CAMRYN KLUETMEIER

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Education

Duke University, Durham, North Carolina — August 2025-present
Ph.D. Student in Earth and Climate Sciences

Middlebury College, Middlebury, Vermont — February 2018-February 2022
B.A. in Environmental Studies & Geology
Major GPA: 3.98 | Overall GPA: 3.85 | summa cum laude

University of Canterbury, Christchurch, New Zealand, semester abroad — July-November 2020
Frontiers Abroad, New Zealand geology semester and field camp program — January-June 2020

Research Interests

- Water resources, cryospheric science, satellite remote sensing, hydrology, glacial geology and geomorphology, citizen science
- How climate change impacts the storage and movement of water reserves, especially in alpine and Arctic environments

Professional Experience

Research Specialist — August 2022-August 2025
University of North Carolina-Chapel Hill, Global Hydrology (Pavelsky Lab) — Chapel Hill, North Carolina

- Calibration and validation of NASA's Surface Water and Ocean Topography (SWOT) satellite through *in situ* field campaigns in New Zealand, Alaska, New England, Oregon, and California.
- Lead collecting water surface elevation, inundation extent, and discharge using GNSS, pressure transducer, ADCP, and LiDAR data.
- Manage logistics for nine months of fieldwork, including selecting sample locations, securing research permits, organizing and maintaining equipment, managing personnel, and coordinating with contractors and community partners.
- Process and analyze field data and novel SWOT data.

Senior Thesis and Post-Bac InSAR Analyst — September 2020-May 2022
Middlebury College, Geology Department (Handwerger/Munroe Lab) — Middlebury, Vermont

- InSAR-based characterization of rock glacier kinematics and water resource potential across the La Sal, Unita, and Wind River Mountains (UT, WY).
- Processed and analyzed Sentinel-1 radar data in Python (ISCE, MintPy) and optical imagery (Landsat, Planetlab) in QGIS, MATLAB, and R.

Geology Field Assistant — August 2021
Middlebury College, Geology Department (Munroe Lab) — La Sal & Uinta Mountains, Utah

- Designed and conducted differential GPS surveys and GPR transects of backcountry rock glaciers, maintained dust samplers and time-lapse cameras, and collected water samples to analyze seasonal variation in glacier spring outflow.

Summer Student Fellow — May 2021-August 2021
Woods Hole Oceanographic Institution, Applied Ocean Physics and Engineering (Walker Lab) — Woods Hole, Massachusetts

- Analyzed Landsat8 and ICESat-2 data in QGIS and MATLAB to investigate the evolution and morphology of rift propagation across West Antarctica.

Glacial Geomorphology Intern — November 2020-May 2021
University of Canterbury, School of Earth and Environment (Purdie Lab) — Christchurch, New Zealand

- Processed, filtered, and analyzed swath bathymetry data using Bathyswath-2 and ArcGIS to characterize subaqueous glacial geomorphic landforms and interpret their relationship with phases of the Tasman Glacier's retreat.

Whakaraupō Sedimentation Project Research Assistant — September-December 2020
University of Canterbury, School of Earth and Environment — Christchurch, New Zealand

- Collected and analyzed surface sediment samples and cores using geochemical componentry, grain size, and foraminifera to characterize sediment sources and the influence from port dredging in Whakaraupō Harbor.

Geology Research Assistant — September 2018-December 2019
Middlebury College, Geology Department (Amidon Lab) — Middlebury, Vermont

- Prepared calcite samples for ICP-MS to date dikes throughout the Champlain Valley to understand the post-rift rejuvenation of the northeastern US and prepared glacial moraine samples for cosmogenic dating.

Limnology Technician May-August 2019
University of Wisconsin-Madison, Center for Limnology (Stanley Lab) Madison, Wisconsin

- Installed sensors and processed water samples to measure stream respiration and primary production.
- Sampled Lake Mendota to determine links between cyanobacteria blooms and limnic greenhouse gas emissions.

Stream Ecology Technician May-August 2018
University of Wisconsin-Madison, Center for Limnology (Stanley Lab) Madison, Wisconsin

- Sampled stream carbon dioxide and methane flux in response to floods.
- Organized and facilitated hands-on activities for community events at Center for Limnology.

Northern Lakes Sampling Base Crew June-August 2017
University of Wisconsin-Madison, Center for Limnology (Trout Lake Station) Boulder Junction, Wisconsin

- Collected limnological data and operated boats on seven study lakes for North Temperate Lakes LTER.
- Analyzed the sensitivity of spectrophotometric chlorophyll analysis to fluctuations in pH.

Awards

2026	National Center for Airborne Laser Mapping Seed Proposal
2025-2030	National Science Foundation Graduate Research Fellowship
2025	Duke University Centennial & Graduate Professional Fellowship
2022	Middlebury College Geology Department high honors
2022	Middlebury College Environmental Studies Department honors
2022	Angelo Tagliacozzo Memorial Geological Scholarship from the American Institute of Professional Geologists
2022	Joan W. Miller Scholarship from the Juneau Icefield Research Program
2021	Woods Hole Oceanographic Institution Travel Award
2020, 2021	Middlebury College Academic Conference Travel Award (awarded 4 times)
2020	Middlebury College Undergraduate Research Baldwin-Coney Scholarship for Geology Field Camp
2016	Wisconsin Student Volunteer Stream Monitoring Award, UW-Extension & WI Dept. of Natural Resources

Total Funding Awarded: $179,671.15

Publications

ORCID – **Google Scholar**

In preparation:

6. Yang, X., Yoon, S., **Kluetmeier, C.L.,** Arp, C.D., Bondurant, A.C., Nolan, M., Pavelsky, T.M., Assessing SWOT elevation retrieval over freshwater ice cover. *In Preparation for GRL.*

5. **Kluetmeier, C.L.,** Pavelsky, T.M., Rowley, T., Bennitt F.B., Gleason, C.J., Minear, J.T., Smith, L.C., Thellman, A., Tooley, W., Olson, A.J., Wald, M., Cooley S.W. Validation of SWOT water surface elevation, slope, and inundation extent in the Yukon River Basin, Alaska, USA. *In Preparation for WRR.*

4. Hughes, M.J., Pavelsky, T.M., **Kluetmeier, C.L.,** Brasington, J., Stout, J.C., Rogers, J.M., Rowley, T., Gleason, C.J. Validation of SWOT for braided rivers: comparisons of water surface elevation and area on the Waimakariri River, Aotearoa New Zealand. *In Preparation for WRR.*

Published:

3. **Kluetmeier, C.L.,** Handwerger, A.L., Munroe, J.S. (2026), Active and transitional rock glaciers above the 0°C mean annual air temperature isotherm in the La Sal Mountains, Utah, USA. *Arctic, Antarctic, and Alpine Research, 58(1).* doi.org/10.1080/15230430.2026.2680743

2. Daroya, R., Rowley, T., Flores, J.A., Friedmann, E., Bennitt, F.B., An, H., Simmons, T.T., Hughes, M.J., **Kluetmeier, C.L.,** Kica, S., Vélez, J.D., Esenther, S.E., Howard, T.E., Ye, Y., Turcotte, A.J., Gleason, C.J., Maji, S. (2026), RiverScope: High-Resolution River Masking Dataset. *Proceedings of the AAAI Conference on Artificial Intelligence, 40(45).* doi.org/10.1609/aaai.v40i45.41175

1. Munroe, J. S., Soderstrom, E. J., **Kluetmeier, C. L.,** Tappa, M. J., Mallia, D. V., Bauer, A. M. (2023), Regional sources control dust in the mountain critical zone of the Great Basin and Rocky Mountains, USA. *Environmental Research Letters, 18(10).* doi.org/10.1088/1748-9326/acfb26

Conference and Seminar Presentations *(presenting author)*

Oral

Oct 2025 **Kluetmeier, C.L.,** T.M. Pavelsky, T. Rowley, W. Tooley, A. Turcotte, F.B. Bennitt, A. Thellman, S.W. Cooley, Validation of SWOT in the Yukon River Basin, Alaska, *SWOT Science Team Meeting, Arcachon, France.*

Apr 2025 **Kluetmeier, C.L.** and T.M. Pavelsky, The Surface Water and Ocean Topography mission: NASA's new eye in the sky for Earth's water (joint invited talk), *Middlebury College Department of Earth and Climate Sciences seminar series, Middlebury, Vermont.*

Nov 2023 **Kluetmeier, C.L.** and T.M. Pavelsky, NASA's Surface Water and Ocean Topography Mission: A new satellite for measuring Earth's surface water (invited talk), *Woodwell Climate Research Center Seminar Series, Woods Hole, Massachusetts.*

Oct 2023 Pavelsky, T.M., **C.L. Kluetmeier,** M. Dudek, Measuring Water from Space (invited panelist), *UNC Chapel Hill Research Week, Chapel Hill, North Carolina.*

May 2022 **Kluetmeier, C.L.,** A.L. Handwerger, J.S. Munroe, InSAR-based characterization of rock glacier kinematics in the La Sal Mountains, Utah, USA, *European Geosciences Union General Assembly, Vienna, Austria.*

Dec 2021 **Kluetmeier, C.L.,** A.L. Handwerger, J.S. Munroe, Projecting InSAR LOS velocities downslope using the surface parallel flow assumption in the La Sal Mountains, UT, *Midwest And Random Stragglers (MARS) glaciology group seminar (virtual).*

May 2021 **Kluetmeier, C.L.,** H. Purdie, J. Harrison, The submerged footprint of the Tasmin Glacier, New Zealand, *Middlebury College Spring Symposium, Middlebury, Vermont.*

Poster

Dec 2025 **Kluetmeier, C.L.,** T.M. Pavelsky, T. Rowley, W. Tooley, A. Turcotte, F.B. Bennitt, A. Thellman, S.W. Cooley, Water surface elevation, slope, and inundation extent validation of SWOT in the Yukon River Basin, AK, *American Geophysical Union Fall Meeting, New Orleans, Louisiana.*

Dec 2024 **Kluetmeier, C.L.,** T.M. Pavelsky, T. Rowley, W. Tooley, A. Turcotte, F.B. Bennitt, A. Thellman, Validation of SWOT in the Yukon-Porcupine River catchments, Alaska, *American Geophysical Union Fall Meeting, Washington D.C.*

Dec 2023 **Kluetmeier, C.L.,** T.M. Pavelsky, J.T. Minear, C.J. Gleason, Validation of SWOT in high latitude lakes, Yukon Flats National Wildlife Refuge, AK, *American Geophysical Union Fall Meeting, San Fransico, California.*

Dec 2021 **Kluetmeier, C.L.,** Walker, The evolution and morphology of the McMurdo Rift, West Antarctica, *American Geophysical Union Fall Meeting, New Orleans, Louisiana.*

Dec 2020 **Kluetmeier, C.L.,** J. Borella, M. Hutchison, P. Almond, S. Hampton, D. Gravley, Early lichen colonization on earthquake induced rockfalls: Implications for lichenometry and paleoseismicity, *American Geophysical Union Fall Meeting, online.*

Nov 2020 **Kluetmeier, C.L.,** J. Borella, M. Hutchison, P. Almond, S. Hampton, D. Gravley, Early lichen colonization on earthquake induced rockfalls: Implications for lichenometry and paleoseismicity, *Geoscience Society of New Zealand Annual Conference, Christchurch, New Zealand.*

Oct 2020 **Kluetmeier, C.L.,** J. Borella, M. Hutchison, P. Almond, S. Hampton, D. Gravley. Early lichen colonization on earthquake induced rockfalls: Implications for lichenometry and paleoseismicity, *Geologic Society of American Annual Meeting, online.*

Teaching & Mentoring

Juneau Icefield Research Program, Juneau Icefield, AK
Summer 2026 Teaching Faculty, Block 2 (3 weeks) glaciology field camp (31 students)

University of North Carolina-Chapel Hill, Chapel Hill, NC
Fall 2025 Guest lecturer, EMES201: Earth's Surface Processes, Landforms, and History (28 students)
Fall 2023 Guest lecturer (x3) & 3-day field camp leader, EMES72 Honors: Field Geology of Eastern California (30 students)

Middlebury College, Middlebury, VT
Spring 2023 Guest lecturer, ECS350: The Mountain Critical Zone (15 students)

Undergraduate Students Advised:
Trevor Sumlin (UNC) – 2024-2025
Honors thesis: Which water bodies does SWOT observe? A case study in Orange County, North Carolina.

Volunteer & Leadership Experience

- Duke Women's Center Lunch & Learn **Fieldwork Safety Panelist**. (November 2025)
- ReCYCLEry NC **Volunteer Bike Mechanic** at weekly sessions for LGBTQIA+ people. (2024)
- Madison West High School AP Environmental Science **Volunteer Presenter**. Taught ~150 students about opportunities in hydrology. (October 2022)
- Cambridge University **Earth Science Demonstrator**. Taught undergraduate students on a weeklong fieldtrip. (April 2022)
- UW-Madison Earth Evolution Research Group **Volunteer Lab Technician**. Performed column chemistry to isolate Sr and Nd in mountain dust samples for TIMS and MC-ICP-MS analyses. (February 2022)
- International Antarctic Centre **Antarctic Ambassador**. Led school visits about cryospheric geology. (July 2020-January 2021)
- Christchurch **Pop Up Penguin Ambassador**. Presented to primary school assemblies about a public art trail of sculpted penguins to bring attention to themes of climate change and the endangered, yellow-eyed penguin. (August-October 2020)
- Middlebury College Cycling Team **Co-President**. Led weekly rides for a variety of cycling disciplines and levels, coordinated racing, facilitated club sponsorships and social events. (2019-2021)
- Middlebury College **Wilderness Orientation Trip Leader**. Led freshman on three-day backpacking trips. (Fall 2018, Fall 2019)
- National Interscholastic Cycling Association Certified Level 1 **Assistant Coach.** (Fall 2017, Summer 2018, Summer 2019)
- Rock River Coalition/UW-Extension Water Action Program, **Volunteer Stream Monitor**. Sampled monthly from May-October for eight years. (2010-2017)

Fieldwork

Jul 2026 **Juneau Icefield, Alaska** – Teaching Faculty for three weeks of the Juneau Icefield Research Program. Led 31 students in activities and lectures on NASA's SWOT satellite Cal/Val, glacial hydrology, rock glaciers, and lichenometry.

Jun 2026 **Toolik Field Station, Fairbanks, and Delta Junction, Alaska** – Installed pressure transducers with a coworker in 17 lakes across the Alaska Interior and North Slope for NASA's SWOT satellite Cal/Val.

Jul-Sep 2024 **Yukon River, Alaska** – Led a 14 person team in a two month campaign to collect GNSS surveys and install 80 pressure transducers across ~830 km of river and 10 lakes in the Yukon-Porcupine river basin for NASA's SWOT satellite Cal/Val.

May, Oct 2024 **Sierra Nevadas, California** – Led two field assistants in the installation and retrieval of pressure transducers in nine alpine lakes for NASA's SWOT satellite Cal/Val.

Apr 2024 **Fairbanks, Alaska** – Assisted in UAV monitoring of suspended sediment flux during ice breakup on the Tanana River for the NSF-funded Sediment, Ice, and Learning on the Tanana (SILT) project.

Jul-Aug 2023 **Fairbanks, Alaska** – Led a seven person field team in six weeks of GNSS surveys and installed 18 pressure transducers along ~60 km of the Tanana River for NASA's SWOT satellite Cal/Val.

Jul, Oct 2023 **Sierra Nevadas, California** – Led two field assistants in the installation and retrieval of pressure transducers in seven alpine lakes for NASA's SWOT satellite Cal/Val. Led instruction for three days of a 28-student UNC undergraduate field course.

Jun 2023 **Fort Yukon, Alaska** – Led a four person field team in installation of pressure transducers across 20 lakes in the Yukon Flats and GNSS surveys of ~90 km of the Yukon River for NASA's SWOT satellite Cal/Val.

Feb-May 2023 **Waimakariri River, Aotearoa New Zealand** – Co-led an 18 person field team in a three month campaign to collect airborne LIDAR and boat-mounted GNSS surveys and install 12 pressure transducers along ~60 km of river NASA's SWOT satellite Cal/Val.

Jun-Aug 2022 **Juneau Icefield, Alaska and Canada** – Participant in the two month Juneau Icefield Research Program. Traversed the Juneau Icefield and researched firn aquifer development with GPR and thinning of the icefield through Be^{10} dating.

Aug 2021 **La Sal and Uinta Mountains, Utah** – Worked in a team of three to design and conduct differential GPS surveys and GPR transects of backcountry rock glaciers, maintain dust samplers and time-lapse cameras, and collect water samples to analyze seasonal variation in glacier spring outflow.

Jan-Feb 2020 **North and South Island, Aotearoa New Zealand** – Participant in the five week Frontiers Abroad Geology Field Camp focused on stratigraphy, geomorphology, volcanology, and geologic mapping.

Field Safety Certifications

- American Canoe Association – Swiftwater Rescue Certification (16 hours - 2023)
- NOLS – Wilderness First Responder Certification (80 hours – 2018, recertified 2023)
- Wisconsin Boater Safety Certification, Wisconsin Dept. of Natural Resources (2017)

Training and Skills

- Proficient in Python, R, Google Earth Engine, MATLAB, QGIS, ArcGIS, Git/Github, High-Performance Computing, Slurm, Bash, Microsoft Suite, Adobe Creative Cloud, Agisoft, InSAR processing, LiDAR processing
- Teledyne Acoustic Doppler Current Profiler training (24 hours – 2023)
- Unlearning Racism in Geoscience (URGE) curriculum (January-May 2021)
- UW-Extension – Level 1 and Level 2 Citizen Stream Monitoring Training (10 hours - 2010, 2016)
- UW-Extension – Aquatic Plant Identification and lake sampling protocol (8 hours - 2016)

Media Coverage

"All the water in the world", Carolina Arts & Sciences, Fall 2023

"Measuring Water from Space", UNC Research Endeavors, September 14, 2023

"These Students Are Part of a 75-Year Study to Map Alaska's Glaciers", Smithsonian Magazine, April/May 2023

"Rock Glacier Flow", AntarcticGlaciers.org, September 1, 2022

"Trout Lake Research Rewind: Monitoring Macrophytes & Crushing Chlorophyll", Water Blogged: The Science and Stories of the Center for Limnology, October 2, 2017

"Off The Reel: Sampling "Trout Tower" with Sydney & Camryn", Water Blogged: The Science and Stories of the Center for Limnology, July 10, 2017

"By monitoring streams, Madison West student furthers passion for water, community", Wisconsin State Journal, May 12, 2016