Program Ice Core Working Group Community Meeting, April 2, 2020, Virtual Meeting*, 1–13.

Badgley, J., Pettit, E., Carr, C., Tulaczyk, S., Mikucki, J., & Lyons, W. (2017). An englacial hydrologic system of brine within a cold glacier: Blood Falls, McMurdo Dry Valleys, Antarctica. *Journal of Glaciology*, 63(239), 387–400. doi:10.1017/jog.2017.16

FELLOWSHIPS AND AWARDS

Earth and Space Sciences Research Gala, Best Overall Poster Award	2021
National Science Foundation Office of Polar Programs, Conference Travel Funding from Dr. Jen Kay through Grant #1745839	2018
National Science Foundation, Graduate Research Fellowship	2017
Rocky Mountain Association of Geologists, Neal J. Harr Memorial Outstanding Student Award	2015
Colorado College, Dean’s List	2012-2015
Barry Goldwater Scholarship	2014
American Institute of Professional Geologists, National Undergraduate Scholarship	2014
Colorado College, William A. Fischer Scholarship	2014
National Science Foundation, Research Experience for Undergraduates Fellowship University of Alaska Fairbanks	2013-2014
Colorado College, GIS Research and Career Collaborative Fund Grant	2012

PRESENTATIONS

** indicates an invited presentation*

Hercules Dome workshop, Virtual	2021
– Inferring paleoaltimetry of the Antarctic Ice Sheet from ice cores. Talk.	
Earth and Space Sciences Research Gala, Virtual	2021
– Inferring paleo-elevation from temperature-sensitive climate records. Poster.	
*University of Copenhagen Ice Modeling and Observations Group Meeting, Virtual	2020
– Quantifying past changes in Greenland climate and the ice sheet by combining data and models. Talk.	
*Ice Drilling Program Ice Core Working Group Community Meeting, Virtual	2020
– South Dome: A new Greenland ice core. Talk.	
*School of Aquatic and Fishery Sciences Quantitative Seminar, Seattle, WA	2019
– Towards skillful reanalysis of Greenland temperature over the last 20,000 years. Talk.	
American Geophysical Union Fall Meeting, San Francisco, CA	2019
– Greenland temperature and precipitation over the last 20,000 years using data assimilation. Talk.	
American Geophysical Union Fall Meeting, Washington DC	2018

- The Holocene Thermal Maximum as an analogue for future warming: Insights from paleoclimate data assimilation. Talk.
- Graduate Climate Conference**, Seattle, Washington 2018
- Holocene climate reconstruction for Greenland: What can we learn using data assimilation? Poster.
- American Geophysical Union Fall Meeting**, New Orleans, Louisiana 2017
- Surface mass balance of the Greenland Ice Sheet derived from paleoclimate reanalysis. Talk.
- Graduate Climate Conference**, Woods Hole, Massachusetts 2017
- Reconstructing Greenland Ice Sheet climate forcing and elevation change. Poster.
- NSF Workshop: How stable is the Greenland Ice Sheet?**, Buffalo, New York 2017
- Holocene climate reconstruction from Greenland ice cores. Talk.
- Meeting of Northwest Glaciologists**, Seattle, Washington 2016
- An englacial hydrologic system within a cold glacier: Blood Falls, McMurdo Dry Valleys, Antarctica. Poster.
- American Geophysical Union Fall Meeting**, San Francisco, California 2015
- Imaging englacial brine within a -17°C polar glacier: Blood Falls, McMurdo Dry Valleys, Antarctica. Poster
- Colorado Springs Undergraduate Research Forum**, Colorado Springs, Colorado 2015
- Geophysical evidence for englacial brine associated with Blood Falls, McMurdo Dry Valleys, Antarctica. Talk.

SERVICE

- Inspiring Girls Expeditions**, Steering Committee Member 2019-present
- Database Developer and Administrator 2020-present
 - Application Reviewer 2016-present
 - Onsite Coordinator for Girls on Ice Cascades 2017
- Undergraduate Mentorship**, Joshua Anderson, University of Washington 2017-2018
- Earth and Space Sciences Awards Committee**, Elected Graduate Representative 2019-present
- Geosciences Accessibility and Inclusivity Network (GAIN)**, Founding Member 2020-present
- Program on Climate Change Graduate Student Steering Committee**, Member and Public Engagement Subcommittee Member 2017-2019
- Curiosity Days: Climate Change Weekend**, Pacific Science Center Volunteer 2017, 2019, 2020
- Graduate Climate Conference**, Organizer and Session Co-Chair 2018
- Earth and Space Sciences Research Gala**, Organizer 2018
- Seattle ICO**, Volunteer Trip Leader 2016

COMPUTING

Completed Projects:

- Developer for *icepack*, an ice-flow modeling Python library (<https://icepack.github.io/>)
- Designed and deployed a PostgreSQL database for Inspiring Girls Expeditions

Computing: proficient in Python, MATLAB, Bash command line, relational databases (MySQL and PostgreSQL), basic LaTeX, ESRI ArcMap; experience with Ubuntu, MacOS, and Windows

Collaborating: GitHub and git command line, pair programming

Climate and Ice-Flow Modeling: ice-flow modeling experience with *icepack*; classroom experience running simple climate model simulations with CCSM4; proficient with model output in netCDF format

EMPLOYMENT

- Research Assistant**, Earth and Space Sciences, University of Washington 2016-present
- Teaching Assistant for “Glaciers and Global Change”**, University of Washington 2021
- 2 lectures, oversaw final projects, updated labs, and developed a template for productive in-class discussions in a virtual learning environment
- Acting GIS Administrator**, Colorado College Keck GIS Commons 2016
- GIS Teaching Assistant**, Colorado College Keck GIS Commons 2015-16
- Research Intern**, Chemical Oceanography, University of Washington 2015
- Statistically analyzed ocean carbon measurements. Advised by Dr. Paul Quay.
- GIS Lab Technician**, Colorado College GIS Lab, part-time 2012-15
- Cartographer**, State of the Rockies, part-time 2013-15
- Research Intern**, Minimally Invasive Direct Glacial Exploration Project 2013-14
- Collected, processed, and interpreted geophysical data from Blood Falls. Advised by Dr. Erin Pettit.
- Lab Intern**, University of Washington Cosmogenic Nuclide Lab 2013
- Prepared rock samples for cosmogenic radionuclide measurements. Advised by Dr. John Stone.
- GIS Research Intern**, Colorado College Geology Department 2012
- Investigated the glacial buzzsaw hypothesis in the Colorado Rocky Mountains. Advised by Dr. Eric Leonard.

FIELD EXPERIENCE

- AIARE Level 1 Certificate, United States** 2019
- Nuuk, Greenland** 2017
- lake sediment coring for climate and ice sheet reconstructions; glacial erratic sampling for cosmogenic radionuclide dating
- Amundsen Glacier, Antarctica** 2016
- sampling of glacial erratics for cosmogenic radionuclide dating; reconstruction of glacial history through landscape morphology
- Southwestern United States** 2011-15
- field-based classes for structural geology, geomorphology, geophysics, and volcanology in Colorado, New Mexico, Wyoming, Utah, and California
- McMurdo Dry Valleys, Antarctica** 2013
- Minimally Invasive Direct Glacial Exploration Project; geophysical data collection
- Kennicott Glacier, Alaska** 2012
- geophysical workshop for radio echo sounding data collection and interpretation
- Mt. Baker, Washington** 2010
- Girls on Ice Cascades, Inspiring Girls Expeditions

WORKSHOPS AND SHORT COURSES

- Advanced Climate Dynamics Course, Finse, Norway** 2018
- CESM Polar Modeling Workshop, NCAR Mesa Laboratory, Boulder, Colorado** 2018
- Polar Geospatial Center Boot Camp, University of Minnesota** 2015

RESEARCH IN THE NEWS

Briner et al. (2020):

- <http://www.buffalo.edu/news/releases/2020/09/044.html>

Badgeley et al. (2017):

- <https://news.uaf.edu/researchers-solve-the-100-year-old-mystery-of-blood-falls/>
- More at: <https://www.altmetric.com/details/19535610>