

Marion A. McKenzie

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RESEARCH INTERESTS

I am a glacial geomorphologist with expertise in sedimentology, stratigraphy, geochronology, glaciology, and quantitative geomorphology. My research interests focus on elucidating subglacial dynamics and connecting paleo and modern glaciology research and landscape evolution.

POSITIONS

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- NSF Earth Sciences Postdoctoral Fellow** September 2023-Present
Colorado School of Mines, Golden, CO
Pairing on-and-offshore observation of paleo-ice streams to constrain and elucidate dynamics of the Cordilleran Ice Sheet (PISCES), Mentored by Dr. Ryan Venturelli, in collaboration with Drs. Lauren Miller and Tamara Pico.
- Postdoctoral Researcher** June-August 2023
University of Virginia, Charlottesville, VA
Environmental Institute Grant: *Legacy blue carbon – long-term storage in seagrass meadows and potential to mitigate climate change*, Advised by Drs. Peter Berg and Lauren Miller
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EDUCATION

- Ph.D. in Environmental Sciences** May 2023
University of Virginia, Charlottesville, VA
Dissertation: *Ice-sheet sensitivity to Earth's surface: an assessment of landscape records*, Advised by Dr. Lauren Miller
- B.S. in Environmental Studies, Mathematics Minor** May 2019
Gettysburg College, Gettysburg, PA
Summa Cum Laude, Honors Thesis: *Using streamlined landforms to reconstruct and compare paleo-ice flow paths in Bárðardalur, north Iceland and northwestern Pennsylvania*, Advised by Dr. Sarah Principato
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PEER-REVIEWED PUBLICATIONS

- McKenzie, M.A.**, Simkins, L.M., Slawson, J.S., MacKie, E.J., Wang, S. (2023). [Differential impact of isolated topographic bumps on glacial ice flow and subglacial processes](#). *The Cryosphere*.
- McKenzie, M.A.**, Simkins, L.M., Principato, S., Munevar-Garcia, S. (2022). [Subglacial bedform sensitivity to bed characteristics across the deglaciated Northern Hemisphere](#). *Earth Surface Processes and Landforms*.
- McKenzie, M.A.**, Simkins, L.M., Lepp, A.P. (*in review*). Outcrop perspective on spatial and temporal effects of topography on the marine-terminating Puget Lobe of the Cordilleran Ice Sheet. *Climate of the Past*.
- McKenzie, M.A.**, Miller, L.M., Wiman, C., Hebert, R.*, Muñoz, S., Berg, P., Fiss, M., Stubbins, A., Guo, Z.*, Wiggins, T.* (*in prep*). Sedimentary Records of Blue Carbon and Environmental Change in Coastal Virginia: An Assessment of Seagrass Meadow Sediment Deposition and Carbon Cycling Variations. *Sedimentology*.
- Prakash, M.*, Miller, L., Limaye, A., **McKenzie, M.**, Smith, J. (*in prep*) Morphometric comparison of terrestrial eskers and martian sinuous ridges reveal paths of persistent meltwater drainage. *Geology*.

*students advised by M. McKenzie

***in prep* manuscripts available upon request

RESEARCH
FUNDING

<i>Total to-date awarded to M. McKenzie</i>	\$193,965
NSF Earth Science Directorate Postdoctoral Fellowship	\$180,000
<i>Project: Pairing on-and-offshore observation of paleo-ice streams to constrain and elucidate dynamics of the Cordilleran Ice Sheet (PISCES), Mentored by Dr. Ryan Venturelli, in collaboration with Drs. Lauren Miller and Tamara Pico.</i>	
Moore Graduate Student Award, 2022	\$5,000
<i>Department of Environmental Sciences, University of Virginia Project: Leveraging deglaciated landscapes to inform ice flow behavior of the Greenland Ice Sheet</i>	
Graduate Student Internship, 2022	\$1,540*
<i>National Ocean Science Accelerator Mass Spectrometry Laboratory Project: Getting the timing right: Pairing optically stimulated luminescence and radiocarbon dating techniques to provide marine reservoir corrections for the Puget Lowland, WA</i>	
<i>*analytical cost covered by program</i>	
Double Hoo Research Grant, 2021	\$6,000
<i>University of Virginia, co-written with undergraduate student Medha Prakash Project: Glacial or marine? Utilizing a novel research approach to characterize stratigraphic units in the Puget Lowland, Washington state.</i>	
Exploratory Research Grant, 2020	\$1,425
<i>Department of Environmental Sciences, University of Virginia</i>	

MENTORING

Co-mentor for Coastal NSF REU	2022
<i>University of Virginia Coastal Research Center, Cape Charles, VA Renee Hebert, University of Virginia Project: "Assessing legacy Blue Carbon in a restored seagrass meadow" conducted with Drs. Peter Berg and Karen McGlathery</i>	
Undergraduate Research Mentor	2019- 2023
<i>University of Virginia, Charlottesville, VA Marion Donald, Maya Weiss</i>	
<i>Project: Characterizing a subglacial lake through sedimentology in the Puget Lowland, Washington state</i>	2023
<i>Medha Prakash</i>	2021-2023
<i>Project: Morphometric comparison of terrestrial eskers and martian sinuous ridges</i>	
<i>Jacob Slawson, now: PhD student, Colorado School of Mines</i>	2020-2021
<i>Project: Just a bump in the road? Assessing the influence of topographic relief on Cordilleran Ice Sheet flow from deglaciated landscapes</i>	
Alumnae College Mentor	2022
<i>Linden Hall School for Girls, Lititz, PA</i>	

RESEARCH
EXPERIENCE

PaleoCAMP Student	2022
<i>PaleoCAMP Organization, Mammoth, CA</i>	
NSF funded Research Experience for Undergraduates Student	2018

Geophysical Institute at the University of Alaska, Fairbanks, AK
Project: *The impact of permafrost forecasting accuracy on Predicting the influence of Arctic vegetation type and Disturbance events on permafrost degradation*

Cross-Disciplinary Science Institute Research Assistant 2017
Environmental Studies Department at Gettysburg College, Gettysburg, PA
Project: *Using streamlined landforms to reconstruct and compare paleo-ice flow paths in Bárðardalur, north Iceland and northwestern Pennsylvania*

TEACHING
EXPERIENCE

University of Virginia
Environmental Sciences Teaching Assistant 2020-2023
Fundamentals of Geology Lecture and Lab (3 semesters)
Applied Statistics for Environmental Science (1 semester)
Polar Environments Teaching Assistant (1 semester)
Cavalier Athletics Support Team Content Tutor 2021-2022
Environmental Science Content Tutor (2 semesters)
School of Education Summer Enrichment Program Instructor 2020-2021
Middle School Course "The Cool Cryosphere!" (2 summers)

Gettysburg College
Environmental Studies Peer Learning Associate 2017-2018
Earth System Science (2 semesters)
Mathematics Department Tutor 2017-2018
Calculus I, II, and III (3 semesters)

AWARDS AND
HONORS

University of Virginia
Graduate Student Mentorship Award 2023
Graduate Student Association Award 2021
Henry W.A. Hanson Scholarship Award 2019

Gettysburg College
Gertrude Lawrence Ledford Scholarship Award 2019
David Wills Academic Scholar 2015-2019
Deans List Scholar 2015-2019
Gettysburg Senior Scholarship Award 2018
Dean Frank B. Williams Memorial Prize 2018

PROFESSIONAL
SERVICE

Referee Service
Journals: *Journal of Earth System Science* review, *Polar Science* co-review

Community Engagement
CryoCommunity co-development of "Graduate Student Resources" Article 2023

Conference Service
Co-convening AGU Sessions: 2023
C010: Archives and Observations from Sub-ice Environments,
co-convened with Drs. Ryan Venturelli, Matthew Siegfried, and Jon Hawkings.
EP024: Landscape Evolutions Beneath and Beyond the Ice,
co-convened with Shanti Penprase and Drs. Andrew Wickert and Dougal Hansen.

[West Antarctic Ice Sheet Workshop](#) co-development of
community college lesson plan 2022
Northeast Geological Society of America student volunteer 2022

Certificates

Fundamentals of Learning for Science Mentors Course 2020
University of Virginia PhD+ Professional Seminar 2020

Graduate Student Association Co-President 2022-2023
Department of Environmental Sciences, University of Virginia, Charlottesville, VA

Diversity, Equity, and Inclusion Committee Representative 2020-2022
Department of Environmental Sciences, University of Virginia, Charlottesville, VA

[ESIP](#) **Community Data Cluster Fellow** 2020-2021
Earth Science Information Partners Federation, Remote

INVITED TALKS

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- [5] Exploring ice behavior, dynamics, and timing through sedimentary records and
Beneath the surface.
UW Madison Geoscience Seminar, Madison, WI 28 Nov. 2023
- [4] Ice-sheet sensitivity to Earth's surface: an assessment of landscape records
UVA Environmental Sciences Seminar, Charlottesville, VA 16 Apr. 2023
- [3] Differential impacts of subglacial bed conditions on paleo-ice flow and subglacial
processes.
Pal(a)eoPERCS Seminar Series, Virtual 8 Nov. 2022
- [2] Ice-sheet sensitivity to Earth's surface: an assessment of Cordilleran Ice Sheet behavior
across the Puget Sound
Friday Harbor Labs Seminar Series, San Juan Island, WA 30 Nov. 2022
- [1] Building Bridges in Community Engagement Panel
ESIP 2022 Winter Meeting, Virtual 19 Jan. 2022
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SELECT CONFERENCE ABSTRACTS

- [10] **McKenzie, M.**, Miller, L., Berg, P., Hebert, R., Guo, Z., Wiggins, T., Kuzminski, S., Wiman, C., Muñoz, S. Sedimentary Records of Blue Carbon and Environmental Change in Coastal Virginia: An Assessment of Seagrass Meadow Sediment Deposition and Carbon Cycling Variations. American Geophysical Union 2023, San Francisco, CA, USA. Oral Session PP040: Sedimentary records of Holocene climate and environmental change.
- [9] **McKenzie, M.**, Miller, L., Lepp, A., DeWitt, R. Outcrop Perspectives on Spatial and Temporal Effects of Topography on the Marine-terminating Puget Lobe of the Cordilleran Ice Sheet. American Geophysical Union 2023, San Francisco, CA, USA. Oral Session C010: Archives and Observations from Sub-ice Environments.
- [8] **McKenzie, M.**, Simkins, L.M. Outcrop Perspectives on Spatially Variable Retreat of the Marine-terminating southern Cordilleran Ice Sheet. American Geophysical Union 2022, Chicago, IL, USA. Poster Session: PP014 - Ice-sheet variability and behavior through the lens of geologic data and numerical modeling.
- [7] **McKenzie, M.A.**, Slawson, J., Simkins, L.M., Wang, S., MacKie, M. 2022. Influence of bed highs on ice flow as determined by bedform morphology. Northeast GSA Annual Meeting Abstract, Lancaster, PA, USA.
- [6] Berg, P., Hebert, R., **McKenzie, M.**, Groff, L., Wiman, C., Fiss, M., McGlathery, K., Munoz, S., Stubbins, A. Legacy Blue Carbon below Modern Seagrass Beds. Association for the Sciences of Limnology and Oceanography 2023, Palma de Mallorca, Spain.
- [5] Dellert, C.D., Reynolds, L., **McKenzie, M.**, Simkins, L.M., Kennedy, W. Carbon Content of Coastal Lake sediments from Whidbey Island, Washington State. American Geophysical Union 2022, Chicago, IL, USA. Session: PP015 - Limnology,

Paleolimnology, and Limnogeology - Lakes as Archives of Climate and Environment Variability and Geohazards.

- [4] Prakash, M., Simkins, L. **M.**, **McKenzie**, M., Smith, J.W., Limaye, A.B. Morphometrics of Terrestrial Eskers and Martian Sinuous Ridges Reveal Persistent Pathways of Subglacial Meltwater Drainage. American Geophysical Union 2022, Chicago, IL, USA. Session EP024 - Surface Processes on Rocky and Icy Bodies across the Solar System.
- [3] **McKenzie**, **M.A.**, Simkins, L.M., Principato, S. 2021. Streamlined bedform sensitivity to bed characteristics from deglaciated landscapes. West Antarctic Ice Sheet Workshop Talk Abstract, Sterling, VA.
- [2] **McKenzie**, **M.A.**, Romanovsky, V. E., Kholodov, A. L. 2019. The impact of permafrost forecasting accuracy on predicting the influence of Arctic vegetation type and disturbance events on permafrost degradation. Arctic Workshop Annual Meeting Abstract, Stockholm, Sweden.
- [1] **McKenzie**, **M.A.**, Principato, S.M., Benediktsson, I.O. 2017. Geomorphic evidence for a paleo-ice stream near Bárðardalur, north Iceland. GSA Annual Meeting Abstract, Seattle, WA, USA.