NSF/UVM Community Cosmogenic Facility

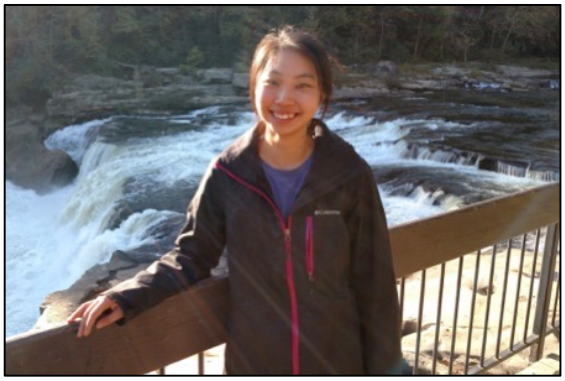
Visitors and Visitor Projects

SAMPLE PROCESSING VISIT

Age and retreat of Ohiopyle Falls, Youghiogheny River, Pennsylvania

Lehigh University

I am using cosmogenic dating to determine how fast Ohiopyle Falls are marching upstream and, by extrapolating that velocity downstream, estimate where the falls were born. This will test the idea that integration of the Ohio River downstream of Pittsburgh following an early glaciation ~2 million years ago could have triggered lowering base-level, migration of waterfalls, and carving of the western Pennsylvania landscape.



Visitors: Christy Li, Josh Gonzales, and Katrina Gelwick
Visit dates: November 2017 and January 2018

Christy Li is a senior undergraduate working on her senior thesis and the lead P.I. on this project. Josh and Katrina are M.S. students learning the cosmogenic technique as they will be applying it on their respective thesis projects in 2018-19.

OBSERVATION VISIT

Late Quaternary Glacial History of McMurdo Sound, Antarctica

Boston University

Marine-based portions of the Antarctic ice sheets are susceptible to under-melting from the surrounding ocean, leading to sea level rise within the next few centuries. Cosmogenic exposure and radiocarbon chronologies of glacial sediments deposited during past glacial periods in McMurdo Sound provide useful insights into deglaciation dynamics and regional Antarctic contributions to sea level rise relevant to on-going global climate change.

Visitor: Andrew J. Christ

Visit dates: January 15-26 and March 19-23 2018

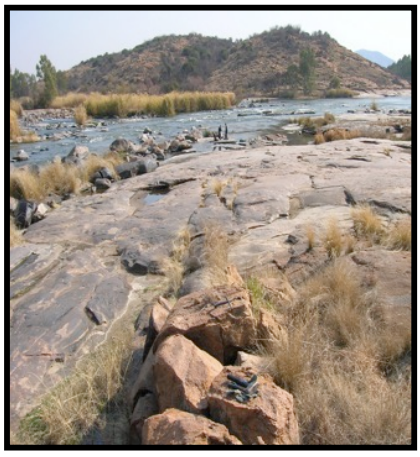
Drew is a PhD candidate from the Dept. of Earth & Environment at Boston University. During his visit to the UVM Cosmo Nuclide lab he will learn essential Be-10 and Al-26 sample preparation techniques and learn more about geochemical methods.

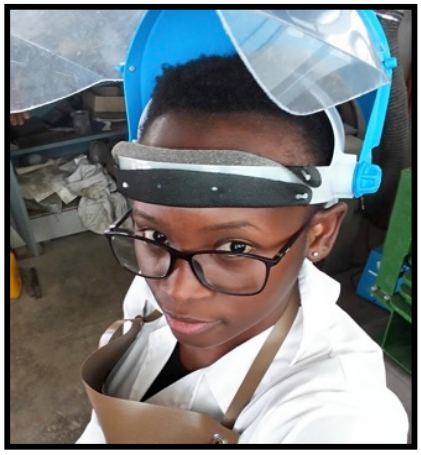
SAMPLE PROCESSING VISIT

Determination of erosion rates along the Vaal River in the Vredefort Dome, South Africa

University of Johannesburg, iThemba LABS

The Vredefort Dome is the largest and oldest known meteorite impact crater in the world and a world heritage site in Parys, South Africa. The Vaal river flows through the remnants of the eroded dome (from east to west) eating away at the rocks that the river flows along. The relative erosion rates of these rocks will help determine how quickly the river erodes, contributing towards landscape evolution studies in South Africa.





Visitor: Rivoningo Khosa

Visit dates: January 15-26 2018

Rivoningo is an MSc candidate at the University of Johannesburg(UJ) and NRF iThemba LABS. Her visit to UVM will see her learn how to extract Be-10 and Al-26 from quartz samples and learn more about cosmogenic nuclides and the cosmolab.

OBSERVATION VISIT

Antarctic ice sheet chronologies with in situ cosmogenic carbon-14

Tulane University

Filling in the final holes of our knowledge regarding the deglaciation of Antarctica remains a vexing problem. Complications in dating have made it difficult to understand rates of future ice sheet change and the distribution of past contributions to sea level change. I am using in situ cosmogenic carbon-14 to elucidate the patters of ice sheet retreat in the outer Ross Sea area of Antarctica.

Visitor: Brent Goehring
Visit dates: January 22-23 2018

I'll be visiting the lab to talk all things cosmogenic nuclides and to present my research in Antarctica using in situ cosmogenic carbon-14.

UVM STUDENT

Quantifying Background Erosion Rates on a Landscape Scale in Cuba

The University of Vermont

My research is part of a larger NSF funded project aimed at understanding the relationship between land use and erosion in Cuba. I am developing a method for measuring erosion in carbonate lithologies using ^{26}Al, and the background erosion rates I measure will be paired with short-lived fallout radionuclide measurements to quantify erosion at multiple temporal scales in a country that has experienced rapid changes in land use.

Student: Mae Kate Campbell, M.S. in Geology
Graduating: Spring 2019

I am a masters student working with Paul and Lee here in the Cosmo Lab! I am really excited to be a part of all the fun here and love meeting our visitors. Outside of the lab I am a plant mom and I love cooking (pizza nights!), hiking, and exploring Vermont.

UVM STUDENT

Using ^{10}Be to Understand the Erosion Effects of Hurricane Maria on the Island of Dominica

The University of Vermont

Hurricane Maria caused massive erosion throughout Dominica's landscape. This project, serving as an honors thesis, will use meteoric ^{10}Be and in situ ^{10}Be of samples pre- and post-hurricane to determine erosion rates. The temporal replication analyses and parameters affected by the hurricane (i.e. precipitation, landslides) will be used to understand the effects of the Hurricane.

Student: Melinda Quock, B.S. in Geology
Graduating: Spring 2019

Melinda is an undergraduate student at UVM working on her honors thesis. In the cosmolab, she extracts meteoric and in situ ^{10}Be. She is also working on a side project with Paul and Lee on refining methods of extracting ^{10}Be from olivine.

SAMPLE PROCESSING VISIT

Quantifying bedrock fracturing controls on the relationship between topography and erosion rate

Penn State University

The relationship between tectonics and topography is often obscured as rocks arrive at the surface of the earth with a range of strengths. In the San Gabriel and San Jacinto mountains of California, we contrast landscapes of similar climate and bedrock composition, but different bedrock fracturing. We measure the inherited damage of bedrock hillslopes and quantify how differences in rock strength affect topography and sediment transport.

Visitor: Alexander ("Al") Neely
Visit dates: January 22 – March 2 2018

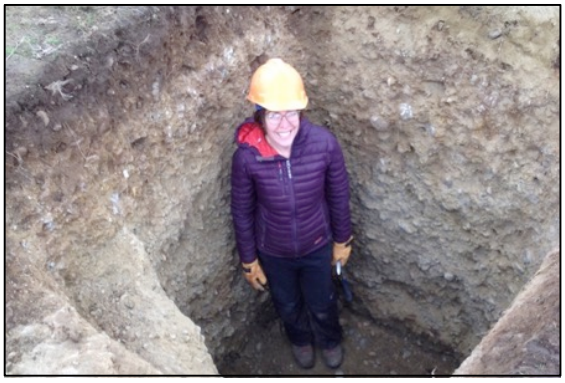
Al Neely is a 3rd year Ph.D. student at Penn State University. He enjoys collecting data and substantial hikes into seldom-visited parts of steep mountain ranges. Outside of geology, he also enjoys drawing, traveling, going really fast down hills, and playing games.

SAMPLE PROCESSING VISIT

Miocene-Pleistocene landscape evolution of the Cascadia backarc: clues from the Ringold Fm.

U.S. Geological Survey

My field area is the Pacific Northwest and I am focusing on the history of faulting and river reorganization. The Ringold Formation is a terrestrial stratigraphic unit in central Washington that is a key marker for understanding when and how fast faults have moved. It also contains amazing fossil information that will help us define how rivers have responded (or driven) landscape evolution from Idaho to the Pacific Ocean.



Visitor: Lydia Staisch

Visit dates: January 24 – February 23 2018

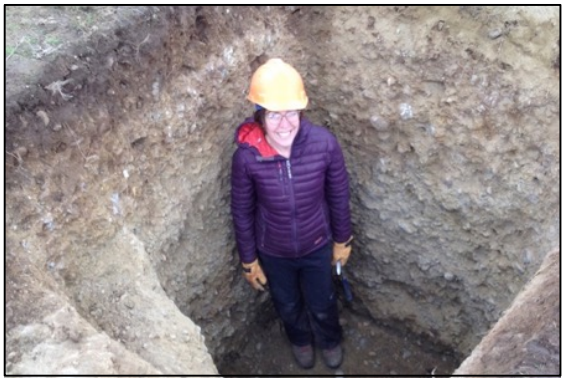
I'm a research geologist with the US Geological Survey. I work primarily in the Pacific Northwest on neotectonics, tectonic geomorphology, structural geology, and earthquake hazards.

SAMPLE PROCESSING VISIT

Cenozoic landscape evolution of the southern Rocky Mountains – Geologic Mapping

U.S. Geological Survey

This work is part of a larger USGS National Cooperative Geologic Mapping Program effort to complete new, detailed bedrock and surficial geologic maps of the San Luis Basin (SLB) in southern Colorado and northern New Mexico. Moraine exposure ages are being used to constrain the timing of deglaciation in the mountains surrounding the SLB, fault slip rates, and the interplay of alluvial, fluvial, and glacial deposition at range fronts.



Visitor: Lydia Staisch

Visit dates: January 24 – February 23 2018

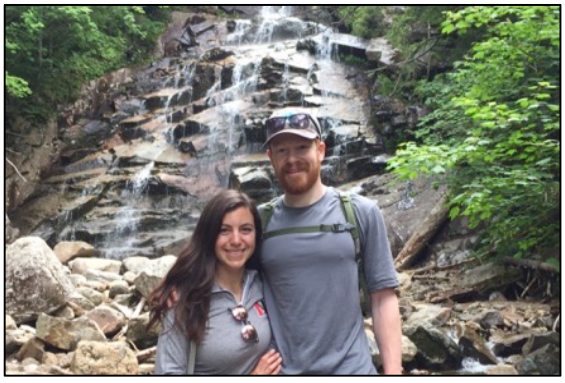
Andy is a research geologist at the USGS working on Quaternary tectonic and geomorphology problems in southern CA and CO, USA. Lydia is a research geologist and colleague at USGS who is processing samples from CO along with some of her own work.

SAMPLE PROCESSING VISIT

Determining the Timing and Rate of Laurentide Ice Thinning in New England using In Situ 10Be

Boston College

The retreat of the Laurentide Ice Sheet out of New England approximately 21 – 13 thousand years ago had profound impacts on sea level, ocean circulation, and even global climate. Accurately depicting this retreat is difficult due to uncertainties about the rate and timing of ice thinning in the region. This project uses in-situ 10Be exposure ages from various elevations around New England to constrain this thinning history.



Visitor: Christopher Halsted
Visit dates: January 29 – February 2 2018

Chris Halsted is a graduate student at Boston College, working towards a Master's of Geology. He works on ice sheet reconstructions and cosmogenic nuclide geochemistry. He intends to pursue these interests while working towards a PhD at UVM.

GROUP TOUR

Exploring geochronologic techniques in action with a graduate-level class

Université du Québec à Montréal

The visit to the Cosmogenic Laboratory was carried out in the context of our Dating Methods class, a MSc level course on dating techniques available for geologists, geomorphologists and archaeologists. This lecture runs every winter term and has about 5 to 10 students. The visit was our first experience going to a lab. The goal was to see how one starts with a rock sample and ultimately gets a cosmo age from which geological interpretation can be drawn. The visit was a true success, students and professors were extremely satisfied with the visit. This lab is world class. Thanks Lee and Paul.

Group Tour

Visit date: February 21, 2018

Names of Participants:

Dr. Michel Lamothe
Dr. Martin Roy
Marjorie Bogur
Philippe Roberge
Zeinebou Laraibi
Marc-Antoine Lévesque
Laurence Forget Brisson (PhD student)
Florent Bigot
Charles Kavanagh-Lepage
Gaelle Labat

GROUP TOUR

Kicking off the Community Cosmogenic Facility with an open house

Northeastern Geological Society of America Meeting, Burlington VT

To celebrate the opening of the NSF/UVM Community Cosmogenic Facility, we hosted an open house as part of the Northeastern Geological Society of America Meeting. Visitors ranged from undergraduate students to graduate students to faculty, and came to see the facility, learn about cosmogenic nuclide science, see laboratory procedures in action, and brainstorm for future collaborative projects and visits.

Group Tour
Visit date: March 19, 2018

Names of Participants:

Dwight Bradley (USGS)
Duane Braun (Bloomsburg U.)
William Caffee (U. Buffalo)
Tim Cook (Worcester U.)
Ben DeJong (Norwich U.)
Autumn Hanley (Lock Haven U.)
Linley Hanson (Salem State U.)
Greg Hoke (U. Syracuse)
John Hughes (U. Vermont)
Eli Orland (Middlebury Coll.)
Will Ouimet (U. Connecticut)
Noel Potter (U Maine)
Mariah Radue (U. Maine)
Mike Retelle (Bates Coll.)
Sam Rickerich (Bates Coll.)
Noah Snyder (Boston Coll.)

SAMPLE PROCESSING VISIT

Bedrock incision of the Fortymile River, eastern Alaska and Yukon, Canada

U.S. Geological Survey, Alaska Science Center

The Fortymile River flows from eastern Alaska to the Yukon River in Canada. A deeply incised strath terrace flanks the lower Fortymile and records landscape-altering bedrock incision that sequestered gold-bearing river gravels hundreds of m above the modern channel. Cosmogenic techniques allow us to test base-level lowering mechanisms, determine terrace abandonment timing, and quantify subsequent incision.

Visitor: Adrian Bender
Visit dates: April 9-27 2018

I'll be visiting UVM from Anchorage, Alaska, where I work for the U.S. Geological Survey on projects that utilize cosmogenic nuclide techniques to quantify geomorphic processes related to active tectonics or, in this case, coevolution of landscapes and placer gold.

OBSERVATION VISIT

Coupled interactions between drainage reversal and escarpment evolution

Department of Geosciences, Colorado State University

Drainage reversal is a mechanism by which drainage divides and escarpments move across landscapes, and are associated with peculiar topographic features such as hooked-shaped channels and windgaps. Despite implications for drainage reorganization and landscape evolution, the mechanisms driving flow reversal are unclear. This study will address this knowledge gap using field studies, cosmogenic nuclides and modeling.

Visitor: Sean F. Gallen
Visit dates: April 9-13 2018

I'll be visiting the UVM from Colorado State University to learn about their cosmo lab procedures in preparation for projects that apply cosmogenics to study landscape evolution and to gain information for setting up a quartz purification facility at CSU.

OBSERVATION VISIT

Testing the relationship between erosion rates and rock properties on ridgeline outcrops in Virginia

College of William and Mary

We are testing the relationship between erosion rates and rock properties on outcrops along ridgelines in Shenandoah National Park.

Visitor: Gregory Hancock
Visit dates: April 9-13 2018

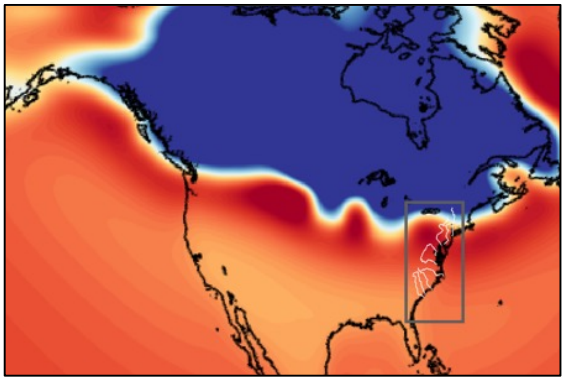
I am a professor in Geology at the College of William and Mary. Although I've had a small Cosmogenic Radionuclide processing lab for almost 20 years, I am interested in updating the methods I use.

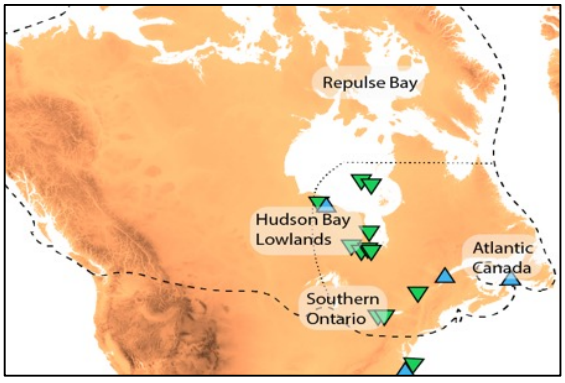
OBSERVATION VISIT

Using glacial isostatic adjustment to understand ice volumes during the last glaciation phase

Harvard University

Rapid glaciation of the Laurentide Ice Sheet late in the glaciation phase can induce high rates of solid Earth crustal deformation. I explore the effects of glacial-isostatic adjustment induced deformation on river dynamics on U.S. east coast rivers.





Visitor: Tamara Pico
Visit dates: April 9-11 2018

I will be visiting the lab to observe and learn about cosmogenic nuclide dating methods and learn laboratory processes.

OBSERVATION VISIT

Assessing the origin of boulder deposits within a late Eocene erosion surface of Colorado

Department of Geosciences, Williams College

Inspired by decades of work by Professor Bud Wobus (Williams), Erikka Olson will seek to unravel the origin of obscure boulders in her senior thesis. The boulders reside within a flat surface of central Colorado that has been unperturbed by erosion for millions of years. With petrography, cosmogenic dating of the boulders could unlock the mystery of how such flatness was preserved in the midst of great tectonic and climatic upheaval.

Visitor: José Constantine
Visit dates: April 12 2018

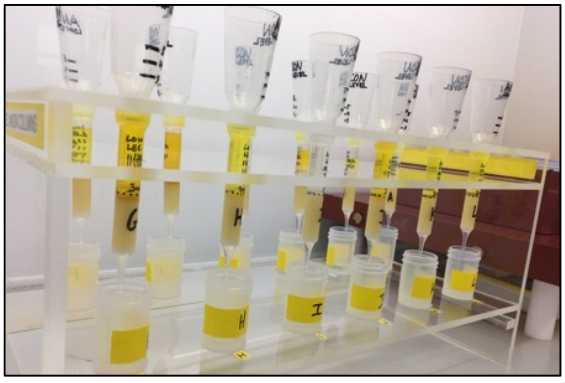
As Erikka's co-advisor (with Bud Wobus), I will be visiting the lab to learn more about the potential to age the boulders as a part of Erikka's thesis.

OBSERVATION VISIT

Why is *that* study news? Getting your research covered in the popular science press

Science Magazine

Tim is the News Editor of Science Magazine. He came to University of Vermont to give a public seminar on science research in the popular media.



Visitor: Tim Appenzeller
Visit dates: April 12 2018

Tim visited the Community Cosmogenic Facility to learn about the laboratory, meet other visitors, hear about collaborative projects, and observe cation column chromatography methods.

SAMPLE PROCESSING VISIT

Meteoric accumulation of 10Be in the Shackleton Glacier Region, Antarctica

The Ohio State University, Byrd Polar and Climate Research Center

As the East Antarctic Ice Sheet (EAIS) began to retreat ~20 kya, surfaces that were once overlain by glaciers became exposed. This research will 1) measure concentrations of 10Be in shallow soil pits to help determine the relative surface ages of soil where biological communities are found, 2) estimate the highest elevation of the EAIS during the LGM, and 3) determine meteoric accumulation rates of 10Be over time

Visitor: Melisa Diaz

Visit dates: April 19 – May 2 2018

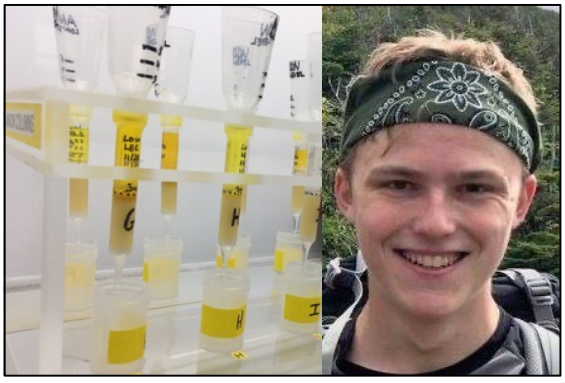
Melisa Diaz is a PhD student in the School of Earth Sciences at The Ohio State University. Her research focuses on the geochemistry of ice-free areas in Antarctica, particularly regarding the use of isotopes to understand surfaces processes and change.

UVM STUDENT

Laboratory assistance, website development, and database work

University of Vermont

I'll be helping to process samples while learning laboratory methods. I'll also be working on improving the lab website and database.



Student: Landon Williamson, B.S. in Geology
Graduating: Spring 2020

I am currently a sophomore from Dover, Massachusetts with a passion for skiing, hiking, and science! I will be working in the laboratory this summer, and plan to continue working there during the rest of my time at UVM.

OBSERVATION VISIT

One rock at a time? Temporal clustering of rock slope failure and implications for geohazard risk

Queen's University Ontario, BGC Engineering Inc.

One of the problems we regularly encounter is estimating the probabilities of rare geohazard events. We think these events are probably clustered temporally, maybe all occurring in the paraglacial time or later under the influence of widespread triggers like large earthquakes. If we could put ages on a number of past events of various magnitudes (and triggers) it would help us characterize the risk much more precisely.

Visitor: Dave Gauthier
Visit date: May 17, 2018

Cosmogenic nuclide dating has many under-utilized applications in both my research and professional practice, and this is visit is to learn more future possibilities. Ideally a graduate student project, supported by BGC and Queen's, would help us get started!

SAMPLE PROCESSING VISIT

Investigation of post-glacial passive margin disequilibrium within the Poultney River watershed

Castleton University

This project is an investigation into the disequilibrium that exists within the Poultney River watershed. A knickpoint, gorge and multiple terraces were formed by fluvial bedrock incision and could result from several possibilities. These hypothesis include: (1) passive margin tectonic uplift increasing slope and stream power, (2) glacio-isostatic rebound leading to uplift in the area, (3) or post glacial variables such as the base level drop of Lake Champlain. The study will help us gain a better understanding of Vermont's complicated environmental history

Visitor: Alden Woodard

Visit dates: June 13 - July 13 2018

I have recently graduated from Castleton University with a BS in Environmental Science and a Minor in Chemistry. I am from Vermont, and grew up in the small town of Waterville. I enjoy the outdoors and hope to find myself employed in a career that deepens my understanding of our scientific world.

SAMPLE PROCESSING VISIT

Using cosmogenic radionuclides to understand climactic controls on dryland hillslope processes

Whitman College

This project is interested in answering two main questions about dryland landscapes and dryland landscape evolution. These are as follows; how have Pleistocene changes in climate altered rates of soil production? How does climate change influence soil production processes in dryland regions? We look to answer these questions by analyzing samples from two field sites in the Sandia Mountains, NM and the Mojave Desert, CA.

Visitor: Christoph Suhr

Visit dates: June 13 – July 27 2018

I am a rising senior at Whitman College in Walla Walla, WA, and am majoring in Geology. More specifically, I am particularly interested in surficial geologic processes and how anthropogenic activity and changes to the climate affect these processes.

SAMPLE PROCESSING VISIT

Soil residence times on an ancient surface, Nicoya, Costa Rica

Central Michigan University

For this project, we are extracting meteoric ^{10}Be from a soil profile collected from the Nicoya Peninsula, Costa Rica. The samples are collected from a ridgetop location to measure the soil residence time on a high elevation, low relief surface, thought to be relict topography from a pulse of uplift during the Miocene. Profile samples were collected at 10cm depth intervals to refusal (saprolite interface) at ~70cm.

Visitor: Nicole West
Visit dates: June 20-28, 2018

Nicole West is an Assistant Professor at Central Michigan University. She visited the cosmogenic lab at UVM several times during her PhD and has come back twice as a faculty member.

OBSERVATION VISIT

Using cosmogenic radionuclides to understand climactic controls on dryland hillslope processes

Whitman College

I am a geomorphologist interested in how humans and climate shape landscapes. My current research projects include investigations of 1) how climate, aspect, vegetation, and weathering interactions influence hillslope form and processes in the desert southwest, 2) geomorphic controls on human settlement patterns in the Aleutian Islands, and 3) natural and historical variability in rivers, beavers, and climate in Yellowstone

Visitor: Lyman Persico
Visit dates: July 16-20, 2018

We want to visit the CCF to learn more about the lab methods involved in CRN analyses. We are processing samples from our research in the southwest and are interested in comparing slope erosion histories using both CRN and OSL.

UVM STUDENT

Determining the timing and rate of Southeastern Laurentide Ice Sheet thinning using ^{10}Be dipsticks

University of Vermont

The thinning history of the Laurentide Ice Sheet during the last deglaciation is poorly constrained due to a lack of empirical data. To address this issue I am calculating ^{10}Be exposure ages along vertical transects of mountains in the northeastern United States and southern Quebec and performing statistical analyses to determine the most likely timing and rate of ice thinning in each location (the 'dipstick approach').

Student: Christopher Halsted, PhD in Natural Resources
Graduating: Spring 2022

I am originally from the greater Boston area of Massachusetts but always loved exploring the mountains of northern New England. When not working I am either reading, cooking, or hightailing it to the mountains to ski, hike, and climb.

SAMPLE PROCESSING VISIT

Inferring glacial history and ice thinning rates from nunataks in the Juneau Icefield, Alaska

Juneau Icefield Research Program

We plan to improve tectonic evolution, deglaciation, and erosion models of Southeast Alaska. We will use cosmogenic nuclide dating methods to determine the Pleistocene and Holocene glacial history of the Juneau Icefield. We also hope to use dating methods to determine if there is a lateral difference in Holocene deglaciation and erosion history across the icefield from maritime to continental regions.

Visitor: Annie Chien
Visit dates: August 20-24, 2018

Annie is a recent graduate of Occidental College ('18), with a degree in geology. She is from Los Angeles, CA, and completed the Juneau Icefield Research Program in the summer of 2018. She came directly off the ice to travel to UVM for a week of sample preparation work.

UVM AFFILIATE

Late Quaternary Glacial History of McMurdo Sound, Antarctica

University of Vermont & Boston University

Marine-based portions of the Antarctic ice sheets are susceptible to under-melting from the surrounding ocean, leading to sea level rise in the next few centuries. Cosmogenic exposure and radiocarbon chronologies of glacial sediments deposited during past glacial periods in McMurdo Sound provide useful insights into ice sheet dynamics and regional Antarctic contributions to sea level rise relevant to on-going global climate change.

Student: Andrew Christ, PhD in Earth and Environment
Graduating: Spring 2019

Drew is a Visiting Graduate Fellow at the University of Vermont and a PhD candidate from the Dept. of Earth & Environment at Boston University. He is currently writing his dissertation at UVM and continuing to learn lab methods in the cosmo lab.

UVM STUDENT

Assessing Isostatic Response to Deglaciation in Southern Greenland

University of Vermont

We are quantifying ^{10}Be in samples from southwest Greenland to estimate post-glacial isostatic uplift rates over thousands of years. Our results will allow us to generate an uplift curve for south Greenland, quantify how the landscape responded to ice retreat, assess the responsiveness of mantle flow, and study the relationships between surface Earth and deep Earth.

Student: Landon Williamson, B.S. in Geology
Graduating: Spring 2020

Landon is an undergraduate student at the University of Vermont. He has been working in the Cosmogenic Laboratory for the past year as an assistant and to do website design; this is his first independent project.

SAMPLE PROCESSING VISIT

Knickpoints as Geomorphic Markers of Crustal Deformation in an Intraplate Setting

Lehigh University

Reading and Lancaster Counties in Pennsylvania experience seismicity that has historically been absent in neighboring areas. In order to compare the seismic and aseismic regions, I will be looking at knickpoint elevations as a measure of crustal deformation, and at erosion rates (derived from alluvial samples for an upstream basin-average) below, within, and above the major knickpoints in two tributaries to the Susquehanna.

Visitor: Joshua Gonzales

Visit dates: September 11- October 11, 2018

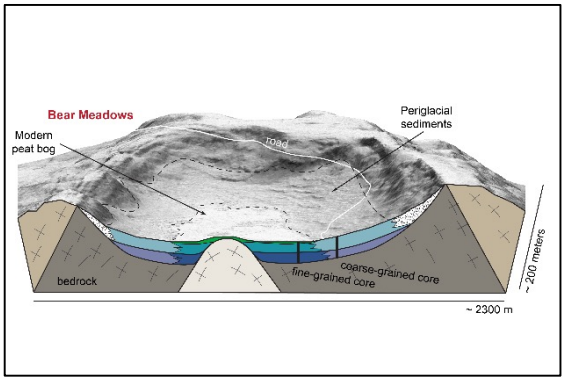
Joshua Gonzales is an MS student visiting from Lehigh University. He is working with Dr. Frank Pazzaglia and Bookyo Sur, an undergraduate student at Lehigh. Joshua graduated with a BS in Geologic Sciences from Arizona State University in 2017.

SAMPLE PROCESSING VISIT

Periglaciated basins as novel records of climate-modulated erosion

Pennsylvania State University

This project will study the erosional, depositional and ecological history of a structurally-controlled basin in central PA called Bear Meadows, which is a modern peat bog but bears topographic and sedimentological evidence of pre-Holocene cold-climate processes. We seek to analyze sediment for both erosion/burial rates and paleobiological evidence of past ecosystem and hydrologic conditions.



Visitor: Joanmarie Del Vecchio

Visit dates: September 10-20 and November 26-30, 2018

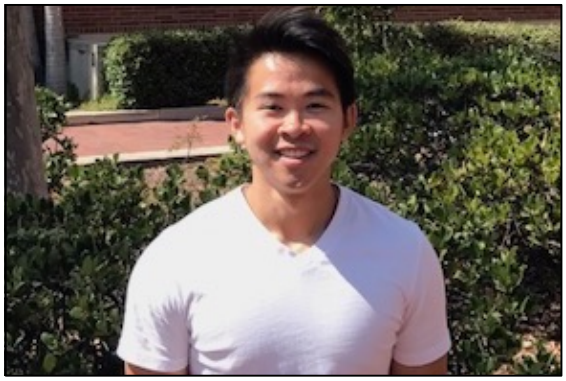
Joanmarie is a Ph.D. student with Roman DiBiase. It is her fourth year at Penn State. Her projects include periglacial geomorphology, geophysics in the critical zone, and waterfall morphology. She is seeking bike routes, hikes and rock climbing locales in Burlington.

SAMPLE PROCESSING VISIT

Climatic controls of landslides in the eastern end of Himalaya

University of California Los Angeles

In this student project, we examine the spatial distribution and characteristics of precipitation-induced landslides and compare them with catchment erosion rates in the eastern end of Himalaya. We expect erosion rates to potentially be greater than 1 mm/yr. Close inspection of how climate and tectonics influence landslide processes will offer insight into the mechanics of long-term landscape evolution in the region.



Visitor: Kevin Shao

Visit dates: September 17-21 2018

I am a 1st year graduate student from the University of California Los Angeles studying under Professor Seulgi Moon. I was born and raised in New Jersey and am interested in studying geomorphology as well as how it applies to natural hazard mitigation.

GROUP TOUR

BIO1020: Environmental Biology
Learning about Past Terrestrial Biomes

Vermont Technical College

We are an environmental science class at VTC looking at various ecosystems across the state of Vermont. Our scientific backgrounds are varied, with majors ranging from business to dairy farm management. Most of us signed up for the class to fulfil a degree requirement. Our visit to the CCF is an opportunity to learn how researchers determine the glacial history of VT, helping us better understand the modern day ecosystems .

Group Tour

Visit date: September 20 2018

Names of Participants:

Sophia Bourgeouis
Jordan Camp
Jessica Chapman
Deibyoday Dey
Gabrielle Fenton
Louis Grove
Brendan Lahue
Cayden Theberge
Ross Lieblappen

OBSERVATION VISIT

Cross-pollination between cosmogenic nuclide sample preparation facilities

German Research Center for Geosciences, University of Potsdam, Germany

Friedhelm von Blanckenburg visited the Community Cosmogenic Facility on a trip to the northeastern US. He observed lab methods, met with faculty, students, and visitors, and exchanged ideas about running a lab with a visitor program.

GFZ

Helmholtz Centre
POTSDAM

Visitor: Friedhelm von Blanckenburg
Visit date: September 26, 2018

Friedhelm von Blanckenburg is a geomorphologist and geochemist who studies Earth surface processes primarily through isotopic analyses. He does cosmogenic nuclide work, and also uses isotopes of metals such as Li, Mg, Si, and Sr.

SAMPLE PROCESSING VISIT

Reconstruction of relative sea level history in Finnmark, northernmost coastal Norway

Bates College and University Centre in Svalbard

As part of an interdisciplinary study of Holocene marine climate in Finnmark, my main contribution is to locate, survey and determine the age of postglacial beaches that are currently above sea level. These raised beaches are dated using radiocarbon on mollusk shells and cosmogenic ^{10}Be on beach cobbles and boulders. The timing and nature of the postglacial sea level history provides critical information on the timing of ice sheet retreat.

Visitor: Mike Retelle

Visit dates: September 24-28 and November 12-16, 2018

Mike Retelle is a professor of Geology at Bates College, Maine and adjunct professor of Arctic Geology at the University Centre in Svalbard.

OBSERVATION VISIT

Institutional Leadership, Sustainability And Innovation

Jackson State University

My introduction to research was via work in Remote Sensing as an undergraduate. Subsequent training and research centered around Physiology, Biophysics, and Neuroscience, with a major focus on chemical and electrical signaling mechanisms in the Basal Ganglia. I served as Associate Director of the NASA GESTAR Program from 2011 to 2016. My current interests include institutional leadership, sustainability and innovation.

Visitor: Joseph Whittaker

Visit dates: October 7-10, 2018

Dr. Joseph A. Whittaker is the Associate Provost/Associate Vice President for Academic Affairs at Jackson State University in Jackson, MS. In this capacity, he also has oversight for research and sponsored programs, federal relations, technology transfer and commercialization, and economic development.

OBSERVATION VISIT

Formative evaluation and place-based geoscience teaching and learning

Arizona State University

I'm an ethnogeologist and geoscience-education researcher who is interested in better understanding how our connections to places and our diverse cultural identities influence the way we explore, study, learn about, and teach about the Earth system. I'm working with the Cosmolab and NSF as an external evaluator, applying ethnographic educational research and analysis to help the Lab's principal investigator and team meet project goals.

Visitor: Steven Semken
Visit dates: October 7-10, 2018

I'm a professor of Geology and Education at ASU and I'm here at UVM to learn much as I can about how the Cosmolab serves its participants, the University, and the broader geoscience community. I'll also present some of my work on place-based teaching.

OBSERVATION VISIT

Timescales and rates of mountain-building, erosion, and sedimentation

University of Connecticut

Our research group studies ancient phases of mountain building and erosion to understand how tectonics, surface processes, and climate interact to influence the Earth's dynamic mountain belts. Our research draw upon numerous methods in our research, including low-temperature thermochronology, provenance analysis, field mapping, geochronology, and structural reconstructions.

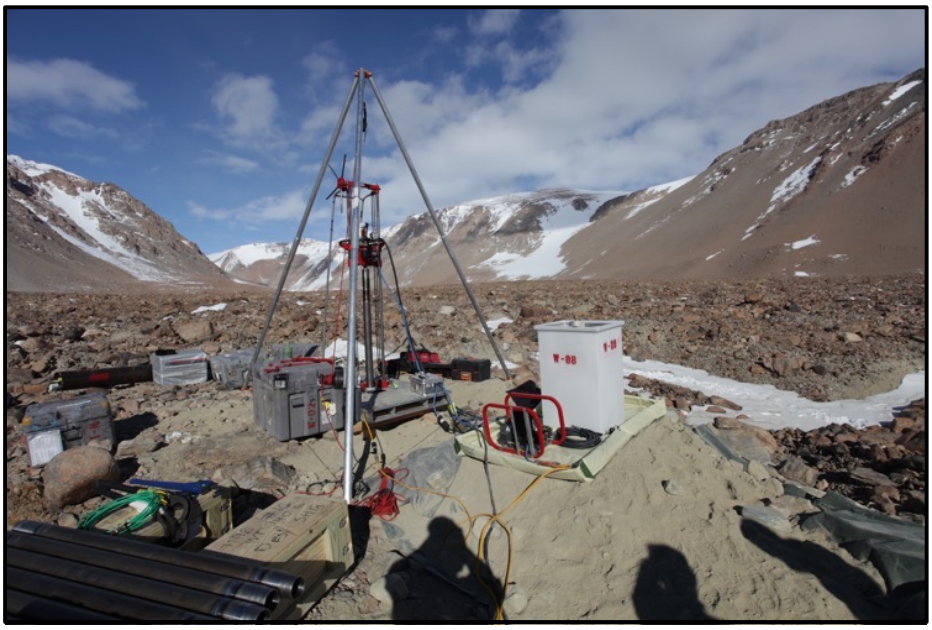
Visitor: Julie Fosdick
Visit dates: October 8-9, 2018

I am looking forward to visiting the UVM CCF to learn more about the state-of-the-art facility and its capabilities, interact with the lab's research team, and discuss strategies for running successful community laboratory facilities and promoting inclusivity and diversity.

SAMPLE PROCESSING VISIT

The Oldest Ice on Earth?

University of North Dakota, Vanderbilt University, and Berkeley Geochronology Center



We are studying a buried ice mass in Ong Valley in the Transantarctic Mountains, Antarctica. The ice has been suggested to be greater than 1.1 million years old, and some of Earths oldest ice. We are measuring cosmogenic nuclide concentration in both the ice and the above laying till to determine the age of the ice and rate at which it is sublimating.

Visitor: Marie Bergelin
Visit dates: October 8-26, 2018

Marie Bergelin is a Ph.D. student at University of North Dakota. She is originally from Copenhagen, Denmark and has been in the United States for the past 10 years. She is an active person and enjoys outdoor activities such as golf, running, biking, and swimming.

GROUP TOUR

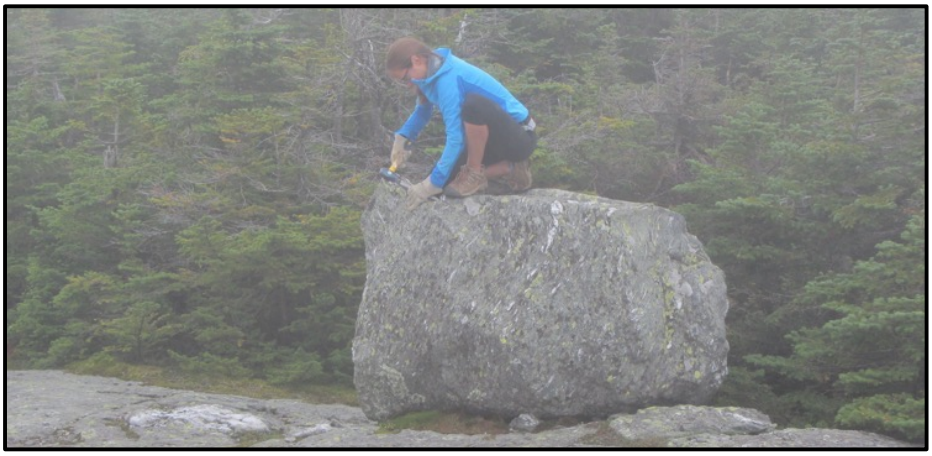
New Views on the Deglaciation of Mt. Mansfield, Vermont's Highest Peak

Field trip of the New England Intercollegiate Geology Conference

This field trip investigated the deglaciation history and geomorphology of Mt. Mansfield and discussed new cosmogenic nuclide data from a collaborative project between University of Vermont, Boston College, and Bentley University. We examined deglaciation timing, ice thinning history, and erosional processes through the lens of both field evidence and isotopic data. As part of the field trip, a subset of the group came to the Community Cosmogenic Facility to see how samples are processed.

Group Tour

Visit date: October 12, 2018



OBSERVATION VISIT

Refining Methods for the Stanford Cosmogenic Radionuclide Facility

Stanford University

I am a thermochronologist interested in tectonic and glacial geomorphology. My last project used sediment cores drilled in the Gulf of Alaska to reconstruct exhumation rates and sediment routing in Southeastern Alaska from 10 Ma – 60 Ka. We were specifically interested in the efficacy of thermochronometry to record exhumation patterns in synorogenic sediment.

Visitor: Katie Dunn

Visit dates: October 15-19, 2018

I am the Earth Materials Lab Manager at Stanford's School of Earth, Energy & Environmental Sciences. PhD student, Aaron Steelquist, and I look forward to observing the procedures at UVM to help us update the methods we use at Stanford.

OBSERVATION VISIT

Constraining San Juan River incision rates using 10Be and 36Cl

Stanford University

One chapter of my PhD dissertation is focused on fluvial deposits which currently sit 32 meters above the modern San Juan River near Mexican Hat, Utah. Our goal is to constrain the <1 million year incision rates for the San Juan River to further our understanding of how the Colorado River basin may be affected by the incision of the Grand Canyon.

Visitor: Aaron Steelquist
Visit dates: October 15-19, 2018

Aaron and Stanford Earth Materials Lab Manager Katie Dunn will be coming to learn processing protocols as they exist at Vermont and compare to current operating procedures at the Stanford Cosmogenic Radionuclide Target Prep facility.

SAMPLE PROCESSING VISIT

Collecting Compositional Data for a variety of International Samples from Oberlin College

Oberlin College

We are a team of students from Oberlin College visiting the lab in order to gather compositional data using UVM's new XRF. We're running samples from China, Dominica, Cuba, Ohio and Puerto Rico, in addition to the grain coatings of some of these samples suspended in neutralized salts (site photo from Cuba). The exciting challenge of the week will be discovering if the XRF is able to accurately process the composition of those salts.

Visitors: Monica Dix, Ely Bordt, Amelia Lewis
Visit dates: October 22-26, 2018

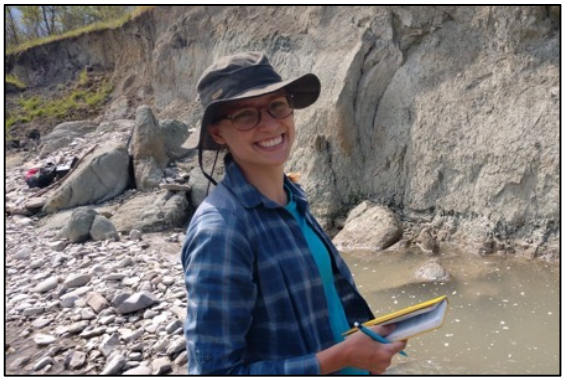
Amelia is a second-year student and Monica and Ely and third-year students at Oberlin College. We are all Geology majors working under Dr. Amanda Schmidt, with research backgrounds in geomorphology and geochemistry.

SAMPLE PROCESSING VISIT

Testing for climate-driven sedimentation in the building of basin stratigraphy

Lehigh University

Traditionally, cycles in the stratigraphic record are interpreted as the result of large-scale forces, like climate change. However, recent studies have shown that smaller-scale fluvial and hillslope processes can dominate stratigraphy. We are using cosmogenic nuclides to date and determine paleo-erosion rates for cyclical sediments exposed in the northern Apennines, Italy to determine whether the cycles are tied to Pleistocene glaciations.



Visitor: Katrina Gelwick
Visit dates: January 21-25, 2019

Katrina is a second year MS student at Lehigh University, studying with Dr. Frank Pazzaglia. This is her second visit to the UVM Cosmo Lab and this time it's with her own samples. The Maine native is happy to be back and is enjoying "real" winter.

SAMPLE PROCESSING VISIT

Tectonic and erosional evolution of the San Bernardino Mountains

University of California – Los Angeles

I am processing samples collected from different drainage basins, close to the San Andreas fault, in the San Bernardino Mountains in California. By obtaining erosion rates from these samples I will be able to compare them to previous studies done nearby in order to better understand how the San Bernardino Mountains are forming in relation to tectonic activity and river incision.

Visitor: Marina Argueta
Visit dates: February 11-15, 2019

I am from Torrance, California and graduated from the University of California Los Angeles with a Bachelor of Science in Geology. I am currently working as a lab assistant in both the cosmogenic and the optically stimulated luminescence labs at UCLA.

SAMPLE PROCESSING VISIT

Relationship between physical and chemical erosion in transient landscapes

Central Michigan University

We are working in two landscapes, the Klamath Mountains in northern California (above) and the Nicoya Peninsula of Costa Rica (below). Tectonic processes are thought to engender transient denudation rates at both sites. We hope to capture the complex responses of chemical erosion to changing patterns of physical erosion using ^{10}Be, geochemical mass balance, topographic analysis, and regolith formation modeling.

Visitor: Miles Reed

Visit dates: April 1- May 10, 2019

I am a 1st-year PhD student with Dr. Nicole West at Central Michigan University. I studied erosion on mountaintop removal/valley fill landscapes at West Virginia University for my master's degree. I enjoy watching European soccer, hiking, and chilling with my cats.

SAMPLE PROCESSING VISIT

Fortymile River landscape response to long-term climatic change eastern Alaska and Yukon, Canada

U.S. Geological Survey, Alaska Science Center

The Fortymile River flows from eastern Alaska to the Yukon River in Canada. Deeply incised strath terracse flank the lower Fortymile and records landscape-altering bedrock incision that sequestered gold-bearing river gravels hundreds of m above the modern channel. Cosmogenic techniques allow us to test base-level lowering mechanisms, determine terrace abandonment timing, and quantify subsequent incision.

Visitor: Adrian Bender
Visit dates: April 8-12, 2019

I'll be visiting UVM from Anchorage, Alaska, where I work for the U.S. Geological Survey on projects that utilize cosmogenic nuclide techniques to quantify geomorphic processes related to active tectonics or, in this case, coevolution of landscapes and placer gold.

OBSERVATION VISIT

Expanding our knowledge about quartz purification and ^{10}Be and ^{26}Al extraction

Aarhus University, Denmark

The Aarhus Cosmogenic Nuclide Group specializes in pairing cosmogenic nuclide analyses with computational modelling to resolve questions related to (1) the history of ice sheets, (2) erosional processes under glaciers and ice sheets, and (3) desert landscape processes. Our field sites include mainly Scandinavia and Greenland.

Visitors: Birte Lindahl Eriksen and Rikke Brok Jensen
Visit dates: May 6-10, 2019

We are laboratory technicians at Department of Geoscience, Aarhus University, and work with all processes in purifying quartz as well as the column chemistry and packing the targets for the AMS. We are interested in optimizing our laboratory procedures.

OBSERVATION VISIT

Quantifying the role of climate in the post-tectonic landscape evolution of southeast Arizona

Arizona State University

I am a 2nd year PhD candidate working with Arjun Heimsath in the Sky Island topography of southeast Arizona. We are using a combination of cosmogenic radionuclide, paleoclimate, and paleomagnetism techniques to constrain the timing and rates of landscape evolution following Basin and Range tectonics.

Visitor: Lorraine Carnes
Visit dates: May 6-10, 2019

I process samples in the ASU cosmogenic lab, but I'm interested in a formal lab training experience. I want to learn the latest cosmogenic lab procedures to implement at ASU, as well as learn how to effectively teach new lab users the protocol.

SAMPLE PROCESSING VISIT

Geological analysis of the impact of glaciation in western Pennsylvania

Lehigh University

We are working in two primary locations: The Slippery Rock Gorge in Butler County and the Carmichaels deposits in Fayette County. We are analyzing these glacially created formations to determine their absolute age as well as a rate of formation. From this we will be able to determine if they were formed quickly over the course of one glaciation, or incrementally over multiple glacial cycles. This work is important in understanding the glacial and drainage evolutions of a large area of Western Pennsylvania. This is a student project that I am working on with the advising of Frank Pazzaglia.

Visitor: Mike Simoneau

Visit dates: May 13-17, 2019

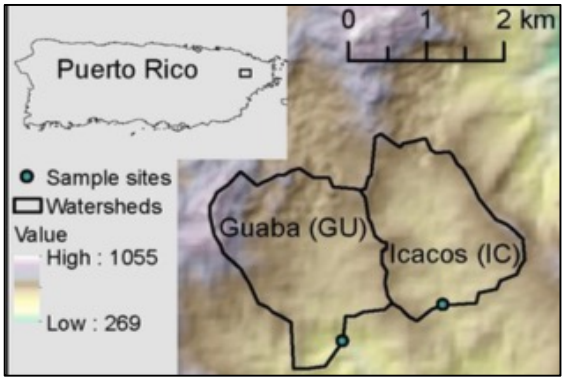
My name is Mike Simoneau and I am a junior year Environmental Science major at Lehigh University in Bethlehem PA. I was born here in Bethlehem and have lived in the area my whole life. Next year I will be working on my senior thesis based on the results of this project.

SAMPLE PROCESSING VISIT

Quantifying the Effects of Hurricane Maria on the Use of Detrital Sediment as an Erosion Monitor

Oberlin College

I will be quantifying in situ and meteoric ^{10}Be in river sediments collected from two watersheds in Puerto Rico (Guabá and Icacos) following Hurricane Maria in 2017. By analyzing ^{10}Be, I will quantify the effect of episodic events on the use of cosmogenic nuclides in sediments as an erosion monitor. This study is important for understanding the effects large storms like Hurricane Maria have on erosion.



Visitor: Alexandra Grande
Visit dates: June 26- August 9, 2019

I'm a rising, fourth-year undergraduate student at Oberlin College, and I'm very excited about this project! I have previously worked on a similar project, using different fallout radionuclides to determine the effects of deforestation on erosion in southwestern China.

SAMPLE PROCESSING VISIT

Constraining the timing and mechanisms of boulder field formation associated with permafrost

Franklin and Marshall College

I am an undergraduate student studying relict landforms associated with recurrent cold-climate conditions during Pleistocene glacial episodes in northern Pennsylvania. I am observing boulder fields and analyzing cosmogenic nuclides produced in the near surface. In discerning mechanisms and processes for formation as well as constraining an "exposure age" for these boulders, I will be evaluating the impact of cold-climate conditions, primarily those associated with permafrost, on landscapes in the mid-Atlantic.

Visitor: John Ruck

Visit dates: July 1-5, 2019

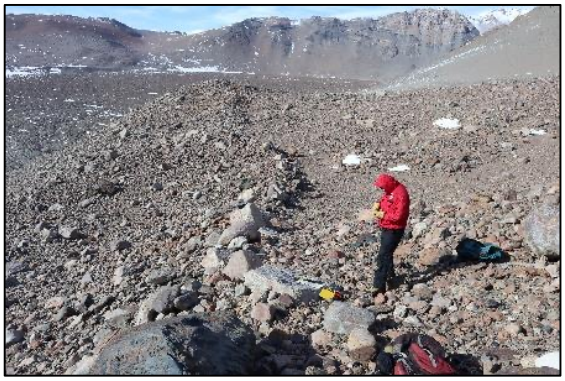
My name is John Ruck, and I am very much looking forward to visiting UVM's cosmogenic facility and meeting members of the laboratory. I am a rising senior at Franklin and Marshall College studying Geoscience and Business.

SAMPLE PROCESSING VISIT

Determining the exposure age of glacial moraines in Ong Valley, Antarctica

Vanderbilt University

The goal of this project is to determine the exposure age of two glacial moraines in Ong Valley, Antarctica. Our data can tell us how the Argosy Glacier has changed over time, and the ages of these moraines themselves will help constrain the age of buried glacial ice in the Valley. We estimate that our samples will be on the order of 1-2 million years old.



Visitor: Emma Rimmer

Visit dates: July 28- August 3, 2019

Emma Rimmer is a rising senior at Vanderbilt University, and is double majoring in Environmental Sociology and Earth & Environmental Science. From Jupiter, Florida, Emma is interested in research that deepens our understanding of Earth's climate and its impact.

SAMPLE PROCESSING VISIT

Constraining the timing and mechanisms of boulder field formation associated with permafrost

Franklin & Marshall College

I am an undergraduate student studying relict landforms associated with recurrent cold-climate conditions during Pleistocene glacial episodes in northern Pennsylvania. I am observing boulder fields and gelifluction lobes and analyzing accumulation of cosmogenic nuclides produced in near surface material. In discerning mechanisms and processes for formation as well as constraining an exposure or burial "age" for these boulders, I will be evaluating the impact of cold-climate conditions, primarily those associated with permafrost, on similar landscapes in the mid-Atlantic.

Visitor: Nic Hertzler

Visit dates: August 19- 23, 2019

My name is Nic Hertzler, and I'm a senior at Franklin & Marshall College majoring in Geoscience and minoring in Film Studies. I was born and raised in Lancaster, Pennsylvania. I'm looking forward to meeting new people and seeing the cosmo lab!

SAMPLE PROCESSING VISIT

The response of the Juneau Icefield, southern Alaska, to changing climate

Columbia University and Juneau Icefield Research Program

We are investigating the glacial history of the Juneau Icefield in Alaska. Questions we seek to answer are 1) How much larger was the Juneau Icefield during the Last Glacial Maximum 2) How quickly did the icefield shrink during the deglaciation?, 3) How was the Little Ice Age expressed at the Juneau Icefield?, and 4) Is the current configuration of the Juneau Icefield unprecedented during the Holocene?

Visitor: Allie Balter

Visit dates: August 19-23, 2019

Allie Balter is a PhD student at the Lamont-Doherty Earth Observatory of Columbia University. She studies how glaciers and ice sheets in Antarctica, Greenland, and North America have responded to past climate change.

SAMPLE PROCESSING VISIT

^{10}Be Dating Constraints on the Deglaciation History of the Juneau Icefield

University of Maine and Juneau Icefield Research Program

I am analyzing surficial rock samples taken from the Juneau Icefield, AK, for cosmogenic nuclide concentrations. These concentrations will provide estimates of how long ago the rocks were covered by glaciers, helping to constrain the glaciation history and thinning rates of this area. These samples were taken as part of the Juneau Icefield Research Program, a two month glacier science field camp in SE Alaska, in the summer of 2019.

Visitor: Jacquelyn Bellefontaine
Visit dates: August 19-23, 2019

My name is Jacquelyn Bellefontaine and I am an undergraduate at the University of Maine, studying Earth and Climate Sciences. I was part of the Juneau Icefield Research Program 2019 field season, where I collected rock samples for surface exposure dating.

SAMPLE PROCESSING VISIT

^{10}Be Dating Constraints on the Deglaciation History of the Juneau Icefield

SUNY Geneseo and Juneau Icefield Research Program

I am analyzing surficial rock samples taken from the Juneau Icefield, AK, for cosmogenic nuclide concentrations. These concentrations will provide estimates of how long ago the rocks were covered by glaciers, helping to constrain the glaciation history and thinning rates of this area. These samples were taken as part of the Juneau Icefield Research Program, a two month glacier science field camp in SE Alaska, in the summer of 2019.

Visitor: Julia Brazo

Visit dates: August 19-23, 2019

My name is Julia Brazo and I am a recent graduate of the State University of New York at Geneseo. I received a Bachelor of Arts in Physics and a Bachelor of Arts in Mathematics with minors in Environmental Studies and Geography. I was part of the Juneau Icefield Research Program 2019 field season.

SAMPLE PROCESSING VISIT

^{10}Be Dating Constraints on the Deglaciation History of the Juneau Icefield

Bates College and Juneau Icefield Research Program

I am analyzing surficial rock samples taken from the Juneau Icefield, AK, for cosmogenic nuclide concentrations. These concentrations will provide estimates of how long ago the rocks were covered by glaciers, helping to constrain the glaciation history and thinning rates of this area. These samples were taken as part of the Juneau Icefield Research Program, a two month glacier science field camp in SE Alaska, in the summer of 2019.

Visitor: Eve Cinquino
Visit dates: August 19-23, 2019

My name is Eve Cinquino and I am a recent graduate of Bates College, with a BS in physics. I was part of the Juneau Icefield Research Program 2019 field season, where I collected rock samples for surface exposure dating.

SAMPLE PROCESSING VISIT

^{10}Be Dating Constraints on the Deglaciation History of the Juneau Icefield

University of Maine and Juneau Icefield Research Program

I am analyzing surficial rock samples taken from the Juneau Icefield, AK, for cosmogenic nuclide concentrations. These concentrations will provide estimates of how long ago the rocks were covered by glaciers, helping to constrain the glaciation history and thinning rates of this area. These samples were taken as part of the Juneau Icefield Research Program, a two month glacier science field camp in SE Alaska, in the summer of 2019.

Visitor: Colby Rand

Visit dates: August 19-23, 2019

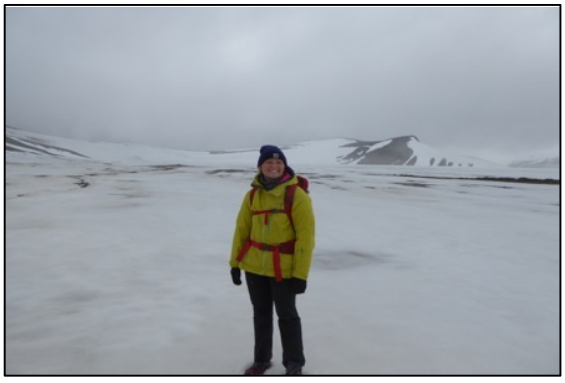
My name is Colby Rand and I am an undergraduate at the University of Maine, studying Earth and Climate Sciences. I was part of the Juneau Icefield Research Program 2019 field season, where I collected rock samples for surface exposure dating.

SAMPLE PROCESSING VISIT

Late Glacial to Holocene Sea Level History of Kapp Linné, Svalbard, Norwegian High Arctic

Bates College

This study will describe the relative sea level in Kapp Linné during the Holocene, located on the western coast of Svalbard. Major ice sheets have the covered Svalbard and evidence from the last major ice age as well as shifts in the regional sea level can be observed throughout the landscape. The sea level reconstruction will be developed through the assessment of marine terraces and raised beaches using radiometric dating.



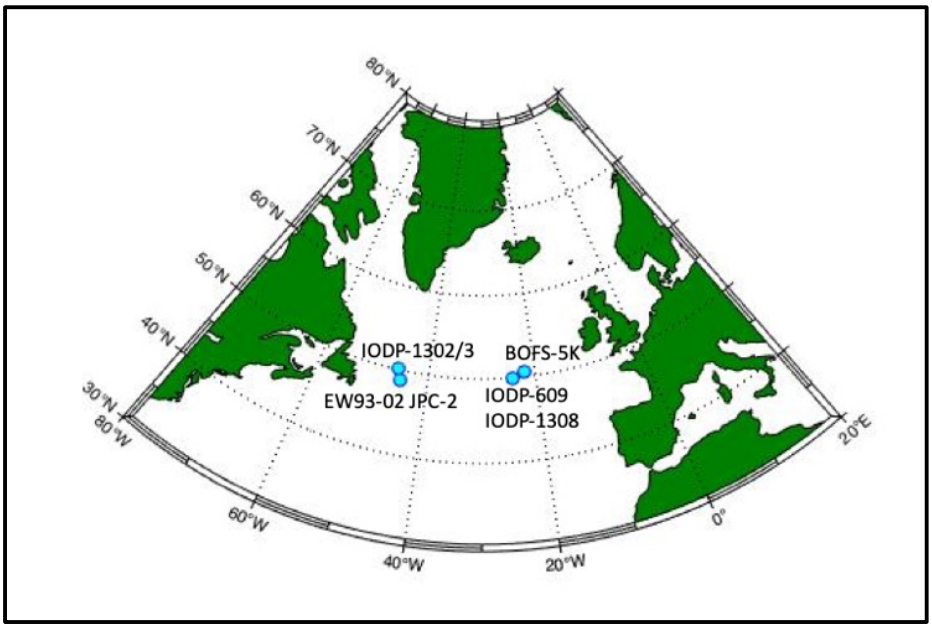
Visitor: Hannah Johnson
Visit dates: August 26-30, 2019

My name is Hannah Johnson I am a rising senior at Bates College and from Brewster Massachusetts. I am a geology major with a minor in anthropology. I am very excited for this opportunity to be working in the cosmogenic lab and starting my thesis!

SAMPLE PROCESSING VISIT

Using cosmogenic nuclides in ice-rafted debris to constrain the ice dynamics of Heinrich events

Boston College



To better understand the ice dynamics associated with Heinrich events – periodic discharges of iceberg armadas expelled from the Laurentide Ice Sheet during the last glacial period – we are measuring cosmogenic nuclides in North Atlantic ice-rafted debris. Because ice-rafted sediments were entrained beneath the Laurentide prior to iceberg discharge, measurement results will suggest a subglacial exposure and erosion history.

Visitor: Danielle LeBlanc

Visit dates: August 25-30 and October 21-25, 2019

Danielle is a master's student at Boston College studying past climates and ice sheets. Before attending BC, she studied petroleum engineering at Louisiana State University and worked briefly as an environmental engineer.

SAMPLE PROCESSING VISIT

Postglacial Sea Level Reconstruction, Kapp Linné, Svalbard, Norwegian High Arctic

Bates College, University Centre in Svalbard

The aim of this study is to reconstruct the postglacial relative sea level history of Kapp Linné, located on the western coast of Svalbard (Norweigan high Arctic). The sea level reconstruction will be developed utilizing raised marine shorelines whose ages are determined using radiocarbon analysis on bivalve shells and cosmogenic exposure ages on boulders.

Visitor: Mike Retelle

Visit dates: September 30- October 4, 2019

I'm a geology professor at Bates College and an adjunct professor position in the Arctic Geology Department at the University Centre in Svalbard. My main interests are in Quaternary geology and Paleoclimate in the North Atlantic region and New England.

OBSERVATION VISIT

Understanding complex planetary surface processes with AMS radionuclide measurements

Purdue Rare Isotope Measurement Laboratory

Marc is the director of the Purdue Rare Isotope Measurement (PRIME) Laboratory, where many of the 10Be and 26Al samples from the Community Cosmogenic Facility are analyzed. In addition to running the lab, his work involves applying a diverse array of radioactive and stable isotopes to understanding the dynamic surfaces of Earth and other planets. He collaborates on a broad range of projects with PRIME Lab users.

Visitor: Marc Caffee

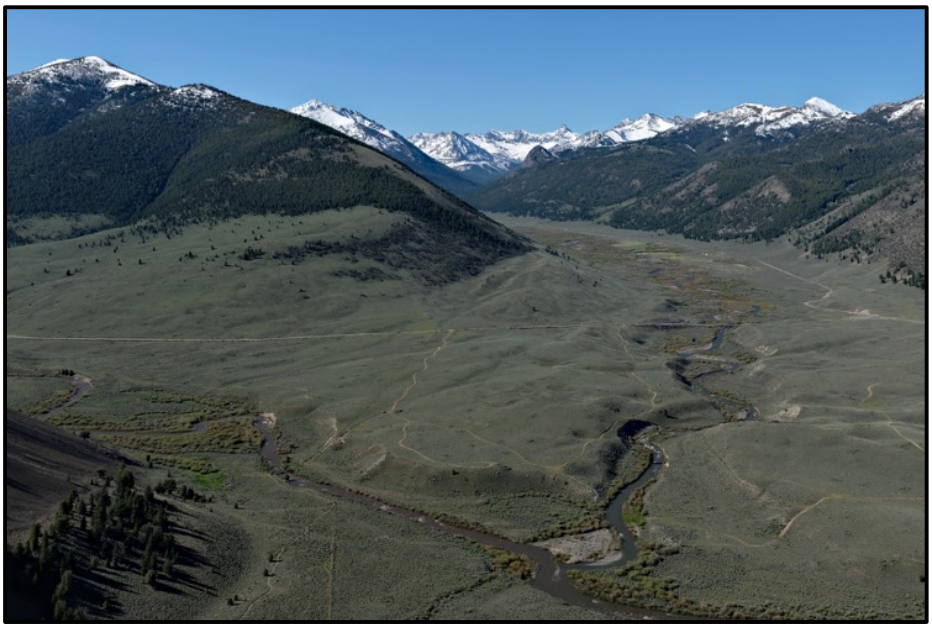
Visit dates: September 30- October 1, 2019

Marc will be visiting the Community Cosmogenic Facility to see the lab, spend time with other visitors, and give a talk in the Geology department seminar series.

SAMPLE PROCESSING VISIT

Plausible flood sources for the Big Lost River Flood(s), Pioneer Mountains, Idaho

Idaho State University



This project uses cosmogenic and OSL dating techniques plus field mapping to better understand potential megaflood sources in the Pioneer Mountains. Evidence for the Big Lost River Flood(s) is recognized 100km downstream, but little evidence links it to a specific source area. This work will yield the first systematic ages from moraine sequences in the Pioneers.

Visitor: Braedon Warner
Visit dates: October 7-18, 2019

Braedon is an MS student from Idaho State University studying under Dr. Glenn Thackray. He grew up in Idaho and has seen his fair share of the Rockies—backpacking, climbing, and hunting.

OBSERVATION VISIT

Discussing recent updates on the extraction methods for low-level ^{10}Be

Geological Survey of Japan

I use ^{10}Be and ^{26}Al to understand Earth surface processes, landscape evolution, and the behavior of the climate system on millennial to million-year time scale.
My current interest is improving the extraction methods to measure low-level samples.
I am revisiting the preparation method of carrier solution from deeply-mined minerals.

Visitor: Atsunori Nakamura
Visit dates: October 7-11, 2019

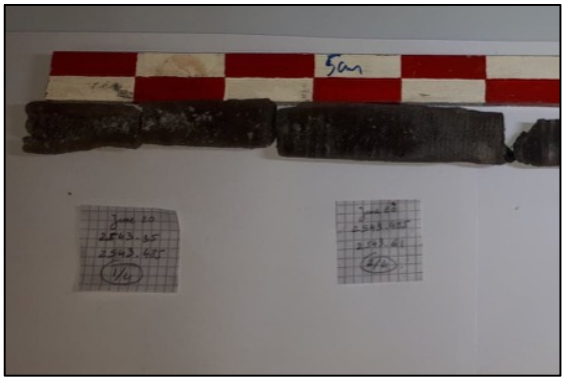
I am a researcher at Geological Survey of Japan. I look forward to learning the procedure at UVM to update the methods used at cosmogenic facilities in Japan.

SAMPLE PROCESSING VISIT

Study of the past fluctuations of the Greenland Ice Sheet through the Pleistocene

Centre for Petrographic and Geochemical Research (France)

This project aims to better constrain the past fluctuations of the Greenland Ice Sheet through the Pleistocene. Samples come from the bottom of a Greenland ice core; measurements of meteoric ^{10}Be will help us to understand the origin and age of the sediment found there.



Visitor: Marie Protin

Visit dates: October 21-30, 2019

I am a French post doctorate. I did my PhD in France during which I worked on glacial fluctuations during the Holocene in the French Alps using *in situ* ^{10}Be and ^{14}C on boulders and bedrock. I just start my post doc, working this time on meteoric ^{10}Be.

SAMPLE PROCESSING VISIT

Constraining the timing and mechanisms of boulder field formation associated with permafrost

Franklin & Marshall College

I am an undergraduate student studying relict landforms associated with recurrent cold-climate conditions during Pleistocene glacial episodes in northern Pennsylvania. I am observing boulder fields and gelifluction lobes and analyzing accumulation of cosmogenic nuclides produced in near surface material. In discerning mechanisms and processes for formation as well as constraining an exposure or burial "age" for these boulders, I will be evaluating the impact of cold-climate conditions, primarily those associated with permafrost, on similar landscapes in the mid-Atlantic.

Visitor: Nic Hertzler

Visit dates: January 6-10, 2020

My name is Nic Hertzler, and I'm a senior at Franklin & Marshall College majoring in Geoscience and minoring in Film Studies. I was born and raised in Lancaster, Pennsylvania. I'm looking forward to meeting new people and seeing the cosmo lab!

SAMPLE PROCESSING VISIT

Origin of Carmichaels Formation on Terraces along the Youghiogheny River, PA

Lehigh University

This project seeks to explain the origin of the Carmichaels Formation in Western Pennsylvania. By dating river terraces, we hope to develop an explanation of how this unit was deposited atop terraces. We are expecting to find that the terraces have formed in the most recent glacial-interglacial cycle, with terrace ages increasing further downstream and at higher elevations, with ages ranging from 1.5 Ma to 500 ka. The dates of these terraces will also be used to further constrain Glaical Isostatic Adjustment in the area.

Visitor: Ethan Kurak

Visit dates: January 6-10, 2020

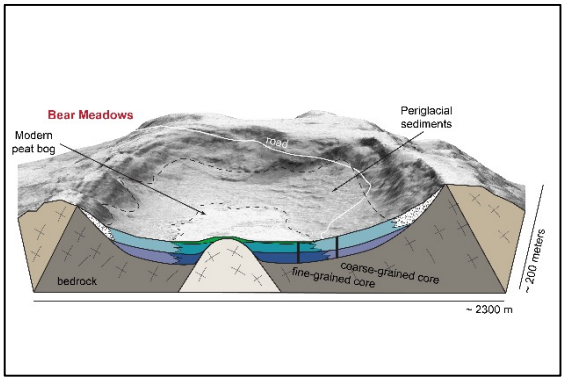
Ethan Kurak is a first year MS student studying Geomorphology at Lehigh University. He graduated from the University of Minnesota with a BS in Earth Science in 2018. He hopes to uncover the story of past landscape evolution using rivers and their geomorphic expression in the landscape.

SAMPLE PROCESSING VISIT

Periglaciated basins as novel records of climate-modulated erosion

Pennsylvania State University

This project will study the erosional, depositional and ecological history of a structurally-controlled basin in central PA called Bear Meadows, which is a modern peat bog but bears topographic and sedimentological evidence of pre-Holocene cold-climate processes. We seek to analyze sediment for both erosion/burial rates and paleobiological evidence of past ecosystem and hydrologic conditions.



Visitor: Joanmarie Del Vecchio
Visit dates: January 13-17, 2020

Joanmarie is a Ph.D. student with Roman DiBiase. Her projects include periglacial geomorphology, geophysics in the critical zone, and waterfall morphology. She is seeking bike routes, hikes and rock climbing locales in Burlington.

OBSERVATION VISIT

Post-glacial temperatures at high latitudes from noble gas and luminescence techniques

UC Berkeley and Berkeley Geochronology Center

Recent studies show that common minerals can retain information about their geologic storage temperature, even when that temperature is relatively cold. Unlike most geothermometers which become 'closed' systems as minerals travel up through the crust, certain noble gas and luminescence signals remain 'open' at atmospheric temperatures. I am measuring these signals in high-latitude boulders that were recently exposed.

Visitor: Nathan Brown

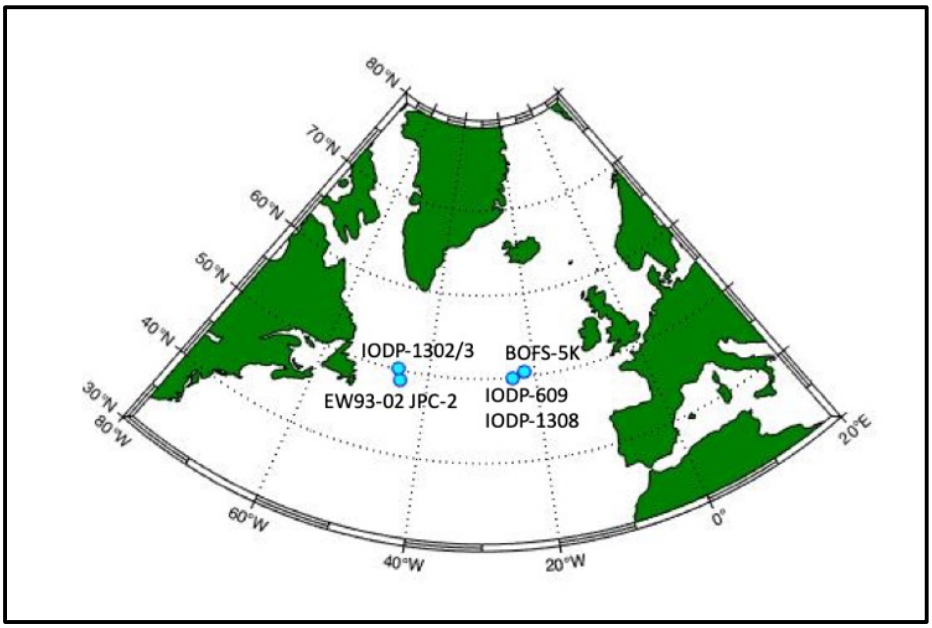
Visit dates: February 10-11, 2020

I will be visiting the lab to collect archived samples for additional measurements and to give a talk about paleothermometry.

SAMPLE PROCESSING VISIT

Using cosmogenic nuclides in ice-rafted debris to constrain the ice dynamics of Heinrich events

Boston College



To better understand the ice dynamics associated with Heinrich events – periodic discharges of iceberg armadas expelled from the Laurentide Ice Sheet during the last glacial period – we are measuring cosmogenic nuclides in North Atlantic ice-rafted debris. Because ice-rafted sediments were entrained beneath the Laurentide prior to iceberg discharge, measurement results will suggest a subglacial exposure and erosion history.

Visitor: Danielle LeBlanc
Visit dates: February 10-14, 2020

Danielle is a master's student at Boston College studying past climates and ice sheets. Before attending BC, she studied petroleum engineering at Louisiana State University and worked briefly as an environmental engineer.

SAMPLE PROCESSING VISIT

Evaluating how reforestation and hurricanes affect landsliding, erosion, and reservoir sedimentation

Colorado State University

Puerto Rico heavily relies on reservoirs for drinking water. However, these reservoirs are rapidly filling. Despite significant reforestation after 1960, landsliding and erosion are still prevalent. I will examine how land use changes and extreme precipitation events affect landslide frequency and sediment flux through quantification of the background, historic agriculturally-induced, and present-day erosion.

Note: dog not coming ☺

Visitor: Johanna Eidmann

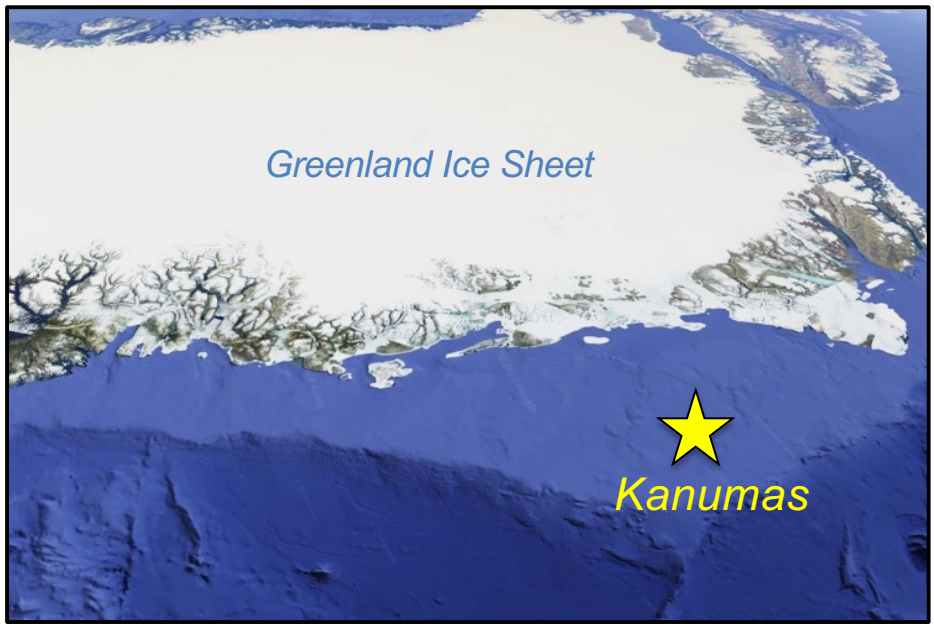
Visit dates: February 10-21, 2020

I am a second-year PhD student working with Dr. Sean Gallen (a UVM alum) at Colorado State University in Fort Collins, CO. I love to go trail running and backcountry skiing with my dog. I recently brewed a delicious Belgian Saison and am currently brewing kombucha.

UVM STUDENT

Glacial marine sediment record of Miocene to LGM evolution of the NE Greenland Ice Sheet

University of Vermont



I am working with Drew Christ to analyze glacial marine sediment samples from the Kanumas core collected from the continental shelf of northeast Greenland. These core sections span the Miocene to the Last Glacial Maximum, offering a deep time perspective on the evolution of the Greenland Ice Sheet.

Student: Emily Cummings, B.S. in Environmental Studies
Graduating: Spring 2021

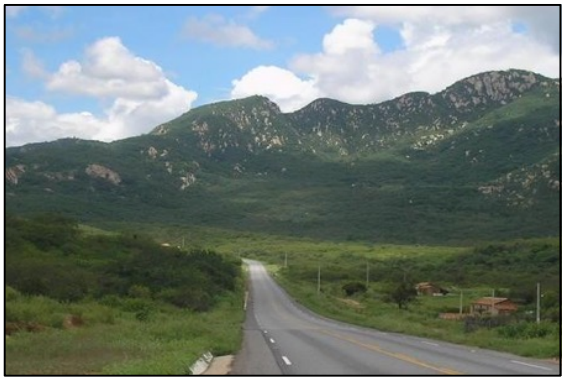
I am a UVM Honors College student and environmental studies major interested in learning more about lab work and geology! I took a class with Paul Bierman last semester where I became interested in his work and getting more involved.

VIRTUAL VISIT

Geomorphology of the Crystalline Massifs of Northeastern Brazil

Federal University of Ceara State, Brazil

Our project investigates the geomorphic history of the crystalline massifs of northeastern Brazil. We want to understand the recent evolution of this topographic relief by studying uplift processes during the late Tertiary and early Quaternary. We also seek to understand the erosion history of the region, which we will investigate by quantifying ^{10}Be erosion rates in drainage basins.



Visitor: Vanda Claudino-Sales

Visit dates: N/A- Unable to visit due to COVID-19 restrictions

Vanda Claudino-Sales is a professor at the Department of Geography of the Federal University of Ceara State, in Fortaleza, Brazil. She is a geomorphologist who is passionate about landscapes. She is currently teaching online classes due to COVID-19.

VIRTUAL VISIT

River landscape evolution in eastern Alaska since ~5 Ma with critical mineral resource implications

U.S. Geological Survey Alaska Science Center

This ongoing project aims to understand rates and processes of fluvial landscape evolution in eastern Alaska by dating pristine late Cenozoic river terraces in the tectonically quiescent Yukon-Tanana upland and active northern Alaska Range. Our findings test fundamental concepts of river landscape response to climate and tectonics while also identifying critical mineral placer resources in these highly prospective regions.

Visitor: Adrian M. Bender

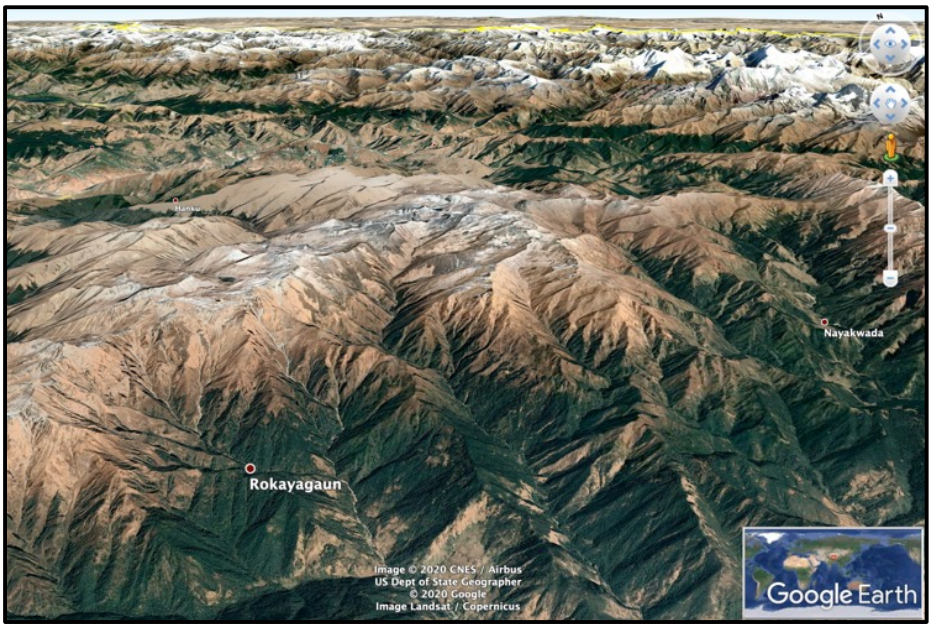
Visit dates: N/A- Unable to visit due to COVID-19 restrictions

I am a geomorphologist interested in river landscapes, active tectonics, and climatic change. I've published 4 studies with CCF data and collaboration since 2016.

VIRTUAL VISIT

Origins of the Bhumichula Plateau, a high-elevation, low-relief surface, Nepal Himalaya

University of Toronto Mississauga, University of Arizona



High-elevation, low-relief topographic surfaces are preserved in many of Earth's mountain ranges, but the origins of these surfaces are poorly understood. The Bhumichula Plateau may represent a recently-uplifted relict landscape or it may be a remnant of a larger proto-Tibetan plateau undergoing erosion due to changing regional climate or orography. We plan to use cosmogenic ages and erosion rates to unravel this history.

Visitor: Alexander Tye

Visit dates: N/A- Unable to visit due to COVID-19 restrictions

I am a postdoctoral researcher at University of Toronto-Mississauga. I use structural geology and stratigraphic records to study the formation and erosion of mountain belts. Cosmogenic nuclide dating is new to me so I look forward to working with the data!

VIRTUAL VISIT

Effect of the Woolsey Fire on ^{10}Be Concentrations from a Burned Catchment

Eastern Michigan University

Photo: Peter Buschmann/USDA

The Woolsey Fire ignited on November 8, 2018 and burned 96,949 acres of the Santa Monica Mountains. The fire presents a unique opportunity to quantify how much 10Be concentrations are affected by a singular, large magnitude wildfire. My portion of this multi-year project focuses on measuring 10Be concentrations in different grain size fractions from Solstice Canyon, one of the catchments burned by the Woolsey Fire.

Visitor: Collin Bogoski

Visit dates: N/A- Unable to visit due to COVID-19 restrictions

I am a current student at Eastern Michigan University. With this project I am excited to work with people who have a deep understanding of Geology so I can learn from them, along with learn more about lab processes and procedures.

VIRTUAL VISIT

Catastrophic Rock Avalanches in the Nooksack River Basin, Whatcom County, WA

Western Washington University

In this study, I examine a suite of long-runout catastrophic rock avalanche deposits in the Nooksack River Basin, Whatcom County, WA. I use two primary dating methods (14C and 10Be CRN) to determine the ages of these landslides and to test their potential triggering mechanisms (e.g., earthquakes, heavy rainfall, glacial debuttressing). I except Cascadia Subduction Zone earthquakes to have triggered one or more of these large landslides.

Visitor: Eric Brown

Visit dates: N/A- Unable to visit due to COVID-19 restrictions

I am a graduate student in the Geology Department at WWU. Unfortunately, due to the COVID-19 pandemic I am not able to visit UVM-CCF in person, but I am still hoping to learn everything I can about cosmogenic dating.

VIRTUAL VISIT

Constraining the last rupture of the Nicholia segment on the Beaverhead fault, ID

Idaho State University

For my Masters thesis I will be constraining the timing of the last earthquake on the Nicholia fault segment in SE Idaho. By accurately timing the last rupture, we can further improve the seismic hazards for the Idaho National Lab , the nations largest domestic nuclear lab. I predict that the boulders located on the fault scarp will yield exposure ages that are around 15ka based on previous studies.

Visitor: Emma Collins

Visit dates: N/A- Unable to visit due to COVID-19 restrictions

My name is Emma Collins and I originally from Pittsburgh, PA. I am currently pursing my Masters in Geology at Idaho State University. I am hoping to learn more about how cosmogenic dating can apply to fault scarps!

VIRTUAL VISIT

Dating Laurentide Ice Sheet retreat from Isle Royale National Park, Michigan

Eastern Michigan University

Isle Royale National Park is best-known for its wolf and moose populations. Despite having been covered by the Laurentide Ice Sheet throughout the Quaternary, it is not known when glacial ice retreated from the island. This study uses 10Be exposure-age dating on glacial erratics on Mt. Desor, Isle Royale's highest point to determine when the island emerged from ice and to better understand links between land, ice, and climate.

Visitor: Eric W. Portenga

Visit dates: N/A- Unable to visit due to COVID-19 restrictions

I am a geomorphologist and a native Michigander. When I returned to Michigan, I was determined to use my 10Be experience to deepen my geological knowledge of my state. What better place to do this than Isle Royale, our state's only fully-fledged National Park?

VIRTUAL VISIT

The influence of topographic disequilibrium on erosion rates from the San Bernardino Mountains, California

University of California – Los Angeles

I am working in the San Bernardino Mountains, located in southern California. These samples will help me add erosion rate data to my thesis project as well as previous studies. The San Bernardino Mountains are a complex mountain range, and this data will help me further understand how the mountain range formed and provide more insights to disequilibrium features.

Visitor: Marina Argueta

Visit dates: N/A- Unable to visit due to COVID-19 restrictions

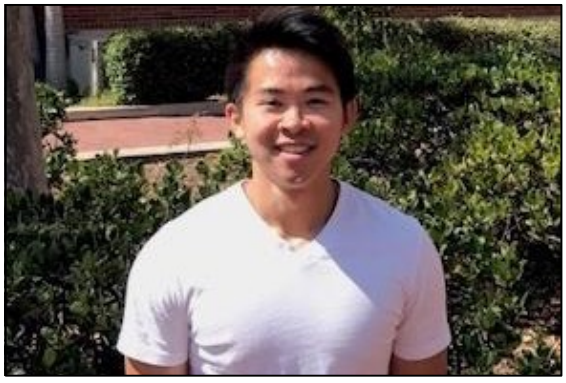
I am a graduate student working on the tectonic geomorphology of the San Bernardino Mountains. I enjoyed my previous visit, and am sad I can't visit this time due to COVID-19 restrictions, but thankful that we can still get samples processed! ☺

VIRTUAL VISIT

Assessing climatic controls of millennial erosion in the eastern end of Himalaya

University of California, Los Angeles

In this student project, we examine millennial timescale erosion rates measured through cosmogenic nuclides along with decadal erosion rates calculated from landslide erosion rates in the eastern end of Himalaya. We expect catchment erosion rates to be around and greater than 1 mm/yr. Examining erosion on various timescales will offer insight into the mechanics of long-term landscape evolution in the region.



Visitor: Kevin Shao

Visit dates: N/A- Unable to visit due to COVID-19 restrictions

I am a 4th year graduate student studying under Professor Seulgi Moon. I am exploring the controls of erosion and landslide susceptibility in the eastern end of Himalaya. I wish I could visit UVM again since I had a great time during my first visit!

VIRTUAL VISIT

Do spatial variations in topography reflect differential uplift across the Cascadia forearc?

Oregon State University

Within the Rogue River Watershed (located in southern Oregon), an abrupt change in topographic relief and fluvial geomorphology is thought to be the result of active uplift along a previously unrecognized fault. We plan to use cosmogenic ^{10}Be basin-averaged erosion rates from nested watersheds within the Rogue to test the hypothesis that the western Klamath mountains are actively being uplifted relative to the eastern forearc.

Visitor: Katherine Worms

Visit dates: N/A- Unable to visit due to COVID-19 restrictions

I am in my second year of graduate school working towards a Ph.D. in Geology advised by Dr. Eric Kirby. I study the relationships between tectonics, climate, and erosion and hope to learn how each of these factors work to shape topography along the Oregon Coast.

VIRTUAL VISIT

Patterns of erosion rate and topography along the Green River in Desolation Canyon, Utah

University of Georgia

Desolation Canyon is a 65 mile long gorge through the Tavaputs Plateau where the Green River is driving incision. I will address questions about when this canyon started to incise and why the steep rugged canyon is shaped the way it is by comparing rock strength and erosion rates in the canyon. Data from ^{10}Be measurement will help us understand geomorphic evolution of the canyon and will help frame talk about the greater Colorado River.

Visitor: Andy Darling

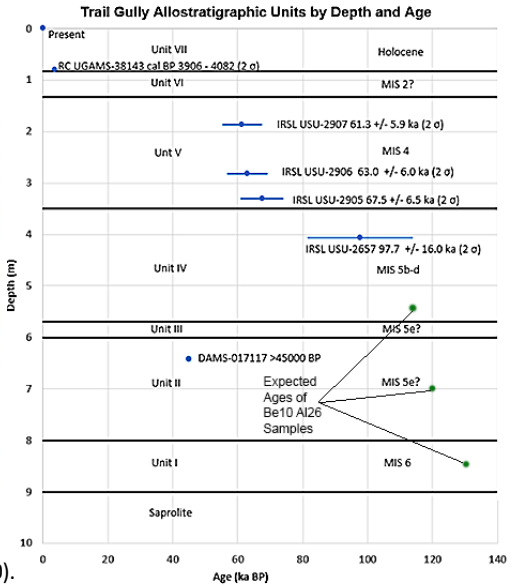
Visit dates: N/A- Unable to visit due to COVID-19 restrictions

Since my MS in'09, I have wanted to tackle the evolution of this canyon. Somehow this research has always been a side project, but now that I am more focused on teaching I also have an opportunity to step back and get back to this fun play!

VIRTUAL VISIT

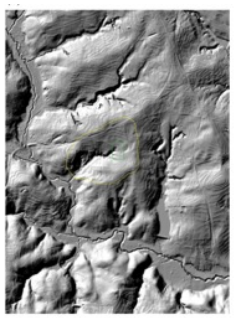
Late Pleistocene Sediment-Filled Valleys in Interfluvial Uplands of the Southern Piedmont

Wofford College



Allostratigraphic units by Age and Depth for sediments exposed by Trail Gully, near Pauline, SC (~1940).

Study area topography is inverted. Remnants of sediment-filled valleys occur in uplands near watershed divides. Seven discrete strata record deposition between erosional time gaps. The lower Units I-III are markedly different from overlying strata, in particular Units I-II contain >100kyr organic deposits. These units may have eroded at depth ~15m deep, while Units IV-VII eroded from surface slopes. Expected sample ages are indicated above.



Historic Trail Gully in 14 ha low-order drainage.

Samples from auger at ladder Base -Trail Gully head (2017).

Visitor: Terry Ferguson

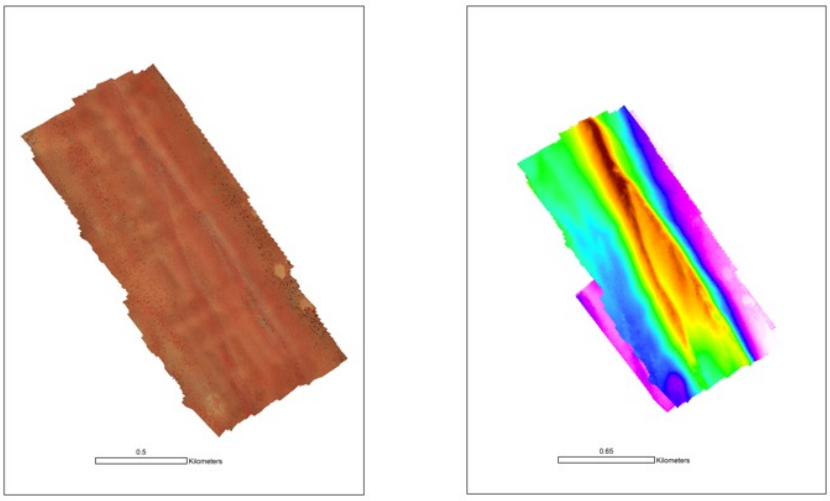
Visit dates: N/A- Unable to visit due to COVID-19 restrictions

Professor Emeritus, Environmental Studies, Wofford College, Spartanburg, SC. Currently studying several Southern Piedmont localities indicating dynamic systems of erosion, transportation, and deposition.

VIRTUAL VISIT

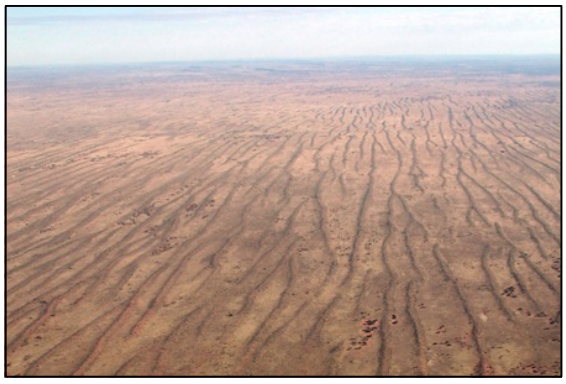
Testing Models of Linear Dune Formation

Center for Earth and Planetary Studies, National Air and Space Museum, Smithsonian Institution



An orthophotomosaic of a linear dune near Madigan Camp 11 in Australia's Simpson Desert. The resulting digital elevation model from the unmanned aerial vehicle (UAV) data is shown on the right.

Linear dunes are the only dune form that has been found on all the terrestrial worlds with an appreciable atmosphere. However, we currently have a poor understanding as to how they form. We have been collecting samples from across the Simpson Desert in Australia for two decades to understand how the age and composition of the dunes change by location as a way of testing the different formative models that have been proposed.



The samples for our analysis are being collected here. Notice the length of the auger (7 meters). This is the deepest sample from the base of the dune that is located in the center of the Simpson Desert near Madigan Camp 11.

Visitor: Bob Craddock

Visit dates: N/A- Unable to visit due to COVID-19 restrictions

Bob Craddock is a geologist at the Smithsonian Institution focusing on the early geologic history of Mars and planetary surface processes. Bob also conducts Earth analog studies that include dunes in Australia and Namibia and basaltic landscapes in Hawaii and Iceland.

SAMPLE PROCESSING VISIT

Ancient Ice Buried Below a Meter of Regolith; Ong Valley, Antarctica

University of North Dakota, Berkeley Geochronology Center, and Vanderbilt University

We have discovered and cored a massive buried ice mass in Ong Valley located in the Transantarctic Mountains, Antarctica. The ice mass has been dated to be greater than 1.1 Ma, making this one of Earth's oldest ice masses. We determine the age of the ice directly by dating the dirt suspended within the ice and by dating the till layer covering the ice using numerous cosmogenic nuclides: ^{10}Be, ^{26}Al, and ^{21}Ne.

Visitor: Marie Bergelin
Visit dates: April 5 - April 23, 2021

Marie Bergelin is a Ph.D. student at University of North Dakota. She is originally from Copenhagen, Denmark and has been in the United States for the past 12 years. She enjoys outdoor activities such as hiking, running, biking, and paddle boarding.

UVM STUDENT

Constraining Laurentide Deglaciation in Southern New England Utilizing Cosmogenic ^{10}Be

University of Vermont

I am attempting to constrain the timing and rate of Laurentide Ice sheet retreat using Be-10 ages from glacially deposited boulders in Southern New England. Current disagreement between ^{10}Be and ^{14}C retreat ages create uncertainty in ice sheet retreat leading to uncertainty in modern climate change effects on ice sheets. I predict that the ages will agree better at higher latitudes coinciding with changes in paleoclimate.

Student: Jason Drebber, B.S. Geology, Department of Geology

Graduating: Spring 2022

I am a senior undergraduate interested in glacial geology and paleoclimate. I love to hike, bike, ski and be outside. I love to listen to The Grateful Dead and Phish and have recently started learning the guitar.

VIRTUAL VISIT

Assessing the timing of megagravel emplacement in coastal boulder deposits: a pilot study

University College Dublin and Williams College

In this project we are using cosmogenic 10Be to try to learn more about the deposition of megagravel in coastal boulder deposits. While these deposits are well recognized in the literature, the timing/rate of emplacement is not understood. Here, we will determine the exposure history of megagravel clasts located in western Ireland. The timing of deposition of this deposit is unknow but is likely late Holocene (>4000 years).

Visitor: Sam Kelley

Visit dates: N/A- Unable to visit due to COVID-19 restrictions

Sam Kelley is an Assistant Professor in the School of Earth Sciences at University College Dublin. Much of his previous work has focused on using cosmogenic nuclides to understand glacial history in western Greenland.

UVM STUDENT

Ongoing, collaborative research measuring erosion rates & water chemistry in Cuban rivers

University of Vermont

Building on almost a decade of UVM-Cuban collaborative research, this project seeks to understand stream chemistry patterns and quantify rates of landscape erosion through weathering and dissolution across Cuba. Two previous field seasons brought back water and sediment from 45 streams across central Cuba. We hope to sample the eastern and western portions of the Island to build a comprehensive understanding of these dynamic systems.

Marika Massey-Bierman during previous field season

Student: Bella Bennett, PhD Student, School of Natural Resources

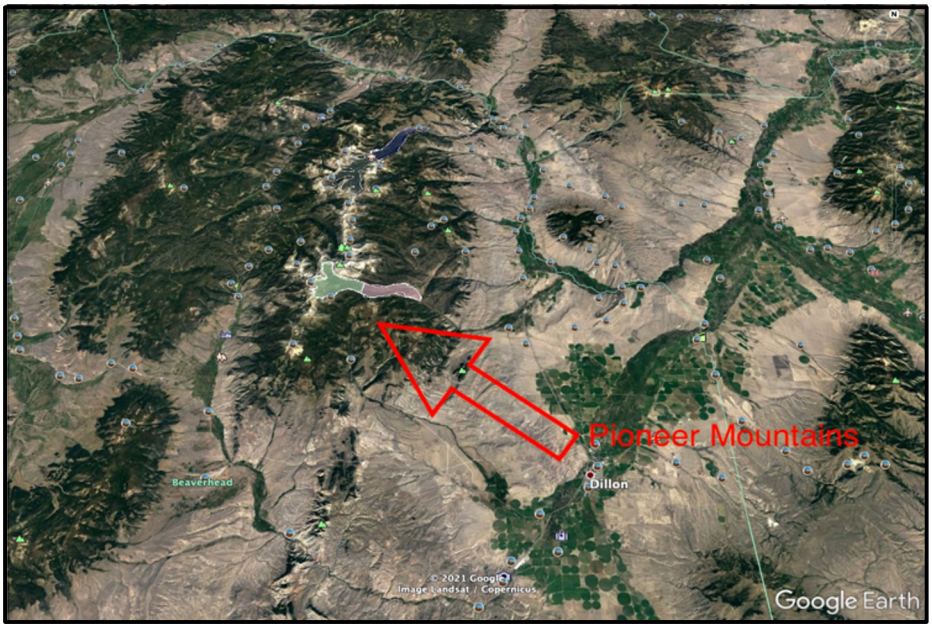
Graduating: Spring 2024

I've always loved islands – growing up on Martha's Vineyard, studying abroad in Iceland and New Zealand – I'm fascinated by each island's unique geologic story and how humans interact with these landforms. I'm very excited to get to know Cuba next!

SAMPLE PROCESSING VISIT

Pioneer Mountains, Montana: an investigation of very dry, alpine glaciation proximal to LIS

University of Montana Western



Our project is based in southwest MT near Dillon in the Pioneer Mountains. We chose to collect samples from this range because there are no TCN dates, and we feel it is important in drawing climatic connections and getting the bigger picture as it relates to the Greater Yellowstone and Wind River Ranges. We hypothesize that the glacial maxima in this range and others in southwest MT might have occurred prior to the LGM.

Visitor: Will Larson

Visit dates: June 14 - August 6, 2021

I am an undergrad at the University of Montana Western studying Environmental Sciences. Growing up in Montana, I've always had an affinity for exploring the outdoors and generally being immersed in wild places.

SAMPLE PROCESSING VISIT

Pioneer Mountains, Montana: an investigation of very dry, alpine glaciation proximal to LIS

University of Montana Western

Located in Southwest Montana, the Pioneer Mountain range is an extraordinary example of paleo glacier landforms. The focus of the study is to get TCN dates from our samples and to better understand the timing of retreat within the context of the Greater Yellowstone and Wind River Ranges. We hypothesize that the glacial maxima in the southwest Montana ranges occurred earlier than the traditional LGM (21 ka).

Visitor: Mana Bryant

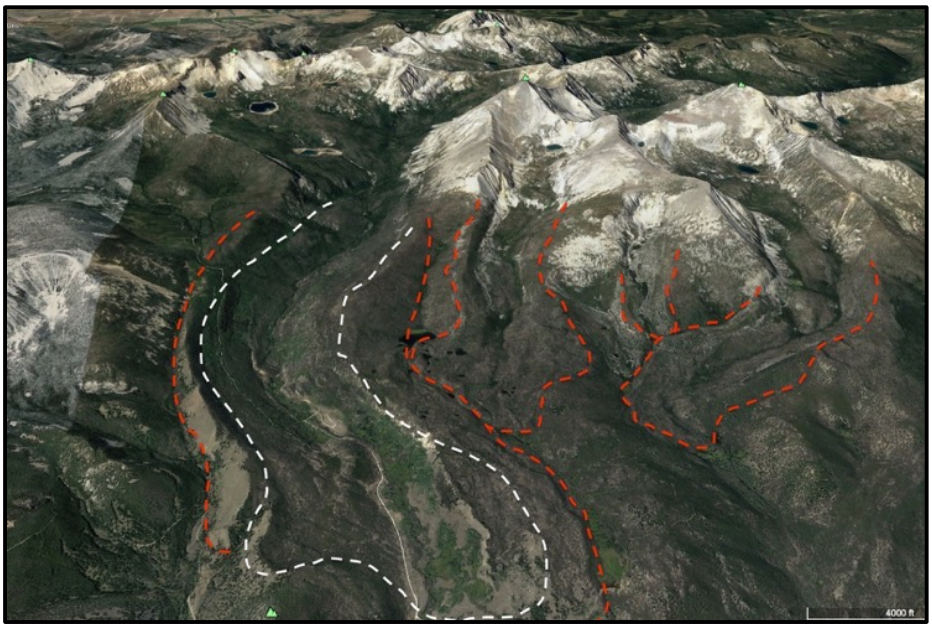
Visit dates: June 14 - August 6, 2021

Originally from Hawaii, I am an undergraduate at UMWestern with a major in Env. Sciences. My interest in glaciers started when I had the chance to go inside the Mer de glace in Chamonix, FR. I am excited to learn about glacial landforms and lab processing.

OBSERVATION VISIT

Pioneer Mountains, Montana: an investigation of very dry, alpine glaciation proximal to the LIS

University of Montana Western



We are working in southwest Montana, in the spectacular Pioneer Mountains. This region has no existing age control and was in close proximity to the Laurentide Ice Sheet, which may have caused glacier maxima to occur earlier than the traditional LGM (~21ka). The site could provide important constraints on how the growth of the Laurentide affected regional circulation and precipitation patterns, and new ages may help explain the large (~2-3 ka) discrepancies in timing observed in the Greater Yellowstone Glacier System and Wind River Range.

Visitor: Spruce Schoenemann
Visit dates: July 8-9, 2021

I am an Associate Prof at the University of Montana Western. I am relatively new to the cosmogenic nuclide research community, as my background is in using ice and sediment cores to reconstruct past climates.

VIRTUAL VISIT

Glacial history of the Krkonoše Mountains: Labe and Bíle Labe moraines

The Krkonoše Mountains National Park Administration

This project deals with the dating of 12 samples obtained from three previously non-dated glacial moraines in the Krkonoše Mts (Central Europe). All of these moraines are located in the central part of the mountain range, with specific topographic position related to other moraines being dated so far. The results should bring new chronological knowledge towards open questions about past glaciers in the area.

Visitor: David Krause

Visit dates: N/A- Unable to visit due to COVID-19 restrictions

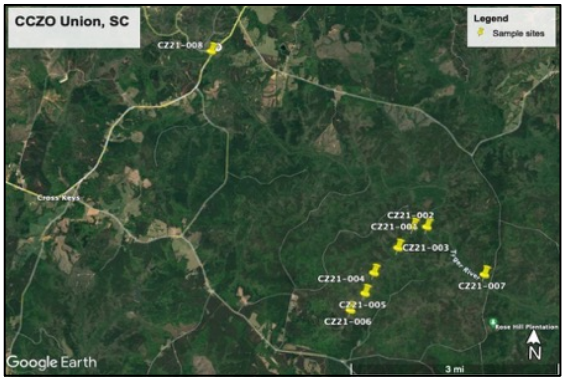
I currently work as a geomorphologist at the Krkonoše Mts National Park Administration, dealing with a project focused on complex mapping and research of geomorphic features. Glacial history is a very important part of this project.

SAMPLE PROCESSING VISIT

Erosion Rates of Sediment-Filled Valleys in the Calhoun Critical Zone Observatory (CCZO) Union, SC

The University of Georgia

The CCZO is located in a dendritic drainage system on the Piedmont, where during the 1800's to mid-1900's legacy sediments were emplaced from eroded soils due to poor farming practices. The Soil Conservation Act of 1935 set this land aside for study to understand how humans impact soil recovery. Measuring *in situ* ^{10}Be in quartz from Holcombe Branch and Tyger River sediments will help determine erosion rates in the CCZO. Further ^{10}Be measures of quartz in *in situ* soil profiles aid in this understanding.



Visitor: Holden D. Aronson

Visit dates: October 25 - November 12, 2021 and February 28 – April 8, 2022

I am Master's Student and Research Assistant at The University of Georgia. Prior to attending UGA I completed my undergraduate degree in Geology at Appalachian State University.

OBSERVATION VISIT

Geomorphology of the Pereiro Massif, Ceará, Northeast Brazil

State university of Ceará (UECE-Brasil)

I am conducting a Geomorphology research in the Pereiro massif, Ceará, Brazil, under the advise of Dr. Frederico Bastos, from a morphostructural perspective that seeks to explain the origins of this relief, supported by SIG and denudation rates, in order to verify the hypothesis that such relief is the result of differential erosion processes.

Visitor: Edmundo Rodrigues de Brito
Visit dates: November 10-12, 2021

My visit to CCF will take place with my PhD advisor (Frederico Bastos) and we will follow the analysis steps involving the measurement of cosmogenic isotopes produced in situ, seeking to understand the use of the method.

OBSERVATION VISIT

Geomorphology of the Pereiro Massif, Ceará, Northeast Brazil

State University of Ceará (UECE – Brasil)

My focus is developing researches in Geomorphology on the semiarid region of Northeastern Brazil. I try to interpret the morphostructural relationships and the origin of regional reliefs. I do morphostratigraphic and morphostructural analysis with the use of GIS. I am supervising a doctoral research that aims to analyze the Pereiro massif, where we will interpret the denudation rates from the measurement of cosmogenic isotopes.

Visitor: Frederico de Holanda Bastos
Visit dates: November 10-12, 2021

My visit to CCF will take place with my PhD student (Edmundo Brito) and we will follow the analysis steps involving the measurement of cosmogenic isotopes produced in situ, seeking to understand the use of the method.

SAMPLE PROCESSING VISIT

Channel Steepness, Erosion Rates, and Differential Uplift in the Klamath Mountains

Will Hefner and Eric Kirby (UNC), Kirsty McKenzie and Kevin Furlong (Penn State)

During summer of 2021, we collected samples of stream sediments to determine erosion rates in the Klamath Mountains of Northern California. This project is part of an effort to understand patterns of uplift in the Klamath and the processes that drive mountain building along the southern Cascadia forearc. I am very excited to follow up summer field work with my visit to UVM to process samples as the first step in my PhD at UNC.

Visitor: Will Hefner

Visit dates: November 15-19, 2021 and April 11-15, 2022

I am a new (summer 2021) PhD student in the Tectonic Geomorphology Group at UNC. I have a background in marine geophysics from my master's at UNCW where I worked on a volcano geodesy project at Axial Seamount, Juan de Fuca Ridge. I am very excited to start a new chapter as a geoscientist in my new field as a geomorphologist.

OBSERVATION VISIT

Exploring Landscape Evolution and Geomorphology

Middlebury College

Landscape Evolution is a 200-level undergraduate geology class taught at Middlebury College. Students in the course come from a variety of academic disciplines, including geology, geography, and environmental studies. At the CCF, we hope to get a firsthand look at how geomorphologists use laboratory methods as a tool to understand the processes that shape the Earth's surface.

Group Tour

Visit date: November 11, 2021

Names of Participants:

Josie Bourne
Elise Chan
Jack Clarner
Ethan DeMaio
Erin Hansbrough
Amanda Manoogian
Kyra McClean
Max Memeger
Justin Moran
Sara Murphy
Raffi Najarian
Alex Price
Emmet Schmeling
Eliza Tod
David Vargas
Molly Arndt (TA)
Vincent Falardeau (TA)
Lisa Luna (Instructor)

SAMPLE PROCESSING VISIT

Determining the controls on bedrock exposure and erosion in steep landscapes

Pennsylvania State University

This project aims to quantify the controls climate and vegetation on soil production and erosion rates in steep landscapes, where there is a mix of soil and bedrock at the surface. We have collected samples from multiple watershed in the Eastern Sierra Nevada Mountains in California in order to quantify how erosion rates vary across a gradient in climate and vegetation.

Visitor: Sarah Jonathan

Visit dates: February 21 - March 11 and May 9 - 20, 2022

Sarah Jonathan is a PhD student at Penn State studying geomorphology. She is interested in how climate and ecology shape geomorphic processes.

SAMPLE PROCESSING VISIT

TESPRESSO Project: Stratigraphy of the High Creek Provo delta, Utah

Lehigh University

The NSF TESPRESSO project wants to understand how exogenic forcings vs. autogenic processes conspire in building stratigraphy, in a source-to-sink system. Understanding past geomorphic responses to environmental changes enlightens on the future management of landscape and natural resources, preventing the impact, at human dimension, of future environmental conditions.

Visitor: Francesco Pavano
Visit dates: February 28 - March 11, 2022

I am a Post-Doctoral Research Associate at Lehigh University, collaborating with Dr. Frank Pazzaglia in research projects focused on still open questions in tectonic geomorphology. My other fields of expertise are also tectonics, structural geology and field mapping.

VIRTUAL VISIT

Exploring Cosmogenic Surface-Exposure Dating as a Tool for Dating Rock Glaciers

Middlebury College & North Dakota State University

Rock glaciers, like the one shown above, are mixtures of rock and ice that move slowly downslope in many mountain environments. A warming climate is causing ice within some rock glaciers to melt. We are studying the role of rock glaciers as sources of water and are using cosmogenic surface-exposure dating to determine how old this representative rock glacier in the Uinta Mountains of northern Utah is.

Visitors: Jeff Munroe and Ben Laabs
Visit dates: Virtual visit during spring 2022

The samples were collected by Jeff Munroe (faculty, Middlebury College) and Ben Laabs (faculty, North Dakota State University). They were processed to clean quartz at North Dakota State before being sent to UVM for Be extraction.

SAMPLE PROCESSING VISIT

Effect of the Woolsey Fire on ^{10}Be Concentrations from an Unburned Catchment

Eastern Michigan University

The focus of my research is to study if and how the 2018 Woolsey Fire, which burned through the Santa Monica Mountains, affected concentrations of ^{10}Be measured on different grain sizes of stream sand. My work focuses on samples from an unburned catchment and will be compared to existing grain size data from a burned catchment. I expect to have a higher ^{10}Be concentration because of a lack of landsliding.

Visitor: Colin O'Neill

Visit dates: June 13 – August 13, 2022

I am an undergraduate student in the Professional Geology program at Eastern Michigan University. Through this opportunity, I hope to gain experience working in a professional laboratory. I am excited to be able to hike and study all the areas around Burlington.

SAMPLE PROCESSING VISIT

Quantifying Soil Production Rates for the Appalachian Plateau Using Beryllium-10

Denison University

This is a student project that Matt plans on expanding once I leave Denison. We are quantifying soil production rates for the Appalachian Plateau. In tandem with these numbers, we are gathering depth profiles Cesium-137 to quantify decadal erosion rates. With background rates of erosion and recent anthropogenically accelerated rates, we can understand the long-term behavior of the landscape and how humans have impacted it.

Visitor: Daniel Gunther

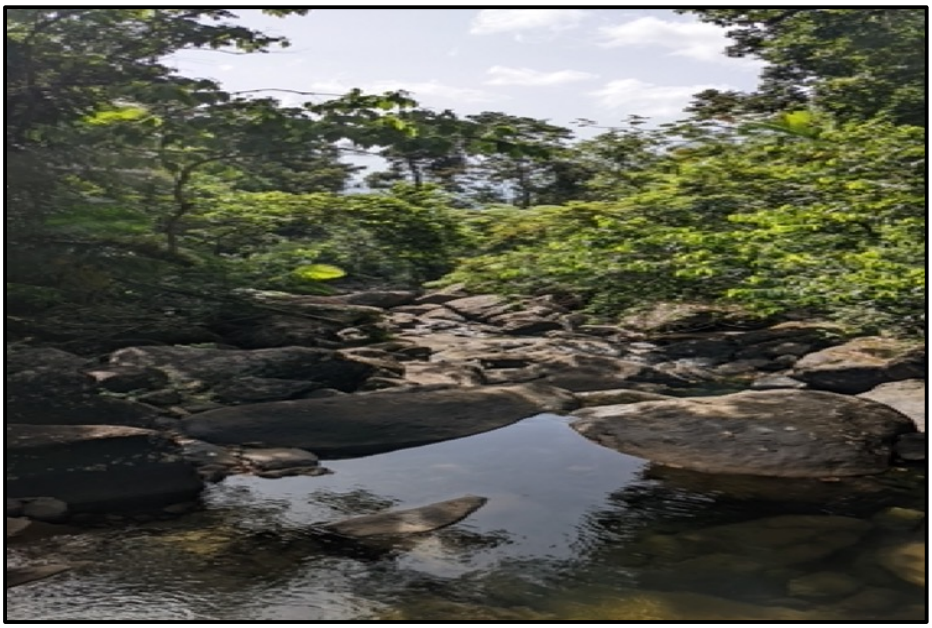
Visit dates: June 12-18 and September 5-9, 2022

Hello! I am a rising senior at Denison University. I grew up in New Jersey, but also spent time living in upstate New York (New Paltz for you climbers) and New Hampshire. I spend a lot of my time reading and have taken up cooking in the past few years.

SAMPLE PROCESSING VISIT

Comparing erosion rates and water chemistry between two rivers in Puerto Rico

Jackson State University



I am looking at how the water flow in two Puerto Rican rivers changes over time; for example, the dry season as compared to the wet season. I am interested in how the landscapes changes over time due to weather conditions. If climate conditions such as rainfall change, will the environment look different then what it looks like now?

Visitor: Janae Goodwin
Visit dates: June 13-26, 2022

I am from Illinois; I am currently an Undergrade at Jackson State University with a major in Meteorology. My interest in GIS started when I took an intro class at Jackson State. I am excited to learn about how to design the map associated with the study area.

SAMPLE PROCESSING VISIT

Comparing erosion rates and water chemistry between two rivers in Puerto Rico

Jackson State University

We are sampling water and sediment in two watersheds in Puerto Rico. These samples will provide us with details about the erosion rates of the granodiorite in the areas as well as nutrients and minerals in the water. We will analyze these samples to figure out the effects of current and past land use and if it is sustainable. This study will help us understand how these changes will affect the local communities.

Visitor: Mouhamadou Kane
Visit dates: June 13-26, 2022

Greetings, I am a rising senior from Atlanta, GA, studying biology with a concentration in environmental science at Jackson State University. I enjoy watching soccer and traveling to new places. I have an interest in climate change and I am excited to work in the lab.

SAMPLE PROCESSING VISIT

Comparing erosion rates and water chemistry between two rivers in Puerto Rico

University of Puerto Rico

We took samples from two rivers in the south of Puerto Rico to study their sediments and to explore how exposed these rivers may be to bacteria or factors that affect the community. How can water chemistry and erosion affect food systems over time? These rivers are close to agricultural fields, so it is important to know what we have around those fields that supply us with the main water source in these systems.

Visitor: Alondra Mercado
Visit dates: June June 13-26, 2022

I am a Puerto Rican and a second year Industrial Engineering student at the University of Puerto Rico. I am looking forward to expanding my knowledge and skills in science to implement my career in different areas. Excited to go see the cosmo lab!

SAMPLE PROCESSING VISIT

Study of the sediment and water geochemistry of Maunabo and Guayanés Rivers

University of Puerto Rico at Mayaguez

This research aims to quantify the differences between the Maunabo and Guayanés Rivers located in the southeast of Puerto Rico. We are studying the sediments and the geochemistry of the water in the tributaries located in the upside of the mountains and areas under the influence of human activity. The conclusion of this research will help us to have better knowledge of these two rivers and see how this affects the community.

Visitor: Iliomar Rodriguez Ramos
Visit dates: June 13-26, 2022

I am an undergraduate student from the University of Puerto Rico majoring in Theoretical Physics with a minor in Astronomy and curricular sequence in Applied Mathematics. I was born in Puerto Rico. I am looking forward to learn more about geoscience.

SAMPLE PROCESSING VISIT

Comparing erosion rates and water chemistry between two rivers in Puerto Rico

Jackson State University

We collected samples of water and stream sediments and tested for conductivity, dissolved oxygen, and E.Coli to determine erosion rates between two rivers in neighboring water sheds in Puerto Rico. This research is essential for agricultural purposes and human resources. I am looking forwards to visiting UVM to process these samples to presenting our finding at the annual GSA meeting in Denver, Colorado!

Visitor: Breanna Taylor

Visit dates: June 13-26, 2022

I am a senior from Jackson State University! I am a major in Criminal Justice and a minor in Chemistry with a concentration in Forensic Science. I enjoy traveling, nature, and exploring.

SAMPLE PROCESSING VISIT

Riverine landscape evolution in central Alaska with critical mineral resource implications

U.S. Geological Survey Alaska Science Center

This ongoing project aims to understand rates and processes of fluvial landscape evolution in eastern Alaska by dating pristine late Cenozoic river terraces in the tectonically quiescent Yukon-Tanana upland and active northern Alaska Range. Our findings test fundamental concepts of river landscape response to climate and tectonics while quantifying critical mineral resource-forming processes in these regions.

Visitor: Adrian M. Bender
Visit dates: June 20 - July 8, 2022

I study river landscape responses to active tectonics, climatic change, and human actions. I've published 4 studies with CCF data and collaboration since 2016 and look forward to visiting the lab again in 2022 to prepare 30 samples from the Yukon River basin in Alaska.

UVM STUDENT

When the ice left Canada: using ^{10}Be and ^{26}Al to date post-glaciation exposure

University of Vermont

I seek to better understand how the Eastern Canadian landscape has been impacted by paleoclimatic glaciers. To do so, I have spent time in Canada collecting modern and deglacial sediments for cosmogenic nuclide analysis. Reconstructing past climates, including periods of glacial growth and melting, is one part of informing modern climate action. Insight about climate change can be found in understanding our planet's past.

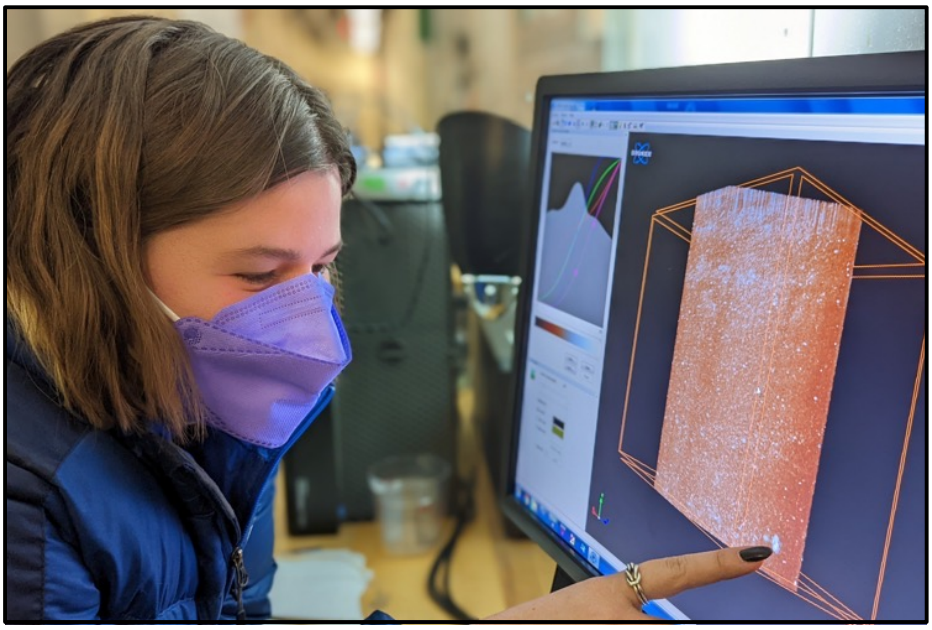
Student: Peyton Canvar, M.S., Environment and Natural Resources
Graduating: Spring 2024

I'm an avid environmentalist from the great state of Texas! My circle of expertise involves climatology, sustainability science, and Indigenous climate adaptation methods, the latter was the core of my undergraduate research and kindled my love of field work.

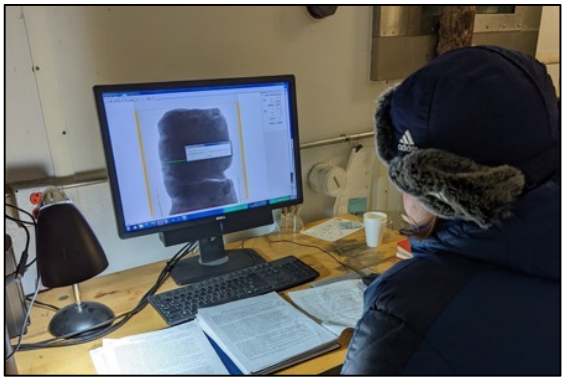
UVM STUDENT

Camp Century: characterizing sediments from beneath the Greenland Ice Sheet

University of Vermont



Using frozen sediment cores collected in the 1960s from beneath the Greenland Ice Sheet, we plan to better understand its history and susceptibility to melting with climate change. I will focus on the physical characteristics of the cores, using CT scans to look inside the samples to study the stratigraphy preserved. I will also look at ways to automate the characterization of the cores using machine learning techniques.



Student: Cat Collins, M.S., Environment and Natural Resources
Graduating: Spring 2024

I am a new Masters student at UVM from Albuquerque, New Mexico. I did my undergrad at Arizona State University in geology. I find the intersections of geology and climate science really interesting and I am excited to explore Greenland's history in that context.

UVM STUDENT

Paleo-ecology of Camp Century sediment, northwest Greenland

University of Vermont

My project focuses on studying past ecosystems to inform understanding of modern climate systems. This is part of a much larger collaborative effort to provide multiple lines of context for the history of the Greenland Ice Sheet. My work will involve macrofossil identification, pollen analysis, stable isotope analysis, SEM imaging and microfossil sample preparation from the Camp Century ice core.

Student: Halley Mastro, M.S., Environment and Natural Resources
Graduating: Spring 2024

I am originally from New Paltz, NY and finished a B.S. in Environmental Studies and Biology at Gettysburg College in December, 2021. I love hiking, crocheting, plants, and coffee.

UVM STUDENT

Geochemistry of Camp Century subglacial sediment, Greenland

University of Vermont

My research is leading the geochemical analysis of the Camp Century sub-ice cores. The goal is to interpret the depositional environment of the sediment, the glacial and deglacial history, and the weathering history of the sediment during interglacial times in Greenland. I will use geochemical and isotopic methods including oxygen isotopes, ICP/OES and ICP/MS analysis of pore water and sediment, and meteoric ^{10}Be.

Student: Juliana G.R. de Souza, M.S., Environment and Natural Resources
Graduating: Spring 2024

I am from southeast Brazil, and just completed my B.S. in Geological Engineering by the Federal University of Ouro Preto in July 2022. I love glaciers, nature, and intercultural experiences.

SAMPLE PROCESSING VISIT

Searching for the Missing Ice Sheet in North-East Siberia

Aarhus University, Denmark

My field work takes place in NE Siberia, where I'm looking for traces of the ice sheet that once occupied the area. I have sampled boulders left behind by the ice to estimate the timing of retreat of the ice sheet. Better understanding of the Siberian ice sheet will help us understand the climate system and global ice volume/sea level relations. The boulders are most likely from either the last or penultimate glacial period (~20 ka or ~135 ka ago).

Visitor: Jesper Nørgaard

Visit dates: August 29 - October 8, 2022

I'm a PhD student from the Institute for Geoscience at Aarhus University in Denmark. I have worked with quaternary climate and cosmogenic nuclides ever since I started my Master's project at Aarhus University.

OBSERVATION VISIT

Valley deepening in the Sudetes and Tatra Mtns using cosmogenic burial dating of cave sediments

Syracuse University and University of Wrocław, Poland

The karstic cave networks of the Tatra and Sudetes Mountains are developed in levels that serve as paleo-water table indicators. As valley incision progresses, the karstic cave network lowers, resulting in the transition of karst conduits from phreatic to vadose. We sampled allochthonous cave sediments derived from the headwaters of the surface catchments of the Tatra and Sudetes Mountains for cosmogenic nuclide burial ages.

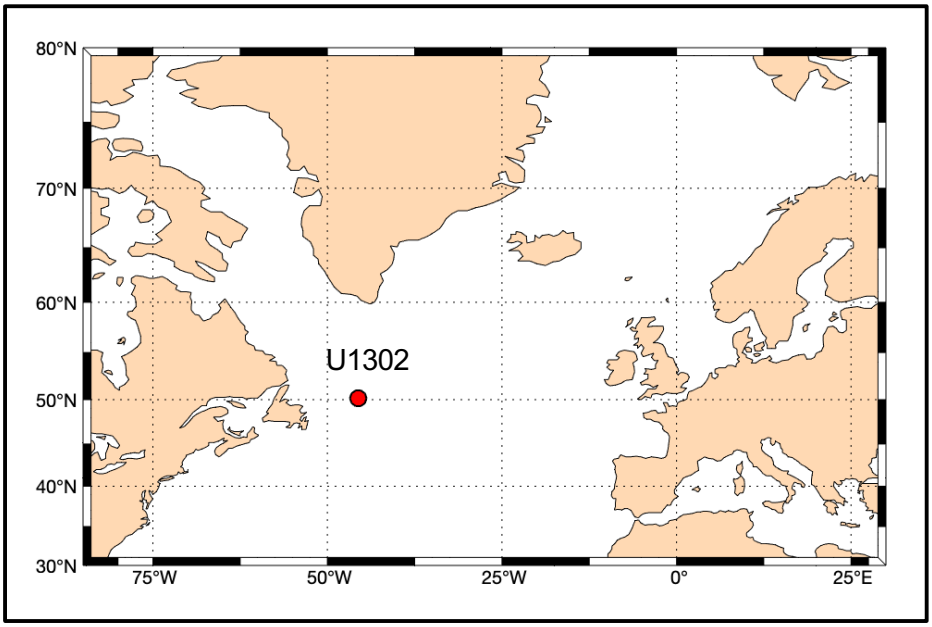
Visitors: *Greg Hoke (Syracuse U.) and Artur Sobczyk (U. Wrocław)*
Visit dates: September 21-22, 2022

Greg Hoke is a professor at Syracuse University. Artur Sobczyk is an assistant professor at the University of Wrocław and leads the new quartz preparation laboratory there. We are visiting the CCF to learn about methods and see column chemistry on our samples.

SAMPLE PROCESSING VISIT

3 Myr of Laurentide Ice Sheet History Inferred from Cosmogenic Nuclides in Ice-Rafted Debris

Boston College



The goal of this project is to reconstruct the evolution of the Laurentide Ice Sheet across the Pleistocene. To do this, we are analyzing cosmogenic nuclides ^{10}Be and ^{26}Al in quartz separates of ice-rafted debris taken from North Atlantic sediment cores. Previously, this approach was applied to North Atlantic sediments across the last glacial period and showed the Laurentide may have been persistent across many Pleistocene interglacials.

Visitor: Danielle LeBlanc

Visit dates: February 14 - March 3, 2023

Danielle is PhD student at Boston College studying paleoclimatology and paleoceanography. She is interested in using the marine sediment record to reconstruct changes in ice sheet and ocean processes.

SAMPLE PROCESSING VISIT

Glacial and Periglacial Influences on a High-Elevation, Low-Relief Western Nepal Surface

University of Toronto, University of Arizona

My work concerns a low-relief surface perched between 4.3 and 4.8 km in the Nepal Himalaya. The area contains abundant features indicative of glacial and periglacial erosion, but it is unclear whether these processes are responsible for low relief or simply overprint an initially low relief surface. This project will explore how ice modifies landscapes and whether the Tibetan Plateau once extended much further south.

Visitor: Josh Wolpert

Visit dates: February 27-March 17 and May 1-19, 2023

Josh is a third year PhD student at the University of Toronto. His research in tectonic geomorphology has taken him to some awesome places, including Georgia (Caucasus), Brazil, and Nepal. He likes to run, play squash, and explore new places!

OBSERVATION VISIT

Interplays between tectonics, climate, and rock type as drivers of landscape and biotic evolution

Queens College, City University of New York

I investigate the interactions between rock type, tectonics, climate, and surface processes and their individual contributions to the evolution of mountain ranges and continental interiors. In the Amazon and Parana basins, I study how rock types cause river network reorganization, which may help us to better understand biodiversity. I am also working in the Amazon region to understand human impacts on soil erosion.

Visitor: Pedro Val
Visit dates: April 5 – 7, 2023

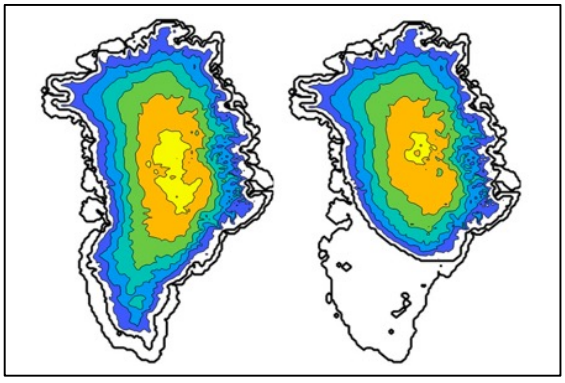
I am visiting the CCF because I would like to learn more about the facility and to learn about its procedures in the lab so that my group (myself and students) can be trained and process samples in the future. I am an Assistant Professor at Queens College, CUNY.

OBSERVATION VISIT

Modeling and observing Greenland Ice Sheet melt during MIS 11 and the Eemian

University of Pennsylvania

My current research focuses on modeling Greenland Ice Sheet melt and subsequent sea level rise during marine isotope stages 11 and 5e (the Eemian), periods that serve as possible analogues for present and future melt of the ice sheet under current warming predictions. I hope to supplement such work with cosmogenic nuclides from the bedrock of Greenland as well as stable isotopes found in ice cores.



Visitor: Chris Larson

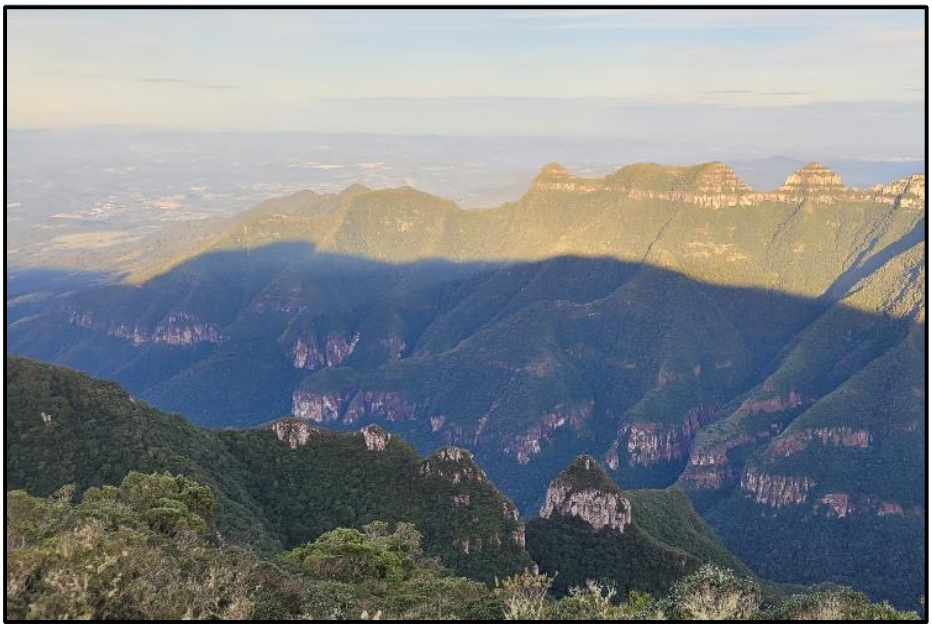
Visit dates: May 3-4, 2023

I am a first-year PhD student in the Department of Earth and Environmental Science at the University of Pennsylvania, working with Dr. Michael Mann.

SAMPLE PROCESSING VISIT

Erosion rates along the continental escarpment in Southern Brazil

University of Toronto



Continental escarpments are common features along many passive margins. This project seeks to determine erosion rates along the Brazilian continental escarpment (> 1,000 m in elevation) in SE Brazil. Erosion rates will be used to understand the long-term evolution of this landscape, and answer the following questions: 1) how lithology influences the rate of escarpment retreat? 2) what are the effects of river capture in this region?

Visitor: Mauricio Barcelos Haag

Visit dates: June 19-30 and September 18-28, 2023

I am 2nd year Ph.D. student at the University of Toronto studying the landscape and tectonic evolution of the Parana-Etendeka Igneous Province. I am visiting the CCF because I want to get hands-on experience in sample processing for erosion rates.

SAMPLE PROCESSING VISIT

Improvement to the use of ^{10}Be in Pyroxene for cosmogenic nuclide exposure dating

Berkeley Geochronology Center

Measurement of multiple cosmogenic nuclides in single samples is routinely feasible only in quartz-bearing rocks. However, in Antarctica, the majority of clasts on the surface of extensive moraine sequences in the Transantarctic Mountains, are Ferrar Dolerite. Therefore, this research project attempts to (i) improve the efficiency of ^{10}Be extraction from pyroxene in the Ferrar Dolerite by fusion and (ii) make more precise estimates of the production rates of ^{10}Be in pyroxene than are currently available.

Visitor: Marie Bergelin

Visit dates: September 4 - October 5, 2023

Marie Bergelin is a Postdoctoral Fellow at Berkeley Geochronology, and this visit will be her third time visiting the Cosmo Lab. She is an active person and enjoys outdoor activities such as hiking, running, biking, and paddle boarding.

UVM STUDENT

Analysis of a Saprolite Profile in southeastern Puerto Rico

University of Vermont

I am working on analyzing and interpreting the saprolite profile pictured here from Puerto Rico. I helped hand collect it this past summer with Bella Bennett, Adriana Morales, and Cat Collins. While at the UVM Cosmo Lab I will be working on identifying the elemental composition and I will be looking at ^{10}Be concentrations at the different depths, to gain insight into how intense tropical weathering has impacted the composition of the slope.

Student: Maddie Lewis, B.S., Environment Science and Geology

Graduating: Spring 2024

My name is Maddie Lewis and I am a current second year undergrad at the University of Vermont. I am originally from the suburbs of Chicago, IL and I am studying Environmental Science with a concentration in Geology at UVM.

SAMPLE PROCESSING VISIT

Erosion rates and burial ages of uplifted fluvial-deltaic deposits in NE Sicily

Utah State University

We are dating and determining erosion rates for Pleistocene fluvial-deltaic deposits in Sicily to constrain the timing and rates of local tectonic processes. These datasets will be used to investigate how tectonics and climate conspire to form sedimentary archives and geomorphic markers. We are also exploring if luminescence properties of quartz sand from these deposits can be used as a proxy for environmental changes.

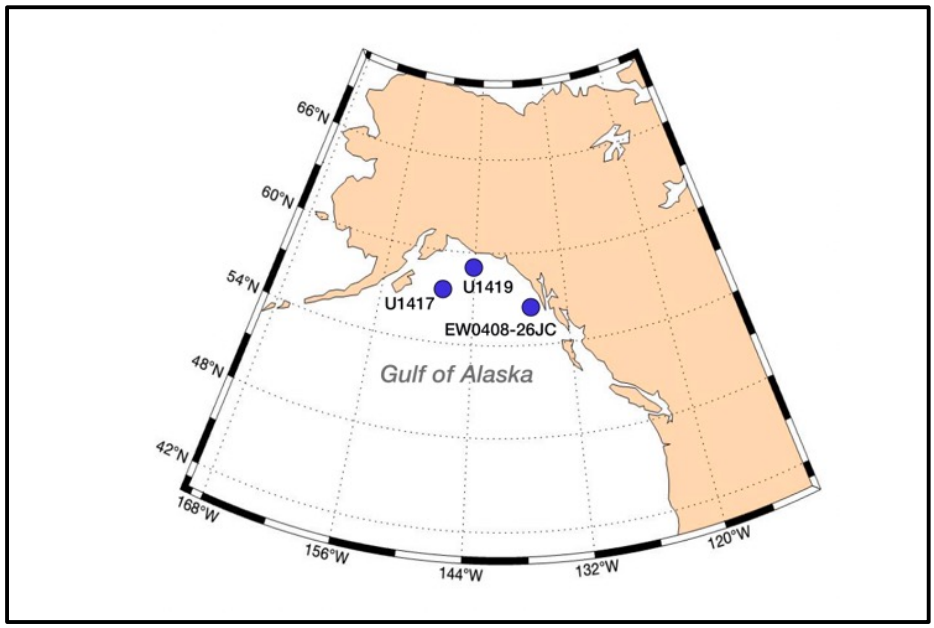
Visitor: Natalie Tanski
Visit dates: March 4 - 8, 2024

I am a PhD candidate in the Geosciences Department at Utah State University, and I am advised by Dr. Tammy Rittenour. I am visiting the CCF to get hands-on training and to learn about Be/Al extraction.

SAMPLE PROCESSING VISIT

Cordilleran Ice Sheet history from cosmogenic nuclides in ice-rafted debris

Boston College



Our goal is to examine Cordilleran Ice Sheet processes, including erosion history and sensitivity to climate shifts, over millions of years. While terrestrial cosmogenic nuclide concentrations are often "reset" during each glaciation, cosmogenic nuclides in ice-rafted debris (IRD) offer an opportunity to reconstruct ice sheet process over multiple glacial cycles. We will measure ^{10}Be and ^{26}Al in quartz isolated from IRD in three North Pacific sediment cores near the former ice sheet margin. Combined with prior work, our data will also help to constrain contributions to past sea level changes.

Visitor: Calen Rubin
Visit dates: March 4–8, 2024

Calen is a PhD student at Boston College. She uses a multi-proxy approach to reconstruct long-term North American ice sheet history and climate conditions. When she's not in the lab, she enjoys reading, winter hiking, and trying new recipes.

SAMPLE PROCESSING VISIT

Dating the incision of the Lower Amazon River

Queens College, CUNY

This PhD research project is an investigation of the evolution of the Amazon River Basin. We are studying the northern tributaries of the Lower Amazon River in the Amazonas state. We aim to obtain the age of waterfalls in these rivers as a proxy for the age of the formation of the transcontinental Amazon River. This work is a contribution to basin evolution dynamics with potential links with biogeographic studies.

Visitor: Pedro Oliveira

Visit dates: March 25-29 and September 9-20, 2024

Pedro Oliveira is a 2nd year PhD Student at Queens College, City University of New York.
His research is focused on the landscape evolution of the Amazon River Basin
He has an undergraduate degree in Geology from the Federal University of Ouro Preto.

SAMPLE PROCESSING VISIT

Quantifying long-term aeolian abrasion rates on hard rock surfaces

University of Texas at Arlington

This project is quantifying the erosion rate of ventifact surfaces - in Silver Lake and Garnet Hills, CA - using a combination of luminescence rock surface exposure dating and cosmogenic Be-10 and C-14 exposure dating. Together, the techniques should reveal long-term erosion rates at different scales on natural ventifacts.

Visitor: Diana Valenzuela Davila

Visit dates: April 15-26 and October 7-11, 2024

I am a 1st year PhD student at the University of Texas at Arlington.

SAMPLE PROCESSING VISIT

Analyzing Meteoric ^{10}Be in the Camp Century Sub-Ice Sediment Core

University of Pennsylvania

I will be measuring the meteoric ^{10}Be down the length of the Camp Century sub-ice sediment core to gain a better understanding of Greenland ice sheet history and behavior during interglacial periods. This lab work encompasses the third chapter of my PhD thesis, providing a supplement to my modeling work in the other two chapters, where I focus on modeling Greenland ice sheet melt during the Eemian and MIS 11.

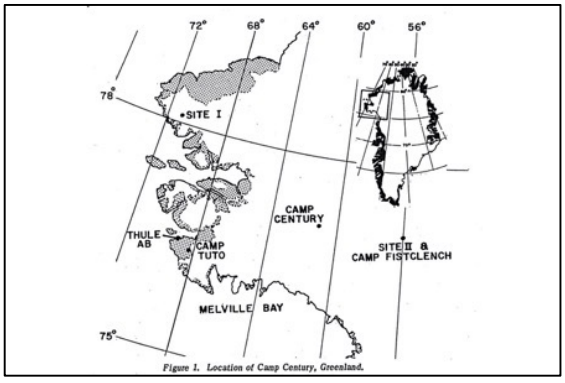


Figure 1. Location of Camp Century, Greenland.

Visitor: Chris Larson

Visit dates: May 6-10, 2024

Chris Larson is a second-year PhD Candidate working with Michael Mann at the University of Pennsylvania. His research focuses on Greenland ice sheet stability during the Eemian and MIS 11. He holds a BS in Meteorology from Texas A&M University.

SAMPLE PROCESSING VISIT

Understanding ice sheet processes from glacial sediments in depositional environments

Williams College

Our team is investigating what can be learned about ice sheet histories and processes from measuring cosmogenic nuclides in glacial deposits. Ice-contact delta deposits in New England will help us understand the erosional efficiency of the Laurentide Ice Sheet. Glacial marine sediments collected off the northwest coast of Greenland will help us understand the long-term history and dynamics of the Greenland Ice Sheet.

Visitor: Chris Halsted (with Jazmin Morenzi and Charlie Halverson)
Visit dates: June 26 – September 6, 2024

Halsted is a visiting professor at Williams College and a former PhD student at UVM. Morenzi and Halverson are Williams students, geoscience majors, and summer research assistants.

SAMPLE PROCESSING VISIT

Greenland Ice Sheet long term history from IODP Expedition 400 sediments

Williams College

We are measuring cosmogenic nuclides in marine sediments collected off a glaciated margin to investigate the size and dynamics of the Greenland Ice Sheet over the past 10 million years. Our analyses will indicate if the Greenland ice sheet was smaller during periods of analogous temperatures to today. What can Be-10 levels in marine sediment cores tell us about the Greenland ice sheet's evolution and sensitivity?

Visitor: Jazmin Morenzi

Visit dates: June 26 - 28, 2024

Jazmin is a rising junior and undergraduate summer research assistant working under Prof. Chris Halsted at Williams College.

SAMPLE PROCESSING VISIT

Cosmogenic analysis of ice-contact deltas to understand Laurentide Ice Sheet subglacial erosion

Williams College

Our team is using cosmogenic nuclide analysis to look into sediment remnants of ice-contact deltas from the Last Glacial Maximum. With Be-10 results from these grains, we are hoping to get a better understanding of the erosional rates from the Laurentide Ice Sheet's effect on altering the New England landscape. Results will demonstrate how far into the soil the glaciers eroded.

Visitor: Charlie Halverson
Visit dates: June 26 - 28, 2024

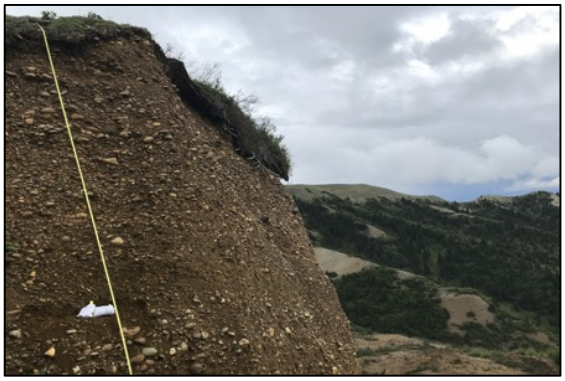
Charlie is from Englewood, Colorado and is a rising junior and undergraduate summer research assistant working under Prof. Chris Halsted at Williams College.

SAMPLE PROCESSING VISIT

From basin to range since Pliocene time? Dating Nenana Gravel deposition (central Alaska, USA)

U.S. Geological Survey Alaska Science Center

The Nenana Gravel (NG) is a regionally extensive ancient basin deposit that is now perched atop the northern Alaska Range foothills (north-tilted range front panels shown above). Thought to record the Pliocene and younger erosion of the rising Alaska Range, depositional ages of the NG will illuminate global climate-erosion linkages and regional long-term landscape related to modern critical mineral deposits and seismic hazards.



Visitor: Adrian Bender
Visit dates: October 14 - 25, 2024

I'm a Research Geologist at the U.S. Geological Survey Alaska Science Center where I study how Alaska's landscapes record and adjust to climatic change, earthquake-related rock uplift, and/or human action over the past century.

SAMPLE PROCESSING VISIT

Mechanisms and Timing of Exhumation in the Altai Mountains, Western Mongolia

Lehigh University

Testing exhumation histories requires a reconstruction of Altai topography through time with respect to the surrounding basins. Through integration of field observations and modeling, we will place limits on the contributions and timing of the tectonic and dynamic processes that built the Altai. Catchment-scale erosion rate is a constraint on long-term rock uplift rates, which helps us determine how the Altais formed.

Visitor: Nora Vaughan

Visit dates: January 6 - 17 and September 8 - 19, 2025

Nora Vaughan is a PhD student at Lehigh University.

SAMPLE PROCESSING VISIT

The Contribution of Landslides to Mountain Denudation: Insights from *in situ* ^{14}C and ^{10}Be

Syracuse University

Landslides are a geomorphic process that plays a major role in shaping steep mountains. Despite its importance for downstream communities, their contribution to mountain denudation and landscape form remains unclear, owing to the sporadic nature of landslides and the short observational timescales. This study is aimed to bridge this knowledge gap by combining *in situ* cosmogenic ^{14}C and ^{10}Be.

Visitor: Benjamín Guerrero

Visit dates: February 24 - March 7, 2025

Benjamín is a Chilean geomorphologist and PhD student at Syracuse University whose research aims to exploit potential imbalances on *in situ* ^{14}C- and ^{10}Be-derived denudation rates to infer landslide denudation rates in the San Gabriel Mountains (CA, USA).

SAMPLE PROCESSING VISIT

Burial dating and erosion rates estimates for sediment dynamics analysis in the Andes

Syracuse University

In mountainous landscapes, sediment dynamics are a critical component of our environment, yet they are often overlooked in data-scarce tropical regions with adverse climatic conditions. In this research project, I aim to investigate the changes in sedimentation dynamics that have occurred over the Quaternary in the tropical Andes by means of catchment-scale erosion rates and burial dating.

Visitor: Helbert Garcia-Delgado
Visit dates: February 24 - March 7, 2025

Helbert Garcia-Delgado is a PhD candidate from Colombia. He has been doing research on landscape evolution and natural hazards in the Colombian Andes. He has also worked on geological mapping, data acquisition, and field sampling for different purposes.

SAMPLE PROCESSING VISIT

Analyzing Sediment Residence Times in the Eastern Sierra Nevada

University of California, Merced

In mountainous landscapes, weathering and erosion play key roles in nutrient cycling and modulating atmospheric CO_2. However, spatial patterns of weathering and erosion in these areas are complex due to their heterogeneity. My aim is to tease apart climate and topography, because they often co-vary, by examining the effects of local slope on sediment residence times in the weathering zone in the eastern Sierra Nevada.

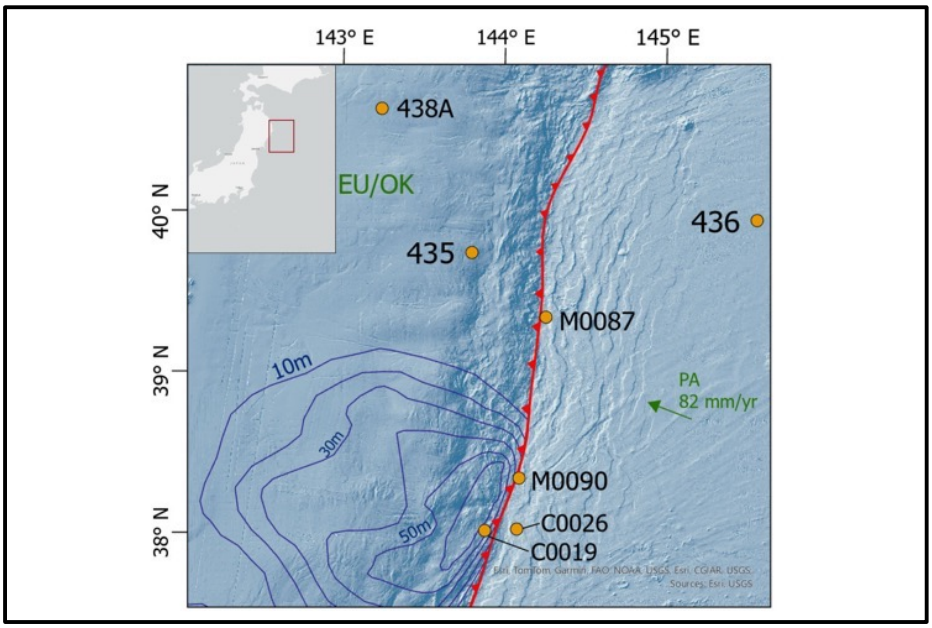
Visitor: Seth Gilchrist
Visit dates: April 14 - 25, 2005

Seth Gilchrist is a fourth year PhD student at the University of California, Merced. His current work involves studying the effects of local slope on the residence times of rocks in the weathering zone, as well as how boulders and cobbles break down into sediments.

SAMPLE PROCESSING VISIT

Grain Size & Compositional Influences on Meteoric ^{10}Be Concentration & Sediment Age

Northern Arizona University



I'm working on a project focused on marine sediments from the Japan Subduction Zone, an area known for powerful earthquakes and tsunamis. By better understanding how ^{10}Be dating works in different types of sediment, I hope to improve our ability to detect hidden faults in the prism. This could help identify areas that might rupture in future earthquakes and lead to more accurate tsunami models.

Visitor: Alexis Bryant

Visit dates: April 28th - May 22nd, 2025

I'm a first-year Geology master's student visiting from Northern Arizona University. I earned my bachelor's in Geology from Oregon State University. My interests include sedimentology, tectonic geomorphology, geochemistry, and subduction zone dynamics.