PETROGLYPHS

Environmental Earth Science

2022-23 Newsletter 12th Edition

Message from the Chair

Stephen Nathan

Hello Everyone,

Tempus fugit, eh? (That's a little mix of Latin and Canadian.) It's time again to share the many accomplishments made by the Environmental Earth Science students and faculty over the past academic year.

So, let me jump right in with a few tidbits, in no particular order, to entice you to explore the rest of this newsletter. During the past year, our EES National Honor Society (Sigma Gamma Epsilon) chapter inducted twelve new members and held a successful fundraiser for earthquake victims in Turkey and Syria, as well as holding other events. Drs. Drzewiecki and Hyatt successfully guided eleven EES majors on a 12-day Global Field Course to western Colorado and southeastern Utah. There the students took in stunning views of several national parks, all the while learning about the geologic processes that created them and experiencing the local environment and culture. EES majors Emma Bean and Olivia Gentile presented their research at the *first* in-person meeting of CREATE since 2019; yes, the COVID tunnel was that long. EES senior Emily Watling won top honors for her presentation at the New England Estuarine Society annual meeting, while four EES students and three faculty participated in the 2023 joint Northeast/Southeast Geological Society of America meeting. At NE/SE-GSA EES students Jonathan Lepire and Cameron Soulagnet presented posters of their research. Last, nine EES students also kept busy with a wide range of exciting research projects during the summer of 2023.

We wrapped up the school year with our annual End-of-Year Celebration. During the celebration five research recognition awards, a $1000 Solar Energy Association of Connecticut scholarship, and four academic excellence awards were given, with the top award for overall achievement going to EES senior Emily Watling. Our guest speaker, EES alumnus Mackenzie Fannon ('15; Project Manager at Verdantas) did a great job offering the students very helpful career advice.

I can't leave out giving credit to the entire EES faculty for their hard work during the past year. The deep and genuine commitment the full-time and part-time EES faculty have for their teaching is unmatched. The same can be said for the advising and mentoring they provide the EES students, all the while maintaining the highest level of scholarship.

To close, I want to thank Assistant Department Chair Bryan Oakley for all his hard work and support during the academic year and my three-year term as Chair. It has been an honor for me to serve as Chair and an experience I will never forget.

In the Spotlight

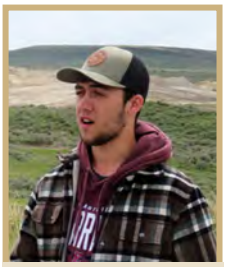
STUDENT RECOGNITION AWARDS

April 27, 2023

Emily Watling

Outstanding Environmental Earth Scientist: In recognition of her enthusiasm, academic achievement and contributions to the Environmental Earth Science major.

Quaternary Geology Recognition: Award is given to students who have excelled in both applied research topics and coursework pertaining to the Quaternary geology of New England.



Aiden Gamache

Hard Rock Geology Recognition: Aiden has demonstrated the highest level of academic achievement in structural geology, mineralogy, and igneous and metamorphic petrology.

Cameron Soulagnet

Quaternary Geology Recognition: Award is given to students who have excelled in both applied research topics and coursework pertaining to the Quaternary geology of New England.

Emma Bean

Geomorphology Research Recognition Award: In recognition of the collective efforts in learning and applying digital photogrammetry to ground and airborne imagery of natural and built environments in Connecticut and Rhode Island.

Solar Energy Association of CT Scholarship Award: Emma has demonstrated the highest level of achievement in student research and academics in the classroom, laboratory and the field.

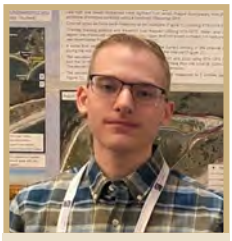
Olivia Gentile

Geomorphology Research Recognition Award: In recognition of the collective efforts in learning and applying digital photogrammetry to ground and airborne imagery of natural and built environments in Connecticut and Rhode Island.

Junior Academic Excellence Award: In Recognition of Academic Excellence in the Junior Class.

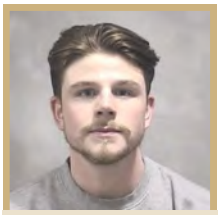
Hans Veltheim

SeniorAcademic Excellence Award: In Recognition of Academic Excellence in the Senior Class.



Jonathan Lepire

Junior Academic Excellence Award: In Recognition of Academic Excellence in the Junior Class.



Nick Aukerman

Sophomore Academic Excellence Award: In Recognition of Academic Excellence in the Sophomore Class.

FACULTY UPDATES

Dickson Cunningham

Wow the years fly by, but somehow, I never seem to get older compared to my faculty colleagues. I also have some land for sale in the Everglades and welcome non-refundable cash offers…

OK, now for the truth! On the teaching front, during 2022-23 I taught Mineralogy/Petrology and Structural Geology, Dynamic Lithosphere and the EES Career Development course. All four courses are fun to teach and I have increased the number of field trip labs in the upper-level courses which the students appear to appreciate. I did not run the extended field course out west this year, which was a welcome break for me.

EES 356 students on Lantern Hill, fall 2023

On the research front. I continue to tie up loose ends from my prior Central Asia summer seasons and have established a fruitful collaboration with Haibo Yang who previously spent a year of his PhD with us here in EES. We published three papers together during the last year on active fault systems in the Hexi Corridor and North Tibetan Foreland of western China. This research connects with my long-term interests in documenting the active intraplate deformation field in Central Asia and processes of crustal re-activation and transpressional mountain building in continental interior settings. This is a topic that is relevant to understanding the geological development of all of Earth's continents. I have now spent nearly 30 years investigating the crustal evolution of Central Asia having completed 19 field seasons in China and Mongolia since 1994. Our recent work also includes quantitative assessment of earthquake hazards for the populous Silk Road cities and oasis towns in Gansu and Xinjiang provinces. Two of our 2023 papers were published in *Tectonics* and the other in the *Journal of Structural Geology*. This research became a priority during the academic year, and so my CT field research was put on hold, but is now being restarted at the time of writing.

Presenting at EGU conference in Vienna, spring 2023

I only presented at one research conference this year, but it was at the European Geosciences Union annual meeting in Vienna in April which had about 18,000 attendees and was a huge and intellectually stimulating meeting. I used to serve on the EGU Organizing Committee when I worked in the UK, so it was great to go back and become reacquainted with the European geoscience community. I gave a talk on some tectonic lessons learned from deforming regions of Central Asia and also took a few days out with my son to enjoy the Alps around Salzburg, and float down the Danube through the Wachau Valley, which was beautiful in springtime.

With Sam at Konigsee, Bavarian Alps

Near Berchtesgaden

Wachau Valley, Danube River Cruise

On Mt. Willard overlooking the U-shaped valley of Crawford Notch, NH

In Late June and early July, I also took two students up to the White Mountains in New Hampshire for eight days of dual-purpose fieldwork. The primary objective was to firm up field trip locations for an extended field course I plan to run during spring, 2024 to New Hampshire and Maine – titled something like "Summits and Seashores". I have spent a lot of time in the White Mountains in my life, but needed another trip to be sure of field trip locations, learning outcomes, trail lengths and some safety and logistical issues, prior to taking an entire class up north. The other purpose was to mentor EES majors Cameron Soulagnet and Andrew Streeter in basic hard-rock field research skills to better document and understand important igneous and metamorphic outcrop features, and make basic interpretations of igneous and structural cross-cutting relationships. In addition, we made many observations of glacial and fluvial landforms. In fact, we saw so many interesting stream and river features that I now think the future trip should be called "Summits, Waterfalls and Seashores".

During the week, we climbed Mts Cardigan, Stinson, Willard, Dickey, Welch and hiked trails in Franconia Notch, Crawford Notch and in the northern Presidential Range. We also visited pegmatite quarries in western Maine and made a quick trip into Vermont to examine the geology of Quechee Gorge. Tourist trips to The Flume and Lost River during rainy periods were also included. One of the non-geological highlights was coming across a very healthy bull moose on the ME-NH border near Evans Notch.

On the personal front, it has been a rewarding year. Our son, Sam continued his hockey career playing for 6 months during fall-winter all over CT and MA. In the spring he played on his high school tennis team and had a very successful season as the number 2 singles player. I took him on a vacation to Puerto Rico in early June and we snorkeled in the islands east of Puerto Rico and hiked and swam in the El Yunque Rain Forest in the central highlands. It was not a geology trip, but all of the stream-side outcrops that we swam from were pillow lavas! Finally, at home, I finished digging, building and landscaping a large pond on our property. We hope it fills with frogs and turtles!

We also hosted a Ukrainian middle school refugee student for 9 months named Nika. Although our role was to provide a safe and secure home for her as she completed 8th -grade, we feel that in turn, she enhanced our lives, and we learned a great deal from her about Ukrainian culture. She has now returned to Kiev to be with her family. We desperately hope peace returns to her country and that she can have a normal life there as she grows up and progresses through her high school years.

Finally, during fall 2023, EES will be celebrating its 50th Anniversary as a department at ECSU. Our department continues to be very strong in every category of endeavor and we are so proud of all that has been accomplished in EES since its founding. We are planning a major celebration event in Fall.

The clear waters of Cayo Icacos, and yours truly leaping into a cool pool in El Yunque rain forest, Puerto Rico.

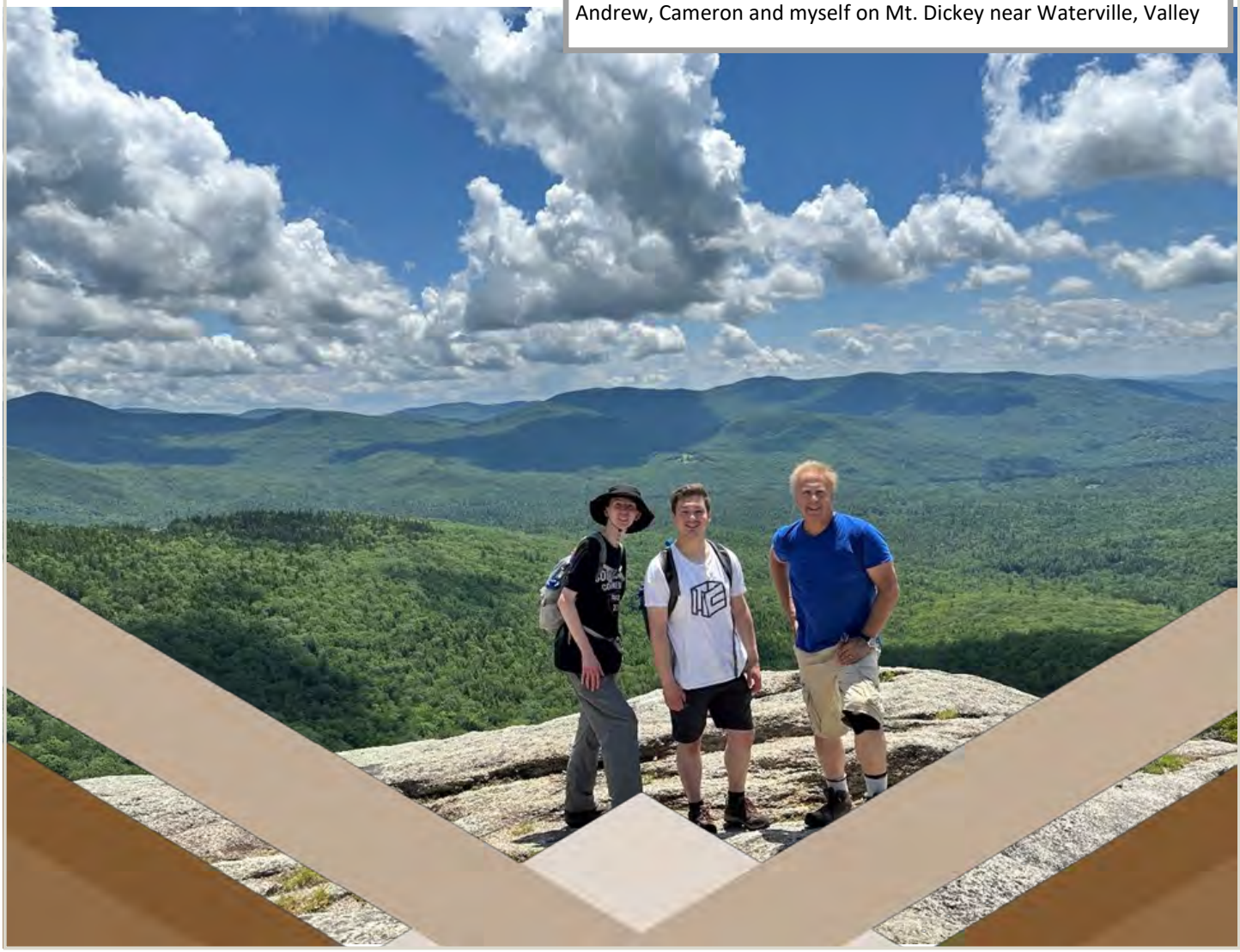
Student Investigations of White Mountain Geology

New Hampshire-July 2023

Dickson Cunningham

In late June-early July, I took EES majors Cameron Soulagnet and Andrew Streeter up to New Hampshire to provide them with field experience in understanding the complex bedrock geology of northern New England. The students made observations and recorded key features at each location related to the region's metamorphic, structural and igneous evolution. The trip was also a dress rehearsal for a future extended field course to New Hampshire and Maine scheduled for spring, 2024.

Both students worked hard every day hiking up and down various mountains and along trails to key geological locations. Highlights included Quechee Gorge, climbing Mts Cardigan, Stinson, Black, Willard, Welch, and Dickey, exploring Crawford, Franconia, Kinsman, Evans and Pinkham Notches, and visiting geo-tourist sites like The Flume and Lost River. Other stops at waterfalls and pegmatite quarries rounded out the trip. Important themes that emerged and will be emphasized on next year's field include, the poly-deformational history of the regional Paleozoic metasedimentary belt, magma chamber processes associated with individual plutons and the White Mtn Batholith, granite landforms, ecological communities at different elevation levels, the region's glacial and fluvial landforms and Ice Age history, landsliding, sustainable geotourism, and the historical pegmatite mining industry.

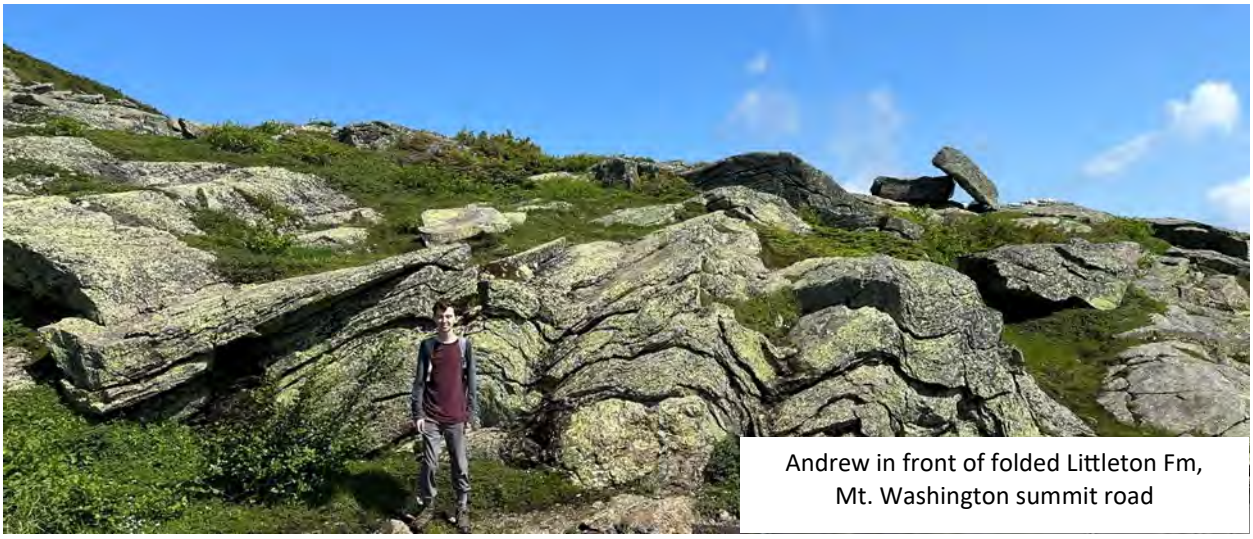


Andrew, Cameron and myself on Mt. Dickey near Waterville, Valley

Some Highlights of our Trip

Andrew and Cameron on Mt. Cardigan

Andrew and Cameron above Huntington's Ravine, Mt. Washington



Andrew in front of folded Littleton Fm, Mt. Washington summit road

Cameron and Andrew at The Flume, Franconia Notch

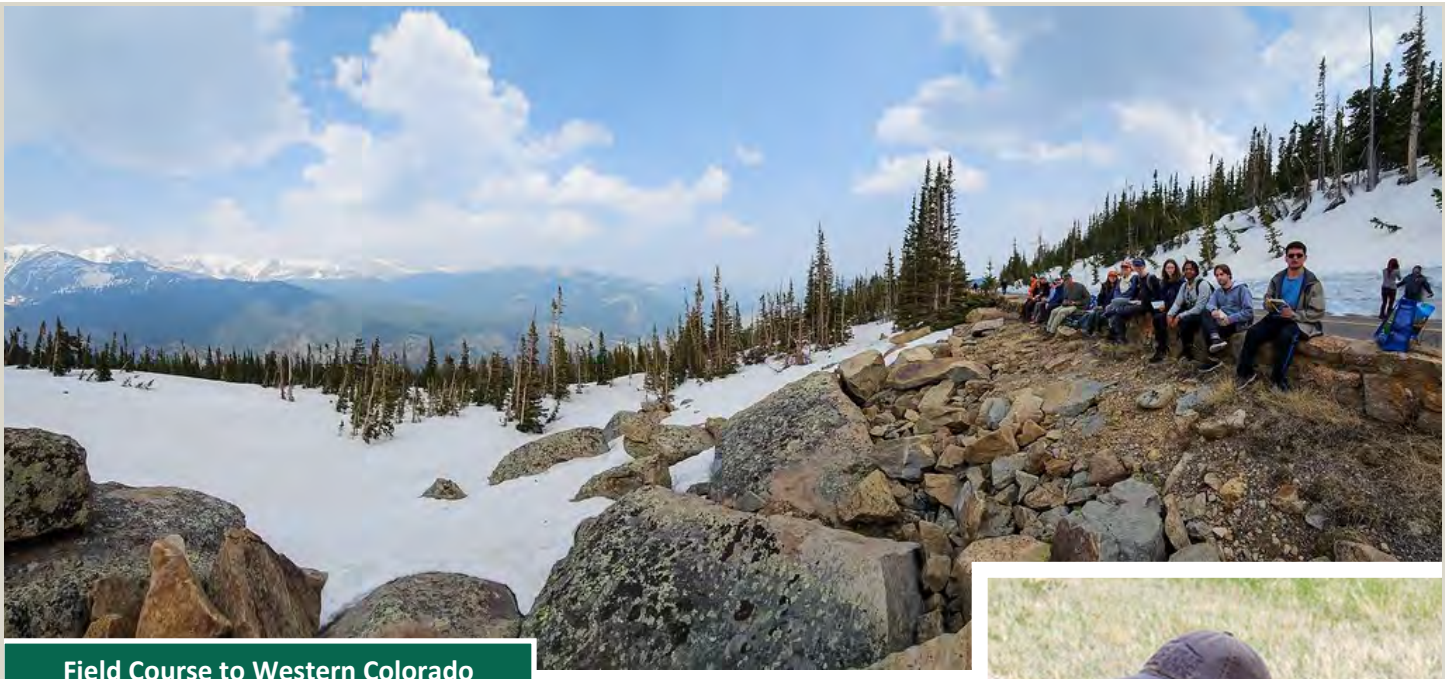
Bull Moose near Evans Notch

Andrew and Cameron, Welch Mtn.

The Basin, Franconia Notch

Andrew and Cameron above Pinkham Notch

Linked potholes



Field Course to Western Colorado

Peter Drzewiecki

Hello to all our EES alumni, students, and friends! I hope everyone is happy and healthy! The 2022/2023 academic year was a busy one for me, but productive as well. Unfortunately, I spent too much time on committee work, and had less time for my research and teaching. But, as I usually write these in a cycle that starts with graduation, I will begin in the summer of 2022, just after returning from a Global Field Course to Idaho and Wyoming (described in last year's newsletter).

Max with one of his Eagle Scout Project signs.

This year had a number of "last times" that centered around my involvement in Boy Scouts. I have been involved in leading the Mansfield troop (while my two sons were in the troop) for 12 years, the last 5 as Scoutmaster. In June 2022, we took our last annual trip to Cape Cod, and in early July, I spent my last week at summer camp. My youngest son completed his Eagle Project constructing informational signs about birds for the Town of Mansfield parks. He turned 18 and "aged out" of Scouts at the end of October. My last campout (we did one a month except during COVID) was in December 2022, as was my last troop meeting. While I enjoyed the time I spent with Scouting, it was an incredible time sink, and it was time to move on… kind of (I did promise to help out with Eagle Projects and there have been four since I left the troop!).

My son Max was my summer 2022 travelling companion. On the left we are on the summit of Mount Ascutney in Vermont, and on the right we are at "The Weekend" concert at Gillette Stadium.

I travelled quite a bit around New England and New York over the summer of 2022 with my son Max, looking at colleges and doing some sightseeing. He has a National Park Passport Book where you get stamps at National Parks, Monuments, Historic Sites, etc., and that dictates our destinations. We travelled to the Catskill Region of New York looking at colleges and happened to pass through Cooperstown, so we toured the Baseball Hall of Fame. We took another trip in August to New Hampshire and Vermont where we visited a few historic sites and climbed Mount Ascutney in the rain. Finally, we took two day-trips to Gilette Stadium near Boston. Once we went to see a couple of professional lacrosse games, and once we went to see "The Weekend" in concert. That was very loud. My whole family had a trip to Buffalo in early July to visit relatives and we spent three weeks over the summer at the family house in Maine. I did return to Mansfield once in a while to mow my lawn!

My Daughter's wedding (September 12, 2022).
I am walking Kaela down the aisle.

My wife and I with Kaela and Avery on the right.
I am the old guy.

We did not take a big family vacation in 2022, because we were focusing on my oldest daughter's wedding. More precisely, her second wedding, but with the same husband. Her first (and actual) wedding was a brief outdoor legal ceremony on March 20, 2020, while the world was closing down for this strange new disease that just showed up in China. So, there was no big celebration. Kaela and Avery wisely waited for several years to have a second ceremony and reception in September 2022. They were married in the clubhouse near the family home in Maine and had the reception at a seaside restaurant. The event was great, and the weather was perfect (it can be questionable in September). I was in charge of decorating the clubhouse (which contains a large moose head), offering the toast, and paying for many things. The only thing to go wrong was that the Maid of Honor had to spend the night in the hospital. She had just turned 21 two days earlier and the bartenders happened to know about her birthday because she had worked at this seaside restaurant all summer. They gave her too much to drink and she passed out in the bathroom. Oh… did I mention she was my younger daughter?

My wife, son and I managed one more weekend trip in October to the Lake George region of upstate New York. The reason was to visit one last college (SUNY Plattsburgh) but we worked in some fall hiking to see the leaf colors. We also got to enjoy a street festival that was right in front of our hotel.

Lake George in early October from atop Buck Mountain

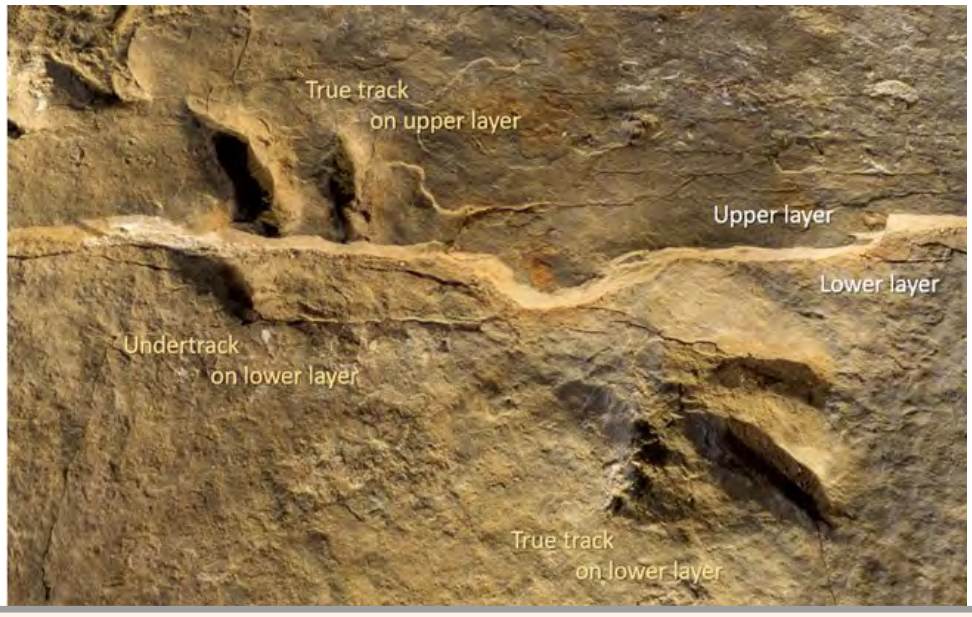
Students in my First-year class at Dinosaur State Park taking measurements of dinosaur tracks.

During the fall semester, I taught Ancient Environments and a First-Year course about dinosaurs (called Connecticut's Jurassic Park). The latter course was a bit time consuming because it was only the second time I had taught it. What really occupied my time, though, was committee work. I served as co-chair of a committee that is redefining Eastern's Liberal Arts curriculum. In addition to having to review hundreds of courses, this committee had to create the guidelines that will govern the program, get them passed through the university senate, and then instruct faculty as to how the new courses will run. During the fall semester, I served as the chair of the Sabbatical Leave Committee as well. Committee work stabilized a bit in the spring semester, but I had three courses that took a lot of time! I decided to completely change the way I taught sedimentology and stratigraphy, whereby I removed tests and made it into a series of class exercises based on data and projects that I have been involved with over my career. Students seemed to enjoy it, but there are a number of wrinkles that need to be ironed out the next time I teach it! At the same time, I taught Geology of National Parks for the first time since 2009, and I developed and ran a new global field course to western Colorado and southeastern Utah (see a description of this trip elsewhere in this newsletter). Both of these were essentially new class preparations. Preparing two new courses and completely overhauling a third was not a wise decision. I have not spent so much time on creating curriculum since my first-year teaching!

During the spring semester, I took several trips. In January I went to Washington DC to drop my daughter off for her last semester of college. I took some time to visit the Washington Zoo. I returned to the area in March with Bryan Oakley and Drew Hyatt for the 2023 Northeastern Geological Society of America meeting in Reston, Virginia. I returned to DC one last time in May to attend my daughter's graduation from American University in May. The last bit of travelling I did before the summer started was the Global Field Course to Colorado and Utah. Drew Hyatt and I took 11 students, and we had a great time – spectacular geology, fantastic weather, and inspiring landscapes. This is covered elsewhere in the Newsletter.

The Great Falls of the Potomac near Reston Virginia (NE-GSA conference).

Research suffered the most as a result of my committee work. I did not work with any students during the summer of 2022 or the following academic year. I did manage to write up and submit three papers. One, dealing with salt tectonics and the tectonic evolution of the northern Iberian (Spain) plate margin is out, and two dealing with tracks at Dinosaur State Park have been accepted but await publication. I am fortunate to be able to work with students again starting this summer.



Two dinosaur tracks at Dinosaur State Park in Rocky Hill, CT. The upper track is found preserved on two stratigraphic layers. One of my papers (co-authored with Drew Hyatt) deals with determining which print represents the layer the dinosaur actually stepped on (called the true track) so that the track can be assigned to the proper layer. This is important when studying dinosaur behavior.

My family continues to get older! My older daughter Kaela is married, bought a house, has a nicer car than me, and works as a Genetic Counselor for UConn Health in Hartford. She has two young dogs that I do my best to spoil. My older son Aiden is working as an engineer in Boston where he lives with his long-time girlfriend. As mentioned, my younger daughter graduated from American University with a degree in Graphic Design and spent the summer working as a waitress in Maine. My younger son Max completed his lacrosse career and graduated from high school. Next year he will be attending SUNY Oneonta to start a degree in Environmental Sustainability. My wife continues to safeguard the Connecticut taxpayers as a state auditor for the University of Connecticut. Next year, after spending 26 years raising four children, we will be empty-nesters – at least until my son comes home for winter break. I am not sure what we will do with all the spare time, but something tells me it will involve wine!

I wish you all a happy and prosperous 2023/2024!

Field Course to Western Colorado and Southeastern Utah

By Peter Drzewiecki and Drew Hyatt

From May 20 to 31, Peter Drzewiecki and Drew Hyatt embarked on a Global Field Course to western Colorado and southeastern Utah with eleven EES students (Caitlin Andrews, Emma Bean, James Bragg-Phillips, Annalise Kennedy, Harrison Fain, Xavier Jackson-Ward, Harrison Moss, Nick Peteros, Hunter Piscatelli, Connor Rego, and Andrew Streeter). This trip provided the students with the opportunity to see and explore many of the geological features, and the processes that formed them, that students are typically only exposed to in text-books or through faculty lectures. For many of our young adventurers, it was the first time they had ever seen the iconic landscapes of the west.

Trip participants: Xavier Jackson-Ward, Harrison Fain, Andrew Streeter, Connor Rego, Annalise Kennedy, Caitlin Andrews, Harrison Moss, James Bragg-Phillips, Drew Hyatt, Emma Bean, Hunter Piscatelli, Peter Drzewiecki, and Nick Peteros in front of Double Arches at Arches National Park in southeast Utah.

For the first few days of the trip, we focused on the sedimentology, structural geology, paleontology and landscapes of the Rocky Mountain Front Range around Golden and Morrison, CO. We visited Dinosaur Ridge, often considered the best dinosaur tracksite in the country, the iconic Red Rock State Park, sites around Golden, CO, and Rocky Mountain National Park. This last destination was particularly impressive for the students, most of whom had never seen mountains of this scale before. Students learned about the origin of the Rockies during an event called the Laramide Orogeny that took place between 80 and 55 million years ago and resulted in many of the mountain ranges currently exposed in America's west. They also saw the "Great Unconformity" – a surface between two rock layers that represents about 1.4 billion years of missing Earth history! The lower layer is 1.7 billion years old, while the upper layer is about 280 million years old. We were fortunate to meet up with former EES student Erick Bora, now working on a masters at Colorado School of Mines.

James Bragg Phillips and Connor Rego racing up the stadium seats at Red Rock Park near Golden, CO

Hunter Piscatelli, Caitlin Andrews and Emma Bean finding inspiration at Rocky Mountain National Park

Annelise Kennedy and Caitlin Andrews at the Little Book Cliffs Wild Horse Range near Grand Junction, CO

The Group embarrassing themselves in front of the Maroon Bells near Aspen, CO

From Golden, we left the landscapes of the Laramide Orogeny and headed west to Grand Junction, CO in the heart of the Colorado Plateau. Along the way we stopped at Maroon Lake near Aspen to view the Maroon Bells – two scenic mountains that grace the cover of many Colorado tourism brochures. Just outside Grand Junction, we were delayed by a train that sat across the road for about 15 minutes, but we made it to the Little Book Cliffs Wild Horse Range. After a brief review of the stratigraphy, the students were rewarded when we spotted one of the wild horse herds in the region. The students were very intrigued by the horses and were especially excited when a young foal stood up and revealed itself above the sage and tall grass .

For the next few days of the trip, we explored the Colorado Plateau. This is a large region in the states of Colorado, Utah, Arizona, and New Mexico that has remained a relatively stable landmass during all the deformation that took place out west that resulted from several mountain-building events. The plateau is characterized by layers of sedimentary rock that were uplifted, and has had huge canyons (including the Grand Canyon) erode through them. We explored the scenic Colorado National Monument and the famous Dinosaur Hill paleontological site where a huge Apatosaurus skeleton (now at the Field Museum of Natural History in Chicago) was excavated in 1901.

Colorado National Monument near Grand Junction, CO

The following day we entered Sego Canyon in Utah where we examined rock layers deposited in the Western Interior Seaway – an ocean that flooded North America in the Cretaceous (about 120 to 70 million years ago) during the age of the dinosaurs. The canyon is also home to a famous Native American petroglyph site and the old coal-mining ghost town of Sego. From there we headed south to Moab, Utah, and to Canyonlands National Park. In the evening, we went to neighboring Dead Horse Point for dinner on the rocks and to take in the sunset. These two locations offer breath-taking views of deep canyons carved by the Colorado and Green Rivers over the past 6 million years. Faculty and students alike were inspired. At Canyonlands, we visited Upheaval Dome, a small, circular region of deformation interpreted as a meteor impact crater. Our last day on the plateau was spent in Arches National Park, observing how arches form, and visiting Double Arch, Delicate Arch, Balanced Rock, Sand Dune Arch, and the Moab Fault. Students learned how deeply buried salt deposits from long-gone oceans rose to the surface in areas, deforming the rocks and establishing the conditions needed for arch formation.

Xavier Jackson Ward, Peter Drzewiecki and Harrison Moss at Double Arches, Arches National Park, Utah

The group at Canyonlands National Park, Utah

We left Moab for Ouray, CO in the San Juan Mountains of southwestern Colorado. Along the way we made several quick stops in the Paradox Valley, another salt-related feature and then exited the Colorado Plateau. The San Juan Mountains are of volcanic origin (40-30 million years ago) and are comprised of at least 15 large calderas. We travelled to a series of three mountains called the Red Mountains due to the color imparted on the rocks by the iron they contain. This region has a rich history of mining from the 1870's to the 1970's, where they mainly mined metals such as gold, silver, copper and iron. We hiked to the Yankee Girl Mine which operated in the late 800's.

Part of the group in front of the Yankee Girl Mine (circa 1880) near Ironton, CO

Connor Rego, James Bragg Phillips and Hunter Piscatelli at the base of a dune that they ascended to the top, Great Sand Dunes National Park, CO

The following day we explored the geology around Ouray, CO, including a deep, narrow canyon (called Box Canyon) and the scenic Cascade Falls, and we viewed several volcanic features from a distance. The day after that we travelled through the San Juan Mountains, stopping to look at the rock types and features of collapsed volcanoes (calderas) including a the resurgent Cochetopa Dome. In the afternoon, we exited the mountains and crossed the exceedingly flat San Luis Basin, which is part of the much larger Rio Grande Rift Basin that extends from Colorado south to the Gulf of Mexico. Nestled in a crook in the mountains on the eastern border of the valley is Great Sand Dunes National Park. Here students learned about the wind-driven processes of sand dune formation and got to test their skills at sand-boarding and sand-sledding. Five members of the group, including the two older leaders, made the difficult trek to the top of the dunes. By nighttime, we made it to Colorado Springs.

Last Day

The group at Black Canyon of the Gunnison National Park, CO

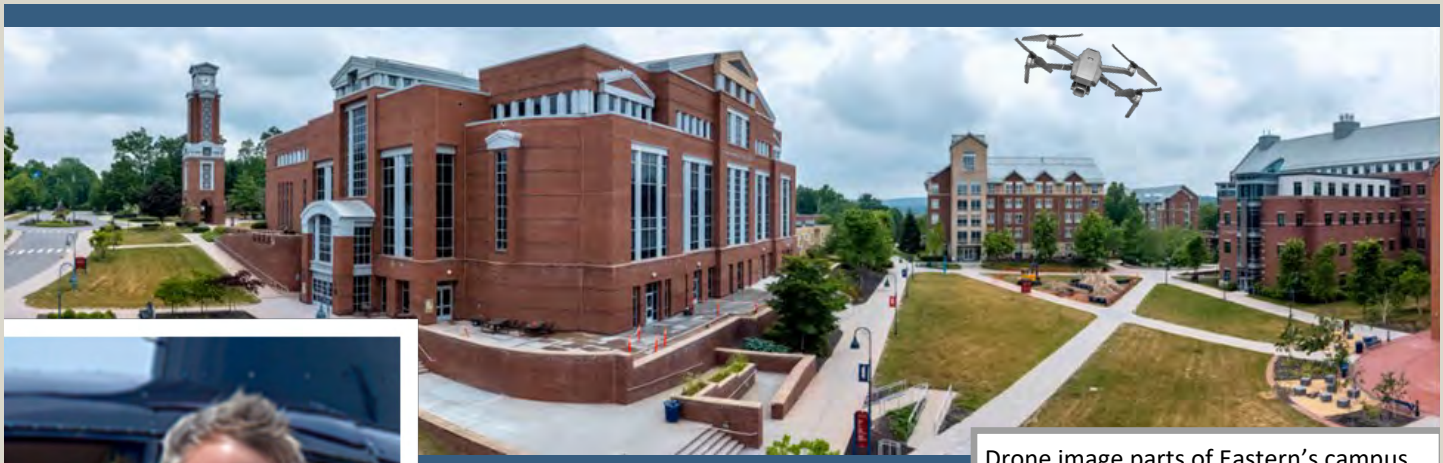
View from the top of Pikes Peak (elevation 14,115 feet) near Colorado Springs, CO

The last day of the trip began with a visit to Florissant Fossil Beds National Monument where exquisite fossil fish, insects, flowers, and giant redwood trunks tell of a warmer, wetter climate in the area 40 million years ago. The lakes and forests at that time were inundated by volcanic flows from the San Juan volcanics that buried them and preserved the fossils. We then drove to the top of Pikes Peak - the highest elevation anyone on the trip had ever been. It was about 30 degrees colder at the top of the mountain than the base, and several people felt the effects of the high altitude. Our last stop of the trip was at Garden of the Gods. This is a stunningly beautiful place, with pinnacles of reddish rock that tower above pinion pine and scrub oak forests that were full of birds and deer. It was formed by the same events the students explored the first few days of the trip (Laramide Orogeny) and was a fitting end to our adventure. We flew home the following day.

Last group photo at Garden of the Gods, Colorado Springs, CO

Overall, the students (and faculty) enjoyed the trip and learned a tremendous amount of geology while making memories that will last them a lifetime. In addition to the geology lessons, they were able to experience seven of America's National Parks and Monuments, including some of the most iconic. They also experienced the culture and history of western Colorado and eastern Utah, from the Native American petroglyphs to the Coors Brewery in Golden! They learned about the settlement of the area by Americans and how it was often driven by mining for coal or metals. Finally, they got to see plenty of wildlife, including mule deer, pronghorns, bighorn sheep, wild horses, a variety of birds, marmots, lizards galore, a fox, and even a moose. In the end, they discovered and explored a part of America's geology, landscape, and culture that is unique from their experiences in New England.

Photographs were provided by Drew Hyatt.



Drone image parts of Eastern's campus

Drew Hyatt

Hello all. Time flies and here we go with reflections on the past year in EES. It was so nice to finally return to pre-COVID conditions, as well as meeting the next wave of EES majors, and working with students I got to know over the past year or more. The following identifies a few chronological highlights, from class activities, undergraduate research experiences (both completed and new), and personal highlights.

I've got to begin with my personal highlight of the year! We were touched and thrilled to be a part of the wedding between our daughter Hannah and her now husband Gordon in October of 2022. It was a very memorable day and, despite some rain in southern California (the wedding was at San Clemente), the entire event was fantastic! The outdoor ceremony enjoyed beautiful weather and then there was a sudden downburst and the outdoor dining tables were brought inside to the dance floor to accommodate the storm. In many ways the rain added to the event contributing to a wonderful atmosphere with guests, plenty of dancing and views of a spectacular ocean sunset. The weekend also included walking on the beach, whale watching, surfing, and other fun activities. A very special part for us was to have so many family and friends together in the same place, at the same time. That is a rare occurrence for us with family/friends in two countries. What a special time it was. A few photos are included below.

A good time was had by all!

My first ever horizontal at sea while waiting for the whales to show up!

Field Methods (EES 350) class for fall 2022

This past year seemed busier than normal. In the fall I had 2 sections of Introductory Geology (EES 104), Field Methods (EES 350), and an Earth Science Practicum (EES 392) with 3 great EES majors. Spring was a little less hectic with continuing practicum work, Landform Analysis (with 2 labs), and efforts to move along new collaborative coastal research with assistant chair Bryan Oakley.

The introductory courses are always interesting both to meet a new wave of students, some of whom become EES majors, and to get a sense how students adjust to university life. It was very heart-warming to see student comradery and general fun-bouncing back from COVID times. That said, I continue to sense difficulties for some students in managing the fun part of school with the need to bear down, study hard, attend all classes, and read supporting resource materials for coursework. These skills sets seem to be a bit more variable between students than in the past, but most find the groove and do well particularly as they find their academic passion.

The standard plank-under-the-theodolite move, oldest one in the books!

With the intro class, as in the past, I always particularly enjoy the opening field lab on campus, and exchanges in class as I get to know individuals. Field Methods (EES 350) is always one of my favorites to teach. This past year we had a rather large class of 17, and I had to adjust the schedule slightly from its normal compressed format as I needed to be at Hannah's wedding mid-semester. This adjustment pushed EES 350 finishing time back slightly later into the semester, but fortunately we did not experience much bad weather and the course otherwise finished as normal.

I include a few images from the class and the final project that was held at Shelter Falls in Mansfield. Spring semester's Landforms class was very enjoyable. A good group of students joined the program, and as in the past, I taught 2 lab sections. Through the class and labs, I really get to know folks. Although labs include a mix of observation and computer work, I really enjoy the final 2 field labs that examine local glacial features and bedrock-controlled streams (see some of the included pics). There were several standout students, some of whom have become involved in 3D modelling work.

A drone selfie at Shelter Falls with the Field Methods Class

Field Work

Spring EES 224 Class visiting field sites in Mansfield and surrounding areas

EES 271 Field Course

EES 271 Field Course Class

In addition to the normal ebb and flow of classes, part way through the semester I was asked (and happily agreed) to help with Dr. Peter Drzewiecki' s EES 271 field course to Colorado and Utah. This involved six meetings prior to the 12-day trip. Interestingly, the students taking the course included several from my ongoing landforms class which meant we had a great mix of new majors to graduating seniors. Peter will no doubt comment on some of the details of this excellent course, so I will only mention a few things that stood out for me. First, the trip was **AWESOME !!!**

I was a newbie to all sites we visited, although I did read up on places and contributed where appropriate (again leaving details for Dr. D). While there was not a single site I disliked, several aspects of the course really stood out for me. First, upon landing we experienced the first effects of fires north of the border. Fortunately, that rapidly cleared but it was rather bizarre to land in Denver and not see the mountains!

Secondly, the wide variety of geologic conditions and differences between each day of the trip was very impressive. I have always loved visiting and hiking in arid lands, and the 3-park/monument sequence of CO National Monument, Canyonlands, and Arches was fantastic (we did visit several other parks/monuments and interesting sites). It also was fun being the driver of what may best be called the "dude" van. The folks in my ride were totally "into-it" as a group. While there was a bit of cat-napping during the longer drives, everyone was very intent on checking out everything we drove by.

My van also amassed a sizable collection of spilled pretzels and other floor decorations that were (mostly!) cleaned out before returning the van at the end of the trip.

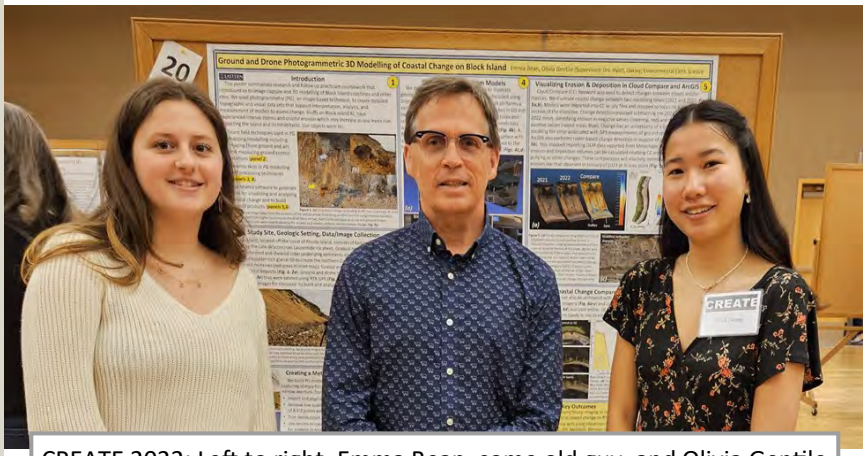
Student Research Activities

This past year I was able to work to conclusion undergraduate research activities with 3 students that visited Block Island with Dr. Oakley and myself in the summer of 2022. As well, two new students were introduced to the site, complete with a doors-off helicopter ride around Block Island this past summer. The 2022 crew (Emma Bean, Olivia Gentile, and Hans Veltheim) conducted summer field work and follow up data analysis meetings in the summer and fall. Emma and Olivia continued in the spring, but unfortunately work obligations prevented Hans from participating that semester. In spring, Emma and Olivia developed a poster and presented it at the first in-person CREATE meeting since 2019. Not surprisingly they did a fine job and their poster (accessible through the CREATE web site) which drew considerable interest on the day of the meeting. It was also quite fun meeting family and friends of Emma and Olivia.

Photo depicts the eroding southern shoreline near the main lighthouse.

Field work examined several sites on Block Island, with Hans and Emma

Antonio (center) and Dan (right) were also treated to 4 laps around Block Island in the helicopter shown (minus any doors!) Three areas were imaged for photogrammetry.



CREATE 2022: Left to right, Emma Bean, some old guy, and Olivia Gentile with their poster entitled “Ground and Drone Photogrammetric 3D Models of Coastal Change on Block Island”.

Similar techniques were used by Dan and Antonio to build ground and drone models for the Clayhead shoreline on Block Island.

Dan and Antonio learning to fly and drone image parts of Eastern’s campus

Work on Block Island continues, and I will be on sabbatical in the spring of 2024 to analyze the various data sets developed on the ground, using 2 different drones, and from the recent helicopter flight around the island. In fact, that flight and other modelling also provided an opportunity to introduce 3D photogrammetry to 2 new students (Dan Castagnetta and Antonio Cazassa) during the summer of 2023, both of whom were in my most recent Landforms class.

Through the field work and follow up meetings Dan and Antonio learned to process drone and ground images, and develop and compare associated 3D models. They even had a chance to collect some ground penetrating radar data on campus, and to model and 3D print the Library building. While it will not be possible to continue practicum work the coming year, given that I will be unavailable in spring when I must devote all of my time to the sabbatical research project, Dan and Antonio did get a solid introduction to these research techniques.

That’s my round up for this newsletter. I trust everyone is well and please stop by to say hi if you are on campus.

Best, Drew Hyatt

Grabbing a few waves on my SUP

Bryan Oakley

"Nothing Great Was Ever Achieved Without Enthusiasm"

(Ralph Waldo Emerson)

That phrase sticks with me as a good summation of the past year. The EES department continues to evolve and grow mostly on the back of the enthusiasm and commitment of our students and my faculty colleagues within the department. The graduating class of '23 left some big shoes to fill, and I look forward to working with both the students and my colleagues for the 2023-2024 academic year! The 2022-2023 academic year was my last of this stint as Assistant Chair of the EES department. Come August 2023, I switch hats with Dr. Nathan and take over as the Chair of the department. I am looking forward to the challenges this brings, while also hoping that I can still manage time for research! This past year I taught Coastal Geologic Hazards as well as two different courses for the Liberal Arts Core (Dynamic Earth and Environmental Geology). The department also spearheaded some curricular changes that will take effect in the fall of 2024. These changes are being done to help keep EES current and cutting edge to prepare our graduates for the environmental issues of the 21st century. This work, coupled with the teaching, Assistant Chair responsibilities and chairing the First-Year Program Committee limited my research time a bit but things have continued to progress on a number of research fronts.

My on-going research projects have continued, focusing on the link between the shoreface (area just offshore of the beach and shoreline change, examining sorted bedforms on the shoreface, working with a colleague on various projects examining the shallow-water geology offshore of Cape Cod, monitoring the shoreline on Block Island (collaborating with volunteers) and Napatree Point. Dr. Hyatt and I have continued to work on Block Island bluff erosion, and we currently have a funded research project to begin drone mapping. I am also still serving as a science advisor for the Napatree Point Conservation Area.

The partnership between Eastern EES, the University of Rhode Island Coastal Institute and the Watch Hill Conservancy remains a great asset to the department and will continue to provide student research opportunities in the future! The research on Napatree has garnered significant local and national attention. As many of my research projects are continual and ongoing, I am always looking for motivated students to help with field and lab work, especially if you have already taken GIS! Contact me for more information if you are interested in working on a project.

Family

Julie, Aidan and Haley at the Ice Castles in New Hampshire

Aidan, Haley and Rocky at Watch Hill Lighthouse

On the home front, my kids continue to grow; Aidan is 13 ½ and recently competed 7th grade while Haley is approaching 10½ and is starts middle school in the fall. They both have found music as a hobby; Aidan has taken up guitar, moving from his ¾ scale classical guitar to a Fender Strat, while Haley began leaning Ukulele. Both kids had their first recitals and did great in front of a crowd! Julie continues to work at both L&M Hospital in New London and Westerly Hospital, overseeing the Cardiac Rehab programs at both sites. Coupled with Rocky the dog we have a busy schedule but try to sneak out for some salt-water therapy in a bunch of different forms as often as we can. If we aren't on the boat or our SUP's as a family I am probably surfing (yes, even in the winter!) or fishing with my father on his boat .

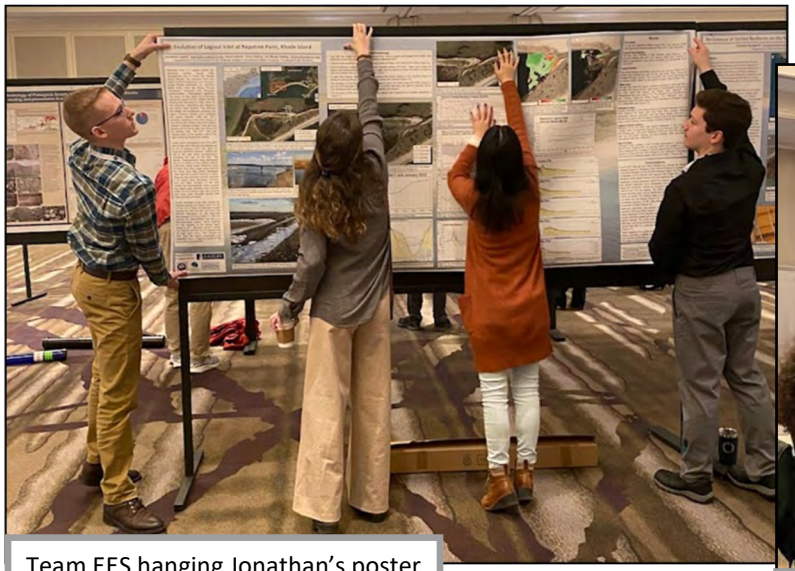
Captain Aidan navigating our 17ft boat 'Loki' out on Wequetequock Cove in Stonington. First mate Haley was making sure he stayed in the channel.

The Oakley kids on the Stand-up Paddle Boards (SUP's) on Winnapaug Pond, Westerly (June2023)

Haley assisting the harvest of Quahogs (Mercenaria mercenaria) from Winnapaug Pond in May 2023. For the record, we made some killer stuffies with these, if anyone wants the recipe, just let me know!

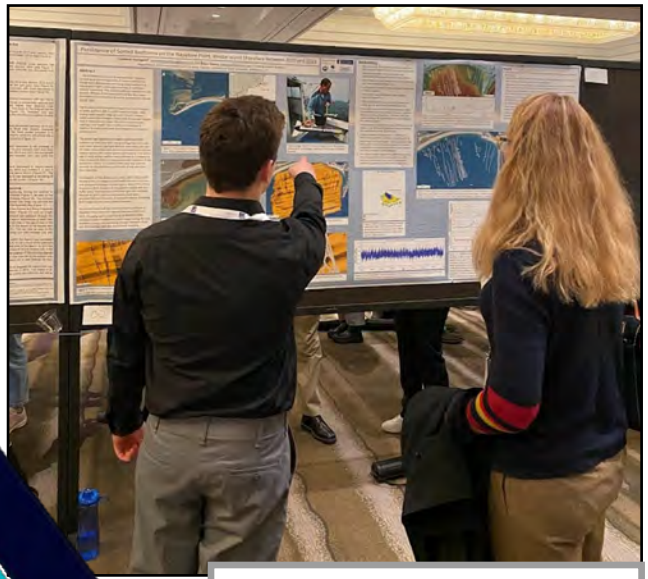
Joint Northeast/Southeast Geological Society of America Meeting

In March 2023, Professors Peter Drzewiecki, Drew Hyatt and Bryan Oakley, along with EES students Cameron Soulagnet, Emma Bean, Jonathan Lepire and Olivia Gentile attended the joint meeting of the Northeast and Southeast sections of the Geological Society of America in Reston, Virginia. Jonathan, Cameron, and Professors Oakley, Hyatt and Drzewiecki all presented at the meeting. On the way down they also managed to sneak in a short trip to Great Falls National Park.

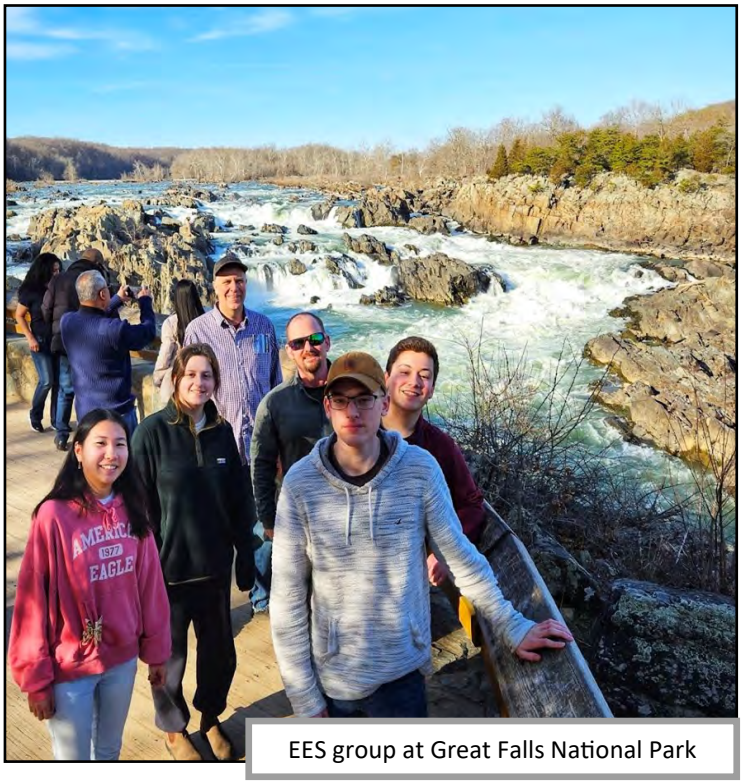


Team EES hanging Jonathan's poster

Jonathan presenting his poster



Cameron presenting his research to Lara Turner from the Bureau of Ocean Energy Management



EES group at Great Falls National Park

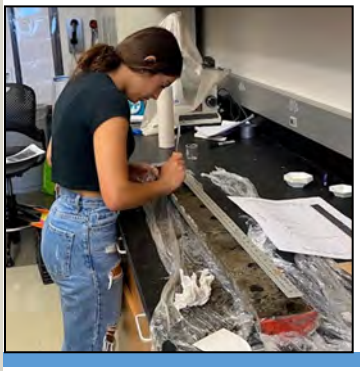
Summer 2023 Research with Students

Bryan Oakley

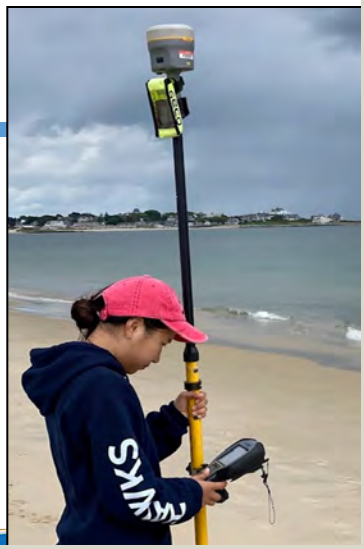
This summer, I am working with four very talented EES majors on directed research projects, while also assisting Dr. Hyatt with fieldwork involving two additional students.

EES Senior **Jonathan Lepire** is mapping coastal change at the Napatree Point Conservation Area with RTK-GPS. His specific focus is understanding the hydrodynamics and changes over the last few years at the 10-acre Napatree Lagoon, an important part of the overall ecosystem of the NPCA. His project builds off of previous work by EES Alumni Alyson Augenstien, Madeline Varney and Joey Marsalisi. This important work is carried out in conjunction with the Watch Hill Conservancy and allows them to manage the conservation area using the best available science to make management decisions, improving the natural environment and public use of this ecosystem. Jonathan has also assisted on other projects with EES students as well as staff from the Watch Hill Conservancy and presented results from his project at the NE/SE Geological Society of America meeting in Reston, VA in March 2023 and will continue to work on the project in 2023-2024 academic year.

EES Senior **Cameron Soulagnet** is studying the persistence and migration of sorted bedforms on the shoreface offshore of the Napatree Point barrier spit. These features form on the shoreface (the area just offshore of the beach) around the world, although the formation and related processes are still poorly understood and may have an influence on shoreline behavior over time. Cam conducts this work using side-scan sonar and airborne LiDAR data to examine how these features have changed over the last five years. Cam has also assisted on other projects with EES students and presented results from his project at the NE/SE Geological Society of America meeting in Reston, VA in March 2023 and will continue to work on the project in 2023-2024 academic year.



EES Junior **Daria DiBiaso** is studying the sedimentary record along southern New England's coastline to examine the frequency of overwash events during intense coastal storms as part of her University Honors thesis. This involves collecting sediment cores, examining the sediment properties in the lab and applying age-dating techniques like radiocarbon and lead isotope analysis to determine the ages of past storms. This builds upon a previous EES Honors project conducted in 2016-2017 by EES Alumni Emma Avery.



EES Junior **Olivia Gentile** is examining the accuracy of a predictive equation that estimates wave run-up on a shoreline. This equation is frequently applied to coastal models to simulate the response of the shoreline (i.e., will the shoreline erode during a storm). Her work utilizes beach surveys collected over the last 10 years to compare the actual wave run-up to the predicted elevation. This important work will help guide shoreline models in southern New England. Olivia has also assisted on other projects with EES students as well as staff from the Watch Hill Conservancy.

The EES Field Crew: Daria DiBiaso, Olivia Gentile and Cameron Soulagnet holding sediment cores collected from a saltmarsh at the Napatree Point Conservation Area

Emily Watling inspecting the eelgrass beds off of Napatree Point using a mask and snorkle (August 2022)

Additionally, **Emily Watling '23**, continued to work on Eelgrass Mapping in Little Narragansett Bay during the 2022-2023 academic year, building on work done previously by Nina Musco. She presented the results of her work at two professional conferences in May 2023 (one poster, one oral presentation) and she received the Rankin Awards for the best undergraduate presentation at the New England Estuarine Research Society annual meeting. She will publish her work in the annual 'State of Napatree' report and we are currently exploring peer reviewed options for this work as well.

EES Student wins the Rankin Award for best undergraduate presentation at the New England Estuarine Research Society Annual Meeting

Emily Watling presenting her poster at the Northeast Natural History Conference, Burlington, VT (April 2023)

Emily Watling received the Rankin Prize for the best undergraduate oral presentation at the recent annual meeting of the New England Estuarine Research Society (NEERS). The Rankin award has been given out annually since 1989 at the NEERS annual meeting. Emily is the third student from Dr. Oakley's lab to win a prize at NEERS in recent years. Alyson Augenstein '19 won the Warren Prize for best undergraduate poster in 2019 and Jack Cerra '21 won the Rankin Prize in 2021.

EES Theta Upsilon Chapter of the Sigma Gamma Epsilon (SGE) National Honor Society in the Earth Sciences

Annual Report by Faculty Advisor, Dickson Cunningham

On May 4th, the Environmental Earth Science Department was proud to induct 12 new members to its Theta Upsilon chapter of the Sigma Gamma Epsilon (SGE) National Honor Society for the Earth Sciences. Those that were inducted have achieved both a high University GPA, and a high EES Major GPA. Our inductees are thus formally recognized for their excellent academic record.

By being inducted into the Society, our members have joined a national community of accomplished earth and environmental science students, academics and professionals. This is a signal honor that should appear on every EES Honor Society graduate's resumé and LinkedIn profile and will be recognized by other parties as a nationally recognized qualification. Our SGE graduates have received lifetime memberships and this is a mark of distinction that we hope enhances their professional opportunities.

Importantly, our SGE chapter members organize enjoyable and productive extracurricular events throughout the year, and this helps strengthen the EES department community and fosters lifelong friendships.

Following 2 years of Covid disruptions, the EES Honor Society rebounded nicely this past year with many new members contributing to the Society's academic year events.

During the year the following events were organized by the SGE members:

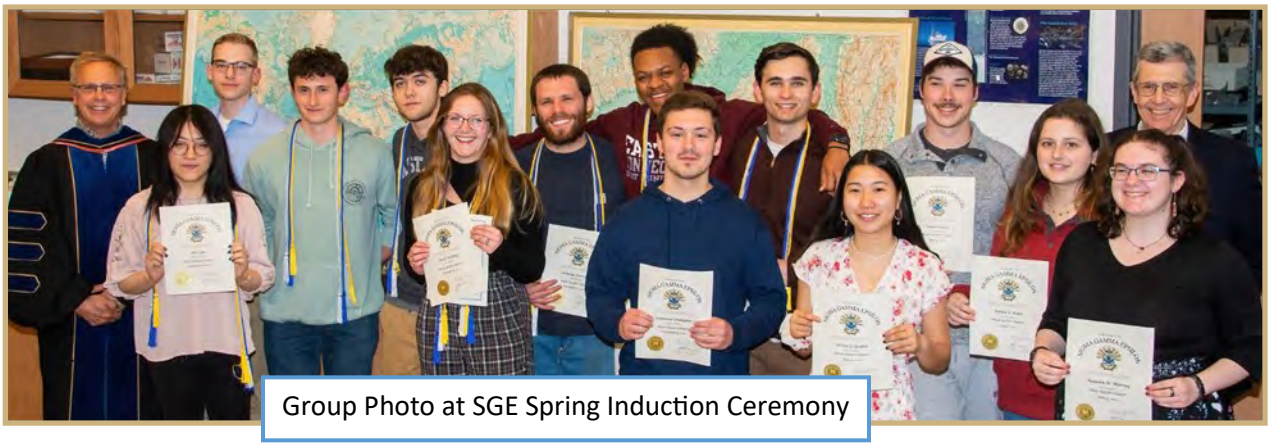
1. During the fall, Jacob McCourt and Logan Contes represented EES at the biennial SGE national meeting that was held at the University of Tennessee at Martin. The conference included an open forum of chapter announcements and idea sharing followed by a day collecting Cretaceous marine fossils at the nearby Coon Creek Center. Jacob and Logan represented EES well and were the only New England university delegates at the meeting. Jacob was also live-interviewed for WBBJ, an ABC TV affiliate! The Department appreciates support from the EES Founders Fund that contributed to Jacob and Logan's travel costs.
2. During the fall, some EES members also spent an afternoon cleaning up garbage in the University Arboretum. Although there was not that much litter to be found, it was left even more spotless and natural!
3. The devastating February earthquakes in Turkey and Syria took the lives of more than 50,000 people and caused huge infrastructure damage to the region. SGE decided to run a bake sale to support child victims of the catastrophe. About $400 was raised over several days and this amount was sent to the UNICEF Earthquake Child Relief Fund.
4. SGE hosted a speaker series during the spring semester that included: 1) EES alumnus Alex Fazzino talking about careers in the Environmental Consulting field, 2) Doug Thompson from Connecticut College who presented on Campus Sustainability/Carbon Neutrality Topics, 3) Tony Edgington from UConn who talked to our students about applying to and succeeding at graduate school, and 4) and I talked about my 35-years experience as a geologist exploring the Andes from Ecuador to Tierra del Fuego.
5. During the fall semester, SGE organized a duckpin bowling night. This odd form of bowling challenged everyone– very few broke 100 as a final score!
6. During the spring, a small SGE group attended the Meriden Mineral Show and some great specimens were purchased at good prices. We then went to Wadsworth Falls and finished with a nice pizza lunch.
7. SGE provided a sample quiz table at the spring Earth Day fair.
8. A highlight of the year was a Saturday trip to Purgatory Chasm in Sutton, MA. Eleven students and Professor Hyatt and myself explored the geology and dramatic landscapes of this spectacular location. We enjoyed the boulder scampering and tight squeezes on the various trails and debated ideas on how the chasm could have formed. Some of us also watched a weasel up close that was dipping in and out of the boulder field. Following our adventurous scrambles, we stopped in Putnam, CT for a nice lunch on the way back to campus.

The newly inducted (May, 2023) SGE members are:

Emma Bean		Hailey Cocca
Daria DiBiasio		Olivia Gentile
Alyssa Kendrick		Nhi Lam
Jonathan Lapire		Autumn Murray
Connor Rego		Cameron Soulagnet
Hans Veltheim		Emily Watling

Nine SGE members also graduated this past May: Ryan Barretta, Logan Contos, Aiden Gamache, Xavier Jackson -Ward, Nhi Lamb, Jacob McCourt, Kilee Nutbrown, Nicholas Perreault, and Emily Watlling.

Finally, Emily Watling received this year's SGE individual-chapter W A Tarr Award. Emily enthusiastically co-led the society, organized activities, and communicated with society members. She also demonstrated outstanding scholarship which is the essential basis of the award.



Group Photo at SGE Spring Induction Ceremony

Receiving their SGE membership certificates

Olivia Gentile

Nick Perreault

Cameron Soulagnet

SGE Student Activities

Top: Arboretum trash clean-up and Bowling Night

Middle: Turkey-Syria Earthquake Relief Bake Sale

Bottom: Meriden Mineral Show and Wadsworth Falls

SGE Purgatory Chasm Field Trip – Spring 2023

Eastern Connecticut State University
Environmental Earth Sciences
83 Windham Street
Willimantic, CT 06226

Dr. Stephen Nathan
Department Chair
Email: nathans@easternct.edu

Dr. Bryan Oakley
Assistant Department Chair
Email: oakleyb@easternct.edu

We're on the Web!

See us at:

https://www.easternct.edu/environmental-earth-science/index.html

SUPPORTING EES STUDENTS

The faculty members of the EES Department are committed to providing our students with practical research, field, and presentation experience as often as possible Many of the activities our students participate in are supported through EES Founders Fund, which was established for these purposes. We welcome your tax-deductible donations to this fund and encourage you to contact Mr. Joseph McGann at Institutional Advancement (860-465-4514) or email him at (McGannJ@easternct.edu), if you would like to learn more about how to contribute to experiences that open minds and support career development for new generations of EES students. Thank you in advance!

Eastern EES Facebook Page: Alumni, if you are not currently a member of the Eastern EES Facebook page, please email Bryan at OakleyB@easternct.edu and he can send you the link. The Facebook page is a great way to stay connected to the department as well as a growing resource for the EES related jobs.

EES Students and Faculty in the Lost River Range, Idaho