



PETROGLYPHS

2018-19 EES Newsletter

8th Edition

Message from the Chair

Dickson Cunningham

Greetings all!

Another year has rolled by (in a blur) and in this newsletter, we highlight many of the activities and achievements during the last 12 months in the Department of Environmental Earth Science at ECSU. In all ways, our department is excelling – with dedicated professors, enthusiastic students, strong support staff and successful alumni. We are proud of our department and are optimistic for our future as a leading science department that provides a diverse major curriculum and important courses within the liberal arts core. Environmental Earth Science has never been more relevant to humanity and the environment, with climate change, sustainability, resource management, earth systems, natural hazards and environmental degradation emerging as major societal, political and economic issues. As these subjects continue to grow in importance, EES graduates will be well positioned to enter the workforce and graduate programs to contribute to this important employment sector in Connecticut and beyond.

This year, the new EES chapter of the Sigma Gamma Epsilon National Honor Society in the Earth Sciences got off to an excellent start with a visiting speaker program and Saturday field excursion. Much more is planned for 2019-20 as 11 new members were inducted in May 2019. The department's trip to Wyoming/Idaho in May-June was a great success – please see the separate trip report in this newsletter. Thirteen students carried out independent summer research projects and more than twenty-five students gave presentations at NEGSA, CREATE and various other undergraduate research, geoscience, GIS and sustainable energy conferences during the year. The department also successfully completed its 7-year academic program review and was praised in all categories of endeavor. At the time of writing, the department is exploring two new concentrations ('tracks') within the major focusing on geospatial and environmental science. We remain grateful to all members of the EES community for their contributions during the last year to ensure that EES remains a friendly, positive and caring community of passionate educators and enthusiastic learners. Finally, we had 16 graduating EES seniors this past May and we encourage all our alumni to stay in touch and come home to EES and say hi, whenever you are passing through eastern Connecticut.

Best wishes to all,

Dickson

On Mt Washington,
June 2019



Inside: Student Research, Notable Events/Achievements, Faculty/Alumni Updates

DEPARTMENT NEWS

Message from the Assistant Chair
Drew Hyatt

Howdy folks! I hope you enjoy the latest newsletter with updates and reports on activities alluded to in Dickson's opening salutation. I too have found this past 12 months to be busy, and I look forward to working with Steve Nathan who will take over the assistant chair position at the start of the new academic year. I continue to be enthusiastic about the program and our students and note that the present cohort of students are as engaged as ever.

I also want to congratulate Dickson Cunningham for being selected the 2019 Eastern Connecticut State University Distinguished Professor, and Bryan Oakley who received the Eastern faculty 2019 research award. Others in the department remain busy and you will find updates describing related details. It is always nice, however, to begin with a few images that capture the successful close to last year – namely the year-end celebration. This past year students received advice and encouragement from Nicholas Jones (EES 2012). So read-on to get an update on recent happenings in Environmental Earth Science.



Top: A quick view of those in attendance at the 2019 year-end celebration. **Bottom-left** Nick Jones from Eversource and a 2012 graduate provided words of encouragement to students. Dickson Cunningham and Bryan Oakley (**bottom center, right**) received distinguished professor and research awards at Eastern.

Congratulations Graduates! 2019

As Nora Ephron said,

“Your education is a dress rehearsal for a life that is yours to lead.”

Enjoy every minute of this journey! It’s just the beginning!



The Environmental Earth Science Department (faculty and students) participating and enjoying the graduation ceremony
May 2019

EES Celebration 2019

Following opening remarks from Nick Jones, a variety of awards were given to students, with the 2019 outstanding EES student distinction being received by Jennifer Croteau. Jennifer's parents were present, along with a wide assortment of current and former EES students.



Outstanding Environmental Earth Scientist

And the award goes to...
Jennifer Croteau



Congratulations
to all EES
Awardees!





ANNUAL STUDENT

AWARDS



MADISON KNOX
Junior Academic
Excellence



EMMA AVERY
Senior Academic Excellence



JACK CERRA and JOSEPH MARSALISI
Sophomore Academic Excellence



**DAVID BAFUMO, JENNIFER CROTEAU,
ALYSON AUGENSTEIN**
Quaternary Geology Recognition



DANIEL SIMPSON
Sustainable Energy Science



ERICK BORA
Soft Rock Geology Recognition



KATRISHIA BELL and THOMAS ZIMMERMAN
Geomorphology Research Recognition



ALYSON AUGENSTEIN and ERICK BORA
Hard Rock Geology Recognition



ALYSON AUGENSTEIN
Geographic Information Systems



**JAMES WARGO, MADISON
KNOX, DOMINIC LIVOTI**
Hard Rock Research Recognition

ACADEMIC PROGRAM REVIEW REPORT

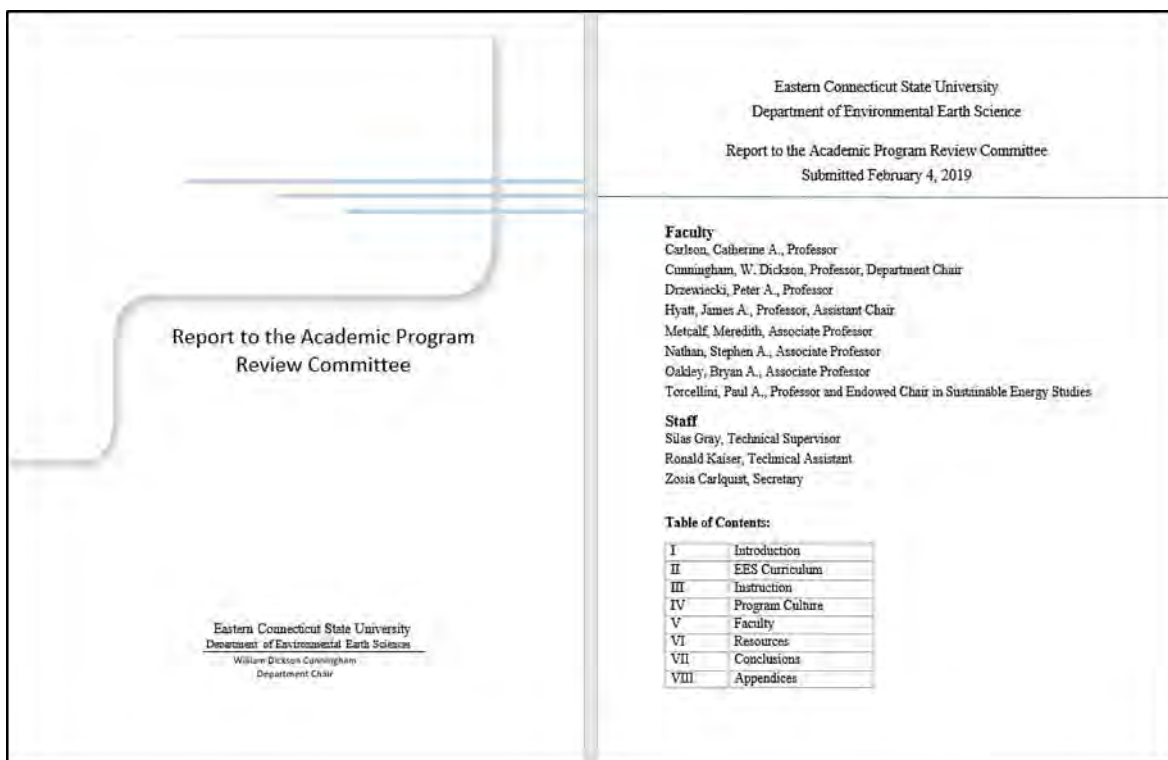
by Dickson Cunningham

The Department of Environmental Earth Science successfully completed its 7-year academic program review during winter-spring, 2019. The process involved writing a comprehensive self-report during December-January involving detailed collection, analysis and synthesis of a wide variety of data and information related to instruction, program culture, faculty, and department resources. The report reviews many sub-categories of endeavor and achievements within its 390 pages.

Following internal review by the Academic Program Review Committee, the report was sent to two external reviewers, Professor Elizabeth Gordon, Fitchburg State and Professor Brad Hubeny, Salem State University. Professors Gordon and Hubeny visited the Department in April to complete their evaluation of the department through meetings with faculty, the Provost, Dean, and EES majors, and to carry out on-site review of the department's academic activities and resources. Their summary report was received three weeks later in early May.

In their very positive report, Professors Gordon and Hubeny noted the depth and breadth of the EES curriculum, its unique SES track, diversity of experiential learning opportunities and the excellent resources available to support undergraduate research. Professors Gordon and Hubeny also remarked that they were impressed with the department's dedication to its students' education and the overall program culture and breadth of EES student activities. Faculty teaching excellence, scholarship, service to the university and wider community, and individual contributions to their fields of research were also praised.

The external reviewers noted that the department should consider developing one or more new major tracks with greater focus on environmental science, environmental health science and geospatial science. This recommendation is well taken and at the time of writing, the department is actively exploring two new tracks within the major and the appropriate course components for each.





HOLIDAY PARTY

Our holiday party was more fashionable than ever this year, with holiday sweater elegance, as the photos indicate. We also had a secret Santa gift bag, a fiercely contested cornhole competition, holiday pizza with dessert treats, and a variety of embarrassing professor behaviors.







EES 456 Field Trip

Instructor: Bryan Oakley

EES 456 (Coastal Geologic Hazards) held a fieldtrip to Napatree Point, RI in April, 2019, where they met with Janice Sassi, the manager of the Napatree Point Conservation Area (NPCA) and Dr. Peter August, the chair of the NPCA Science advisors to discuss issues related to storms and sea level rise. The class then walked the barrier, discussed ongoing research and even saw a seal. The afternoon was spent examining vulnerabilities of the area to storms and sea level rise, which was part of the final project for the course. Photos by Janice Sassi.



EES Wyoming-Idaho Spring Field Course Trip Report

By Dickson Cunningham

In May, 2019, 24 EES students and three wizened professors flew to Salt Lake City for a 12-day field course in Utah, Idaho and Wyoming (with a brief foray into Montana). After arriving late at night and discovering that Dr D had forgotten his driver's license, then found it and lost it, then found it, then lost it and then found it again, the group set off on a clockwise route with 3 days of thunderstorms and rain in the forecast. Fortunately, a quick stop at the Great Salt Lake (Antelope Island) went smoothly and we were able to see the pretty lake amidst swarms of flies hovering over microbial mats, with views of the distant Wasatch Range and its impressive faulted mountain front. We then drove north into Idaho and turned west to the City of Rocks in the southern Albion Range. We lucked out with the weather and had a marvelous hike in the heavily jointed and weathered granite landscape leaving the students in happy spirits because we had truly entered a very scenic part of the wild west. We arrived late in Twin Falls, but still had time to peek into the Snake River Canyon and watch base jumpers plunging past flood basalt cliffs.

The evening began with a group meal at Idaho Joes with burgers and pie slices for most. A medical incident left some people poorly rested for the next day, but after a brief stop at dramatic Shoshone Falls, we raced up to Craters of the Moon where again, we somehow avoided the rain, (although we watched a tornado) and saw all the main sites of the amazingly raw volcanic landscape of the northern Snake River Plain. Cinder and spatter cones, vast pahoehoe lavas, and a wide variety of landscapes and volcanic products provided a crash course in fissure eruption and flood basalt volcanology. We left time to explore the lava plains and lava tubes and felt as if we had gone back in time to a primeval Earth.

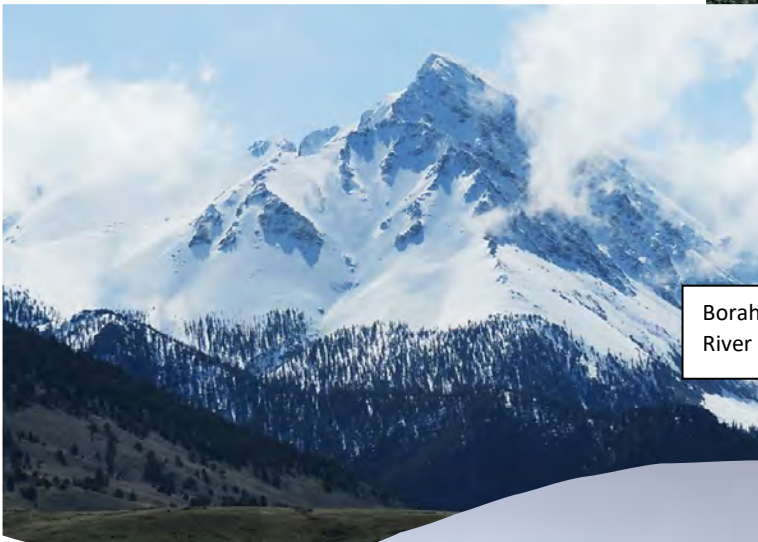


EES crowd maintains positive spirit, despite storm clouds above and volcanic unrest below at Craters of the Moon NM, ID

The following day was spent in the Lost River Range where we explored the 1983 Borah Peak earthquake zone with its interesting multi-scarp ground rupture. During the morning, Borah Peak itself emerged from the clouds displaying beautiful fresh snow cover, enticing us to explore the range further. So, we spent the afternoon at the range's northern end bushwhacking into a high valley with much late spring snow to wade through. We reached the tree line and enjoyed discovering a wide variety of coral and marine invertebrate fossils in the Mississippian carbonate talus blocks. The hike took us to 9000' elevation and was initially challenging for many students, but all persevered and ultimately everybody felt a strong sense of accomplishment. The views of the folded Paleozoic strata at the head of the valley and in the distant mountains was a reminder of the impressive crustal forces that produced the Sevier fold-and-thrust belt. A second night was spent in Mackay, ID, one of our favorite towns on the trip, which included a dinner feast at Amy Lou's.



1983 Borah Peak complex surface rupture (drone photo by Drew Hyatt)



Borah Peak, Lost River Range, ID



High in the northern Lost River Range, ID

Mesa Falls, ID



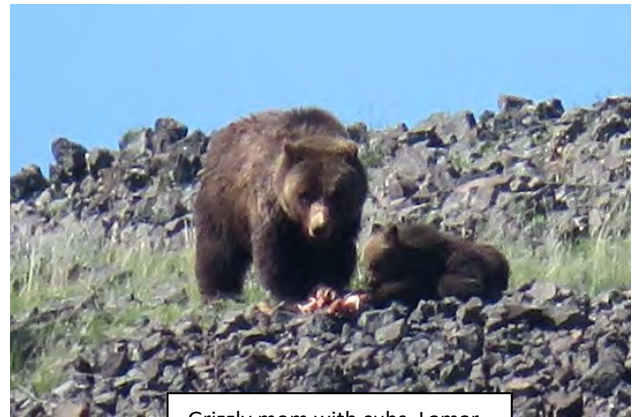
We crossed the Snake River Plain the next day en route to Yellowstone. Highlights of the day included hiking up North Menan Butte – a hydro-volcano tuff cone, viewing Mesa Falls in the Island Park Caldera, and visiting the Madison Landslide and learning about the devastating co-seismic event that buried a campground and created “Quake Lake” in 1959. We arrived late at the KOA in West Yellowstone where we would spend 3 nights in our rustic cabins made cozier by the soporific sounds of three snoring leaders.

At Grand Prismatic Spring, Yellowstone NP





Group discussion near Old Faithful, Yellowstone NP



Grizzly mom with cubs, Lamar Valley, Yellowstone , NP

We spent 2 full days in Yellowstone - in sunshine - enthralled by the geothermal sights (and sounds and smells), rich scenery, diverse landscapes, amazing wildlife and the sheer vastness of the park. Highlights included hiking through the Norris Geyser Basin, and Old Faithful-Grand Prismatic Spring-West Thumb geothermal areas, visiting the awesome Grand Canyon of the Yellowstone, and wildlife viewing in the Lamar Valley. We were treated to bison traffic jams, a distant view of a mother grizzly with two cubs, a black bear with cubs, numerous pronghorn, elk, bighorn sheep and a hungry coyote. Old Faithful performed on cue and the mud pots burped and blipped as expected. We left Yellowstone satisfied that we had observed Earth's largest concentration of volcanic and hydrothermal indigestion.

Then we headed south to Grand Teton National Park. We stopped along Jackson Lake for a superb lunch picnic and panoramic view of the range – again in glorious sunshine - and then drove to the top of Signal Mtn where we had a grandstand view of the glacial landscapes in the northern Teton Valley and the regionally tilted hanging wall valley floor. We arrived later at Teton Village for an afternoon ride up the tram to Rendezvous Peak (elevation 10,500'). There was too much snow for a summit hike, and it became cold and windy, but waffles and cocoa were on offer in the summit hut and the more adventurous huddled on the summit and posed for “hero selfies”. The wide-ranging views of the west-dipping Paleozoic strata that unconformably overlie the tilted Precambrian basement block were impressive.



Bryan discussing Snake River terraces, Grand Teton NP

We woke early the next day for a relaxing and blissful float trip down the Snake River through the terraced floodplain. The weather was cool, the scenery gorgeous and we saw bald eagles and a mother moose with 2 calves. In the afternoon, we raced over to Jenny Lake and crossed it by boat and then hiked up Cascade Canyon. It was a bit rushed, but we all managed to reach the hanging valley floor and most scrambled up the boulder talus to elevated outcrops that afforded glorious views of surrounding peaks and the Teton Valley, including Jenny Lake and its bounding terminal moraine. We also examined multiply intruded, metamorphosed and deformed 2.0 Ga Proterozoic basement gneisses which most students soon realized were the oldest rocks they had ever stood on. Late in the day, we zipped over to the Gros Ventre landslide and were awed by the huge scale of the landslide deposit and the large collapse source area clearly visible on the distant mountainside. That evening, we enjoyed dinner and some down time strolling around the very touristy but pleasant town of Jackson. Many students took the opportunity to shop for T-shirts, sweatshirts and various treats for those back home, while a cadre of EES hipsters headed to the cowboy saloon to dazzle the locals with their latest dance moves.



Float trip, Grand Teton NP



Three Stooges on Rendezvous Peak, Grand Teton NP



In Cascade Canyon, Grand Teton NP

Next, we drove SE to the Wind River Range where we were awed by deeply scoured glacial Lake Fremont and its bordering moraines, before heading up Skyline Drive. Snow blocked the road to the highest accessible areas, but we were able to gain views of some of the high summits and examine Precambrian basement rocks that are exposed throughout the range interior. We then stopped at the Museum of the Mountain Man which all agreed was superb and much better than expected. We learned a great deal about the Native American heritage and European exploration of the region, including the rendezvous points for the early fur trappers. In the afternoon, we drove into the Pinedale Anticline gas field and examined the regional setting of one of the largest fracking operations and natural gas producing regions in America. We then drove south through rain and the high sagebrush desert of the Green River Basin arriving that evening in Kemmerer.

The next morning we headed straight to the American Quarry in the hills NW of Kemmerer where we split open laminated lacustrine carbonates to find flattened fish, bony fish and then believe it or not, more dead fish. All students were successful in finding beautiful fossils to bring home. A few students found very complete and valuable specimens worthy of museum display. After lunch, we arrived at Fossil Butte National Monument and the displays there revealed what other paleontological wonders can be found in the Green River Formation. A nice presentation and Q&A from the park ranger enhanced our learning of this amazing Eocene lagerstätte. That evening, the students had their final examination and then we all crossed the street to feast and sip refreshments at the El Jaliciense Mexican restaurant, and celebrate our wonderful trip, newfound friendships and fond memories.

We arrived at Salt Lake City the next day for our flight home, arriving back in Hartford in one piece and pleased with all that we had seen, learned and accomplished. The trip was marvelous overall, and one of the best I have ever had the pleasure of leading/co-leading. All students and faculty got along well, the weather held throughout, the geology, scenery and wildlife exceeded our expectations, and we achieved all of our educational objectives whilst enjoying each other's company and returning home safe and sound.



High above Fremont Lake, Wind River Range, WY



Baby moose, Grand Teton NP, WY



**EES Majors Joey and Kayla
show off their beautiful
fish fossils**



(Thanks to Drew Hyatt for most of the photos shown here!)



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

Annual Report by Faculty Advisor, Dickson Cunningham

The EES Chapter of the Sigma Gamma Epsilon National Honor Society in the Earth Sciences is Theta Upsilon. Formal recognition by the SGE National Committee occurred in May, 2018 after a successful petition by our department and a site visit by Dr Mark Noll from SUNY, Brockport who is the SGE committee representative for the NE region. During the 2018-19 academic year, the society began its activities by hosting a visiting speaker program and organizing a spring field trip. Five speakers made presentations about various earth science subjects (formal program is shown below). The spring trip included visits to Wadsworth Falls, Mt Higby and the Yale Peabody Museum with a fun lunch at famous Pepe's Pizzeria in New Haven. During the last year, Jennifer Croteau served as Society President and Maddie Varney and Katrisha Bell served as Society Vice President during the fall and spring semesters, respectively. During the spring, 2019 induction ceremony, 13 new members were inducted into the honor society. During the induction ceremony, many family members and friends attended and the Dean was also present. The society has ambitious plans for the coming 2019-2020 academic year including additional extracurricular activities and a larger visiting speaker program. Photos from the 2019 induction ceremony and spring field trip are shown below.

EES Chapter of the SGE Honor Society 2018-19 Speaker Program

11/16/18 Topic:	Ralph Lewis , former Connecticut State Geologist and currently Assistant Professor at Long Island Resource Center, UCONN @Avery Point <i>The Role of Acoustic and Mechanical Tools in the Study of long Island Sound's Geology</i>
2/8/19 Topic:	Dickson Cunningham and Haibo Yang , Department of Environmental Earth Science, ECSU <i>Tectonic Processes of Plateau Development: A Journey to the North Tibetan Margin, China</i>
2/22/19 Topic:	Catherine Carr , Project Geologist at HRP Associates, Farmington, CT <i>What to Expect from a Career in Environmental Consulting</i>
3/22/19 Topic:	Harold Moritz , Geologist and Mineral Collector, Geological Society of Connecticut <i>Minnesota Iron</i>
4/12/19 Topic:	Mark Evans , CCSU Geological Sciences Department <i>Piecing Together the Central Appalachian Valley and Ridge: 170 years of Progress</i>



EES SGE Honor Society Members:	
Returning 2018 Inductees:	Kayla Andrews, Katrishia Bell, Madison Knox, Thomas Zimmerman
Inductees who graduated in May 2019:	Alyson Augenstein, Emma Avery, David Bafumo, Jennifer Croteau, Chanler Florian, Dominic Livoti, Bryce Mase, James Wargo
Returning 2019 Inductees:	Erick Bora, Katherine Hope, Morgan Kuryluk, Kymberlie Lee, Elizabeth Lemire, Gregory Rodman, Daniel Simpson, Mario Vinci



Group Photo at May Induction Ceremony, L to R: Dickson Cunningham, Gregory Rodman, Emma Avery, Daniel Simpson, Elizabeth Lemire, Morgan Kuryluk, Bryce Mase, Kymberlie Lee, Madeline Varney, Madison Knox, Erick Bora, Kayla Andrews, Jennifer Croteau, Chanler Florian, Katherine Hope, Katrishia Bell, James Wargo, Dominic Livoti, Maro Vinci, David Bafumo.



Bryce Mase receiving his formal SGE induction certificate



Liz Lemire receiving her formal SGE induction certificate

FIELD TRIPS



Left to Right: Dickson, Madison, Tom, Jenn, Aly, Kayla and Katrishia and Drew at the Yale Peabody Museum, April, 2019



Jenn, Kayla, Aly and Tom in the great Hall of Dinosaurs, Yale Peabody Museum, New Haven



View N of summit of Mt. Higby and traprock ridge escarpment



Aly takes in the view from Mt. Higby

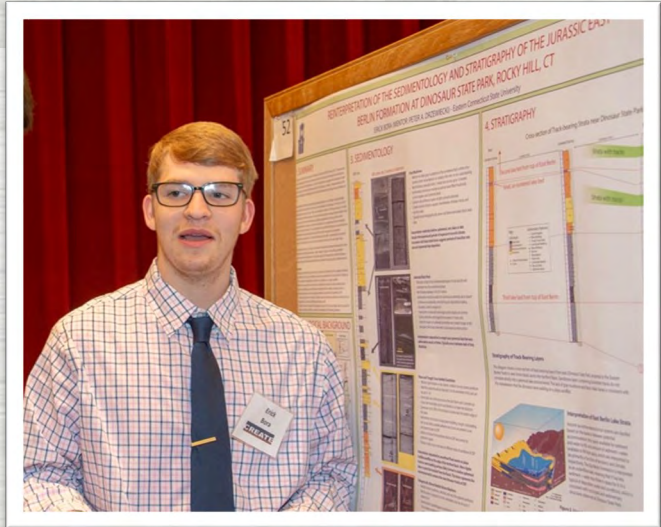


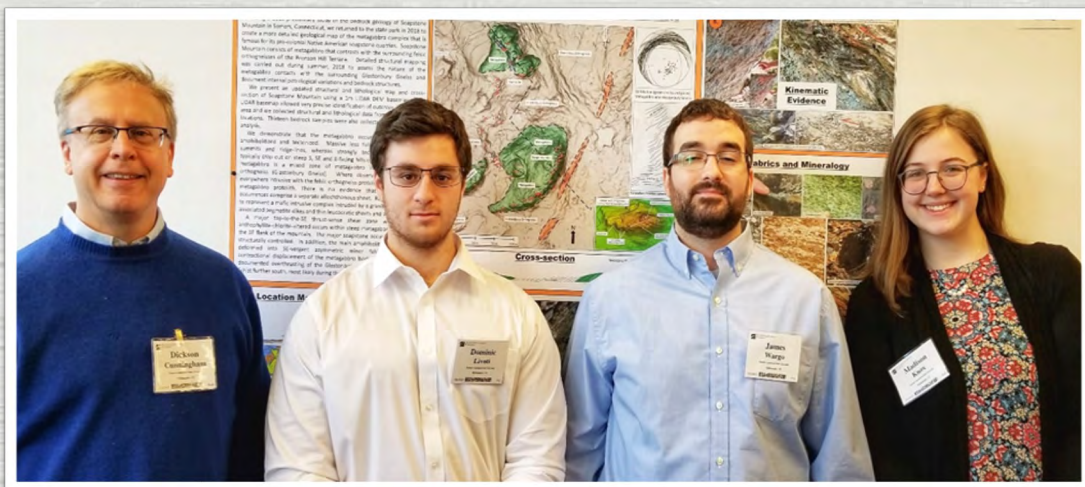
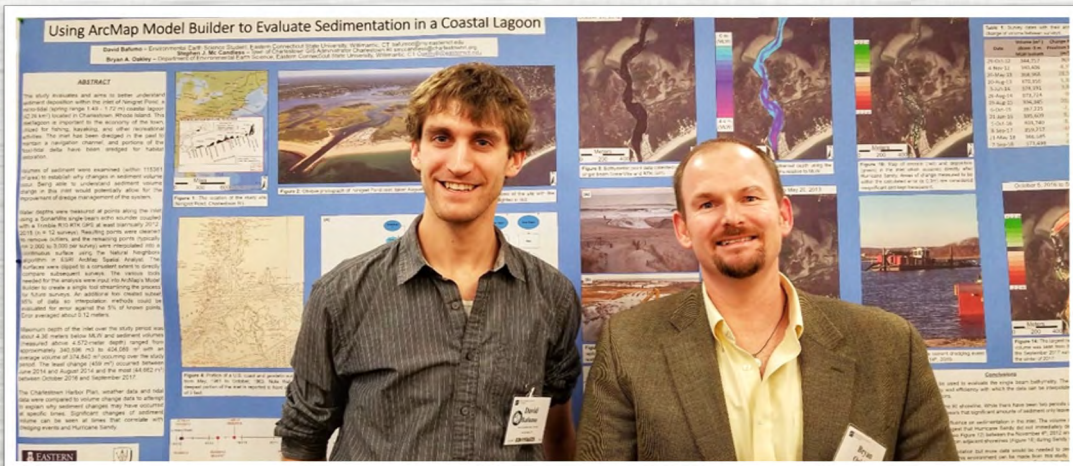
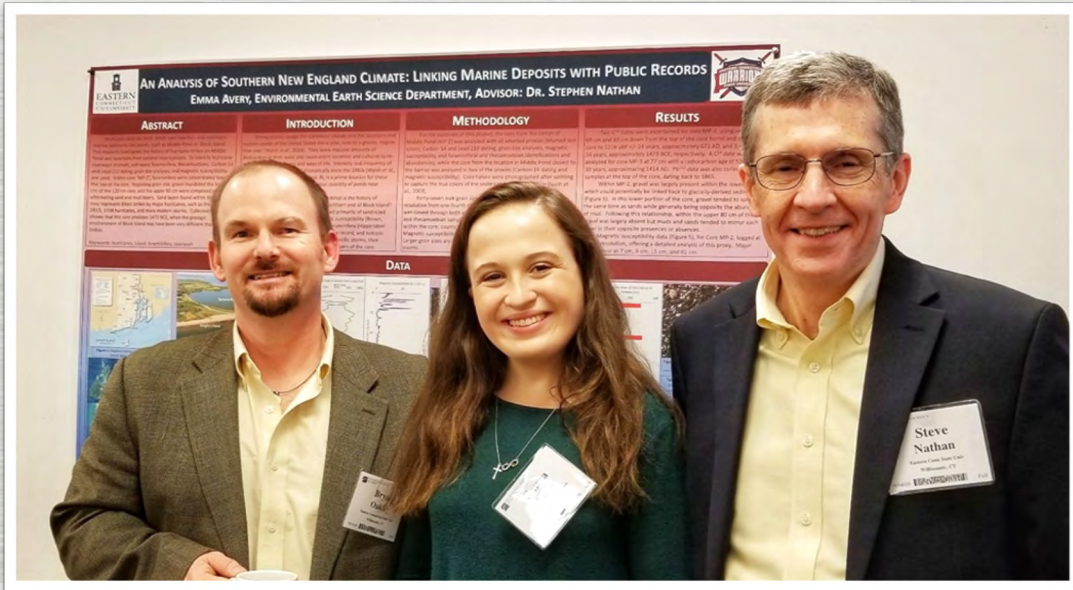
CONFERENCES



It was another strong year for EES faculty and student participation at ECSU, regional, national and international conferences. This included presentations by 12 students at the Eastern CREATE conference, 7 students at the Northeast Geological Society of America meeting, 2 students at the New England Estuarine Research Society Conference, the New England-Saint Lawrence Valley Geographical Society Conference in New Hampshire, and the Northeast Arc Users Conference at Keene State College in NH.







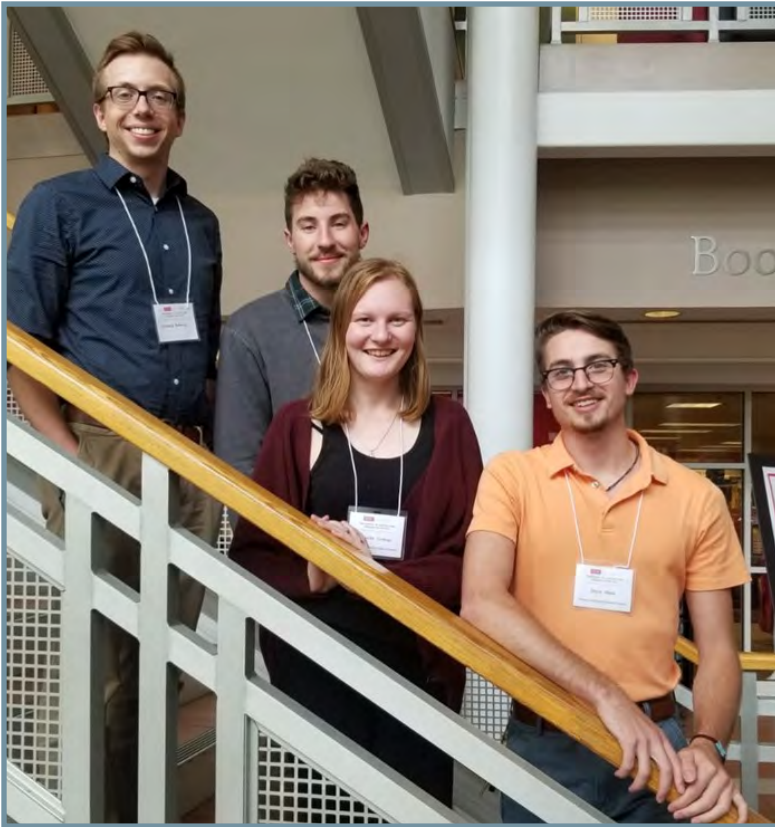


Earlier in May, Katrisha Bell, Erick Bora, Taylor Brown, Allison Brown, and Morgan Kuryluk gave poster presentations of their final projects from Advanced GIS at the Spring Northeast Arc Users Conference at Keene State College. Posters were well received by the GIS community and students were well prepared and incredibly knowledgeable on a broad range of GIS topics.

NEARC Conference
May 14
Keene State College
Keene, NH



Faculty Mentor: Meredith Metcalf



New England Saint Lawrence Valley Geographical Society Conference (NESTVAL)

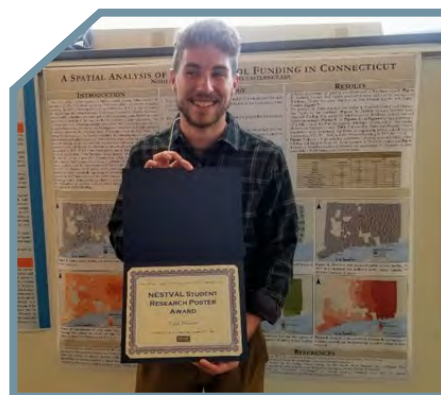
Hosted by Keene State College,
Keene NH

October 12-13, 2018

In the fall of 2018, Zachary Adams, Jennifer Croteau, Noah Hallisey and Bryce Mase attended and presented their work completed in Advanced GIS or in independent study at the New England Saint Lawrence Valley Geographical Society Conference (NESTVAL) hosted by Keene State College in New Hampshire.

Conference Highlights:

- Zachary Adams and Jennifer Croteau gave oral presentations
- Noah Hallisey and Bryce Mase presented posters
- Noah Hallisey was awarded the NESTVAL Student Research Poster Award for his project on evaluating the distribution of school funding across the state of Connecticut.



Congratulations

Faculty Mentor: Meredith Metcalf



New England Estuarine Research Society Annual Conference York Harbor, ME

April 2019

Eastern Connecticut State University EES students Jennifer Croteau (oral presentation) Alyson Augenstein (poster presentation) attended and presented their respective research projects at the 2019 New England Estuarine Research Society (NEERS) annual conference in York, ME. The presentations were very well received, and the feedback received from Dr. Oakley's colleagues at the conference was that folks were impressed that Jenn and Aly were only undergraduate students and not grad students! Two highlights of NEERS were Aly receiving the Warren Prize for the best undergraduate poster at the conference, and Jenn's grandparents from Maine attending her talk.



Aly presenting her poster



Jenn presenting her poster

Faculty Mentor:
Bryan Oakley

Eastern Mappers



During the fall semester, the Eastern Mappers sponsored an event for students interested in environmental consulting to attend the Environmental Professionals' Organization of Connecticut annual dinner meeting at the Glastonbury Boathouse. Students who attended networked with professionals across the state and enjoyed dinner while listening to Jan Czczotka elaborate on his mission as the Remediation Division Director of the CT Department of Energy and Environmental Protection.

Members of the Eastern Mappers enjoying the Environmental Professionals' Organization of Connecticut annual dinner

Students who attended the meeting included Mario Vinci, Ryan Cueto, Zachary Adams, Taylor Brown, Jennifer Croteau, Elizabeth Lemire, Alyson Augenstein, Madie Varney, Dan Jakubielski, and Bryce Mase.

The Eastern Mappers hosted and participated in other events over the year including "pumpkin painting" and "Earth Day" and they worked on a project to assist Eastern's Campus Police in identifying the locations of Blue Lights across campus to create a more accurate map.



Painting pumpkins for Halloween in October

Student Research

Project Title: Evidence for a Cryptic Ophiolitic Suture in Western Connecticut

Student:
Benjamin VanDine

Faculty Mentor:
Dickson Cunningham



Ben on serpentinized ultramafic outcrop, Harwinton, CT

This project concerns an unusual suite of talc-, tremolite- serpentine- and kyanite-rich schists from the New Hartford-Harwinton region of western CT. The rocks occur as highly deformed isolated lenses at the southern end of a belt of altered mafic and ultramafic rocks that continues through the northern Appalachians into Quebec, where they comprise the famous Thetford Mines ophiolitic suture. Thus, we suspect that the suite in western Connecticut may also represent the southern, highly deformed continuation of this cryptic suture. Accordingly, samples were collected from previously mapped serpentinite localities to test the hypothesis that the talc-tremolite-serpentine-rich rocks represent highly altered and deformed scraps of oceanic lithosphere. Thin-section analysis from 3 new locations yield important insights into the petrological evolution of the talc and serpentine-rich rocks.

Highly serpentinized relict olivine is present in 3 of the lenses strongly suggesting a peridotitic protolith. Up to 100% talc-tremolite-chlorite and serpentine alteration of the original lithology is indicated in some samples and impressive 1-5 cm stellate clusters of secondary tremolite locally overprint all primary minerals and mineral textures. Bordering the talc-tremolite-serpentinite bodies in New Hartford are kyanite-phengite-rich rocks with blue-grey kyanite blades up to 10 cm-long locally comprising at least 50% of the rock mass. These bordering kyanite-rich schists suggest high pressure metamorphic conditions adjacent to the serpentinized ophiolitic rocks consistent with a paleo-subduction environment. Collectively, the field and petrographic data suggest that the cryptic Taconic suture identified in the northern Appalachians can now be traced southwards into western Connecticut.

Research presented at CREATE

Student Research

Project Title: Lithological and Structural Evolution of the Soapstone Mountain Metagabbro Complex, Somers, CT

Students:
Madison Knox, Dominic Livoti,
James Wargo

Faculty Mentor:
Dickson Cunningham



Dominic, Madison and James at gabbro outcrop,
Soapstone Mtn, Somers, CT

Following a 2013 preliminary study of the bedrock geology of Soapstone Mountain in Somers, CT, we returned to the state park in 2018 to create a more detailed geological map of the metagabbro complex that is famous for its pre-colonial Native American soapstone quarries. Soapstone Mountain consists of metagabbro that contrasts with the surrounding felsic orthogneisses of the Bronson Hill Terrane. Detailed structural mapping was carried out during summer, 2018 to assess the nature of the metagabbro contacts with the surrounding Glastonbury Gneiss and document internal petrological variations and bedrock structures. We present an updated structural and lithological map and cross-section of Soapstone Mountain using a 1m LiDAR DEM basemap. The LiDAR basemap allowed very precise identification of outcrops in the study area and we collected structural and lithological data from more than 100 locations. Thirteen bedrock samples were also collected for petrographic analysis. We demonstrate that the metagabbro occurrences are variably amphibolitized and tectonized.

Massive less foliated zones comprise summits and ridge-lines, whereas strongly tectonized amphibolites typically crop out on steep S, SE and E-facing hillslopes. The base of the metagabbro is a mixed ne of metagabbro intruded by granitic orthogneiss (Glastonbury Gneiss). Where observed, the contact is everywhere intrusive with the felsic orthogneiss protolith intrusive into the metagabbro protolith. There is no evidence that the metagabbro occurrences comprise a separate allochthonous sheet. Rather, they appear to represent a mafic intrusive complex intruded by a granitic complex with associated pegmatite dikes and thin leucocratic sheets and apophyses. A major top-to-the-SE thrust-sense shear zone which is talc-anthophyllite-chlorite-altered occurs within steep metagabbro outcrops on the SE flank of the mountain. The major soapstone occurrences are thus structurally controlled. In addition, the main amphibolite fabric is locally deformed into SE-vergent asymmetric minor folds. SE-directed contractional displacement of the metagabbro bodies is consistent with documented overthrusting of the Glastonbury Complex over the Bolton Schist further south, most likely during the Alleghenian orogeny.

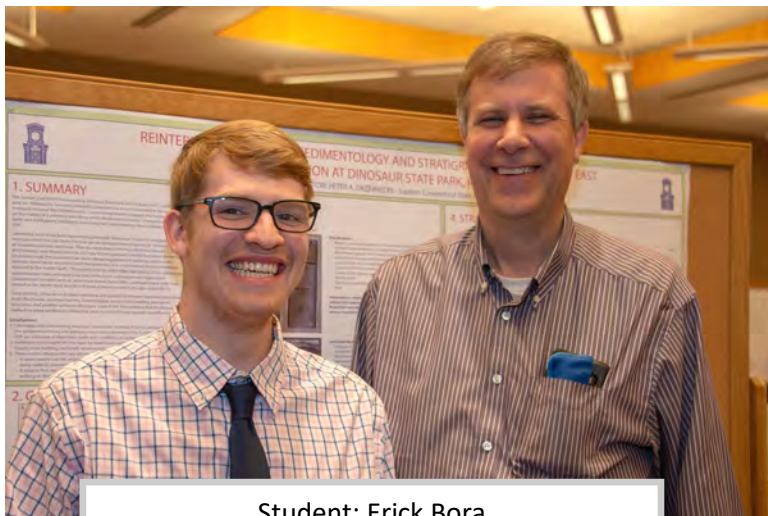
Research presented at CREATE and
NEGSA Spring 2019

EES 2018 Undergraduate Student Research

Project Title: Interpreting Depositional Environments at Dinosaur State Park, Rocky Hill, CT

Erick presented his findings at Eastern's CREATE Conference, and at the spring Northeastern Geological Society of America meeting in Portland, Maine. At the latter meeting, he enjoyed watching his professor defend the new interpretations against arguments made by long-time proponents of the lake margin interpretation!

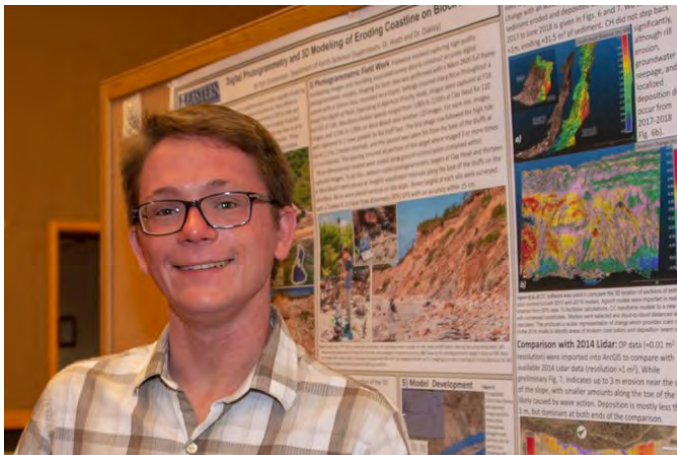
Description: The goal of this project was to examine and interpret the depositional environments in the rocks exposed at Dinosaur State Park in Rocky Hill, CT, in light of ideas that I have been exploring for many years now. The depositional environment is currently interpreted to be a margin of a large freshwater lake, with dinosaurs visiting to search for fish to eat. Some ambiguous tracks are interpreted to be made by swimming dinosaurs. Over the past several years, however, I have made numerous sedimentological and stratigraphic observations that made me question these interpretations. I worked with EES major Erick Bora to re-interpret the depositional environment and question some of the interpretations of dinosaur behavior. We examined rocks exposed in the park, as well as those from the same stratigraphic interval from a core at the park, two nearby outcrops, and two cores from south Hartford.



Student: Erick Bora
Faculty Mentor: Peter Drzewiecki

The strata within which the *Eubrontes* trackways occur are not composed of the fish-bearing black shale deposits typical of perennial lakes within the Hartford basin. They are found in relatively coarse sandstone that contains planar bedding and cross-bedding typical of deposition by flowing water over land, and not within a standing body of water. Interbedded layers contain mudcracks. These are typical of deposition within a playa environment – a valley in an arid setting that is typically dry but will fill with a shallow, temporary lake during floods, like Death Valley. Some of the track layers are covered with wave ripples that are of dimensions that suggest water depths of 20-40 centimeters. The main surface contains structures indicative of a microbial mat developing on a wet, but exposed surface. There is no evidence of a perennial lake at this time. This is supported by correlation to nearby outcrops and cores. The dark shales representing perennial lakes are stratigraphically above and below the Dinosaur State Park trackways, and are likely 1000's of years older and younger. There is no evidence that a perennial lake occurred in the Hartford basin at the time the tracks were made. These observations call into question the swimming and feeding behavior of the dinosaurs noted above, neither of which are likely to occur in a shallow, temporary playa lake.

Undergraduate Research



Project: 3D Modelling and Point Cloud Analysis of Eroding Shorelines at two sites on Block Island and at Napatree Point, Rhode Island

Students:
Katrishia Bell and Tom Zimmerman

Faculty Mentors:
Drew Hyatt and Bryan Oakley

EES majors Katrishia Bell and Tom Zimmerman were introduced to field and computing techniques that support ongoing analysis of several eroding coastlines in Rhode Island. Both students learned to use high-quality imaging and GPS surveying equipment to collect data suitable for examining conditions at Napatree Point (Kat) and two sites on Block Island (Tom). This work built on previous efforts by former students to map change that had occurred over several years at these sites. Tom and Kat utilized several hundred full-frame camera images and a variety of software packages to construct detailed X-Y-Z point cloud models of the two eroding sites. In Tom's case, this included conditions at an eroding municipal dumpsite (West Beach), and a tall eroding bluff (Clay Head). Kat focused her efforts on the tip of Napatree Point where wave action has progressively eroded a till-cored headland resulting in somewhat limited coastline retreat. Both students presented their findings at the 2019 CREATE conference at Eastern.



Students: Bryce Mase and Erick Bora
 Faculty Mentor: Meredith Metcalf

This year I have been working with colleagues at the University of Connecticut and SUNY Plattsburgh on evaluating sources of salt contamination in several bedrock wells owned by the Town of Sherman.

What some may think is an easy problem to understand, is incredibly complex owing to groundwater flow conditions in the fractured rock. I have been lucky to have Bryce Mase and Erick Bora assist in the field as we continue to evaluate this issue in more detail over the next few months.

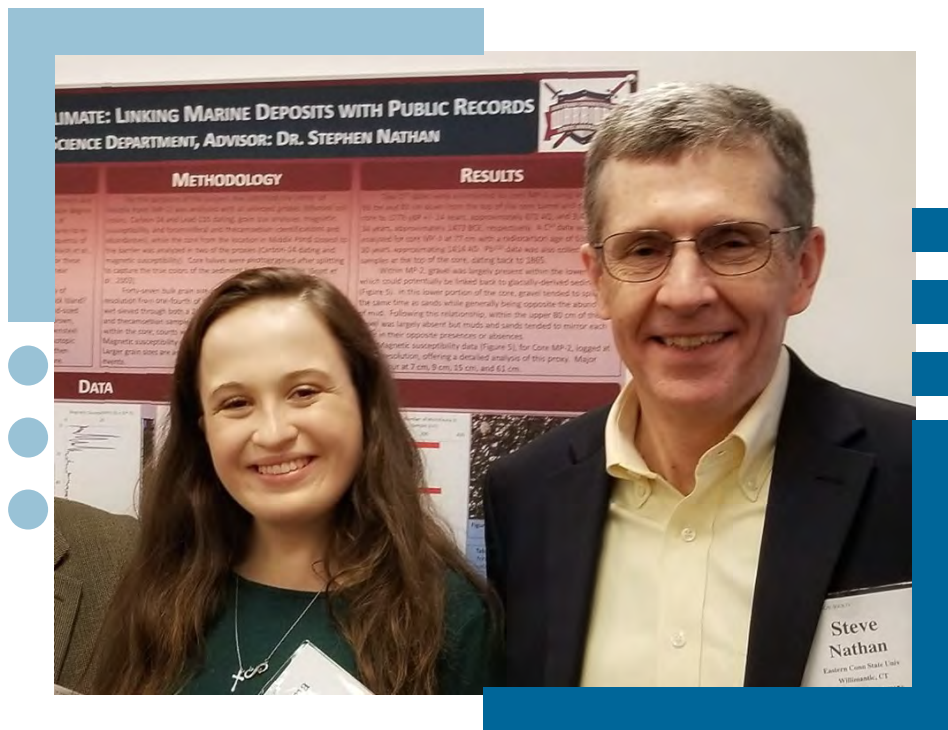
Bryce Mase (above) and Erick Bora (below) assisting in water quality sampling and profiling of fractured bedrock wells to better understanding salt contamination and fracture flow conditions.



Student Research

Project Title: An Analysis of Southern New England Climate: Linking Marine Deposits with Public Records

Student: Emma Avery
Faculty Mentor: Stephen Nathan



EES Senior and Honors Student, Emma Avery, wrapped up her research in paleoclimatology. Emma used microfossils to gauge the severity and/or frequency of historical tropical storms upon Block Island. Emma made some great findings and she presented her work at the October 2018 COPLAC, CREATE and Northeast GSA in early spring, and at the April 2019 NCUR meeting. Emma will start at UConn School of Law in August 2019, specializing in environmental and energy law.



Student Research

Faculty Mentor: Bryan Oakley

Over the past couple of years I have had the privilege of working with some really outstanding students. When working one-on-one or in small teams these student researchers transcend into collaborators, and I always miss seeing them as we check in on research projects weekly, daily (or in some cases multiple times a day!). The enthusiasm and hard work of all the student researchers I have worked with is one of the things I enjoy the most about my job! Recent EES graduates have been engaged in projects that expanded the EES scope of work well beyond shoreline change. Jennifer Croteau completed her project, which began in the spring of 2017 examining the vulnerability of the salt marsh within the Napatree Lagoon to sea level rise and crab predation. Jenn presented her work at the New England Estuarine Research Society (NEERS), Northeast Geological Society of America Meeting (GSA), as well as at CREATE.

Before graduating in December and starting grad school at the University of Rhode Island, Madie Varney examined evolution of the barrier spit that enclosed the Napatree lagoon following the 1938 Hurricane, presenting her work at Northeast GSA. Alyson Augenstein completed a survey of the Napatree Lagoon, comparing bathymetric changes between 2014 and 2018, including a detailed survey of the flood-tidal delta. All three of these projects help foster the science-based management of this important part of the Napatree ecosystem. David Bafumo, another May 2019 graduate completed an externally funded project examining sedimentation within a coastal inlet related to dredging for navigation and water quality. This was in partnership with the GIS/Environmental Science staff of a local town and his work greatly improves both the town's work efficiency on this project and allows for a better understanding of the processes within this complex system. David also presented at Northeast GSA. I am looking forward to starting research projects in the summer of 2019 and continuing into the 2019-2020 academic year with Greg Rodman, Joe Maralisi, Kym Lee and Liz Lemire.



In the field with Madie, Jenn and Aly at Napatree Point. These three really were my 'A-team' for all things Napatree the last couple of years, and leave big shoes to fill (note: that is not a green-shoe joke!).



As many of my research projects are on-going, I am always looking for motivated students to help with field and lab work, especially if you have already taken GIS! More information on these projects can be found on my website:

<http://www1.easternct.edu/oakleyb/>

FACULTY UPDATES

DICKSON CUNNINGHAM – PERSONAL STATEMENT

The 2018-19 academic year was very busy for me, but personally fulfilling. I served as Department Chair for a second year and have enjoyed the responsibilities that come with leading the department. We completed our 7-year academic program review this year. During the 2012-19 period, the department has grown from 3 to 8 full-time faculty and student major numbers and total EES course enrollments have remained buoyant. EES is on firm footing in every category and is recognized across campus as a strong department with dedicated, hard-working faculty. All faculty, students and staff contribute to the very positive and friendly community atmosphere that we all enjoy.

This year the EES Chapter of the SGE Honor Society in the Earth Sciences began its first full year and we expect that our chapter (Theta Upsilon) will grow and flourish in the future. The Society hosted 5 academic speakers during the year and also ran an enjoyable Saturday trip to Wadsworth Falls, Mt Higby and the Yale Peabody Museum. On the teaching front, I continue to teach hard rock subjects. I also led (with Drs Hyatt and Drzewiecki) a return field course to Wyoming/Idaho in May for the second time. A summary report of that trip is also included in this newsletter.

Last summer, four EES students carried out undergraduate research with me. Dominic Livoti, Madison Knox and James Wargo completed a bedrock mapping project at Soapstone Mtn in Somers, CT. They produced a detailed geological map of the state park that is worthy of publication. They also completed a thin-section petrographic analysis of key lithologies and tectonites to better document the rock types, mineralogy, conditions of metamorphism and deformational history. All three students presented their results at CREATE and NE GSA in Portland, ME. We hope to get the Soapstone Mtn project published in 2020. In addition, Benjamin VanDine completed a project on metamorphosed ophiolitic rocks from Harwinton in western CT. Ben's project is part of a continuing effort to document a possible cryptic suture in western CT that is defined by discontinuous serpentinitized and talc-tremolite-anthophyllite-altered ultramafic lenses. Benjamin presented a poster of his research at CREATE during spring, 2019.

With Sam
at Lincoln
Memorial,
Washington,
DC



On the research front, I continued with my Central Asia research working on publications related to the active deformation field north of Tibet. Having had 21 field seasons in Central Asia in 26 years, I still have a lot of unpublished field data to get out. So, despite several tempting invitations, I did not travel to Asia this year, instead preferring to catch up on some previous research. In spring, 2019, I gave two talks at EGU in Vienna: 1) on active faults systems along the northern Tibetan margin and, 2) the case for a UNESCO Geopark in the northeast Gobi Altai region of Mongolia. It was great to return to EGU which is Europe's largest meeting dedicated to geoscience. I used to attend EGU every year and I also served on the conference organizing committee for 4 years. After Vienna, I stopped in Lisbon for a short visit on the way home and enjoyed exploring one of Europe's most pleasant port cities.

Haibo Yang, a talented and hard-working PhD student from China is visiting EES for a year. We have worked closely on several manuscripts tied to his work concerning the active tectonics along the northern margin of Tibet. Haibo's research connects strongly with my areas of interest and our collaboration has been enjoyable and fruitful. Haibo also joined our Wyoming field course and has integrated well in the department. We have very much enjoyed getting to know Haibo and will be sorry to see him depart in the fall.

With Haibo Yang, Rendezvous Peak, Teton Range, Wyoming June 2019



During summer, 2018, I accepted the President's invitation to co-Chair the campus-wide Employability Council. We are charged with creating a workable plan involving all campus organizational units to create a step-change improvement in undergraduate employability. This is a large and complex task that will involve a multi-year process to develop a tenable program that benefits all current and future ECSU students.

This year, I also accepted a major editorial role with Elsevier to serve as the Regional Geology section editor for the 2nd Edition of the Encyclopedia of Geology (digital and print). This involved carving up the planet's land areas into approximately 50 regions and then soliciting expert authors for each region. This is also a multi-year process that is time consuming, but also very rewarding because I am corresponding with many of the world's most renowned geologists and learning a great deal from them about different continental regions. ECSU holds the first edition of the Encyclopedia of Geology in the reserve section of the library. It is an amazingly informative and well-illustrated multi-volume resource on virtually every geoscientific topic. I urge faculty and students to look through the volumes and take advantage of them.

On a different note, I received the ECSU Distinguished Professor Award in May. Bryan Oakley also received the ECSU Excellence in Creative and Scholarly Activity Award. We both are grateful to our faculty colleagues for being recognized for these awards.

I travelled less during the academic year than usual, but we did squeeze in a family visit to Oregon where we have family living along the Columbia River Gorge. We enjoyed visiting Mt Hood's Timberline Lodge and spent an afternoon at the most geological of wineries: Syncline Vineyard on the Washington side of the gorge!

On the home front, our son continued with his hockey exploits this year playing in various tournaments around New England and helping his team win the state championship in his division in March. At the time of writing, we have just returned from a camping trip in New Hampshire. Highlights included climbing Mt Chocorua, exploring Franconia Notch and seeing several moose along the Androscoggin River. I also scouted out some potential geological field stops for a future EES field trip to the White Mts.

As I look towards the next academic year, I am confident that EES will continue to provide an excellent undergraduate curriculum to majors and non-majors and contribute meaningfully to the scholarship and administrative activities that sustain Eastern and make it such a pleasurable place to work. In 2019-20, we expect to develop 1-2 new tracks in the EES major involving greater emphasis on geospatial and environmental science. We accept that our curriculum must evolve as workforce needs in New England change and societal issues involving environmental earth science and sustainable energy use become increasingly relevant and important. These are exciting times for our department and we stand poised to grow and evolve and maintain academic excellence on all fronts.

With Sam on Mt. Chocorua, New Hampshire, June 2019



At Mesa Falls, Idaho/Wyoming field trip, May 2019



Our state hockey champion!



PETER DRZEWIECKI

Summer is upon us! It is time to reflect on the previous 12 months and to prepare something for the 2019 edition of the EES Newsletter. The summer, as always, was full of travel! It began with a trip to Franklin and Marshal College in Lancaster, PA for my daughter's graduation...that was the last thing covered in last year's newsletter. In June, I was back in Spain to conduct some more field work and to train Equinor geoscientists to help run the field course I co-lead every September, as some current leaders are becoming unavailable. While in the field, we were able to demonstrate that understanding the growth history of a Cretaceous carbonate platform constructed of rudist bivalves was the key to documenting a previously unknown phase of salt tectonic deformation in the Pyrenees prior to the compression that uplifted the mountains. I am currently working on a number of publications related to this work with geologists from Equinor, ASA and the CSIC (the Spanish National Research Council-equivalent to our USGS).



In the field, standing in the basin section of the Cretaceous Basturs carbonate platform with the bedded shelf deposits in the background, 2 km away (left). Spanish geologist Enric Pascual and I reaping the rewards of a long field day in the form of Gin Mare (right).

Later in summer, my family and I managed our usual trip to see family in both the Buffalo area and in Maine. These trips are always fun, but rarely relaxing. The "big" family trip this year was to Italy and Croatia. We began in Rome, where we covered the basics – the Pantheon, the Colosseum, Constantine's Arch, the Roman Forum, etc. My kids are at the age where we also just enjoyed walking around and stopping for coffee or limoncello (two of my kids were temporarily of legal drinking age!) and taking in the sights and sounds. From Rome, we took a train to Naples where we were joined by my oldest daughter who could not make the whole trip because she actually has a job... We explored the city one day. The second day we split up a bit. The boys went on a tour of the Roman ruins under the city of Naples, and the girls went to the Island of Capri. We also spent one day visiting Pompeii – my favorite spot on the trip. From Naples we went to Split, Croatia. We explored the city and visited the famous waterfalls at Krka National Park. From there we drove down to Dubrovnik. For those Game of Thrones fans, this is Kings Landing. It was a fun city to explore, sharing Roman and Slavic influences. We had lunch on the Stairs of Shame. The next day we took a boat to the island of Lokrum – an old monastery that has a fort, gardens, beaches, and 100's of imported peacocks! On the last day, back in Split, we took a high-speed boat tour of 7 islands which had isolated beaches, a winery, ice cream, and of course, little harbor towns complete with shopping/eating.



My wife and 3 children haggling over the proper cost of Limoncello at a market at Campo de Fiori in Rome. They did not do a good job - when we went to a supermarket we found it for less than half the price we paid.



Inside the Colosseum



My wife, Lisa, and I in Pompeii with Mt. Vesuvius in the background



Waterfalls at Krka National Park in Croatia
This is a karstic wonderland!

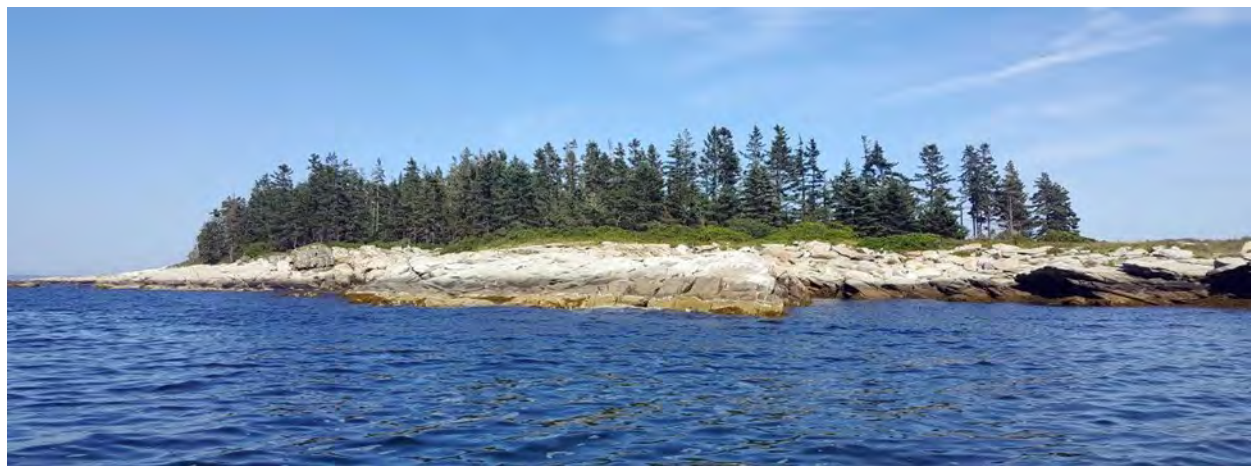


My kids in the harbor of Hvar, Croatia
Left-Max (14), Kaela (22), Shelby (17) and Aiden (20)



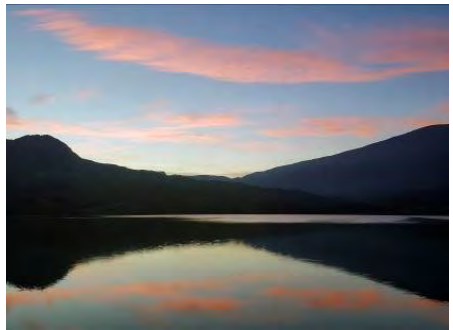
Overview of Dubrovnik, Croatia with the island of Lokrum in the background. This is the filming site of Kings Landing in "Game of Thrones". They added a huge castle and made a city that holds about 10,000 people look like one that holds a million.

Between the big trips, there are some other notable things that happened in the summer. I worked with EES student Erick Bora on refining the sedimentological and stratigraphic story at Dinosaur State Park – more on this in the undergraduate research section of this newsletter. I took numerous trips to Virginia, Boston, Washington D.C., and New York City visiting colleges with my daughter (she finally settled on American University in DC). Finally, I helped my younger son complete his hiking merit badge for Boy Scouts, which involved hiking 70 miles (including a 20 mile hike). What I learned is that I never want to hike 20 miles in a day again.



Shelby and Max at Shenandoah National Park on a college-hunting trip in Virginia (top left). Max at Ocean View atop Mt. Megunticook (Camden, Maine) on one of our 10-mile hikes (top right). Haddock Island offshore of my wife's family's house in Maine (bottom). You are guaranteed to spot a bald eagle sitting in the pines.

September arrived, and I once again taught EES 130 (Ancient Environments). This year, I “cashed in” some teaching credits, and Steve Nathan taught the labs. This freed me up to work on some papers. One is based on my work in Spain, and examines evidence for an episode of salt tectonic influence on a growing carbonate platform in the Iberian Range prior to compression and uplift. The second is closer to home, and looks at a re-interpretation of the paleo environments associated with the trackways at Dinosaur State Park in Connecticut. My interpretation is that the environment was drier than is conventionally thought, and the lakes filling it were shallow and prone to desiccation. It calls into question some popular interpretations of swimming and feeding behavior. In mid-September, I was off to Spain again, this time to co-lead the field course for Equinor. I enjoy the challenges (like being told I am wrong by the “students”) and rewards (see picture below, lower right) of a course for professional geoscientists.



Equinor class examining cyclic carbonate deposits at a location known as Vilanoveta (top left), and the ruins of the Vilanoveta castle after which the location is named (top right). Sunrise at breakfast during the course (bottom left). Course participants and instructors (bottom middle – I am standing 4th from the left). Typical end to a European field course – champagne and gummi bears in front of the outcrop (bottom right). In this case, it is the 800m high cliff called Roca Narieda.

During the Spring 2019, I taught a large section of Sedimentology and Stratigraphy. It is always great to see the intellectual growth in the students from when I first see them in Ancient Environments to when I see them in Sedimentology and Stratigraphy. For the most part, we are continuing to produce some really great geoscientists for the future. I continued to work independently with Erick Bora, and another student, Nina Musco, helped me put together a fossil display in the faculty wing of the Science Building as part of an educational experiential learning project (see the student research section for details). It is always great to have the opportunities to work one-on-one with students.

On the home front, I continue to serve as Scoutmaster of my son's Boy Scout troop. I must be doing something wrong, because I seem to spend 10-15 hours a week on this! I only have 3 more years until my son "ages out". My oldest daughter, Kaela, is officially "out the door". She is living in Middletown, working as a tech for a genetics lab at Yale University. She co-authored her first paper, and decided she needs to take a physics course and study for MCATs as she now wants to go to medical school. Recently, she gave me my first grandcats. My older son Aiden finished his second year of Engineering at UConn and is hanging out in London as I write this. As I already mentioned, my younger daughter Shelby is going to American University next year, but first had to overcome a severe case of Senioritis! Finally, my younger son Max is graduating from Middle School. He recently found out that he has a talent as a goalie in lacrosse. He is the back-up goalie, and played only two (full) games, but so far, he has not let a single goal in! My wife continues to work as a state auditor at UConn.



Members of my EES 344 (Sedimentology and Stratigraphy) class on the outcrop at the intersection of highways 9 & 91. I had to find something to do when they are "working independently", so I practiced taking selfies. This activity does not come naturally to somebody my age!

Best wishes for a happy and healthy year for you and your families. As always, if you find yourself in the neighborhood, please stop by to say "hi"!

DREW HYATT

Another year has passed, and I trust all goes well in the lives of our alumni and EES friends. This past year I served as assistant chair, perhaps for the last time (at least for a while). It has been fun and rewarding as usual and I congratulate Dickson on a well-run year as chairperson for the department. He provides updates on departmental activities elsewhere in the newsletter, but as the image below suggests, it has been fun following his lead. This past year, as always has been busy both with class activities and ongoing research as summarized below.



Despite our best efforts, neither Dickson nor I won the ugly sweater contest at the EES holiday gathering

This past year I returned to teaching Dynamic Earth (had been a while due to chair/assistant chair activities) as well as Field Methods, Landform Analysis, contributions to the EES field course to Wyoming, and undergraduate research practicum classes. Teaching introductory geology after some time away was fun and interesting. I always enjoy meeting new potential majors and it was refreshing to see the range of interest for a class with both majors and non-majors. For my practicum classes, I was also lucky to work closely with two students fine students, Tom Zimmerman and Katrishia Bell, on photogrammetric research. Field methods class in the fall of 2018 involved 14 mostly graduating seniors. As usual the class ramped up quickly with students being introduced to a variety of mapping techniques, both in relation to outcrop description and surface mapping. This gave folks opportunities to get some hands-on experience using compasses, theodolites, total stations, RTK and GPS equipment. New this year was my first somewhat limited use of a drone (see the photo below). That technology is rapidly growing and will become embedded in some of my classes in the upcoming academic year. The final project for Field Methods was conducted at Shelter falls, and the class maintained its good luck with fine weather. It was a very good group of students to work with this past year and I provide a few images depicting them in action.



The Fall 2018 Field Methods class from above at Shelter Falls, as well as a ground-level views of some of the class.



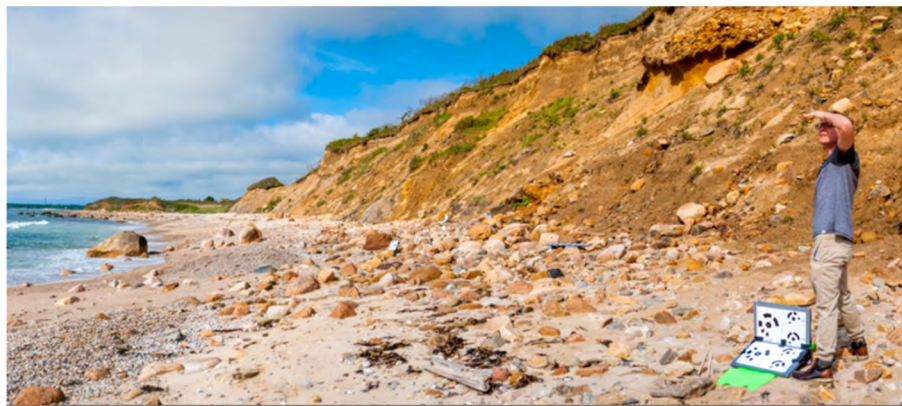
Spring landform analysis class offers me an opportunity to meet the next wave of EES majors, and this upcoming group seems to be quite strong. I increased the number of field labs including an examination of glacial landforms in Mansfield Hollow as before, and I added a field lab to examine bedrock-controlled river landscapes at Dianna’s Pool. Of course, there were lots of other laboratory, map and class activities. I look forward to having several of the students depicted below in future classes.



A view of the next wave-EES 224 class examining sites in Mansfield Hollow and at Diana’s Pool

As is mentioned in the student research summary, I had the pleasure of working with Tom Zimmerman and Katrishia Bell this past year on undergraduate research. Both Tom and Kat utilized photogrammetry and RTK GPS to examine aspects of coastal change at sites on Block Island (Tom) and at Napatree Point (Kat). This work, of course, built on efforts by previous students, but broke some new ground in terms of developing approaches to quantify coastal change through detailed point cloud analysis. Tom and Kat learned to collect, survey, scale, and model eroding coasts and compare those detailed (sub-cm) points (consisting of > 75 million survey grade measurements). Their work furthers our understanding of these new techniques. Indeed, I have already started working with 3 new students in the summer of 2019 who are building on these efforts, including the use of drone-based 3D mapping. In fact, I have proposed a new course called “Imaging in Geoscience” that will be offered in the spring of 2021 that that includes imaging and 3D point cloud modelling along with some use of drone technology. To that end, I recently passed my Part 107 knowledge test which enables me to use drones in a professional capacity (like I intend to do in my spring 2021 class).

More on all of this in next year’s newsletter!



Tom Zimmerman (top) and Katrishia Bell (bottom left) participate in undergraduate research activities at coastal sites in Rhode Island



The other teaching highlight for the year was contributing to the departments most recent field course – an 11-day examination of the spectacular geology of sites in Utah, Idaho, Montana, and Wyoming centered on the Yellowstone area. I leave it to Dickson to describe that trip in detail, but I had to include one of my favorite panoramas that includes a spectacular rotating tail cloud in the upper left of the image.



The class takes a break from discussing cinder and splatter cones at Craters of The Moon to snap a few pics of a waning rotating tail cloud and dramatic skies. It was an action-packed 12-day trip complete with moose, bear, spectacular geology, and ... a rock skipping contest!

My professional focus and interest this past year has been consumed by photogrammetric and scanning work at Dinosaur State Park (DSP). As mentioned in last year's newsletter I am a junior editor on a new book in-the-works that involves contributions from 18+ authors thorough which all aspects of the fossil record at DSP is examined. I am involved in 6 chapters and have had a few sleepless nights thinking about the best way to image, map, model, and measure dinosaur tracks. This seemed like a great idea at the beginning, but it is seriously kicking my butt now! That said, I have learned a great deal, and have developed a wonderful working relationship with my senior editor Dr. James Farlow, Emeritus at Indian-Purdue University. This has also spawned new collaborations with other paleontologists who have interest in building detailed 3D models of fossils and other artifacts. Suffice it to say, life is busy.

Family life goes well. I have again been fortunate to spend another year with the love-of-my life Trudy and we are extremely excited about an upcoming trip to see our daughter Hannah in California that will include 5 days in Yosemite. We also visit our son Jake in Ottawa as often as we can. There is nothing more important than family, and despite the distance, we stay in frequent contact with both of our growing young adults. To say we are proud of them is an understatement.

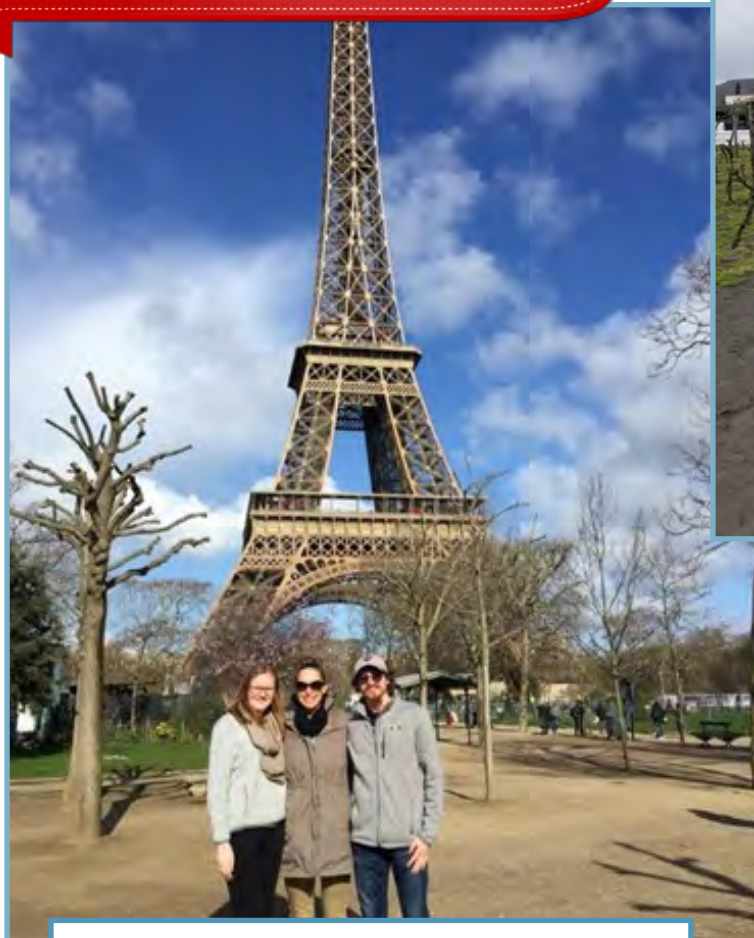
That is my round-up for the year. I continue to enjoy seeing former and current EES majors and encourage any of you reading this newsletter to reach out and let us know what is new with you.

All the best for a happy and healthy new year!



Spring Break 2019

Meredith Metcalf



Jennifer Croteau, me, and Bryce Mase in front of the Eiffel Tower



Bryce Mase and I in a vineyard on the slopes of Mount Vesuvius



Jennifer Croteau enjoying the view of the Coliseum

This year I chaperoned my husband's annual Spring Break travel-study abroad program in March to England, France, and Italy. This year Bryce Mase and Jennifer Croteau received a scholarship to participate and they really enjoyed the first-time experience traveling to Europe. Repeat travelers included Maddie Haynes and Jenny Petrario, as well as EES Adjunct Instructor Aaron Nash.

This year's travel-study originated in London, moved through Paris and ended in Rome - somewhat reversing the movement of the Roman Empire. Called "Londinium" by the Romans, London has many layers of history woven into its streets, having been affected by wars, great fires, and lately some very progressive expansion. From Piccadilly to The Strand, we experienced medieval cobbled streets, Westminster Abby, Wren's great St. Paul's Cathedral and the millennial London Eye.

Paris found us experiencing the "must-see" sites like the Louvre, Tour Eiffel, and Arc de Triomphe but more importantly, we were blessed in being able to spend much time around the Latin Quarter which exists in the omnipresent shadow of Notre Dame (shortly thereafter devastated by the fire of April 15).



Ending where Rome started, the Lazio region of Rome always reliably provides cultural treats around every corner. From the basalt-paved streets of Pompeii to the travertine and concrete monuments around the Forum, we explored Roman roads, quarry and building techniques, models of urban planning and much more; all woven into the fabric of its culture which was so influenced by geographic proximity to volcanic morphology which led to the invention of concrete and supports the unique Italian countryside of agriculture, vineyards, and centuries of villages that complete the harmony.

As some of you may know, this summer my husband and I are expecting a new addition to our family. We are incredibly excited for this new change (although Cooper may not be) and we look forward to welcoming our bundle of joy to our Eastern family in the new academic year!



Mark, Cooper, and I are ready to welcome our new addition to the family in summer, 2019!


2018-2019 was another busy (and fun) year for me! I had a full schedule of teaching, service and research.

On the research front, I spent summer, 2018 working one-on-one with EES Senior and Honors Student, Emma Avery. Building upon my research in micropaleontology and paleoclimatology, Emma devised a project to gauge the feasibility of using microscopic fossils (sand grained sized), as a proxy for measuring the severity and/or frequency of historical tropical/extratropical storms upon Block Island. Emma accomplished this by processing two sediment cores we collected during summer, 2017 (assisted by EES student Kyla Andrews and Dr. Bryan Oakley; a special note of thanks to Bryan for addressing the logistics of that trip and for personally contributing three days of his time in the field). Using a high-end stereomicroscope, Emma examined over two dozen sub-samples for microfossils known as foraminifera and the camoebians (i.e., these single celled protists inhabit marine and brackish environments, respectively), making note of species diversity and abundances.

Emma's project was funded in part by Eastern Exemplary funds for undergraduate summer research (2016, 2017 and 2018) and by my 2017-2018 faculty research grant from CSU-AAUP (Connecticut State University-American Association of University Professors). These grants provided Emma with financial support for each summer as she worked on the project. They also funded a wide range of technical analyses available only through commercial laboratories (e.g., carbon-14 and lead-210 age dating of the pond sediments; continuous Geotec data: magnetic susceptibility, spectral reflectance, density, and color; and XRF data (x-ray fluoroscopy).

Emma presented her findings at the October 2018 COPLAC meeting (Council of Public Liberal Arts Colleges; at SUNY Geneseo) and at the April 2019 NCUR meeting (National Conference on Undergraduate Research; in Atlanta, GA). Emma graduated spring 2019 and will start at UConn School of Law in August 2019, specializing in environmental and energy law.





Regarding teaching, last fall (2018) I co-taught Ancient Environments (EES 130; a.k.a., Historical Geology) with my colleague Peter Drzewiecki. Peter taught the lecture sections for the course while I taught the labs.

In Ancient Environments, students learn about the history of the Earth. But most importantly, they learn about *how* we know this history. In the laboratory students get hands-on experience developing the basic skills needed for observing rocks and in turn, interpreting the story recorded by the rocks. Being able to collect and interpret data are key skills they will need in the workplace. Next fall (2019) I will again split the Ancient Environments course with Peter. I am very much looking forward to teaming up with him to teach this key introductory course for EES majors.

I continue to upgrade my Sustainable Energy (EES 205) and Energy Issues in Geoscience (EES 402) courses. For the former (EES 205) I've updated the content so to keep pace with this very rapidly changing field; while for the latter (EES 402) I engage students through new active learning projects in geothermal energy and fracking for hydrocarbons.

This past spring our long-time adjunct instructor Emile Levasseur “retired” from teaching EES 205 on-line. Emile distinguished himself by coauthoring the EES 205 digital textbook with EES Professor Emeritus, Fred Loxsom. The course was taught by three instructors (Emile, Vishnu Khade, and yours truly) and we all used the aforementioned textbook. After Fred's retirement, Emile voluntarily took on the critical role keeping the textbook up to date; not an easy task given how rapidly the field is changing. All of us sincerely thank Emile for his contribution to the EES department.

In February 2019, I joined Eastern President Núñez, Eastern facilities director Rene Keech, and Lynn Stoddard, Director of the Institute for Sustainable Energy for a conference on Sustainability sponsored by Second Nature. The purpose of the conference was to help higher educational institutions become carbon neutral by 2050. It was a great conference. We learned a lot about how to take on this challenge and it was a great way to network with others in academia who have also adopted the goal of zeroing-out their institutional carbon footprint. This was the key point of the meeting, that academia needs to lead by example in bringing about societal change with regard to climate. We anticipate attending and contributing to next year's meeting in Atlanta, GA.

Between my teaching and mentoring, I also served on several committees such as the University Senate (as the Senator for the EES Department) and Research Reassigned Time. I also chaired the University's Promotion and Tenure committee (PTC) for the first time. The PTC plays a special role at Eastern. It recommends to the Provost which faculty, librarians, coaches and counselors who have applied for promotion and/or tenure, deserve the award(s). By chairing this committee, I learned firsthand that so many of our colleagues at Eastern do an amazing array of work on behalf of the students. From coaching various sports teams, providing guidance and assisting with learning, to standing in front of a classroom of students, it's very impressive how everyone at Eastern is dedicated to the mission of preparing students for their careers. It's such an honor for me to be a part of this team.

BRYAN OAKLEY

Wow! Why is it when we look ahead to the end of the semester it seems to arrive at a glacial pace, yet the beginning of the semester seems like yesterday? This year really flew by, maybe even more than normal. 2018-2019 was a busy academic year; in addition to the introductory course 'Dynamic Earth', I taught Glacial and Quaternary Geology in the fall 2018 semester, and Coastal Geologic Hazards in the spring 2019 semester.

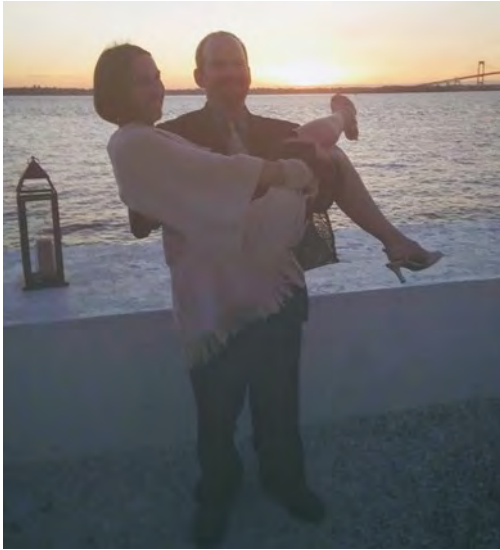
On the home front, my kids continue to grow; Aidan is 9 ½ and Haley is approaching 6 ½, and give my wife and I lots of fun, fast (and even furious) times!!! Aidan is very much into karate now, having reached the rank of Junior Green belt, and Haley is alternating between dancing and swimming. Aidan is starting to get to be old enough to be Dad's field assistant at the beach, and Haley is just trouble (in a good way!). The Oakley Family even managed to sneak away to Florida over winter break for some much needed downtime! When in Florida, just like when I am home, if I am not in the office or in the field, or with my family, you can typically find me cruising a local waterway at dawn on my paddleboard and perhaps chasing a fish or three.



Exploring the mangroves of the Loxahatchee River, Florida (and fishing) on a stand-up paddleboard



The Oakley kids on the Juno Pier



Left: Being goofy with my wife at a wedding in Newport (amazing she puts up with me).
Right: Aidan and Haley with a rare 2018-2019 Snowman!

I was particularly honored to have been nominated by my colleagues and awarded the 2019 Eastern Connecticut State University Award for Excellence in Research and Creative Activity. This is a great honor given the really fantastic research and creative work being done on the Eastern campus! My on-going 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, monitoring the shoreline on Block Island (collaborating with volunteers) and Napatree Point. On the Napatree front, I continue to serve as a science advisor for the Napatree Point Conservation Area, and the Watch Hill Conservancy has funded my on-going monitoring at Napatree through 2019. 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. Locally, the Coastal Institute at the University of Rhode Island has named Napatree a designated example of natural coastal resilience and has commissioned a documentary on Napatree, which was released in the fall of 2017 (Link is available on my website)!



I completed two first author manuscripts this year; one in the *Coastal Sediments Proceedings* and one in *Estuaries and Coasts*. My colleagues and I have two additional manuscripts under review at *Northeast Naturalist* and *Estuaries and Coasts*. I presented at the Coastal Sediments conference in May 2019 in Tampa, FL. This is the preeminent coastal geology and engineering conference held every four years, and also presented and chaired a session at Northeast GSA. The publications and presentations will be on my website sometime this fall.

Working with the Napatree Point Conservation Area and Rhode Island Eelgrass Mapping team on a project offshore of Sandy Point, August 2018



Alumni Updates

Tara Brooks (2018) is a Water Quantity Seasonal Intern at the Department of Energy and Environmental Protection. She works with four other individuals on a water diversion project which involves uploading permit reports to designated sites in a site information management system, organizes water use data from water diversion permit reports, conducts wading field work to install trail cameras, and remaining up-to-date on trainings required for the position.



Tim Bugden completed his master's degree in water management at the University of Connecticut. He studied the effects of changing spatial resolution on watershed scale hydrologic model performance, particularly with the Precipitation-Runoff Modeling System produced by the USGS. Currently he is busy taking courses in Python, assisting a colleague with GIS at UConn, learning Fusion 3D, and studying Italian. He has visited Italy three times now and his most recent interests were visiting the small town of Orvieto north of Rome. The walled city was built on a plateau of tuff with an extensive network of manmade caves under the city. Both the hydrology and geology of the setting makes an amazing learning experience.



David Carney (2013) is currently working with the Forest Service in Montana. He is working out of the Belt Creek Ranger District as the crew leader for a trail crew of seven people. They are responsible for clearing and maintaining trails throughout the six mountain ranges in the district. He also volunteers at an amazing museum in Bozeman Montana preparing dinosaur fossils and providing enjoyable tours to the visitors. This position will help better prepare him as he pursues an advanced degree in paleontology.

Mimi Cedrone (EES Class of 2012) moved to London in the United Kingdom in 2016 and has been working as the Sustainability Manager at the University of East London. She was recently accepted to the University of Cambridge and in September will begin studying for her Master's in Interdisciplinary Design for the Built Environment. The program is structured around emerging trends, opportunities and challenges within the built environment such as: sustainability and resilience, health and well-being, energy, efficiency, conservation and heritage, stakeholder engagement, and political and regulatory landscapes. Mimi has worked in the sustainability field ever since starting as an intern at Eastern's Institute for Sustainable Energy in 2010 and is excited to have this opportunity to further her education.

Hannah Cheney (2017), now Hannah Puchkoris, is currently working as a vacation planner at Topsail Realty Vacation Rentals in Surf City, North Carolina. She communicates with guests vacationing and helps them navigate the reservation process for an enjoyable stay at one of the many beach houses on the island. She also works closely with property services and management to make guests have the best vacation experience.





Tim Ciskowski (2016) started working as a GIS Technician, soon to be a Drone Operator, for Atlas 10 which is a GIS consulting firm located in downtown Cincinnati. He is responsible for mapping properties for clients and determining the health of their pavement and asphalt using remote sensing software. In other words, they are currently using high-resolution aerial photography to determine the accuracy, reliability, and cost to determine the defects in pavement without having to send someone to the site.



Luke Davis (2018) is a Geospatial Intern for the Personal Insurance Platform Team at Travelers Insurance. He works with geospatial technology to increase productivity and assist business partners with the development of layers, maps, and web applications. Luke is one of the three-geospatial interns hired by Travelers Insurance this summer. Luke and Maddie are both enjoying their time “under the umbrella”!



Gerald L. Decelles III (EES Class of 2004) is a teacher of natural science in Norway. After graduating from ESCU he taught at public and private schools in the U.S. before moving to Norway in 2013. In 2017 Gerald was selected to be part of the Norwegian delegation to Science on Stage, an EU sponsored consortium that bring Science and Science teachers together, with his project “Building a Sustainable Future”. He just completed his Master’s in Environmental GeoScience from the University of Oslo with a focus on foraminifera as indicators of biological quality. Gerald’s joint project with a school in Germany “Building a Sustainable Future: School Edition” was chosen to take part again in Science on Stage 2019 in Portugal later in the year.

Martha Denisky (2017) completed her master’s degree in Education this past May (2018) and is now employed as an 8th grade science teacher at Enfield Public Schools where she will primarily be teaching Physics, Earth Science, and Genetics. She’s found it difficult to keep herself away from geology too long as she’s a volunteer at Dinosaur State Park this summer!

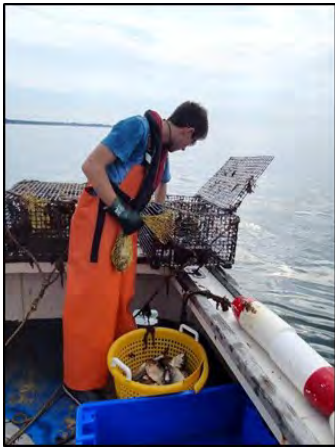


Connor Dunleavy (2017) is working at Phillips Cruises and Tours, a glacier cruise company operating out of Whittier Alaska. As a deckhand, Connor assists with daily operations of the boat, serves passengers, and talks about the sites as the boat cruises. He has been accepted to the University of British Columbia and will be pursuing his master’s degree in Land and Water Systems.





Jeffrey Fontaine (2018) began working at Microbac Laboratories, Inc. in Dayville as a Sample Log-in Technician, joining fellow EES alumni **Matthew Young (2012)** and **Samantha Boyle (2015)**. Jeffrey is responsible for receiving water samples and ensuring the integrity of the sample from the time the lab receives the sample to the time of analysis. This includes recording temperature, verifying how the sample is preserved, and ensuring a proper wait time for analyzing samples for specific parameters. Since he began in May, he has had a dynamic experience involving a great deal of customer relations who are both homeowners and large companies required to test water quality on a weekly basis. **Samantha Boyle (2015)** is a Project Manager and the UCMR4 Operations Manager at Microbac Laboratories, Inc. She oversees the entire UCMR4 project within Microbac. This project with the EPA requires public water systems to test for contaminants that are currently not regulated. She handles all client interactions, as well as shipping and receiving of samples and reviewing of completed data. She interacts directly with the EPA regarding data and client issues. Additionally, Sam reviews the results from the sister labs for the UCMR4 project – she reviews the results and helps when needed. She is the liaison between Microbac Laboratories, Inc. and clients; thus, she is responsible for communicating results and addressing issues with clients. **Matthew Young (2012)** is a Project Manager at Microbac Laboratories, Inc. He largely focuses on private wells in Connecticut, Massachusetts, and Rhode Island. He's also managing all the testing for Providence Water and many Massachusetts public water systems.



Noah Hallisey (2018) is currently an Administrative Assistant in the Environmental Laboratory at Dominion Energy's Millstone Power Station in Waterford, CT. The lab conducts studies on marine ecosystems as part of the permitting process as well as Dominion Energy's commitment to environmental stewardship. Studies include lobster, winter flounder, Ichthyoplankton (fish eggs and larvae), and other marine life. Noah's main function in the lab is to sort Ichthyoplankton samples using a microscope in support of a monitoring program on fish eggs and larvae that are being entrained through the seawater cooling intakes. In the fall, Noah will be a graduate student in the Masters of Environmental Science and Management program (MESM) with a concentration in Conservation Biology at the University of Rhode Island.

Maddie Haynes (2017) is a Geospatial Intern at Travelers Insurance where she is responsible for many GIS projects within the Claim Department. Completed projects provide much needed insights for the company to be more successful at serving clients. Maddie is also a graduate student at Clark University. She is currently pursuing her master's degree in Geographic Information Science for Development and the Environment. While completing her degree, she works as a Teaching Assistant, Research Assistant, and serves as the Program Representative.



Kevin Lacy (2016) is a GIS Analyst with Stantec, a Canadian based engineering firm located in Raleigh, North Carolina. Currently he is responsible for quality control and writing metadata for LiDAR projects for FEMA. He also creates, edits, and quality controls flood insurance maps. He will be heading a field collection team for various cities in the southeast.

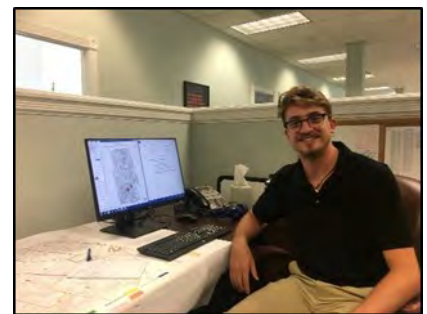
Eric Lindquist (2012) is an Environmental Analyst for the Connecticut Office of Policy & Management, Comprehensive Planning and Intergovernmental Division. He's responsible for assisting in the State's efforts to revitalize cities by building sustainable and economical communities while preserving both the historical and unique properties that Connecticut is known for and its natural resources.

Jaqueline Lorange is pursuing her master's Degree in K-12 education at the University of New Haven. While earning her degree, Jaqueline continues to teach special education at Oak Hill School in Hartford. She enjoys incorporating as much science as she can into her lesson plans.



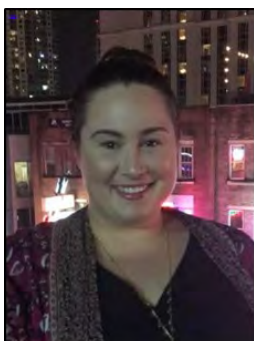
Michael Manzi is currently lives in Boston and is a Client Engagement Professional for a company called EnergySavvy, which provides energy efficiency solutions for utility companies across the country. He works with clients as an account and project manager to help design and implement software solutions for their energy efficiency programs.

Byrce Mase (2019) has been working this summer as a GIS Intern at Milone & MacBroom in Cheshire, Connecticut. He primarily works for the Planning Department and is responsible for completing GIS work for various projects ranging from town conservation and development plans to school planning. He's responsible for making maps, creating data and finding data, and organizing the information internally for each project.



Jeffrey Olandt (2013) just moved to Kansas City, Missouri for a new job located on the Kansas-Missouri state line. He's working as a GIS Specialist II for the fiber optic industry and his work is focused on locating new line development and current design plans. As a member of a small team, he's responsible for data processing, geodatabase management, and analysis of current projects.

Lauren Polansky (2017) is currently pursuing her master's degree in Organizational Management at Eastern Connecticut State University. While completing her degree, she is a Graduate Intern in the Office of Student Activities at Eastern. She is responsible for supervising the Campus Activity Board, overseeing commuter student initiatives and staffing large scale events run through their office.



Katie Rychling (2013) graduated with a Master's in Education from Eastern in 2015) will be starting her 4th year at Hall Memorial School in Willington, Connecticut as the 7th and 8th Grade Science Teacher. Throughout the year she teaches various topics including physical, life, and earth science. She has taken the position of Science Curriculum Chair to assist in the transition to the Next Generation Science Standards. She also serves as 8th Grade Team Leader, 8th Grade Class Advisor, and Staff Development Coordinator.

Mark Skaff (2015) is a Project Coordinator for Ceco Concrete Construction, LLC in Hartford, Connecticut. Ceco Concrete is a national structural concrete contractor that is focused on creating high quality structures at an affordable price in an appropriate amount of time. Mark is responsible for overseeing material and drafting drawings for use in the field.

Natalie Stepniewski (2017) is a Passenger Service Crew Member for Phillip's Cruises & Tours, LLC in Whittier, Alaska. The cruise ship takes daily trips to show passengers the amazing wildlife and the 26 glaciers in the area. Natalie assists passengers on the boat and serves food and beverages while experiencing the beauty of Prince William Sound. She and the other crew members are trained to keep passengers and fellow crew members safe for the duration of the cruise. She's enjoyed the amazing experience that she has been lucky to witness every day.



Lucas Suchinski (2017) is a Product Specialist at Reflex Lighting Group of Connecticut where LED and fluorescent lighting fixtures are sold to interested parties which mainly include distributors and contractors. Lucas is also responsible for putting together lighting packages for new and retrofit construction projects. To future graduates, Lucas' states, "Believe in yourself and never worry. Life and this major will bring you many great, unexpected opportunities. Stay optimistic!"

Eric Tefft (2012) is the GIS Coordinator for the Massachusetts Department of Conservation & Recreation, Division of Water Supply Protection. She supports approximately 75 GIS users with various needs, including administration of ArcGIS Online, development and support of multitude of Collector/Survey123 field applications, management of a fleet of field data collection devices and GPS, development of workflows for all division GIS users, implementation of staff training in both desktop and online software, development and implementation of mapping and metadata standards, development and implementation of Standard Operating Procedures for layer naming, file schemes, archiving, etc., and development of public-facing applications for the Mass.gov website.



For Our Alumni

What are you up to?

We would very much like to include updates from EES alumni in our newsletters. If you would like to contribute, please e-mail responses to the following questions to either Zosia (carlquistz@easternct.edu) or Dickson (cunninghamw@easternct.edu).

All the best for a great year!

To help us build the next newsletter, please send the following:

1. Name, graduation year, current e-mail address.
2. Tell us what you do now (and if you would like us to include this information in the newsletter).
3. A brief paragraph telling us about your other activities since graduating.



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 the EES Founders Fund, which was established for these purposes. We welcome your tax-deductible donations to this fund and encourage you to contact Mr. Peter Dane at University Relations (860-465-4513) or email him at (danep@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.