Sasha Leidman

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Education

Rutgers University
PhD Candidate in Geography, Expected February 2022
Certificate program in Earth System Sciences
Certificate in Geographical Information Systems
GPA: 3.91

University of California at Davis
BS Geology, June 2014
Geographic Information Systems Minor and Watershed Science Minor
Completed Davis Honors Challenge
GPA: 3.54

Research Experience

Rutgers University
PhD Student with Dr. Åsa Rennermalm
2016-present
Glaciology research on hydrologic processes and the albedo of the Greenland Ice Sheet

- Investigate evidence for meltwater refreezing within firn in Greenland's accumulation zone through ice coring, snow pits, and ground penetrating radar.
- Examine seasonal variability of discharge and the morphology of supraglacial streams in SW Greenland.
- Map changes in albedo and ablation rates related to ice topography, sediment content, and supraglacial stream networks via Structure-from-Motion of UAV images and RTK GPS measurements.
- Long-term monitoring of proglacial discharge in SW Greenland.

University of California Davis
2013-2016
Junior Specialist with Dr. Sarah Yarnell

- Investigate instances of extreme hysteresis of sediment transport in Caspar Creek, Fort Bragg, CA during storm events
- Comparative analysis of PIT-tagged rock tracking, total station DEM surface subtractions, Helley-Smith measurements, and sediment traps against modeled outputs for sediment transport rates

University of California Davis
2015-2016
Junior Specialist with Dr. Nicholas Pinter

- GIS analysis of instances of full-town relocations due to repeated flooding events

- Development of model parameters to determine future relocation sites for town planners

University of California Davis
2013-2015
Junior Specialist with Dr. Dawn Sumner
- Fieldwork at Lake Joyce, McMurdo Dry Valleys, Antarctica to collect samples of subice microbial mats and profile chemical gradients in the lake.
- Development of a bathymetric model of Lake Joyce and Lake Vanda based on historic aerial photography, drill hole measurements, and LIDAR surveys.
- 3D modeling of microbial mats using Structure-from-Motion of drill hole imagery.
- Analysis of the water budget and historical lake levels of Lake Vanda.

Denali National Park and Preserve
Jun-Aug 2014
Glacier Monitoring Specialist with Rob Burrows
- RTK GPS measurements of glacier surface height change and speed, satellite remote sensing of glacier extent changes, and GIS analysis to determine the mass balance of Denali NP glaciers.

Juneau Icefield Research Program
July-Sep 2018
Faculty Researcher
- RTK GPS survey, SFM imagery, and water discharge measurements of a supraglacial stream on the Llewellyn Glacier, AK.

Jun-Aug 2012
Student Researcher
- Snow pit surveys, GPR transects, RTK GPS points, and supraglacial stream discharge measurements of the Juneau Icefield to determine the mass balance, thickness, speed, and diurnal flow regime.

Teaching Experience

Rutgers University
Adjunct Instructor, Intro to Physical Geography Online Class, Summer 2020
Teaching Assistant, Intro to Physical Geography, Spring 2020
Teaching Assistant, Intro to GIS, Fall 2019
Guest lecturer, First-Year Interest Group Seminar on Hydrology Methods, Fall 2018
Guest lecturer, Spatial Data Analysis, Fall 2017
Guest lecturer, Earth Systems, Fall 2016

Juneau Icefield Research Program
Faculty member teaching glacial geomorphology, snow physics, remote sensing, fluid mechanics, and supraglacial hydrology, Summer 2018

University of California Davis
Teaching Assistant, Ecogeomorphology, Spring 2015

Undergraduate Advising

Rutgers University

- Emilio Bernal, Field assistant for supraglacial stream research in Greenland
- Alina Schultz, Observing Supraglaical Stream Dynamics of the Greenland Ice Sheet using Remote Sensing, AAG RS Tarr Awardee, Fall 2018-Spring 2019
- Michael Prihoda, Spatial Variabililty of Manning's Roughness within Greenlandic Supraglacial Streams, Presenter at the Undergraduate Research Conference, Fall 2017-Spring 2018
- Ben Kraun, Diurnal Variability of Supraglacial Streamflow on the Greenland Ice Sheet, Presenter at the Rutgers Undergraduate Research Conference, Fall 2016-Spring 2017

Peer Reviewed Publications

Cintron-Rodriguez, I. M., Rennermalm, Å. K., Karpari, S., **Leidman, S. Z.**, Grothe, H. (Submitted 2022) Light absorbing particles and snow ageing feedback enhanceds albedo reduction of the Southwest Greenland Ice Sheet. The Cryosphere.

Leidman, S. Z., Rennermalm, Å. K., Getraer, A., Muthyala, R., Skiles, S. M. (Submitted 2022) Evolution of Supraglacial Floodplains on the Greenland Ice Sheet Over the 2019 Melt Season. Remote Sensing of Environment.

Leidman, S. Z., Rennermalm, Å. K., Lathrop, R. G., & Cooper, M. (2021) Terrain-Based Shadow Correction Method for Assessing Supraglacial Features on the Greenland Ice Sheet. Frontiers in Remote Sensing, 20.

Leidman, S. Z., Rennermalm, Å. K, Muthyala, R. Guo, Q. C., Overeem, I. (2021) The Presence and Widespread Distribution of Dark Sediment in Greenland Ice Sheet Streams Implies Substantial Impact of Microbial Communities on Sediment Transport and Albedo. *Geophysical Research Letters*, 48, 1.

Muthyala, R., Rennermalm, A. K., **Leidman, S. Z.**, Cooper, M. G., Cooley, S. W., Smith, L. C., & van As, D. (2020). Seasonal Variability in In-situ Supraglacial Streamflow and Drivers in Southwest Greenland in 2016. *The Cryosphere Discussions*, 1-28.

Cooper, M. G., Smith, L. C., Rennermalm, Å. K, Tedesco, M., Muthyala, R., **Leidman, S. Z.**, Moustafa, S. E., Fayne, J. V. (2020) Spectral attenuation coefficients from measurements of light transmission in bare ice on the Greenland Ice Sheet. *The Cryosphere, 15(4), 1931-1953.*

Leidman, S. Z., Rennermalm, Å. K, Broccoli, A., As, D. V., Hubbard, A., Steffen, K., Broeke, M. V. D. (2020). Methods for Predicting the Likelihood of Safe Fieldwork Conditions in Harsh Environments. *Frontiers of Glaciology, 8, 260.*

Mackey, T., Sumner, D. Y., Hawes, I., **Leidman, S. Z.**, Andersen, D., Jungblut, A. (2018). Stromatolite records of changing primary productivity in perennially ice covered Lake Joyce, McMurdo Dry Valleys, Antarctica. *Biogeochemistry*.

Mackey, T. J., Sumner, D. Y., Hawes, I., Jungblut, A. D., Lawrence, J., **Leidman, S. Z.**, & Allen, B. (2017). Increased mud deposition reduces stromatolite complexity. Geology, 45(7), 663-666.

Castendyk, D. N., Obryk, M. K., **Leidman, S. Z.**, Gooseff, M., & Hawes, I. (2016). Lake Vanda: A sentinel for climate change in the McMurdo Sound Region of Antarctica. *Global and Planetary Change*, *144*, pp.213-227.

Other Publications

Leidman, S. Z., Nunn, C., Hancock, S., Janoski, K., Reinert, A. E., (2021) Community Wellbeing in the North American Arctic. Arctic Winter College Fellowship Program Policy Briefers

Leidman, S. Z. and Burrows, R. (2014) Updated Condition of Denali National Park Glaciers: A Detailed Look at Changes in Glacier Extent and Ice Loss on the Kahiltna and East Fork Toklat Glaciers. NPS Natural Resources Technical Report.

Conference Presentations

Leidman, S. Z., Rennermalm, Å, K., Rohi Muthyala, Alexander Getraer, S. McKenzie Skiles (2021) Intra-Seasonal Evolution of Supraglacial Floodplains on the Greenland Ice Sheet. AGU eLightning Talk.

Leidman, S. Z., Rennermalm, Å, K., Rohi Muthyala, Alexander Getraer, S. McKenzie Skiles (2021) Seasonal Evolution of Supraglacial Floodplains on the Greenland Ice Sheet. American Association of Geographers Middle States Division, Oral Presentation.

Leidman, S. Z., Rennermalm, Å, K. (2020) Improving Aerial Imagery Classification of Supraglacial Features with a DEM-Based Shadow Modeling. AGU Oral Presentation. (Abstract # C007-09)

Leidman, S. Z., Lauren Thompson, Carolynn Harris (2020) APECS Initiatives for Fostering Inclusive Polar Policies. AGU Oral Presentation. (Abstract #SY037-06)

Leidman, S. Z., Rennermalm, Å, K., Muthyala, R. Guo, Q., Overeem, I. (2020) Why are Supraglacial Streams So Dirty? A Theoretical Explanation for Supraglacial Floodplains on the Greenland Icesheet. AAG Presentation.

Leidman, S. Z., Rennermalm, Å, K., Muthyala, R. Guo, Q., Overeem, I. (2020) Deposition of Low Albedo Sediment in Supraglacial Streams Depends on Cyanobacteria. PARCA Poster

Leidman, S. Z., Rennermalm, Å. K., Muthyala, R., Moustafa, S. (2019) Distribution and Characteristics of Sediment in Supraglacial Stream Channels. AGU Poster

Leidman, S. Z., Rennermalm, Å. K., Muthyala, R., Chu, V. (2019) Hydrologic Modeling of Supraglacial Streams and their Impact on Albedo. Arctic Futures Conference Poster

Leidman, S. Z., Rennermalm, Å. K., Muthyala, R., Moustafa, S., Schulz, A. (2019) Modeling Supraglacial Streams and Sediment and Its Impact on Albedo. AAG Presentation and Session Organizing.

Leidman, S. Z., Rennermalm**,** Å. K. (2019) Shadow Correction Algorithm to Improve Supraglacial Feature Recognition. PARCA Poster.

Leidman, S. Z., Rennermalm, Å. K., Muthyala, R., Cooper, M. (2018) Supraglacial Stream Morphology and Flow Characteristics from Ultra-High Resolution Bathymetric Mapping. AGU Poster.

Leidman, S. Z., Rennermalm, Å. K., Muthyala, R. (2018) Does Sediment Impact the Hydraulic Properties of Supraglacial Streams? American Association of Geographers Middle States Division Poster*.

Leidman, S. Z. (2018) Spatial Heterogeneity of Bed Processes in Supraglacial Streams and Their Effect on Albedo. Antarctic Surface Hydrology Workshop Poster.

Leidman, S. Z. (2018) Spatial Heterogeneity of Bed Processes in Supraglacial Streams. PARCA Poster.

Leidman, S. Z., Rennermalm, Å. K., & Santos, N. (2017) Shadows Over Greenland: The Effect of Topographic Shadowing by Ice on Solar Irradiance. AAG Cyrosphere Group RS Tarr Poster Presentation (Abstract 1629)*.

Leidman, S. Z., Rennermalm, Å. K., Ryan, J., & Acosta, D. (2017) The Contribution of Topographic Shadowing by Ice on Albedo Variability. Arctic Workshop Buffalo Presentation.

Leidman, S. Z. (2016) Modeling Supraglacial Streams with In-Situ Measurements. AGU Flash Freeze Presentation*.

Mackey, T. J., Sumner, D. Y., Hawes, I., Jungblut, A. D., **Leidman, S. Z.**, Andersen, D. T. (2016) Stromatolites Record Changing Primary Productivity in Perennially Ice-Covered Lake Joyce, McMurdo Dry Valleys, Antarctica. AGU Presentation (Abstract B43D-06).

Cooper, M. G., Smith, L. C., Rennermalm, A. K., Pitcher, L. H., Miege, C., **Leidman, S. Z.**, Cooley, S., Kershner, C. M., Overstreet, B. T., Muthyala, R., Ryan, J., Yang, K. (2016) Characterizing Weathering Crust Hydrology in the Southwest Greenland Ablation Zone. AGU Poster (Abstract C41E-0720).

Leidman, S. Z., Rennermalm, Å. K., Broccoli, A. J., As, D. V., Broeke, V. D., Smeets, P., & Steffen, K. (2016) Low Probability of Safe Fieldwork Conditions in Southwest Greenland due to Weather Conditions. PARCA Poster.

Leidman, S. Z. and Yarnell, S. M. (2015) Tracking Sediment Movement with Pittag Surveys during Storm Events in the North Fork of Caspar Creek, California. AGU Poster (Abstract EP33A1058).

Mackey, T. J., **Leidman, S. Z**., Allen, B., Hawes, I., Lawrence, J., Jungblut, A. D., Krusor, M., Coleman, L., Sumner, D. Y. (2015) Characterizing microbial mat morphology with Structure from Motion techniques in ice-covered Lake Joyce, McMurdo Dry Valleys, Antarctica. AGU Poster (Abstract C41D-0726).

Kim, T. W., Yarnell, S. M., Yager, E., **Leidman, S. Z.** (2015) Comparison between Measured and Calculated Sediment Transport Rates in North Fork Caspar Creek, California. AGU Poster (Abstract H51N-1596).

Mackey, T. J., **Leidman, S. Z.**, Sumner D. Y., Hawes, I., Jungblut, A. D., Castendyk, D. N. (2014) Benthic Microbial Mat Expansion and Nutrient Uptake During Lake Level Rise in IceCovered Lake Vanda, McMurdo Dry Valleys, Antarctica. Ecological Society of America Poster.

Leidman, S. Z. (2014) GIS Analysis of the Water Balance of Lake Vanda, Antarctica. UC Davis Undergraduate Research Conference Poster

Leidman, S. Z. (2013) Supraglacial Stream Dynamics: Determining Bed Roughness and Channel Geometries. UC Davis Undergraduate Research Conference Poster

* = Award Winning

Service and Leadership Experience

Association of Polar Early Career Scientists (APECS)

- Interim International Executive Committee Member (2020) Responsibilities: Coordinate efforts with the Indigenous Collaborations Project Group, Diversity/Equity/Inclusion Project Group, and National Committees as well as vote on changes to organizational bylaws and financial decisions.
- Co-Founder and Project Group Leader of the Diversity, Equity, and Inclusion Team (2017-2020) Responsibilities: 1) Leading group meetings, 2) Organizing logistics and speakers for inclusivity webinars such as "Addressing Implicit Bias in Polar Science", "Working with Indigenous Communities", "Harassment in Polar Field Work", and "Polar Policy: How Polar Agencies Are Changing their Policies to be More Inclusive", 3) Creating a resource repository for inclusive polar science literature, 4) Organized a mentor list to connect BIPOC early career researchers with advisors trained in DEI issues, 5) Work with the Executive Committee to update bylaws to be more inclusive.
- National Committee Member (2016-2020) Responsibilities: Help with International Polar Week efforts and other Project Group activities.

Juneau Icefield Research Program (JIRP)

- Member of the Justice Equity Diversity and Inclusion (JEDI) Steering Committee responsible for creating an inclusive action plan, code of conduct, updated safety plan, inclusive recruitment strategies, and demographic reports
- Member of the JIRP Unlearning Racism in Geosciences (URGE) Pod

Interagency Arctic Research Policy Committee (IARPC)

- Member of the Code of Conduct Committee updating policy and deciding actions for reported harassment
- Member of the Diversity and Inclusion Collaboration Team

Arctic Research Consortium of the United States (ARCUS)

- Board Member of the Membership and Development Committee (2021) deciding on policies to increase enrollment and DEI of ARCUS events and membership

Pride in Polar Research (PiPR)

- Board member (2021) Updating mission statement, recruiting volunteers, creating social media posts.

Skype with a Scientist

- Presented at 5 middle school science classrooms about climate change

American Association of Geographers (AAG)

- Cryosphere Group Board Member (2017-2019)

Rutgers University

- Geography Graduate Project President (2017-2018)
- Presenter for the Rutgers Geology Museum "Ask a Geologist" Series

University of California Davis

- Geology Club President (2013-2014)
- Wilderness Medicine Club President (2010-2014)

Awards

- Winner of the AAG Middle States Student Paper Competition (2021)
- Finalist for the Rutgers 3 Minute Thesis Competition (2020)
- Winner of the NSF Graduate Research Fellowship Program (GRFP) Award (2018)
- Winner of the CUAHSI Pathfinder Fellowship (2018)
- Nominee for the AAG National Geography Bowl (2018)
- Second Prize in the AAG Middle States Student Poster Competition (2018)
- Recipient of the RS Tarr AAG Cryosphere Group Award (2017)
- Recipient of the UC Davis Provost Undergraduate Fellowship (2014)
- Finalist for the Mars Arctic 365 Program (2014)
- Recipient of the Thomas W. Todd Scholarship (2013)

Outdoor Experience

- Backpacking, Class 4 White Water Rafting and Kayaking, Sea Kayaking, Snowshoeing, and Cross Country Skiing Guide for UC Davis Outdoor Adventures leading over 100 trips throughout California (2011-2016)
- Pacific Crest Trail Thru-Hiker Class of 2011 and 2013
- Kayaked 200 miles along the coast of Western Greenland as well as across Lake Powell in winter
- Wilderness First Responder Certified
- Red Cross Swift Water Rescue and Small Craft Certified

Software Fluency and Memberships

- Software: ESRI (ArcMap 10.5, ArcGIS Pro, ArcScene, Model Builder, Network Analysis), Excel, Powerpoint, Photoshop, Trimble Business Center, Python, Agisoft Metashape Pro, ERDAS, and ENVI.

- Member of AAG, IARPC, ARCUS, and AGU