

BRENDAN P. MURPHY, Ph.D.

Assistant Professor, Simon Fraser University, School of Environmental Science

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CONTACT INFORMATION:

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APPOINTMENTS

Assistant Professor <i>School of Environmental Science, Simon Fraser University</i>	2020 – present
Associate Faculty Member <i>Department of Earth Science, Simon Fraser University</i>	2021 – present
Associate Faculty Member <i>School of Resource & Environmental Management, Simon Fraser University</i>	2020 – present
Adjunct Assistant Professor <i>Department of Watershed Sciences, Utah State University</i>	2020 – present
Research Scientist II <i>Department of Watershed Sciences, Utah State University</i>	2019 – 2020
Postdoctoral Fellow <i>Department of Watershed Sciences, Utah State University</i>	2016 – 2019
Graduate Research and Teaching Assistant <i>Department of Geosciences, The University of Texas at Austin</i>	2011 – 2013
Research Technician <i>Biosphere2, The University of Arizona</i>	2010 – 2011

EDUCATION

Ph.D., Geological Sciences , The University of Texas at Austin, Austin, TX <i>NSF Graduate Research Fellow</i> Dissertation Title: ‘Feedbacks among chemical weathering, rock strength and erosion with implications for the climatic control of bedrock river incision’ Advisor: Dr. Joel Johnson	2016
B.S., Geology , The College of William & Mary, Williamsburg, VA <i>Magna cum laude, Phi Beta Kappa, High Honors in Geology</i>	2010

PUBLICATIONS

- Jager H. I., Long J. W., Malison R., **Murphy B. P.**, Rust A., Silva L. G. M., Sollmann R., Steel Z. L., Bowen M. D., Dunham J., Ebersole J. L. & Flitcroft R. (2021). Resilience of terrestrial and aquatic fauna to historical and future wildfire regimes in western North America. *Ecology and Evolution*, 1-26. DOI: 10.1002/ece3.8026.
- Fisher A., Belmont P., **Murphy B. P.**, MacDonald L., Ferrier K. L. & Hu K. (2021). Natural and anthropogenic controls on sediment rating curves in northern California coastal watersheds, *Earth Surface Processes and Landforms*, 46(8) 1-19.

8. **Murphy B. P.**, Walsworth T. E., Belmont P., Conner M. M. & Budy P. (2020). Dynamic Habitat Disturbance and Ecological Resilience (DyHDER): modeling population responses to habitat condition, *Ecosphere*, 11(1), 1-26.
7. **Murphy B. P.**, Czuba J. A. & Belmont P. (2019). Post-wildfire sediment cascades: a modeling framework linking debris flow generation and network-scale sediment routing, *Earth Surface Processes and Landforms*, 44(11), 2126-2140.
6. **Murphy B. P.**, Yocom L. L. & Belmont P. (2018). Beyond the 1984 perspective: narrow focus on modern wildfire trends underestimates future risks to water security. *Earth's Future*, 6(11), 1-6.
5. **Murphy B. P.**, Johnson J. P., Gasparini N. M., Hancock G. S. & Small E. E. (2018). Weathering and abrasion of bedrock streambed topography. *Geology*, 46(5), 459-462.
4. DeLong S. B., Youberg A. M., DeLong W. M. & **Murphy B. P.** (2018). Post-wildfire landscape change and erosional process from repeat terrestrial lidar in a steep headwater catchment, Chiricahua Mountain, Arizona, USA. *Geomorphology*, 300, 13-30.
3. **Murphy B. P.**, Johnson J. P., Gasparini N. M. & Sklar L. S. (2016). Chemical weathering as a mechanism for the climatic control of bedrock river incision. *Nature*, 532, 223-227.
2. Pangle L. A., DeLong S. B., et al., [including **Murphy B. P.**] (2015). The Landscape Evolution Observatory: A large-scale controllable infrastructure to study coupled Earth-surface processes. *Geomorphology*, 224, 190-203.
1. Han J., Gasparini N. M., Johnson J. P. & **Murphy B. P.** (2014). Modeling the influence of rainfall gradients on discharge, bedrock erodibility, and river profile evolution, with application to the Big Island, Hawai'i. *JGR: Earth Surface*, 119, 1418-1440.

SUBMITTED/IN REVIEW:

Ahammad M., Czuba J. A., Pfeiffer A., **Murphy B. P.** & Belmont P. (*in review*). Simulated sediment-pulse dynamics in a gravel-bedded river, Nisqually River, Washington, USA. *JGR-Earth Surface*

REPORTS & OTHER PUBLICATIONS:

Belmont P., **Murphy B. P.**, MacDonald L., Fisher A., Ferrier K. & Hu K. (2020). Developing a Sediment Budget for the Upper Elk River, California (FW-FWG-1028) and Sediment Production Rates over Time in Two Sub-watersheds in Little River, California (FW-FWG-1027). Final Project Report. National Council on Air and Stream Improvement.

Wilcock P., Atwood T., Belmont P., Epperly J., Gaeta J., Hammill E., Jones J., **Murphy B. P.**, Stout J. (2019). Comprehensive Study and Recommendations for Instream Flow Requirements on Sixth Water Creek and Diamond Fork River. Final Project Report.

RESEARCH FUNDING

CURRENT GRANTS (*pending proposals):

Dollar amounts listed as: (total award/my portion)

Lead PI, NSERC – Discovery Grant	2021 – 2026
Murphy B. P., Climate, erosion & sediment dynamics: Investigating controls on landscape evolution (\$162,500 CAD)	
Co-PI, National Science Foundation – Hydrology	2020 – 2022

Lane B. & **Murphy B. P.**, *RAPID: Monitoring and modeling watershed-scale post-wildfire streamflow response patterns* (**\$49,810 USD**)

Co-PI, Joint Fire Science Program **2020 – 2023**

Yocom L. L., **Murphy B. P.**, Belmont P., *Evaluating fuel treatment efficacy in reducing risk of high-severity fire and downstream impacts* (**\$445,159/\$135,930 USD**)

Lead PI, National Science Foundation - GLD **2019 – 2022**

Murphy B. P., Belmont P. & Czuba J. A., *Collaborative Research: Predicting post-wildfire sedimentation of reservoirs: probabilistic modeling of debris flow generation and downstream sediment routing*. (**\$480,033/\$160,000 USD**)

COMPLETED GRANTS:

Co-PI, National Council for Air & Stream Improvement, 2019-2020

Belmont P., MacDonald L. & **Murphy B. P.**, *Analysis of discharge-suspended sediment relationships to examine effects of geologic setting and management practices*. (**\$60,000/\$30,000 USD**)

Co-PI, Utah Public Lands Initiative, 2018-2020

Belmont P. & **Murphy B. P.**, *Assessing vulnerability of reservoirs to post-wildfire sedimentation in the Wasatch Front*. (**\$52,000/\$26,000 USD**)

Contributor, National Council for Air & Stream Improvement, 2017-2018

Belmont P. & MacDonald L., *Developing a Sediment Budget for the Upper Elk River*. (**\$33,800 USD**)

PI, National Science Foundation Graduate Research Fellowship, 2013-2016

Murphy B. P., *The influence of climate on landscape evolution: Quantifying the effects of spatially variable precipitation on topography*. (**\$130,000 USD**)

PI, National Center for Airborne Laser Mapping Seed Grant, 2013

Murphy B. P., *Precipitation effects on landscape evolution: Quantifying the role of spatially variable climate in bedrock fluvial incision, Kohala Peninsula, Hawaii*. (**Awarded 40 km² of airborne lidar**)

AWARDS, HONORS & FELLOWSHIPS

Hydrologist of the Year, QCNR Spring Runoff Competition, Utah State, 2020

Staff Researcher of the Year, Quinney College of Natural Resources, Utah State, 2020

Geology Exceptional Reviewer for 2019, The Geological Society of America, 2020

National Science Foundation Graduate Research Fellow, 2013-2016

National Science Foundation Graduate Research Fellowship, Honorable Mention, 2012

Phi Beta Kappa, Alpha Chapter of Virginia, 2010

William & Mary Alumni Association Student Academic Prize for Geology, 2010

Sigma Gamma Epsilon, Delta Alpha Chapter, 2008

Youth Volunteer of the Year, Round Rock School District, 2006

Sportsman-Scholar Award, Friends of Central Texas Lacrosse, 2006

FELLOWSHIPS & SCHOLARSHIPS:

National Science Foundation Graduate Research Fellowship, 2013-2016 (**\$130,000 USD**)

Walter B. Sharp Memorial Scholarship, 2015 (**\$10,300 USD**)

Ronald K. DeFord Field Scholarship, 2015 (**\$1,950 USD**)

Fred Bullard Prestigious Graduate Fellowship, 2014 (\$10,300 USD)
Dean's Prestigious Supplemental Award, 2014 (\$1,000 USD)
Laura T. Barrow Graduate Fellowship, 2013 (\$9,900 USD)
Ronald K. DeFord Field Scholarship, 2013 (\$1,300 USD)
William & Mary Charles Center Scholarship for Domestic Research, 2009 (\$3,000 USD)

MEDIA, PRESS & INTERVIEWS

NPR's Mountain West News Bureau, Sep. 2019, *How Wildfires May Muck Up The West's Reservoirs*: <https://www.kunc.org/post/how-wildfires-may-muck-west-s-reservoirs>

Utah State Magazine (feature story), Aug. 2019, *The Aftermath of Us*:
<https://utahstatemagazine.usu.edu/environment/the-aftermath-of-us/>

UnDisciplined on Utah Public Radio, Dec. 2018, *The Evolutionary Anatomist And The Geomorphologist*: <https://www.upr.org/post/undisciplined-evolutionary-anatomist-and-geomorphologist>

NPR's Mountain West News Bureau, Nov. 2018, *Language Around West's 'Unprecedented' Wildfires Often Lacks Context, Study Says*: <http://www.kunc.org/post/language-around-west-s-unprecedented-wildfires-often-lacks-context-study-says>

Utah Public Radio, Nov. 2018, *More Smaller Wildfires May Increase Water Resources In The West, Study Says*: <http://www.upr.org/post/more-smaller-wildfires-may-increase-water-resources-west-study-says>

Sacramento Bee (& other McClatchy nationally distributed newspapers), Oct. 2018, *Think modern wildfires are bad? Fires once burned up to 36 times more of the West, study says*:
<https://www.sacbee.com/latest-news/article220810830.html>

Environmental Monitor, Apr. 2016, *Chemical Weathering of Bedrock River Erosion Linked To Precipitation*: <https://www.fondriest.com/news/chemical-weathering-bedrock-river-erosion-linked-precipitation.htm>

TEACHING EXPERIENCE

EVSC 100: Introduction to Environmental Science <i>Simon Fraser University, Principal coordinator (enrollment: 200; remote)</i>	Fall 2021
EVSC 305: Methods in Environmental Science <i>Simon Fraser University, Principal coordinator (enrollment: 50; remote)</i>	Spring 2021
EVSC 495/660: Special Topics – Ecogeomorphology <i>Simon Fraser University, Principal coordinator (enrollment: 16; remote)</i>	Fall 2020
GEOG 1000: Physical Geography <i>Utah State University, Principal coordinator (enrollment: 148)</i>	Fall 2018
GEOG 1005: Physical Geography Lab <i>Utah State University, Co-field instructor (enrollment: 8)</i>	Fall 2018
WATS 3600: Geomorphology <i>Utah State University, Guest Lecturer</i>	Fall 2018
WATS 3700: Fundamentals of Watershed Science <i>Utah State University, Co-coordinator (enrollment: 65)</i>	Spring 2017

Climate Adaptation Science Graduate Seminar <i>Utah State University, Guest Lecturer</i>	Spring 2017
Earth Surface Processes <i>The College of William & Mary, Teaching Assistant</i>	Fall 2014
Earth's Environmental Systems: Physical Geography <i>The College of William & Mary, Guest Lecturer</i>	Fall 2014
Freshman Seminar: Geology <i>The College of William & Mary, Guest Lecturer</i>	Fall 2014
Landscape Process & Form <i>The University of Texas at Austin, Teaching Assistant</i>	Fall 2013
Whitewater Kayaking I <i>The College of William & Mary, Teaching Assistant</i>	2009 - 2010
Geology Tutor <i>Sigma Gamma Epsilon - Founded and ran honors society tutoring program</i>	2009 - 2010
Outdoor Trip Leader & Climbing Instructor <i>William & Mary Outdoor Recreation Program & Pathways Program</i>	2008 - 2010

MENTORSHIP

CURRENT STUDENTS & POSTDOCS:

Supervisor

Simon Fraser University (Earth Science)

Lauren Nickell, MSc, started Sept. 2021

Utah State University (Watershed Sciences)

Sara Wall, MS, started Oct. 2019, Post-wildfire debris flow characterization

Alec Arditti, PhD, started July 2020, Post-wildfire wood & sediment dynamics

Justin Stout, Postdoc, started July 2020, Reservoir sedimentation & bathymetry

Scott David, Postdoc, started August 2020, Post-wildfire tools & river dynamics

Graduate Committee Member

Haley Canham, PhD, *Utah State University, Dept. of Civil & Environmental Engineering*

Kipling Klimas, PhD, *Utah State University, Dept. of Wildland Resources*

PAST ADVISING:

Utah State University

2016 - 2020

Advised and mentored 2 PhD students, 4 MS students and several undergraduates in Dr.

Patrick Belmont's lab while he was on sabbatical and ongoing during my postdoc.

Additionally, informally advised one PhD and 4 MS students in other labs.

SERVICE

DEPARTMENTAL:

SES Seminar Series, Co-Founder & Co-Coordinator

Fall 2021 - present

<i>School of Environmental Science, Simon Fraser University</i>	
SES Faculty Supervisor for Shared Labs	Summer 2021 - present
<i>School of Environmental Science, Simon Fraser University</i>	
SES Tenure & Promotion Committee, Member	Fall 2020 - present
<i>School of Environmental Science, Simon Fraser University</i>	
SES Steering Committee, Member	Fall 2020 - present
<i>School of Environmental Science, Simon Fraser University</i>	
Undergraduate Geologic Society, Graduate Co-Coordinator	2014 - 2016
<i>Jackson School of Geoscience, University of Texas at Austin</i>	

UNIVERSITY:

Undergraduate Teaching Fellow (UTF) Program, Mentor	Fall 2018
<i>Utah State University</i>	

PROFESSIONAL:

Journal Peer-Review:

Geology, Earth's Future, Geophysical Research Letters (GRL), Journal of Geophysical Research: Earth Surface (JGR-ES), Earth Surface Processes & Landforms (ESPL), Frontiers in Ecology and Evolution, Geochemistry, Geophysics, Geosystems (G³)

Conference Convener:

American Geophysical Union (AGU) Annual Fall Meeting	Dec. 2020
<i>Hydrology: Point- to Catchment-Scale Effects of Wildfire on Hydrology, Water Resources, and Ecosystems</i>	
Conveners: Joe Wagenbrenner, Alicia Kinoshita, Michelle Newcomer, Daniel Cadol, Nina Oakley, Brendan Murphy, Kevin Bladon, Luke McGuire, Rachel Meyer	
47 abstracts: 2 oral + 1 poster session	

American Geophysical Union (AGU) Annual Fall Meeting	Dec. 2019
<i>Hydrology: Wildfire Effects on Water Resources, Landscapes, and Ecosystems</i>	
Conveners: Nina Oakley, Brendan Murphy, Alicia Kinoshita, Kevin Bladon, Ryan Niemeyer, Francis Rengers, Luke McGuire	
50 abstracts: 2 oral + 1 poster session	

OUTREACH:

Belmont Lab Water Science Day (2nd Graders)	Spring 2018
<i>Utah State University</i>	
GeoFORCE Graduate Mentor	2015 - 2016
<i>The University of Texas at Austin</i>	
K-12 Education & Outreach Programming	2012 - 2013
<i>Kohala Institute, Hawai'i</i>	
Public Outreach & Mentorship	2010 – 2011
<i>Biosphere2, The University of Arizona</i>	

PRESENTATIONS

Invited Presentations:

- Murphy B. P.**, *Beyond the 1984 perspective: narrow focus on modern wildfire trends underestimates future risks to water security*, Colorado School of Mines (online), May 2021.
- Murphy B. P.**, *Wildfire & Western Watersheds: planning for a future with fire*, Boise State University Dept. of Geosciences Seminar Series, Boise, ID (online), Nov. 2020.
- Murphy B. P.**, *Post-Fire Science Needs for Emergency Response, Hazards & Rehabilitation Panel Discussion*, After the Flames 2020 Conference (online), April 2020.
- Murphy B. P.**, Belmont P., Budy P., Czuba J. & Walsworth T., *Post-wildfire sediment dynamics and fish population response to habitat disturbance*. American Fisheries Society & The Wildlife Society 2019 Joint Annual Conference, Abstract 38797, Oct. 2019.
- Murphy B. P.**, Belmont P. & Czuba J. A., *Post-wildfire sediment cascades: watershed-scale dynamics and the vulnerability of reservoirs*. The Geologic Society of America, 2019 Annual Meeting, Abstract 338078, Sept. 2019.
- Murphy B. P.**, *Watershed Dynamics: from landscape evolution to ecogeomorphology*, Simon Fraser University, Burnaby, BC, Canada, June 2019.
- Murphy B. P.**, *Fire & Water: Climate driven mechanisms of landscape change*, SUNY Fredonia, Fredonia, NY, 2018.
- Murphy B. P.**, *Feedbacks among chemical weathering, rock strength, and erosion in bedrock rivers*, Graduate Student Speaker Series, Undergraduate Geological Society at the University of Texas, Austin, TX, 2016.
- Murphy B. P.**, *Precipitation and the erosion of bedrock rivers*, Austin Gem and Mineral Society Speaker Series, Austin, TX, 2015.
- Murphy B. P.**, *Chemical weathering as a mechanism for climatic control of bedrock river incision*, The College of William & Mary Geology Department Seminar, Williamsburg, VA, 2014.
- Murphy B. P.**, *Chemical weathering, rock mechanics and the geomorphic response across an extreme precipitation gradient*, San Francisco State University, San Francisco, CA, 2014.

Oral Presentations:

- Murphy B. P.**, Yocom L. L. & Belmont P. *Beyond the 1984 perspective: narrow focus on modern wildfire trends underestimates future risks to water security*. American Geophysical Union, Fall Meeting 2018, Abstract H21F-07, Dec. 2018.
- Murphy B. P.**, Johnson J., Gasparini N. & Sklar L. *Modeling the feedbacks among chemical weathering, rock strength, and abrasional wear in bedrock rivers*. American Geophysical Union, Fall Meeting 2016, Abstract EP32A-06, Dec. 2016.
- Murphy B. P.**, Johnson J., Gasparini N., Hancock G. & Small E. *Reach-scale evidence for feedbacks among chemical weathering, rock strength, and erosion in bedrock rivers across Kohala Peninsula, Hawai'i*. American Geophysical Union, Fall Meeting 2015, Abstract EP52A-07, Dec. 2015.
- Murphy B. P.**, Johnson J., Gasparini N. & Sklar L. *Climatic controls on mechanical rock strength and channel incision due to bedrock weathering*. American Geophysical Union, Fall Meeting 2013, Abstract EP52A-04, Dec. 2013.
- Murphy B. P.**, Johnson J. & Gasparini N. *Climate-dependent sediment production: numerical modeling and field observations of variable grain size distributions from heterogeneous*

hillslope weathering of fractured basalt flows, Kohala Peninsula, Hawaii. American Geophysical Union, Fall Meeting 2012, Abstract EP43E-06, Dec. 2012.

Posters, Co-authored, & Other:

- Healy B. D., Budy P., Yackulic C. B. & **Murphy B. P.** Towards a better understanding of the population dynamics of a global invader: a stage-based population viability model for predicting eradication success: The Ecological Society of America, Annual Meeting 2021, Long Beach, CA. Aug. 2021.
- Ahammad M., Czuba J. A., Pfeiffer A. M., **Murphy B. P.** & Belmont P. Simulated sediment-pulse dynamics in a gravel-bedded mountain river: American Geophysical Union, Fall Meeting 2020 (online), Abstract EP016-05, Dec. 2020.
- Wall S., **Murphy B. P.** & Belmont P. Controls on Post-fire Debris Flow Grain Sizes Across the Intermountain West: American Geophysical Union, Fall Meeting 2020 (online), Abstract H087-0026, Dec. 2020.
- Ahammad M., Czuba J. A., Pfeiffer A. M., **Murphy B. P.** & Belmont P. Watershed scale impact of upstream sediment supply on the mainstem of a river network: River Flow 2020 – Ninth International Conference on Fluvial Hydraulics (online), July 2020.
- Ahammad M., Czuba J. A., Pfeiffer A. M., **Murphy B. P.** & Belmont P. Simulating Downstream Impacts from Synthetic Sediment Pulses in the Nisqually River, WA Using a Lagrangian, Bed-material Sediment Transport Model: American Geophysical Union, Fall Meeting 2019, Abstract EP33E-2382, Dec. 2019.
- Murphy B. P.**, *Walsworth T. E., Budy P., Conner M. M. & Belmont P. DyHDER: a spatio-temporally dynamic stream population modeling framework. Advances in Population Ecology of Stream Salmonids Symposium V. Granada, Spain. Oral. May 2019.
- Gillard N., Belmont P. & **Murphy B. P.** Effects of post-wildfire changes in hydrology and sediment transport on fish habitat across western United States: American Geophysical Union, Fall Meeting 2018, Abstract H23L-2116, Dec. 2018.
- Murphy B. P.**, Czuba J. A., Belmont P., Budy P. & Finch C. Fish and fire: Post-wildfire sediment dynamics and implications for the viability of trout populations: American Geophysical Union, Fall Meeting 2017, Abstract EP33B-1936, Dec. 2017.
- Murphy B. P.**, Finch C., Belmont P. & Budy P. Fish & Fire, spatially explicit, stage-structured trout population viability model, CSDMS Annual Meeting: Modeling Coupled Earth and Human Systems - The Dynamic Duo, Boulder, Colorado, May 2017.
- Murphy B. P.**, Johnson J. P. L., Gasparini N. M. & Sklar L. S. Climate-dependent chemical weathering as a control on bedrock river incision. Feedbacks Among Climate, Erosion & Tectonics (FACET) Workshop, Taipei, Taiwan, May 2015.
- Cunningham M. T., Sparacino M. S., **Murphy B. P.** & Hancock G. S. Variable erodibility in bedrock-floored channels produced by differential weathering. The Geologic Society of America, 2012 Annual Meeting, Abstract 210474, Nov. 2012.
- Murphy B. P.** & DeLong S. High-resolution topographic change detection of an active earthflow using airborne and terrestrial lidar, Mill Gulch, California. American Geophysical Union, Fall Meeting 2011, Abstract EP41A-0584, Dec. 2011.
- DeLong S., Henderson W., **Murphy B. P.** & Yokelson I. Quantifying Landscape Evolution from Terrestrial lidar and Environmental Process Monitoring. American Geophysical Union, Fall Meeting 2011, Abstract EP33E-02, Dec. 2011.
- DeLong S. B., **Murphy B. P.**, Henderson W. M., Yokelson I. N. & Ferre M. D. Storms, floods and fire: Changing dryland landscapes during the North American monsoon. The Geological Society of America, 2011 Annual Meeting, Abstract 197351, Oct. 2011.

Murphy B. P., Hancock G. S. & Small E. E. Spatially variable erodibility in bedrock channels produced by weathering. American Geophysical Union, Fall Meeting 2009, Abstract EP21C-0615, Dec. 2009.

Hancock G. S., Small E. E. & **Murphy B. P.** The influence of weathering on erosion and cross-channel geometry in bedrock channels. American Geophysical Union, Fall Meeting 2009, Abstract EP21C-0614, Dec. 2009.

FIELD EXPERIENCE

Postdoctoral Research	2016 - 2020
Alaska, Utah, California	
Graduate Research	2011 - 2016
Hawai'i, Mexico, Arizona, Idaho, Utah, Texas, New Zealand	
Field Technician	2010 – 2011
Arizona, California, Mexico	
Undergraduate Research	2009
Colorado, Utah, Virginia	
Regional Field Geology Courses	
Colorado Plateau (Structural Geology)	2008
California (Geomorphology)	2009
Fennoscandia (Economic Geology)	2014

TECHNICAL SKILLS

SOFTWARE & COMPUTING:

MATLAB, Python, R, ArcGIS, ArcPad, Adobe Photoshop & Illustrator, Golden Surfer, TerraScan, Leica Cyclone, and JMP for geospatial and statistical data analysis, construction of mathematical and numerical models, geospatial analysis, comparison of terrestrial and airborne lidar datasets, and topographic change detection analysis.

FIELDWORK:

Repeat topographic surveying – includes Leica C10 ground-based lidar scanner, Leica RTK-GPS, Trimble GeoXT with paired laser rangefinder, and Trimble total station. RFID particle tracking using "smart rocks" developed by Dr. Joel Johnson. The installation and operation of environmental sensor networks collecting climate, soil and stream flow data (Onset, Campbell, etc.). Measurements of *in situ* compressive rock strength using Schmidt hammer. Bedrock sampling using Pomeroy portable coring drill.

LABORATORY:

Uniaxial, unconfined compressive strength and indirect tensile strength properties using ELE Versa-Loader. ED-XRF elemental analysis using Bruker handheld Tracer series spectrometer.

PROFESSIONAL MEMBERSHIP

American Geophysical Union, Geological Society of America, American Fisheries Society