

Petroglyphs



2019-20

# PETROGLYPHS

Environmental Earth Science

2019-20 Newsletter

9<sup>th</sup> Edition

## Message from the Chair

Greetings All!

The last 5 months have been a challenge due to the Covid-19 pandemic, but until mid-March, the Department was humming along at a lively place on all fronts and EES was enjoying another successful academic year. Unfortunately, the campus closure necessitated cancellation of various events that are usual academic-year highlights (extended field courses, faculty/student conferences, end-of-year celebration, and graduation). However, EES faculty and students persevered and successfully completed the spring semester courses via on-line methods. This was challenging for everyone and I think it is fair to say that we all hope for a return to normal and safe, on-ground teaching as soon as possible.

Despite the events of the spring-summer, we do have some exciting highlights to announce in this newsletter. The Department faculty worked hard to establish a new environmental science concentration in the EES major, which was formally approved by Senate in the spring. We expect that this exciting curriculum development, which broadens our educational provision, will attract current and future Eastern students to the major. In addition, 20 EES majors graduated in spring, 2020 and 12 new students were inducted into the EES Honor Society. As detailed in this newsletter, faculty achievements in research and professional development continued over the last year and some EES majors completed excellent research projects and internships. In late August, I will pass the Chair's baton to Stephen Nathan who I am confident will dedicate himself to leading the department onward, and continuing to build a successful future for EES.

Sincerely,

Dickson Cunningham  
EES Department Chair

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

# Department News

## Message from the Assistant Chair Stephen Nathan

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Serving as Assistant Chair during the past academic year has been a great experience. I learned a lot from the previous chairs and I'm very grateful for the help and understanding of all my colleagues in the EES department. Most of my duties as Assistant Chair revolved around class scheduling for the department. But the tasks that lie ahead of me will expand exponentially as I become Department Chair in fall 2020. Fortunately, Dr. Dickson Cunningham, our current Chair, will trade places with me for the fall semester, before taking a well-deserved sabbatical during spring 2021. Dickson will be a tremendous asset as I learn the ropes of being Chair, given that he has been closest to all the issues currently impacting the EES Department.

Dickson has done a tremendous job as Chair. He has accomplished so much during his tenure; I can only hope to achieve half as much. I will do my best to fill his shoes.

Looking ahead to the 2020-2021 academic year, I hope to contribute to the department by making it stronger in as many ways as possible. There are obvious challenges, foremost being the task of weathering the pandemic. This has certainly impacted the University and most importantly, our students. But I am confident that in the fall semester we will all pull together and do the best we can for the students.

I look forward to being Chair, the challenges the job will bring, advocating for my colleagues and department and most importantly, helping our EES majors, minors and all students.



# Highlights

## EES Student Recognition Awards, May, 2020

Sophomore Academic Excellence Award	Abigail Durling
Junior Academic Excellence Award	Jack Cerra
Senior Academic Excellence Award	Dan Simpson, Joseph Marsalisi, Gregory Rodman
Geomorphology Research Recognition Award	Jack Cerra, Arlene Blackwell, Danielle Whitcomb
Soft Rock Geology Recognition Award	Erick Bora, Shane Goodson, Joseph Franklin
Hard Rock Geology Recognition Award	Gregory Rodman and Thomas Zimmerman
Sustainable Science Recognition Award	Joseph Marsalisi
Quaternary Science Recognition Award	Joseph Marsalisi, Gregory Rodman
Outstanding Environmental Earth Scientist	Erick Bora

## Farewell to Haibo Yang, our Visiting Scholar from China October, 2019

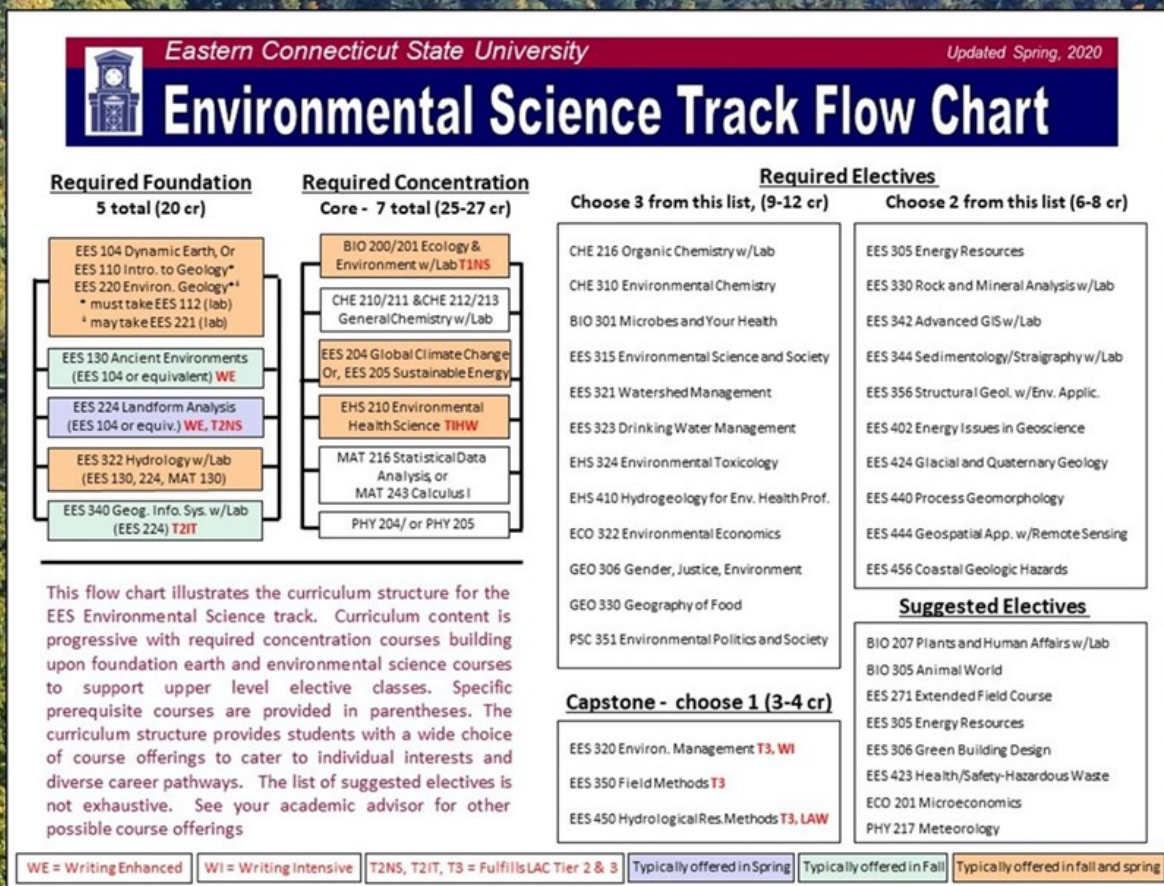


# STUDENTS "HANDS-ON" LEARNING



# The Department of Environmental Earth Science is proud to announce a new track in the EES major: Environmental Science

The Environmental Science track is designed for students who are interested in careers and graduate study in environmental and ecological science, environmental health, environmental policy, and environmental remediation and conservation science. The track provides a strong foundation in environmental earth science with additional courses in mathematics, chemistry and physics. Other required and elective courses allow individual EES majors to pursue environmental science subjects that connect with their academic and career interests.



Environmental Earth Science Majors now have four tracks (concentrations) to choose from:  
Environmental Earth Science, Environmental Science, General Earth Science and Sustainable Energy Science



## FACULTY UPDATES

### *Dickson Cunningham – Year in Review*

Despite the pandemic, overall, the last year has been personally rewarding and we are fortunate that our department community weathered the spring upheavals quite well and largely remained healthy. I will be stepping down as Department Chair at the end of the summer. I will teach in the fall whilst serving as Assistant Chair under the able leadership of Steve Nathan. After Christmas, I will begin a much-needed sabbatical.

EES must continue to evolve as the higher educational landscape faces complex fiscal, public health and graduate employment challenges. Creating a new concentration in Environmental Science was an important and positive step, but our long-standing concentrations in Environmental Earth Science and Sustainable Energy Science need careful scrutiny in terms of content and skills development to support recruitment and retention, graduate employability and alumni engagement. Importantly, our department has been selected as one of three at Eastern to take part in a 2-year CSU program to develop an Essential Employability Qualities Certification. We refuse to remain complacent as we strive to offer the best value, high-quality education in environmental earth science in Connecticut and beyond.

On the teaching front, as always, I enjoyed teaching Dynamic Earth, structural geology, and mineralogy/petrology courses this year. The latter was completed via on-line methods. I continue to increase my field teaching and have identified exciting new locations in eastern CT for additional structural geology field trips.

The SGE EES Earth Sciences Honor Society hosted four invited speakers this year before campus closure, and organized enjoyable science events such as a geology day at the local Barrow STEM elementary school, an EES game show night and peer resumé-support clinics. In May, we inducted 12 new honor society members and said goodbye to 9 graduating members. We had 2 EES students selected to go to the spring SGE biannual meeting in Tennessee, but that was unfortunately cancelled.

My research student, Tom Zimmerman completed an excellent project on the kinematic history of the Honey Hill Fault Zone in Montville and Bozrah. His thin-sections reveal sensational kinematic indicators demonstrating intense transtensional ductile and brittle shear along this key tectonic boundary in southern New England. We are now awaiting Ar-Ar ages to constrain the timing of deformation. This project adds to what we have previously learned about the shear zone further west in Salem and all results will be written up in 2021.

In March, the University Employability Council completed its 2-year mission to create a 3-5-year plan to improve the career readiness of all eastern Students. This plan is now integrated into the larger University Strategic Plan (COFE III). Serving as Co-Chair of the Employability Council was challenging and our collective work involved considerable time and effort. But, our final plan was completed and delivered on April 1<sup>st</sup> and was very positively received by the administration. Full enactment will be phased in over the coming 12 months.

On the research front, I published three papers during the last year with Chinese collaborators in high-ranking international journals (*Journal of Geophysical Research*, *Tectonics*, *Landslides*). Two of these papers were with Haibo Yang who returned to China after spending a year collaborating with me at Eastern. All three papers concern the active fault systems and geological hazards around the northern and eastern margins of the Tibetan Plateau where I have had multiple field seasons in previous years. I also co-wrote 3 other papers during the year which are all currently in review. They also concern crustal reactivation north of Tibet and intraplate mountain building processes. I gave an oral presentation about some of my Central Asia research at the annual GSA meeting in Phoenix in the fall. I was scheduled to give 2 talks at the Seismological Society of America annual meeting in Albuquerque and 2 talks at the International Geological Congress in Delhi during the spring, but unfortunately, both meetings were cancelled due to Covid-19.

During the last year, I also served as a section editor for Elsevier's Encyclopedia of Geology, which is a wonderful resource (digital and print) with nearly 600 chapters covering every branch of earth and planetary science. I reviewed approximately 50 chapters on every terrestrial region on Earth written by leading geoscientists from around the world. I also contributed 2 chapters on the regional geology of a large chunk of Central Asia (Mongolia, China, southern Siberia) that is about the size of Australia! This was the most difficult editorial position I have ever had in terms of time commitment and effort. However, it was also the most satisfying because of how much I learned about our planet's amazing regional geology.

On the home front, we finally got 12 chickens, which our dog now wants to eat. Woodchucks have been eating our vegetable garden, but our dog eats woodchucks (and throws them up on the carpet) and we count at least 15 rabbits/day on our property, which our dog can't catch, but resident hawks can, so we are basically living in the killing fields of Lebanon. Our son continues to play hockey all over New England for 7 months/year and so we criss-cross the state nearly every weekend to away games in far-flung rinks and return home hoarse from collective hockey parent screamathons (soothed by Dunkin Donuts coffee throat treatments). Because of Covid -19, we changed our summer vacation plans, but recently spent a nice week in Maine where I scouted out mineral collecting sites in the Oxford County Pegmatite District (Mt Apatite, Harvard Quarry). I also examined the stunning poly-deformed coastal outcrops in the Cape Elizabeth area near Portland. We also swam, hiked, fished and ate a lot of ice cream. In the future, I hope to run a White Mountain-western Maine/coastal Maine extended field course. My son and I also spent 4 days in the Mohawk Valley in NY state in June visiting the Herkimer mines and other geotourist sites. We found various fossils and "diamonds", but it was so hot in the quarries (95°F) that the campground swimming pool won the day.

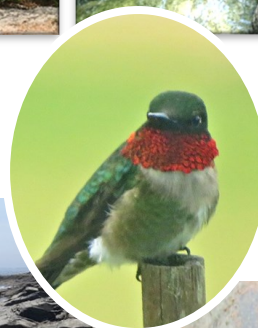
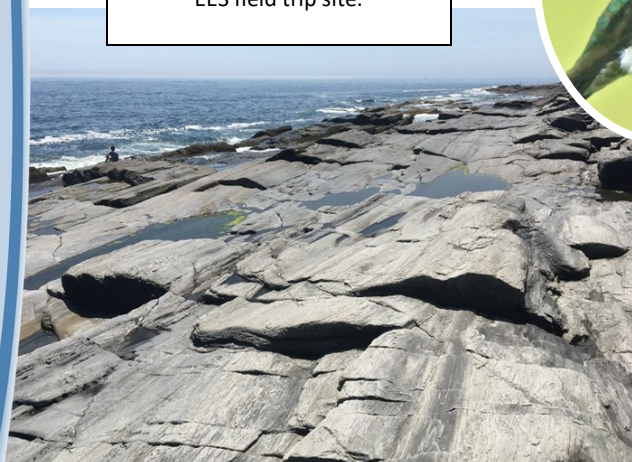


Blueberry Ridge Summit and verdant mountain pool, western Maine



Our hockey champ at Manchester, NH Christmas tournament

Cape Elizabeth, ME. A future EES field trip site.



Two summer visitors to the Cunningham Chateau



# FIELD TRIPS



Fall 2019, EES 356 rock stars, Devils Hopyard fieldtrip



Fall 2019, EES 356 hooligans, Lantern Hill fieldtrip



# Environmental Earth Science Student Research

Student: Thomas Zimmerman  
Faculty Mentor: Dickson Cunningham

Project: Unravelling the Structural Evolution and Regional Tectonic Importance of the Honey Hill Fault Zone, SE, Connecticut



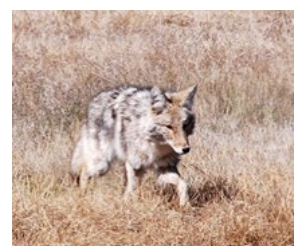
The Honey Hill Fault system (HHF) is one of the most significant fault systems in southern New England because it forms a boundary between two major crustal domains (called 'Avalonia' and 'Ganderia'). It also links with the Lake Char Fault further north which has experienced repeated low-level historical seismicity, including a notable earthquake swarm in Plainfield in 2015. The fault system is poorly understood in terms of its motion history and timing. However, understanding the structural evolution of the HHF is essential for determining: 1) how the crust of southern New England was assembled, 2) how the Appalachian Mountains were created, and 3) how the mountain belt was later disassembled by orogenic collapse. All models of the tectonic evolution of southern New England have remained incomplete until now, because of uncertainty regarding the HHF system's history. In this study, detailed field investigations of the HHF between Bozrah and Norwich, CT were carried out during summer-fall, 2019 to document the rock types that the fault passes through and separates, structural evidence for brittle and ductile deformation, and kinematic indicators.

In addition, samples were collected for thin-section analysis of micro-structures that reveal mineral-scale deformation mechanisms and shear sense. Our results indicate that the fault zone cuts through rocks that experienced two phases of top-to-the-S directed contractional deformation (D1/D2). Overprinting the older contractional structures are spectacular mylonites and ultramylonites that reveal high-temperature ductile shearing indicative of top-to-the-NW sinistral transtensional displacement (D3). Ductile D3 transtension was followed progressively by brittle top-to-the-NW transtensional and E-W sinistral faulting that cuts across earlier structures (D4). The full range of ductile-brittle kinematic indicators are preserved in the mylonitic gneisses. Late-stage retrogressed pseudotachylite is also present. Our results provide further evidence that the HHF was a regionally significant tectonic boundary that accommodated deep-seated orogenic collapse in the southeastern New England Appalachians following Pennsylvanian-Permian Pangea assembly.



## Peter Drzewiecki

Greetings alumni, students, and friends of the EES department! I am sure you have read several times by now how strange this year has been. It started out normal enough last summer (*our timeframe for starting these Newsletters*). Immediately after Commencement 2019, Dickson, Drew and I headed out west with three vans full of students to explore the geology, culture and scenery of the northern rocky mountain states of Utah, Wyoming, and Idaho. The trip involved visits to Great Salt Lake, the Snake River Plain (including Craters of the Moon National Monument), Borah Peak, Yellowstone National Park, Jackson Lake, Grand Teton National Park, Fossil Butte National Monument, “fishing” in the Green River Formation, and many other sites less known but just as beautiful as those recognized by our National Park system. The best part of these trips is always watching students, many of whom have never been outside the Northeast, discover the wonders of the natural world. One such wonder is the phenomenon known as “virga” – when rain evaporates before it hits the ground (see picture below). The students in my vehicle decided that we would be the “Virga Van”, as the observations and discussions of the topic dominated one afternoon’s drive. Highlights of the trip for me included seeing all the wildlife and thermal springs at Yellowstone, examining evidence and impact of geological disasters (Borah Peak earthquake scar, Gros Ventre and Madison landslides), surviving a small “tornado” at Craters of the Moon, and collecting Green River Formation fossils. Of course, the best part was working with the faculty and students, helping them to see and understanding the importance of geological processes in shaping the scenery and culture of the area.



EES trip to Utah, Wyoming, and Idaho. Top left – members of the “Virga Van” posing in front of virga at Craters of the Moon National Monument; Top middle—small tornado at Craters of the Moon National Monument; Top right— morning’s catch of fossil fish from the Green River Formation at the American Fossil Quarry in Kemmerer, WY; Middle left – posing in front of Yellowstone Falls at Yellowstone National Park.; Middle Old Faithful at Yellowstone National Park; Middle right—coyote at Yellowstone National Park; Bottom left, mama and baby at Yellowstone National Park; Bottom right— new bigfoot shirt, a gift from the students.



# The Drzewiecki Family



My wife, Lisa, taking a picture of kids Kaela, Shelby, Aiden and Max at Rocky Mountain National Park

That trip was followed by another trip out west – this time to Colorado with my family. We did manage to get at least one more family vacation, which will become harder and harder as the kids get older and start leaving the nest. We flew into Denver and did some sight-seeing in the mountains west of the city, including Red Rock State Park, and then visited family in Boulder. We had time to explore the town, and my cousin took us to a beautiful overlook of Boulder. From there, we drove to Rocky Mountain National Park

and enjoyed the beautiful mountain scenery. I was struck by the great irony of the National Park system – remote scenic beauty, but crowds and crowds of people. We were restricted in where we could go because parking lots were often full. However, we were patient and did get to see everything we wanted, including the gorgeous Bear Lake. From there we drove west to Grand Junction, stopping briefly in Vail to check that town out. Outside Grand Junction was one of the highlights of the trip – Little Book Cliffs Wild Horse Sanctuary. Despite reading that we were on the wrong side of the preserve for seeing horses during the summer, after about a mile of hot hiking, we were rewarded with seeing four. We got quite close to the horses, and all my kids, especially my daughter Shelby, were quite fascinated with the experience.



My daughter Shelby celebrating her success in approaching a wild horse at Little Book Cliffs Wild Horse Preserve

The next day we visited the gorgeous Colorado National Monument and had fun in Grand Junction. Then we headed a bit south but mostly East and stopped at the Black Canyon of the Gunnison National Park. This was an amazingly different type of scenery! Next, we continued east to Great Sand Dunes National Park – a pile of sand that collected in the lee of the mountains west of Colorado Springs, and offered a unique sport – sand-boarding and sand-sledding. We rented some boards and had a blast until cold rain chased us out.

and had fun in Grand Junction. Then we headed a bit



Great Sand Dunes National Park

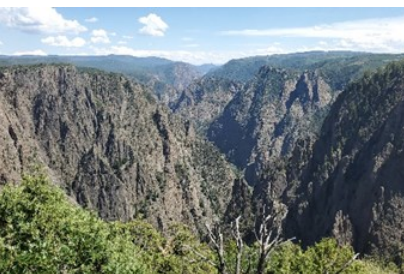


Colorado National Monument

As we headed to the Colorado Springs area, we had an opportunity to do some white-water rafting, drive up Pike’s Peak when it was clear on top, and tour the Garden of the Gods. This was another highlight, because we did so on horse-back – something the kids really enjoyed. After a brief walk through Denver, it was time to come home!



My son Aiden learning that snowboarding skills do not directly translate to sandboarding



Black Canyon, Gunnison National Park



Garden of the Gods

Overall, a great experience

# Summer



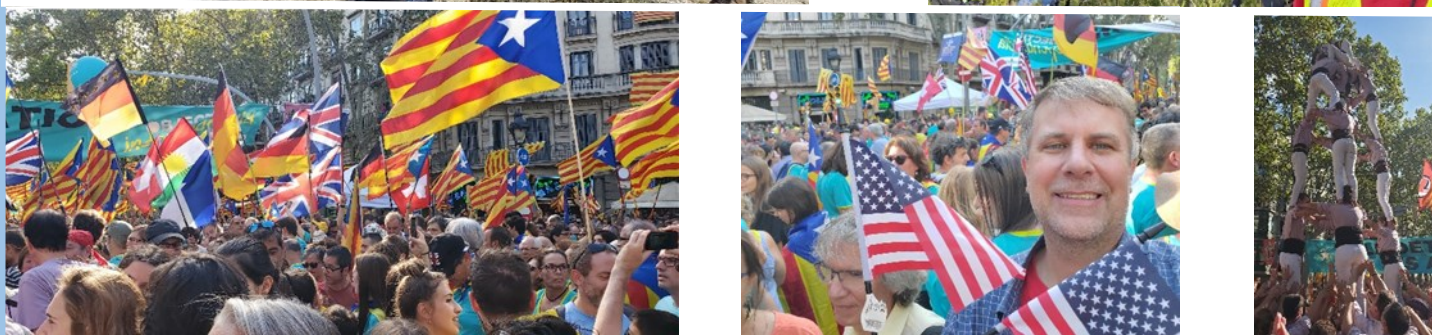
Fun in the sun! Top left – Lisa, Max and I in Washington DC after dropping my daughter off at college. Top right – cherry blossoms in April when we went to pick her up. Middle left - beach in Cancun over winter break. Middle right – diving with my son Aiden (I am in yellow). Bottom left – driftwood fort on a remote beach in Maine. Bottom right - seals sunbathing in Maine.

The summer was also peppered with smaller trips and events. We went to Maine as we do every year, and we did the same stuff that we do every year – relaxing, jumping waves in the boat, walking the seashore, enjoying dinner on the docks. The weather was great, and the place was as beautiful as ever. I also managed to get my son and two of his friends up to Maine for about 5 days. Watching three 14-yr old boys and making sure they did not hurt themselves or cause any damage was not so relaxing for me, but fun for them. We also managed two trips to see my family in Buffalo, and there were a few brief trips to Washington DC for orientation and to drop my daughter off at American University where she was a freshman. In August, when we dropped her off, my wife and son Max spent a day in Washington DC visiting all the National Monuments. Finally, I spent one week at June Norcross Webster Scout Reservation (Ashford, CT) for summer camp with my son's Boy Scout Troop.

Scattered amid this travel, I was able to work with students and faculty on two research projects. A team consisting of myself, Steve Nathan, and students Erick Bora, Joe Franklin, and Shane Goodson examined over 50 short cores from the Adriaen's Landing region of Hartford along the Connecticut River. The project was sponsored by Matty Thomas (State Geologist) and resulted in development of a digital database of all the cores, drafted descriptions, and a few cross sections. The data were tied into previous core datasets from the area. The students had two abstracts accepted for presentation at the 2019 NE Geological Society of America meeting, which never happened because of the COVID-19 pandemic. More on this can be found in the undergraduate research section of this newsletter.

Once September rolled in, I taught two sections of EES 130 (Ancient Environments). Steve Nathan taught the labs, and I cashed in some more teaching credits I had accrued as Department Chair. I also continued to work with my 3 students on independent research. I tried to get some work in on two papers: one that examines evidence for an episode of salt tectonic influence on a growing carbonate platform in the Iberian Range prior to compression and uplift (published in *Basin Research* in January 2020), and one on a re-interpretation of the paleoenvironments associated with the trackways at Dinosaur State Park in Connecticut (submitted May 2020). In mid-September, I was fortunate to be able to join my colleagues at Equinor, ASA in Spain to co-lead a carbonate field course. I was told when I first did this that I would teach the course 3-4 times, but this was my 6<sup>th</sup>. It is always a very enjoyable experience. I served on a few university committees this year. I was chair of the Sabbatical Leave Committee and served on the Student Academic Advising Committee, as well as on a committee to investigate, define, and select new Liberal Arts Learning Outcomes for the University. The latter two committees had important, time-consuming goals for the semester.

Over winter break I was fortunate enough to travel to Cancun to celebrate my in-law's anniversary. It was at an all-inclusive resort. The resort was great, and there was a lot of family fun, but I only managed to get outside the walls and explore the area twice. The first time was on a bike ride into the local town of Puerto Morelos (this was fun!) and the second time was to go SCUBA diving at Marina La Bonita. I had wanted to SCUBA since a child (I almost went into marine biology in college), so this was a major bucket list item for me. I was certified a few years back but never had the chance to dive until now. I went with my older son Aiden, a certified rescue diver, and he promised to save me if I needed it. As it turns out, I kind of did – there were two dive groups, and I almost went off with the other one, but Aiden came and got me. The conditions were good, and we explored the reefs off Cancun during 2 45-minute dives. We saw sea turtles, huge lobsters, and lots of pretty fish. While there we heard reports of this strange, very contagious disease in China, but hey! That's a long way away!



Equinor Field School in Spain. Top left - class examining a Cretaceous reef from a distance. Top right – entertaining myself while the class sketches the cliff across the valley. Bottom left – before the class, I attended a demonstration in Barcelona with a million other people supporting Catalanian independence. Bottom middle – representing the Americans in the “international section” of the demonstration. Bottom right – human tower, a traditional Catalanian competition, at the demonstration; note the little girl crawling up the backs of others to make the summit.

In Spring 2019, I taught a large section of Sedimentology and Stratigraphy and continued to work on independent research with Erick, Joe, and Shane. The semester started normal enough, but as you all know, life changed in March. We went online, and I spent the rest of the semester teaching online from an “office” in my bedroom. Things worked out well considering! I was supposed to lead a field trip to Spain with students from Eastern in May, but that was cancelled early. You may recall that Spain had a high number of COVID-19 cases early on. Committee work intensified as I became co-chair of the committee looking into new Liberal Arts Learning Outcomes. We had to identify and define 5 learning outcomes that the entire university could agree on! In the end, we succeeded and were rewarded by the Provost – I, along with the other co-chair, are now co-chairs of the committee looking into how to implement these learning outcomes into our curriculum!

Sadly, we did not have a Commencement ceremony this year, so we were unable to say good-bye to students properly. We did hold our Year End Celebration and Award Ceremony online, as well as met virtually with our graduating students in full regalia.

On the home front, I served my 3<sup>rd</sup> year as Scoutmaster of my son’s Boy Scout troop. This started out normal enough, but we basically wrapped up the year’s programs with the COVID-19 quarantine. In general, though, this takes several hours a week plus one weekend camping every money. My back is starting to complain!

My oldest daughter, Kaela, got married and bought a house in Windsor in March. She is wrapping up a post-graduate experience at Yale and has been accepted into the Genetic Counseling graduate program at Brandeis University. My older son Aiden finished his third year of Engineering at UConn, but unfortunately did not get a chance to intern this summer as most internship programs were cancelled. My younger daughter Shelby finished her first year at American University, and absolutely loved being away from mom and dad in Washington DC. She is not sure what she wants to do yet, but is leaning toward graphic design. Finally, my younger son Max completed his freshman year of high school. He did well remotely but missed his first high school lacrosse season. My wife continues to work as a state auditor at UConn, and seems to be enjoying working from home! I hope that you are all safe and healthy during these times, and that the impact of the COVID-19 pandemic was minimal in your lives. It will be good to get back to normal soon (hopefully). At such a time, stop by and visit. It is always good to catch up on what is happening!



Celebrating the safe and successful conclusion of the EES trip to Wyoming, Utah, and Idaho on the last night of the trip at the El Jaliciense Restaurant in Kemmerer (home of JC Penny). Don’t worry, I only had one.

Project Title: 3-Dimensional Interpretation of Jurassic Environments in the Hartford Basin from a New Core Collection

Students: Erick Bora, Joe Franklin, and Shane Goodson

Faculty Mentors: Peter Drzewiecki (and Steve Nathan for fieldwork) at the DEEP Randolph P. Steinen Core Repository in Portland, CT

## STUDENT RESEARCH



Joe Franklin (standing) and Shane Goodson describing core



Erick Bora (left) and Steve Nathan describing core



Peter Drzewiecki (front) reviews a core with Shane Goodson



Steve Nathan (standing) and Joe Franklin prepare yet another core for investigation

Peter Drzewiecki worked with three students over the summer of 2019 and throughout the fall 2019 and spring 2020 semesters conducting a project in the lower Jurassic Portland Formation of the Hartford Basin. The project included collaboration with Margaret Thomas (State Geologist) and Dr. Randy Steinen (retired UConn geology professor) of the Connecticut Geological Survey. In addition, Steve Nathan assisted with summer work in the core facility. The main purpose of the investigation was to describe a set of 54 newly acquired rock cores collected during the development of the Adriaen's Landing area (downtown Hartford waterfront) and managed by the Connecticut Department of Energy and Environmental Protection (DEEP). The project involved "fieldwork" in the core lab (at least it was cool and there were no ticks!), drafting of measured sections, preparation of a few samples for thin section work, and creating an ArcGIS database.

The cores, totaling 810 feet in length, were described and drafted. They occur in a dense grid that allowed for 3-dimensional reconstruction of the distribution of paleoenvironmental conditions in this area of the Hartford rift basin during the Jurassic Period. From this reconstruction, the students were able to investigate interactions among tectonic and climatic controls on cyclicity within the depositional environments, and tie their observations into the longer paleoenvironmental record of the Hartford rift basin based on previous work. These cores were combined with 86 other cores in the Hartford basin to enhance a database that records core location, geotechnical data, and logs into an ArcGIS project for the state of Connecticut. We were able to make several detailed cross-sections, but the short nature of the cores (10-20 feet for most) combined with the regional 15° structural dip limited the 3-D correlation. We were, however, able to successfully tie this core set into an older set of cores that record a much longer record of paleoenvironmental change.

The students had two abstracts accepted for the 2019 Northeast Geological Society of America sectional meeting in Washington DC – one on the scientific results and one on the creation of the database – but the conference was cancelled as a result of the COVID-19 pandemic.



## *Drew Hyatt*

Hi everyone – hope all are well and have weathered the Covid storm as best as is possible. More on that in a bit. This fall was a rewarding year for teaching. As described in the student research section I worked with three excellent students (Arlene, Jack, and Danielle) on some 3D photogrammetry research projects. The fall of 2019 was also a chance to teach Process Geomorphology (EES 440), which I always enjoy ... every other year. Similar to previous years, 440 examines the geomorphology of the Arboretum and nearby sites introducing a variety of near-surface geomorphic techniques (from stream mapping, to scanning, and even some drone work inside the forest canopy this go around). It was a bigger class than normal (12 students, one missing in the photo below).



While I think all involved find the course a bit intense; it is cool, when finished, to think about the variety of activities that were undertaken. As the photomontage suggests students in EES 440 collected and analyzed ground radar data, they constructed point cloud models of portions of the arboretum, collected sediment cores, and did a fair bit of writing to boot (after all it is a writing intensive course).



Examining the Stream



Taking the Radar for a Walk



Collecting Vibracore



## FIELD METHODS

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### FALL 2019



I also taught a good-sized field methods class in the fall, this year returning to Bailey's Ravine for the final project. We did have a bit of bad luck with bee stings, which I will be on the lookout for the next time I go to the site.

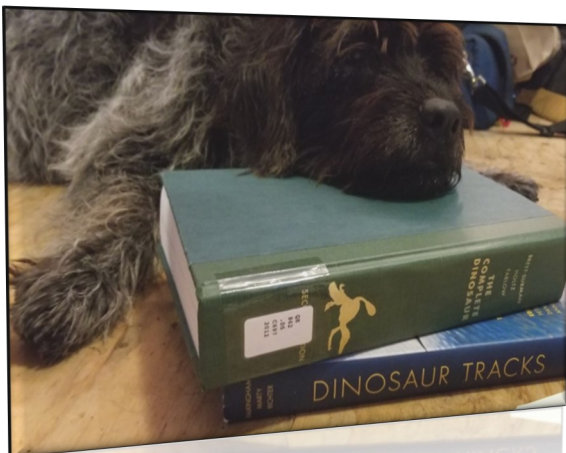


Field Methods with some views learning to survey on campus and traversing the "belly-of-the-beast" at Bailey's Ravine.



In spring, I taught the next wave of EES majors in my Landform Analysis class. This seemed to be a strong bunch and I was really looking forward to our field labs, and to working with some of the new students on summer research projects with .... the covid-bottom dropped! As people are now well-aware, the spring semester switched to fully on-line and, unfortunately, we were not able to undertake summer undergraduate research projects – first time since 2001 for me!

On the up side, in spring I had a new office mate (see below). She was nice, mostly quiet, but really was dog-tired most of the time. Roxy has a brief wake-up while sharing the studio with me during summer research. Looks like she fell on my autobiography (**the Green One!**).



The summer has been flying by in a whirl as I have totally immersed myself in a rather large project mapping in 3D Dinosaur tracks that got side-tracked with the switch to online teaching but now is nearing a finish (I hope!). Sadly, we are not able to visit our kids in California and Canada right now (and probably for a little while yet). However, we talk every week, and we have done a fair bit of work around the house. Life seems as busy as ever. That's about all the news from me. I hope we will be back to some form of normalcy soon, and it would great to see/hear/text/talk with any former grads!

*All the best to all, and be safe —Drew Hyatt*

## ▶ ▶ ▶ STUDENT RESEARCH

Drew Hyatt

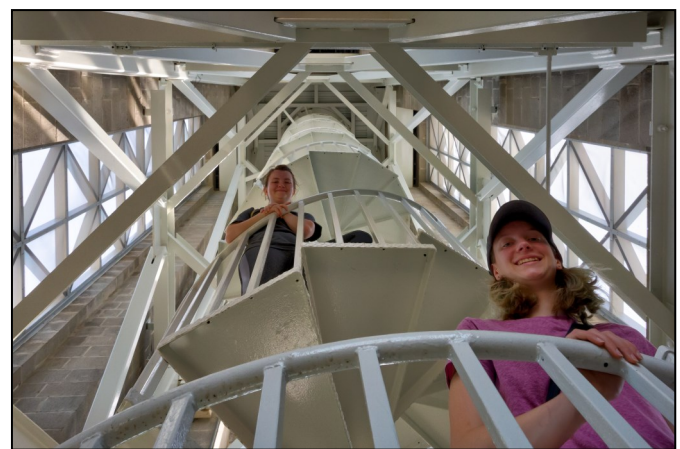
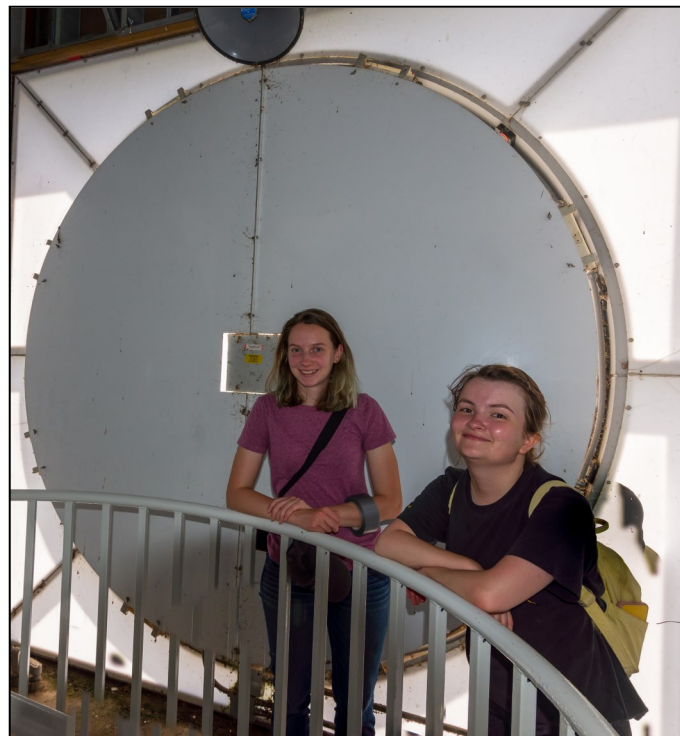
It was another great year for involving students in undergraduate research activities. During the summer of 2019, I got to know and worked with 3 talented EES majors: Arlene Blackwell, Jack Cerra, and Danielle Whitcomb all of whom had just finished Landform Analysis class with me last spring. Upon returning from the Wyoming Field Trip (see the 2019 newsletter), we conducted several days of field work that introduced these students to digital photogrammetric analyses of a variety of sites. First, we all spent a few days with Dr. Oakley on Block Island to re-map eroding coastlines at Clay Head (Jack's site) and the West Beach Landfill site (recently renovated). As well, we collected ground-based images to examine a new section of eroding bluffs at Balls Cove (Arlene). We had a fun time at these sites, and the students subsequently did some interesting analyses on the 3D models they produced (more on that below).



Views of the crew (left) on the way to Block Island (back to front: Bryan Oakley, Drew Hyatt, Danielle Whitcomb, Arlene Blackwell, and Jack Cerra) and collecting imagery and RTK GPS data at Clay Head Beach.

These students were also introduced to 3D drone-mapping on campus (to test out equipment). This was very fun and Arlene and Danielle had a chance to view the Eastern Clock Tower from the inside! In addition to flying the drone, all three students learned how to capture images in a light tent that enabled fully 3-dimensional modelling of conglomerate samples, a goat skull, and some refuse from the West Beach site. Finally, our field work extended to some spectacular outcrops of conglomerates near Glastonbury, where each student was able to fly and capture images to build detailed topographic models of the bedrock.

In addition to their field-work all three students undertook research practica in the fall and spring semesters and prepared a joint poster on their research for presentation at the Northeast Geological Society of America meeting in Reston, VA. Unfortunately, with less than two weeks to go to the conference, the pandemic took hold and all out-of-state travel was ceased. The students still presented their poster at the 2020 CREATE meeting (virtually), and it was a pleasure to work with them on this.



Clockwise from upper left: Arlene and Danielle take-off near the clock tower. A view behind the clock face, and the stairs used to get there. 3D model of Glastonbury outcrop and 3D model of goat skull both from Figures on the students CREATE poster.



## *Stephen Nathan*

Another year has flown by! Starting last summer (2019), I assisted my colleague, Dr. Peter Drzewiecki and three of his students with the field component of their research project. We spent several weeks at the Connecticut Department of Energy and Environmental Protection (DEEP) warehouse in Portland, CT, describing cores of bedrock collected from Adriaen's Landing (downtown Hartford waterfront). The cores are test borings that were originally used to assess the character of the subsurface for future development of the area. Working with these test borings was a great experience for the students. They learned how to make careful observations and keep detailed records, as well as see and handle some great core material.

Shortly after the semester started, I focused on teaching my fall classes. First up was a favorite class of mine, EES 205 Sustainable Energy. The class gives students (predominately non-science majors) the basics on climate change, the use of fossil fuels, an overview of renewable energy sources (e.g., wind, solar, hydro, geothermal), and alternatives such as biofuels. The EES 205 lecture is tied to EES 207, the Sustainable Energy laboratory. In this lab course, students get hands-on experience working with, for example, model wind turbines, electric cars and basic circuits.

Last fall I also co-taught EES 130 Ancient Environments, with Dr. Drzewiecki; he covered the lecture course and I taught the two lab sections. I very much enjoyed teaching the lab. It was a lot of fun helping the students come to understand the basic tools used in sedimentology: identifying different rock types and interpreting depositional environments, basic mapping and correlation, as well as introductory paleontology. In the spring (2020), I continued my teaching of Sustainable Energy and I returned to my advanced class, EES 402 Energy Issues in Geoscience. The latter is a Tier 3 Writing Intensive course that requires students to retrieve online data, reduce and display that data, interpret the data and finally to write-up and present their findings.

Through both semesters I continued my service for a third consecutive year on the Promotion and Tenure Committee; this was also my second year in a row serving as committee chair. On the committee I was joined by eight other faculty and staff who were very dedicated to carefully evaluating all the promotion and tenure applications submitted by our colleagues from across campus. I am always impressed by the great accomplishments made by the coaches, counselors, librarians and faculty at Eastern. I truly believe that everyone gives their all to make our school the very best that it can be for the students.

For all the faculty and staff, and of course the students, everything changed during Spring Break 2020. The unprecedented closure of the campus and switching to fully online was a mad scramble. We did our best to uphold the standards of Eastern. For me it was a seven day a week job to convert all my lectures, quizzes, exams, etc. to an online format. I had to learn a whole new set of technology for holding online lectures, giving (and then grading) assignments electronically, advising students remotely, carrying on with the day to day department routine, and so on. I think I speak for many that when final grades were submitted and we congratulated our 2020 EES graduates on their accomplishments, there was a collective sigh of relief for completing a task done well. Now the challenge before us is to prepare for the fall 2020 semester. For me this entails ramping up my courses for the new normal and for taking on the role of Department Chair.

On a personal note, I am now a citizen of Connecticut. Eight and a half years of commuting from Massachusetts to Eastern (an hour fifteen-minute drive each way, oy!) has now been cut to a third of what it was. Since March, while working from home remotely, my wife and I would use our "work breaks" to unpack boxes and set up shop. (There are still boxes to unpack, which keeps us busy on the weekends; perhaps we shouldn't open them at all!).



## Bryan Oakley

Lately, it occurs to me, what a long, strange trip it's been (Garcia et al., 1976). Normally, I start the newsletter with a comment about how the semester seems that 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, but in a much different format! The fall semester found me on sabbatical getting caught up on some much needed research time, however the transition from traditional on-ground lectures to online has managed to vacuum up time I had set aside to continue that research! Despite Covid, my colleagues and I managed to get two manuscripts accepted into *Northeast Naturalist* (based on work completed on Cape Cod) and *Estuaries and Coasts* (based on work down at Fire Island, NY). I am currently working on a couple of papers that began during my sabbatical for submission in the near future. Academically, instead of offering coastal geologic hazards in the spring semester, I offered a class for the Honors program on sea level rise, which I enjoyed, but missed my EES students!

On the home front, my kids continue to grow; Aidan is 10 ½ and Haley is approaching 7 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 Brown belt, and Haley is alternating between dancing and gymnastics. Julie, who works in cardiac rehab never transitioned to 'work from home' so the kids and I had a lot of time with dad acting as 'principal' of the Oakley Covid Homeschool. Thankfully, pre-Covid, the Oakley Family managed to sneak away to Florida in November 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 catching a wave or perhaps chasing a fish or three.



**Left:** Aidan 'The Cod Whisperer' with a few nice codfish taken with his grandfather and me on the family boat.

**Right:** Haley practicing some yoga (*Dekasana* (airplane pose)) in Glacier Park, Westerly, RI. Near daily hikes in this park became 'gym class' for the Oakley Covid Homeschool.

My wife and I at Napatree Point, Easter Sunday 2020. What a great place to socially distance ourselves!



Dinner (*Quahogs*, *Mercenaria mercenaria*) collected off a local waterway; Haley made sure the catch was up to par.





Part of my sabbatical was collecting and analyzing sediment cores from the Point Judith RI, Harbor of Refuge, in collaboration with the Graduate School of Oceanography at URI. This project builds on Cody Murphy's past project and involves current EES student Kym Lee

## RESEARCH

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, 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 2021.

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.

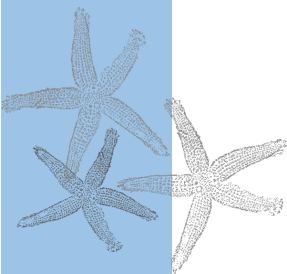


**Left:** Aidan helping measure some post storm profiles at Napatree.

**Right:** the kids riding in the Napatree Point Conservation Area ATV with my colleague Peter August.



Where you can find me most mornings when I am not teaching, catching a few waves on my Surf SUP (yes, year-round!) (credit to @PaddleboarderJoe for the drone photo)



# Summer 2019 Fieldwork

Over the past couple of years, I have had the privilege of working with some outstanding students. 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!). Not working with these students was probably the hardest part of the transition to online learning. The enthusiasm and hard work 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. Joey Marsalisi completed a project (working with Greg Rodman in the field) to measure sedimentation within the flood-tidal delta of the Napatree Lagoon, building on Aly Augenstein's project from last year. Greg Rodman analyzed the sedimentation of all Little Narragansett Bay using historic bathymetric and 2018 LiDAR data. Both projects help foster the science-based management of this important part of the Napatree ecosystem and will likely be presented at the 2021 Northeast Geological Society of America meeting. Kym Lee is continuing to work on sediment cores collected in the Point Judith Harbor of Refuge, as we await age models measured using Lead-210 isotopes. Liz Lemire completed a project examining shoreline change and sea level rise vulnerability in and around Acadia National Park. I also assisted with a project continuing the photogrammetry work of the Block Island bluffs, working with Arlene Blackwell, Jack Cerra and Danielle Whitcomb.



Joey Marsalisi and Greg Rodman measuring tidal current velocities in the Napatree Lagoon as part of Joey's independent study project

As many of my research projects are continual and on-going, 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.



Hyatt at work conducting a photogrammetry survey of the Block Island bluffs, June 2019



The whole crew on the Block Island ferry, June 2019 (back to front; Oakley, Hyatt, Whitcombe, Blackwell, Cerra)



## *Paul Torcellini*

What a difference a few years make! Southern New England is home to the first off shore wind farm located just east of Block Island. In the past two years a major coal plant and nuclear plant have been taken offline permanently in southern New England. It is an exciting time for sustainable energy and watching it grow and change the energy landscape. The Center for Sustainable Energy (CSE), housed in the EES department, is preparing students for the future of the ever changing landscape around energy.

In the Sustainable Energy Laboratory (EES 207), one of the favorite labs is the electric car. Part of this effort is to compare an electric car with the car that students are currently using. Last year, for the first time, a student owned and electric car! Some think that the transition between fossil fuel operated cars and electric vehicles will be rapid. The transition between horses and the automobile was less than 10 years. Will we see the same for electric vehicles? Eastern had a pair of electric charging stations in the parking garage. For the first few years, the system had very few users. Last year The Center for Sustainable Energy (CSE) installed two additional stations to look at usage patterns as a student research project. What we found was that the stations were in hot demand. Two additional stations, to bring the total to 6, are being added this fall.



EES 207 students measure energy flows in and out of a coffee pot



EES 207 students charging their electric car with a small solar panel

## EES 207

Continues to be a popular laboratory with:

- ▶ **model wind turbines**
- ▶ **basic electricity concepts**
- ▶ **solar panels**

Last year almost 200 students took this laboratory from all over campus. Students like the experience of measuring “something” and the hands-on variety of experiments gives many students an introduction to sustainability that they can apply to their daily lives.



Ready, Set, Go—The solar cars efficiency is measured by seeing how far they go on a solar charge

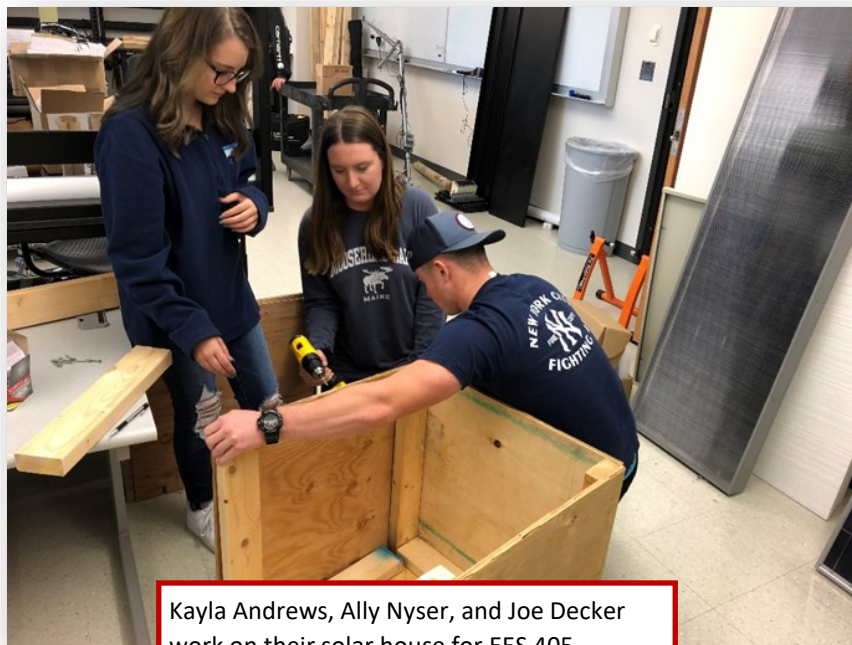


Two of Eastern's electric charging stations in Shakespeare Garage



Energy Analysis (EES 405) continues to be the capstone class with a mixture of experimental design, data collection and analysis with an emphasis on how to communicate results in a very interactive way. The students studied their own energy use patterns using lab-provided meters to record real-time power consumption of their appliances over several weeks. It was interesting to compare the use and the energy efficiency of several different game consoles. As in the past, they created plywood boxes on the fourth-floor patio of the science building with 80W solar panels that mimicked a small house. The experience in setting up the houses, installing a small-scale heating system. Students sifted through thousands of data points and learned to reduce to a management quantity and graphically show the results to understand the house's performance.

Energy Resources (EES 305) and Green Buildings (EES 306) continue to be popular classes where students learn about current energy technologies and analytical skills about energy with a focus on sustainable energy. While field trips were limited this year due to social distancing, more time was spent on looking at their own houses and designing their "perfect sustainable house." Students taking these classes are well equipped to jump into jobs including sustainability coordinators and sustainability and energy planners. Some students this past year took LEED™ training outside of class to prepare for obtaining a LEED Certified Professional title.



Kayla Andrews, Ally Nyser, and Joe Decker work on their solar house for EES 405

This past year, CSE had two paid interns who gained experience in working on integrating sustainability into the Eastern Campus. They organized solar demonstrations on the quad lawn, organized Earth Day activities, hosted sustainability films for the campus and continued to promote mixed recycling on campus. They participated in the Willimantic festival organized in part by the Willimantic Food Coop. The solar cooling demonstrations as well as the Stirling engine and photovoltaic displays draw crowds giving students an opportunity to introduce the community to sustainable energy. We continued to host, with Chartwell's (campus food provider) zero waste events—showing the campus community that we can minimize waste. Perhaps someday, this will be routine.

## *In Other News*

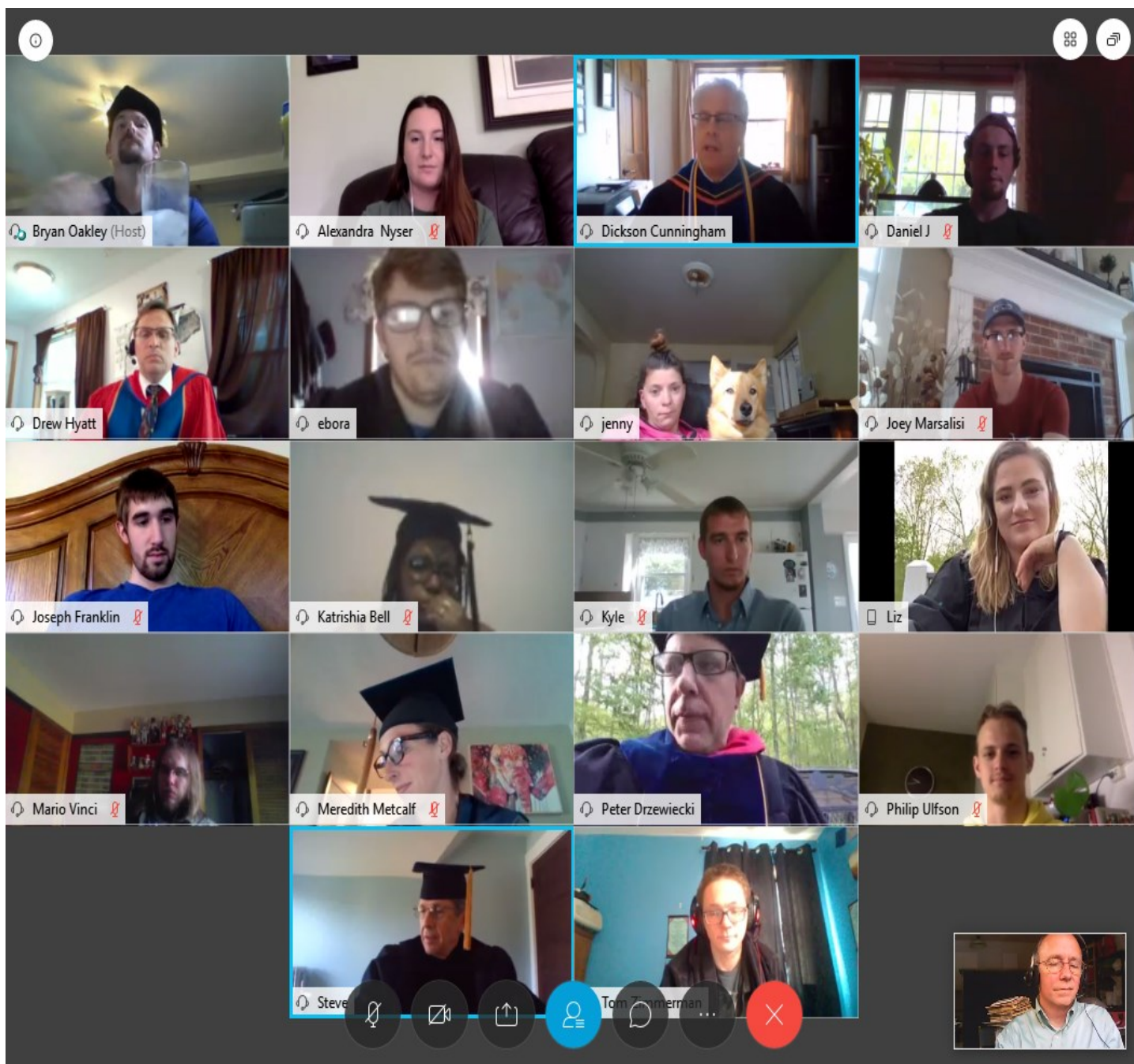
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- Joey Marsalisi (EES '20) is working as a University Assistant replacing Sidney Clements who is headed to graduate school. He just completed updating the Eastern sustainability plan in conjunction with the Eastern Green Committee, the Institute for Sustainable Energy, and CSE. It is an exciting time as Eastern pushes forward to meet climate goals.
- Dr. Torcellini took his electric car to QVCC to talk to students about sustainability and electric cars as part. It was part of a QVCC campus sustainability fair. Even though it was cancelled due to COVID-19, students were preparing for the New York State Green Building Conference including presenting in the student poster displays at this premier professional event. Likewise, participation in Woodstock Academy's Earth Day symposium was also cancelled. I hope that next year will bring back these opportunities for outreach and student engagement.
- Finally, CSE continues to work with school districts in northeastern Connecticut on energy initiatives. Two of the schools have installed PV panels. One, based on data and analysis by several Eastern students over the past 4 years, is getting a heating system upgraded expected to shave 30% off the energy bill. These local, actual projects give students the experience to interface with actual clients and solve problems to help with local sustainability goals.





# EES Virtual Graduation—May 19, 2020



Commencement 2020 was one for the record books. Like everyone else, EES students and faculty had to quickly adapt to the new normal demanded by the pandemic. So, caps, gowns and laptops were the rule for maintaining safe social distancing. The Webex screen capture shows the pre-commencement “send-off” the EES Department held for its graduating seniors before the official commencement ceremony began. Despite the circumstances, those who were able to log-in kept the occasion lighthearted and positive. Faculty took the opportunity to congratulate them for their accomplishments, inquire about their post-graduation plans, and to say good-bye (and to encourage them to keep in touch with the department as they move forward with their careers).

EES

## ALUMNI UPDATES

**Emma Avery (Eastern, 2019)**

Emma graduated from Eastern spring 2019 and entered UConn School of Law the following fall, where she is working on her J.D. and a Certificate in Energy and Environmental Law. Her successful first year earned her a membership on the Connecticut Law Review, a publication frequently cited by the legal community in the United States and abroad. For summer 2020 she will be working for a personal injury and employment law firm, and at UConn Law as a Research Assistant in land use, zoning, historic preservation, and energy (and environmental) law.

**Jenn Croteau (Eastern, 2019)**

Jenn has been working for an environmental consulting company (INSPIRE Environmental, Newport RI) as a Staff Scientist since June. Most of her current projects are offshore wind projects (Atlantic coast). She spends most of her time using GIS to create various maps for clients and interpret the benthic geology and habitats of wind farm lease areas!

**Nick Denegre (Eastern, 2014)**

Since graduating from Eastern in 2014, Nick has covered the globe. In 2017 he went to the University of Graz (Graz, Austria) to work on a MSc degree (during which he spent a month in Egypt doing coral reef monitoring and marine ecosystem work), took the epic trans-Siberian railway from Europe to Vladivostok (2018), and then went to Hiroshima, Japan where he lived and worked for a year. In 2019 he completed his thesis on peer-to-peer energy trading and helped found a startup (Renergy, renergy.ai). Nick returned to the U.S. in May 2020.

## 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. 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!

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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.

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