



PETROGLYPHS

2014 EES Newsletter

4th Edition



Message from the Chair

Peter Drzewiecki

Greetings from the Environmental Earth Science Department at Eastern! The 2013/14 academic year has been exciting for the department. Perhaps the biggest change has been the addition of our final outstanding tenured faculty member. After 6 years of searching for tenure-track and one-year hires, we finally have our full faculty in place. It is my privilege to announce that Paul Torcellini will be joining us next year as the new Endowed Chair in Sustainable Energy Studies. At this time I would

like to extend our appreciation to all those who have helped as we went through a relatively “unstable” time over the past few years. I would especially like to thank Lea Gilbertson, who leaves us this year after two years of wonderful teaching.

In this Newsletter, you will find updates on some exciting activities in which EES students and faculty have been involved. It includes a summary of the undergraduate research opportunities we were able to give to 22 students last year, a list of student accomplishments, and updates on the faculty. Dr. Carlson was on sabbatical during the spring semester, and was unable to contribute to the Newsletter. As always, you can find this, and past Newsletters on our department website: <http://www1.easternct.edu/environmentalearthscience/>

Pleasant reading!

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2013/2104 Year in Review

2013 Commencement

commencement (ke' mansment), noun

1. the beginning; start
2. (US) a ceremony for the conferment of academic degrees

Collins English Dictionary - Complete & Unabridged 10th Edition 2009 © William Collins Sons & Co. Ltd.

The first definition of “commencement” above justifies having this event – the second definition – as a place to start this Newsletter. Eastern’s 2013 Commencement took place at the XL center in Hartford on May 14. An inspiring address was given by Carlotta Walls LaNier, who was the youngest member of the “Little Rock Nine,” the first group of African American students to attend Little Rock Central High School immediately following desegregation. During the commencement, a new crop of EES majors took their initial steps to make their mark on the world.

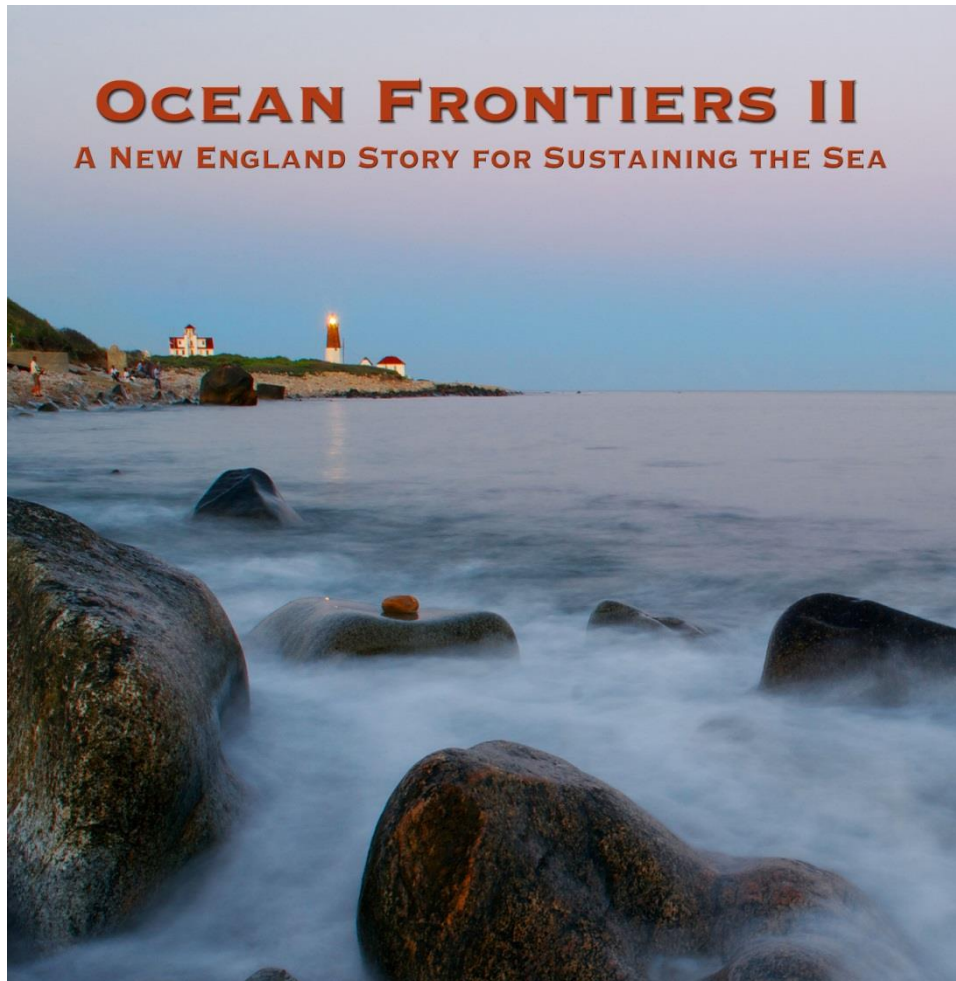
We would like to extend our congratulations to those who graduated in 2013 and wish them the best as they start life after academics.



Selected graduates and faculty at the 2013 Commencement. Front row, left to right: Jonathan Burdacki, Megan Maher, Brittany Roy, Lauren Kostak, Dr. Drew Hyatt, Patrick McNamara, Kelli O’Brien, and Katie Rychling. (Back row, left to right) Dr. Meredith Metcalf, Steve Podurgiel, Prof. Lea Gilbertson, Lindsey Belliveau, Dr. Dickson Cunningham, Dr. Steve Nathan, Dr. Peter Drzewiecki, Dr. Bryan Oakley, Matt Young, and Steve Tutto.

Ocean Frontiers II Premiere

On October 30th, the School of Arts and Sciences and Department of Environmental Earth Science hosted the Connecticut premiere of Ocean Frontiers II. This new documentary from Green Fire productions, highlights success stories in a field known as marine spatial planning, which focuses on the sustainable management of marine resources. Organized by EES Professors Bryan A. Oakley and Steve Nathan, over 50 students, faculty and local residents attended the premiere and offered the filmmakers, Karen and Ralf Meyers a very warm Eastern welcome. Ocean Frontiers II is the second of an award-winning film series produced by Green Fire Productions, and brings audiences face-to-face with those now embarking on the nation's first multi-state ocean plan. The film prominently features the recently completed Rhode Island Ocean Special Area Management Plan, on which Professor Oakley worked on aspects relating to the geology of Rhode Island and Block Island Sounds. Ocean Frontiers II is an inspiring story of citizens coming together to promote healthier economies and healthier seas across New England. Marine spatial planning is a hot button issue in many circles, and incorporates a multitude of uses for water bodies, as well as aspects of the geology, biology and ecology of the region. After the film there was a discussion, with the filmmakers and Professors Oakley and Nathan taking questions from the audience.



<http://ocean-frontiers.org/wp-content/uploads/2013/10/Ocean-Frontiers-II-DVD-Cover-Web.jpg>

2014 College Bowl Champions

In March, students of the EES Department took won the university's College Bowl! This is an annual "trivia game" event run by Tim Swanson (Physical Science Department), in which 5-8 departments participate to see which is most knowledgeable. The EES team does not often meet with success in this event, so we will enjoy any victory when it comes. And victory came this year! EES squeaked out a win in a very close final match.



Congratulations to team members (above, left to right) Cody Lorentson, Dustin Munson, Daniel Grondin, and Mackenzie Fannon!

Geological Society of America

March 23-25, 2014

In late March 2013, seventeen students, along with 4 faculty members, took a 5.5 hour trip to Lancaster, PA to attend the annual Northeastern Geological Society of America Meeting. Everyone enjoyed the posters, talks, and invited presentations, as well as the local culture and cuisine. Seven of the students in attendance presented posters of the results of their undergraduate research projects. For many of these students it was the highlight of their career at Eastern.

Student travel to this event was made possible, in part, by alumni contributions to the EES Founders Fund (see last page of the newsletter).



GSA attendees (left to right): Katie Carr, Jackie Lorange, Laura Dern, Dr. Steve Nathan*, MacKenzie Fannon*, Laura Markley*, Matt Gonsalves*, Lindsey Belliveau, Anthony Sylvester*, Amber McDonald, Dr. Dickson Cunningham*, Brandan Sumeersamauth, Cody Lorentson, Stephanie Rogers, Dan Grondin*, and Tim Bugden. Missing: Jeff Olandt*, Sean Kellarsen*, Dr. J. Drew Hyatt*, and Dr. Peter Drzewiecki*

*This symbol indicates those who presented at the confidence!

Dr. David Fastovsky Talk

On April 9th, the EES Department hosted Dr. David Fastovsky from the University of Rhode Island, who gave a talk titled *Catastrophic extinction of the dinosaurs at the Cretaceous-Tertiary boundary, 65 million years ago*. Dr. Fastovsky is one of the nation's leading dinosaur paleontologists, and is the co-author of *Dinosaurs: A Concise Natural History*. His talk focused on the science behind the catastrophic extinction of dinosaurs 65 million years ago, and the evidence that suggests this was a (geologically) instantaneous event.



http://en.es-static.us/upl/2011/11/David_Fastovsky.jpg

EES 424 – Glacial Geology field trip



Drew Hyatt talks to students about the composition and origin of moraines, while perched on a boulder from the Ledyard Moraine. features on an infamous outcrop of the Portland Arkose 'fanglomerate'

On Saturday April 12th, Dr. Oakley's Glacial Geology course took a field trip to examine glacial features throughout eastern Connecticut. The day started with a hike over a recessional moraine (Ledyard Moraine) at Glacial Park, Ledyard CT. The second stop was at Rocky Neck State Park, where the students discussed weathering of bedrock surfaces, examined a till/eolian mantle outcrop and even discussed a little bit of coastal sedimentology! Following lunch, the trip moved to Glastonbury, where the students saw the inner workings of a proximal glacial delta, and glacial erosional



Students examine an erosional remnant of Jurassic fanconglomerate that was sculpted by glaciers (above). Ujjwal Davda collects data on the outcrop (below).

Student Accomplishments

2014 EES Student Award Ceremony

April 25



2014 EES Award Winners: Front row (left to right): Laura Markley Samantha Walter, Brian Wicks. Back row (left to right): Brandan Sumeersamauth, Sean Kellarson, Sean Christopher (Cody) Lorentson, Tim Bugden

Physical Sciences Award Winner

(For academic achievement in Physics, Chemistry, and/or Astronomy)

Sean Kellarson

EES Award Winners

Discipline Awards

Hard Rock: Sean Kellarson

Geomorphology Recognition: Jacqueline Lorange, Brian Wicks

GIS: Tim Bugden

Sustainable Energy Science: Christopher (Cody) Lorentson

Excellence Awards

Senior: Sean Kellarson, Tim Bugden

Junior: Laura Markley

Sophomore: Brandan Sumeersamauth

Freshman: Samantha Walter

Environmental Service Award

Sean Christopher (Cody) Lorentson

Outstanding EES Major

Sean Kellarson



2014 Outstanding EES Major winner Sean Kellarson accepts his award.

Other Student Accomplishments

Lindsey Belliveau ('13) has been accepted into Graduate School at the University of Connecticut. She was offered a full scholarship, along with a stipend of \$21,000 to support work related to research in Taiwan.

Eastern Honors student **Tim Bugden ('14)** completed his Honors Thesis with Steve Nathan on the response of foraminifera communities to changes in climate near the end of the Miocene.

Nick Denegre ('14) landed an internship with the DOE's National Sustainable Energy Laboratory in Denver, CO. This is the second year in a row that Nick has won a DOE internship.

Mackenzie Fannon ('15) received a very prestigious NSF IRIS internship for this summer. The internship is for students interested in earthquake seismology and geophysical experimentation. Mackenzie will be carrying out summer research at the University of New Mexico investigating earthquake hazards along the Mexican coastline and the precursor signals that could be used for future earthquake prediction. It is important and novel research. Mackenzie is part of an intern group that annually includes Stanford, Cal Tech and Ivy League participants. In addition to a full summer stipend and all travel and research costs, she also receives funding to present at the American Geophysical Union conference next December in San Francisco. A description of the program is at: <http://www.iris.edu/hq/internship/>

Jacqueline Lorange ('15) received a *Geomorphic Research Recognition Award* at the EES year-end celebration and Award Ceremony.

Eastern Honors student **Cody Lorentson ('14)** also completed an Honors Thesis with Steve Nathan examining the thermal conductivity of glacial till and its implications for the design of geothermal energy systems.

Laura Markley ('15) received a Rotary Scholarship for Continued Education in Water and Sanitation from District 7890 to support her education.

Undergraduate Research

This past year, 22 students took part in conducting and presenting undergraduate research projects funded in part by funds provided from the university, AAUP research grants, external grants, and the EES Founders Fund. Summaries of these projects follow.

Student: Joshua Bartosiewicz

Faculty Mentor: Bryan A. Oakley

Project: As part of an externally funded shoreline change project, Josh assisted with the installation and determining the elevation of five survey benchmarks on the Napatree Barrier, Westerly, RI, with the collection of beach profiles and LHTS shoreline positions.

Follow-up: Josh will likely continue on with the project informally during the Fall, 2013 semester and may begin a practicum in the Spring or Fall of 2014 after we have collected sufficient data to begin analysis.



Student: Timothy Bugden

Faculty Mentor: Steve Nathan

Project: For seven weeks Tim Bugden investigated historical changes in global climate by studying microscopic organisms preserved in deep sea sediment cores from the western equatorial Pacific Ocean. These organisms record environmental conditions at the time they lived and in turn, provide clues to how global climate changed during Earth history. Tim's research could provide clues to the timing of a major, historical shift in global climate.

Follow-up: Tim is continuing his summer research through a three credit Honors Thesis. He will present his research at one or more of the following conferences (spring 2014): the ECSU Art and Sciences Research Conference and Exhibition; the Northeast Regional Honors Council; and the Geological Society of America Northeast Section annual meeting.



Student: Samantha Boyle

Faculty Mentor: Bryan A. Oakley

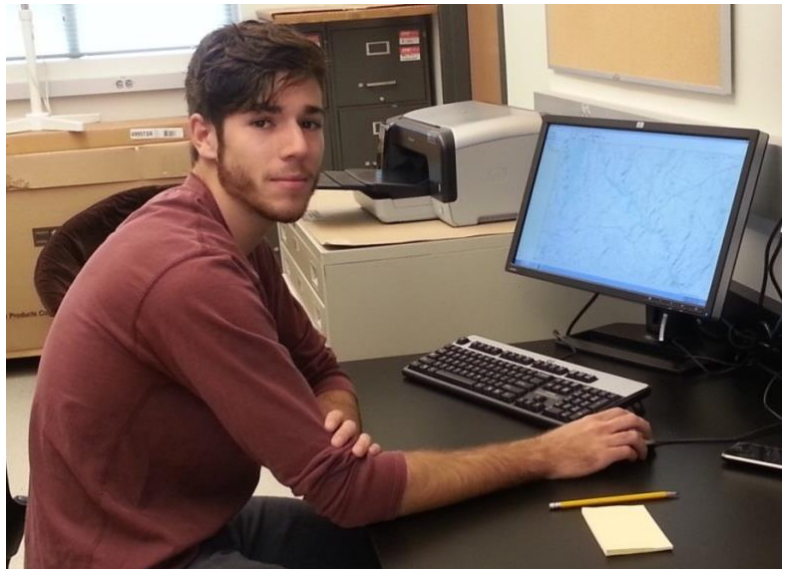
Project: Samantha completed a project looking at a reconnaissance level documentation of the Bluff shoreline along the south, southwest, northeast and northeast portion of Block Island. The goal was to document areas of the bluff that look to be prone to future slumping, or have freshly slumped, to compare to LiDAR based interpretations. These photographs will supplement, and be more current than presently available oblique angle photographs. GPS located photographs will be used as a baseline to examine future bluff failures. The secondary goal was to familiarize her with geomorphology of Block Island, to guide GIS based interpretations in the fall semester.

Follow-up: Samantha is currently completing a 1-credit practicum, taking observations, photographs and GPS measurements collected in the field, and use that information to interpret in ArcMap, the crest and toe of the bluff visible in the hill shade models of 2011 USGS and 2012 (Post-Hurricane Sandy) LiDAR data. She will hopefully present the results at the spring 2014 Arts and Science Research Conference and Exhibition. Pending the outcome of the practicum, this project could be further developed into an independent study project (EES 480) in a future semester.

Student: David Carney

Faculty Mentor: Meredith Metcalf

Project: David spent three weeks during the summer processing bore log data for domestic wells in an area with irregular spatial patterns in groundwater contamination. The summer allowed David the opportunity to become familiar with databases, experience the data entry process, and become familiar with QA/QC procedures required for databases. The data he obtained will provide a definitive evaluation as to the source of groundwater contamination within the area of interest and result in collaborations with local officials, State officials, and public agencies to determine appropriate management measures to reduce future impacts to local water resources.



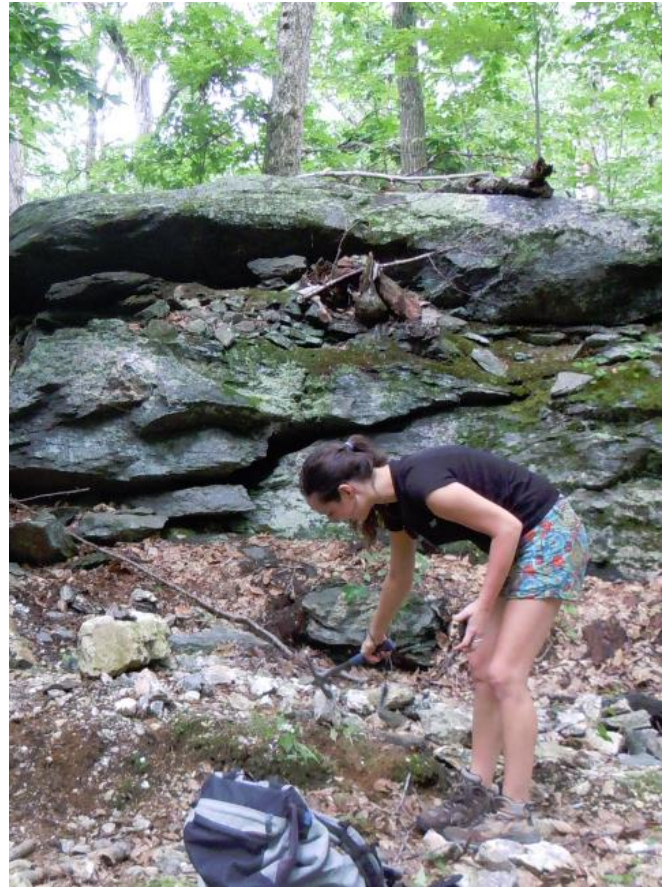
Follow-up: David is analyzing the information within the database to evaluate the hydrogeologic conditions of the fractured rock. David will prepare a poster presentation and an oral presentation that will be presented at the Arts and Science conference, a professional meeting, or a municipal information session for the City of interest.

Student: Catherine Carr

Faculty Mentor: Dickson Cunningham

Project: Catherine's project involves a comparative study of pegmatite bodies in the South Glastonbury mining district in Connecticut. Her project involves a literature review of the pegmatite occurrences and their unique mineralogy including famous gem-quality beryl occurrences. Catherine carried out field investigations of pegmatite outcrops and quarries during summer and fall, 2013 and gathered samples for follow-on mineralogical and textural study. The main goal of her research is to document the diversity of pegmatite geology within the Glastonbury district and to better understand reasons for that diversity.

Follow-up: Catherine will continue to gather all published information on the pegmatite district and its mining history and then add her own observations to that database. She will analyze her own samples and derive a set of conclusions about common features and major differences between pegmatite occurrences in the South Glastonbury district. She will present her research results at the Arts and Sciences Research Conference in spring, 2014.



Student: Mackenzie Fannon

Faculty Mentor: Dickson Cunningham

Project: Mackenzie was part of the EES geological research team investigating huge caldera eruption deposits in southern Idaho. Mackenzie's research involves a detailed study of two major pyroclastic sequences to determine their compositions, flow directions, eruptive source area and to establish correlations with other volcanic sequences in surrounding mountain ranges.

Follow-up: Mackenzie's follow-up research will involve detailed microscopic analysis of the volcanic rocks to better understand their mineralogy and structural evolution. This information will be combined with other data to better document the 12-8 million-year history of super-eruptions along the Snake River Plain. She will present research results at the Arts and Sciences Research Conference in spring, 2014. Her data are likely to be incorporated into a larger publication that she will co-author.

Student: Matthew Gonsalves

Faculty Mentor: Dickson Cunningham

Project: Matt carried out geological field research on and around Soapstone Mountain in Somers, CT during summer, 2013. The objective of Matt's research is to geologically map and structurally analyze the unusual metagabbro bodies that occur there in order to test different magmatic and/or tectonic emplacement models. This is important for understanding the tectonic history of northern-central Connecticut.



Follow-up: Matt's follow-on research involves plotting his field data on a high-resolution LiDAR shaded relief model and generating a new geological map and cross-sections for the Soapstone Mtn area. In addition, thin-sections of key rock types and structures will be analyzed to help derive a petrological and structural evolutionary model for the metagabbro bodies. Matt will present his research results at the Arts and Sciences Research Conference in spring, 2014.



Student: Daniel Grondin

Faculty Mentor: Dickson Cunningham

Project: Dan spent 2 weeks in southern Idaho over the summer as part of a research team investigating the super-eruption history of the

Yellowstone Volcanic Province. Dan's research involves a case study of folds that form during emplacement of massive and super-hot pyroclastic density currents. The folds have unusually complex forms, but are useful for deciphering the flow direction and internal deformation processes that occurred as the pyroclastic flow solidified.

Follow-up: Dan is currently carrying out a literature review of folding in pyroclastic rocks which will provide a useful context for subsequent analysis and interpretation of the structural data that he and his team collected. He will present research results at the Arts and Sciences Research Conference in spring, 2014. His data are likely to be incorporated into a larger publication and if so, he will be a co-author.



Student: Sean Kellarson

Faculty Mentor: Peter Drzewiecki

Project: Sean worked on data previously collected from the Sopiera basin in Spain. These strata have long been recognized as unique to the region, but no satisfactory reason had been postulated. However, recent research suggests that the basin may have formed in response to salt withdrawal. Sean set out to reinterpret the existing data in order to develop a more comprehensive model for sedimentation in the basin, in light of the new interpretation. His project involved detailed thin section work of facies, as well as a reinterpretation of megabreccia deposits that are found in the basin.

Follow-up: Sean is currently conducting a 3 credit Independent Study. He will present research results at the Arts and Sciences Research Conference and Exhibition and at Northeast Geological Society of America meeting, both in spring 2014. This work will become the basis of a guidebook for professional geologists working for Statoil ASA Oil Company.

Student: Jacquelyn Lorange

Faculty Mentor: Drew Hyatt

Project: Jacqueline worked as part of a 4-person research team to map surface and subsurface conditions at Dinosaur State Park for 2 weeks in June, 2013. Jacqueline focused on collecting terrestrial laser scanning data for a small trackway at the park and for several wall-mounted fossil samples. All students in this project contributed in collecting 194 radar transects from sites, collecting approximately 358 pole photographs for map-making, and surveying approximately 200,000 survey points using the scanner.

Follow-up: Jacqueline has begun follow up research through a 1 credit fall practicum. She initially is assembling image maps of the mapped trackway, and will also learn to process TLS data so as to submit 3D printing requests on line. These activities will lead into efforts to present a research poster at the spring 2014 Arts and Science undergraduate research conference.



Students: Christopher (Cody) Lorentson, Anthony Sylvester

Faculty Mentor: Steve Nathan

Project: For two weeks Honors student Cody Lorentson and field assistant Tony Sylvester collected glacial sediment samples in central Connecticut. Analysis of these samples will provide data for a U.S. Department of Energy national geothermal database. The data will also provide for the design of more efficient commercial/residential geothermal systems.

Follow-up: Cody is continuing his summer work as a three credit Honors Thesis. He will present his preliminary research this October at the annual COPLAC conference. Cody will also present his completed research at one or more of the following conferences next spring (2014): the ECSU Art and Sciences Research Conference and Exhibition; the Northeast Regional Honors Council; and the Geological Society of America Northeast Section annual meeting. Tony Sylvester participated in two separate, summer research experiences; one with Dr. Nathan (above) and another with Associate Professor Dickson Cunningham. This fall (2013) Tony is working on a practicum (EES 392) that continues his summer research experience with Dr. Cunningham.



Student: Michael Manzi

Faculty Mentor: Bryan A. Oakley

Project: Mike mapped the Last High Tide Swash (LHTS) Line on Block Island, Rhode Island, using precise, hand-held Global Positioning System (GPS) with sub-meter accuracy. LHTS is a proxy for shoreline position, and will be compared to LHTS visible in historic aerial photography's and vertical aerial photography as part of a larger research project involving the faculty PI.

Follow-up: Mike is currently completing a 1-credit practicum, and will be working with photographs and GPS measurements

collected in the field to mosaic photographs and obtain an approximate X,Y (latitude and longitude) location of the photograph, in the larger context of a shoreline change study. He will become more comfortable with geologic terminology, shoreline processes, and become proficient with Adobe Photoshop and ArcMap or similar mapping software in this practicum.





Student: Laura Markley

Faculty Mentor: Peter Drzewiecki

Project: Laura spent 5 weeks in Spain collecting data that will be used to understand the tectonic and depositional controls on the origin and evolution of a 70 million year old fossil reef system now preserved in the Pyrenees Mountains. Mapping the distribution of the reefs and associated facies and faults in 3 dimensions will provide an understanding of how these reefs responded to environmental conditions during a period of greenhouse climate

Follow-up: Laura is currently conducting a 2 credit Independent Study. She will present research results at the Arts and Sciences Research Conference and Exhibition and at Northeast Geological Society of America meeting, both in spring 2014. This work will become the basis of her Honors Thesis and a guidebook for professional geologists working for Statoil ASA Oil Company.

Students: James Nixon and Kevin Veilleux

Faculty Mentor: Catherine Carlson

Project: James (COM major) and Kevin (former COM major, now EES major) monitored Park Spring in Willimantic, CT weekends from June through August to identify seasonal variations in water quantity and quality and to investigate the response of spring quality to precipitation events. They also researched *The Chronicle's* archives to learn the spring's history. This information will be incorporated into an informational brochure and a website about Park Spring.

Follow-up: James is considering continuing the multi-media project as an independent study through the Communications Department. This information will be incorporated into an informational brochure and a website about Park Spring.

Student: Jeff Olandt

Faculty Mentor: Peter Drzewiecki

Project: Jeff spent 5 weeks in Spain collecting data that will be used to understand the geometries and depositional style of a 120 million year old fossil reef system now preserved in the Iberian Range of northeastern. Tracing strata and mapping facies will provide insights as to rudist reefs responded to the rise and fall of sea level. This work is sponsored by Statoil ASA (the Norwegian national Oil Company), as these outcrops provide an analog for understanding the architecture of Middle Eastern oil fields that occur deep underground.

Follow-up: Jeff is currently conducting a 3 credit Independent Study. He will present research results at the Arts and Sciences Research Conference and Exhibition and at Northeast Geological Society of America meeting, both in spring 2014. This work will become part of a guidebook for professional geologists from Statoil ASA Oil Company.



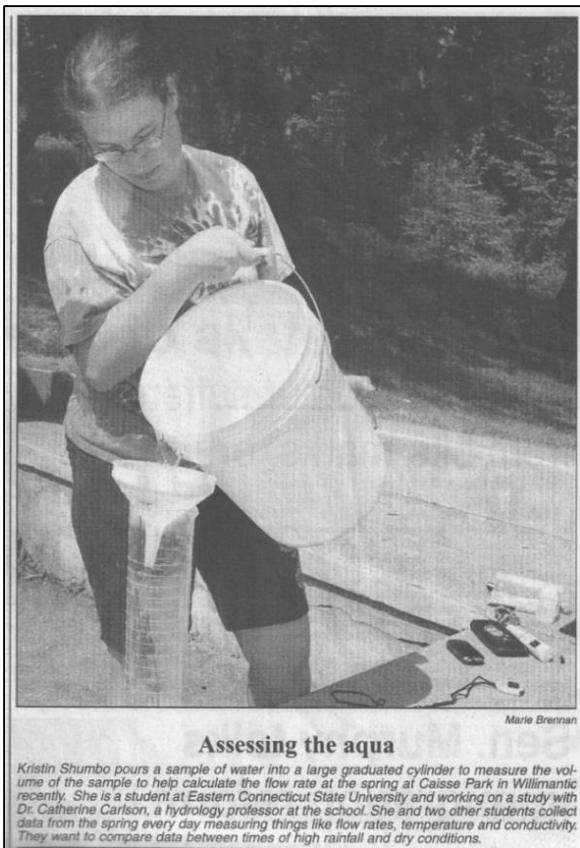
Student: Kristin Shumbo

Faculty Mentor: Catherine Carlson

Project: Kristin monitored Park Spring in Willimantic, CT weekdays from June through August to identify seasonal variations in water quantity and quality and to investigate the response of spring quality and quantity to precipitation events. These data will contribute to a multi-year study of Park Spring hydrology with the goal of aiding the town in effective management of this

resource. Kristin's picture appeared in *The Chronicle* (Willimantic, CT) on July 2nd with a caption briefly describing the research project.

Follow-up: Kristin is currently undertaking 3 credits of Earth Science Research and intends to continue the research project through the spring semester. Spring 2014, she will present research results at the Annual WSSS Interdisciplinary Water Symposium at Tufts University and at Eastern's Arts and Sciences Research Conference and Exhibition.



Assessing the aqua

Kristin Shumbo pours a sample of water into a large graduated cylinder to measure the volume of the sample to help calculate the flow rate at the spring at Caisse Park in Willimantic recently. She is a student at Eastern Connecticut State University and working on a study with Dr. Catherine Carlson, a hydrology professor at the school. She and two other students collect data from the spring every day measuring things like flow rates, temperature and conductivity. They want to compare data between times of high rainfall and dry conditions.

Student: Samantha Schwarz

Faculty Mentor: Drew Hyatt

Project: Samantha contributed to the collection of radar and terrestrial laser scanning data at Dinosaur State Park, and radar data from Andover Lake in June of 2013. In addition to activities described for Jacquelyn Lorange and Brian Wicks, Samantha helped to collect low-level vertical images of the trackway using a pole-mounted camera. These images will be assembled into a seamless image map for importing into ArcGIS in support of more detailed map based analyzes of the trackway.

Follow-up: Samantha's fall course schedule and commitments to a separate internship at the institute for sustainable energy have prompted her to change her mind and decide not to conduct follow-up activities. While unfortunate, this seems to be a wise move for Samantha. She maintains interest in the project, although she will not be formally involved in the preparation of follow-up research and presentation at the spring student conference.



Student: Anthony Sylvester

Faculty Mentor: Dickson Cunningham

Project: Anthony also spent 2 weeks in Idaho over the summer as part of a research team investigating the Yellowstone Volcanic Province. Anthony investigated structural and mineralogical features in a previously unstudied pyroclastic deposit that was produced by a huge caldera-emptying eruption approximately 10 million years ago.

Follow-up: Anthony's follow-on research will involve investigation of microstructures, flow textures and mineral phases within a major pyroclastic deposit in order to derive the eruption source area and correlate the unit with other deposits in surrounding

mountain ranges. He will present research results at the Arts and Sciences Research Conference in spring, 2014. His data are likely to be incorporated into a larger publication and if so, he will be a co-author.

Student: Brian Wicks

Faculty Mentor: Drew Hyatt

Project: Brian Wicks, an EES sophomore, contributed to field work at Dinosaur State Park, as well as a day at Andover Lake. Brian's focused primarily on collecting ground penetrating radar data that will enable him to image subsurface conditions beneath the park's main trackway as well as at a site outside in front of the park visitor center. This outdoor site is of particular interest to the park staff as they hope to uncover additional tracks



which were buried several decades ago to protect them from the elements. Brian's work will help the park staff determine how much fill has been placed on top of the buried tracks so that they can be determined whether fill can be resold to help defray the cost of uncovering the tracks. The radar work involved collecting topographic survey data along each radar line. In addition, Brian and others used a Pulse EKKO Pro GPR unit to collect both 100 MHz and 200MHz radar data.

Follow-up: Brian has begun a 1 credit practicum that will focus on learning how to process radar data in order to prepare 2D and 3D subsurface visualizations. This involves reading articles on the use of GPR, learning several software packages that are used to process radar data, and, with follow up work in spring, preparing a poster for presentation at Arts and Science research conference. Outcomes from this work will be of use to Dinosaur State Park for display and discussion purposes, as well as providing an estimate of the amount of fill that could be recovered were they to unearth more of the trackway that exist outside the visitor center.

Faculty Updates

Dickson Cunningham

I have now completed my second academic year at Eastern. It has been a very satisfying year both personally and professionally, and in every way I am now more settled into my new life in Connecticut. We finally sold our British home and bought a house in Connecticut and our son is happy in school. We feel that our family move from England, which genuinely was a 2-year process is finally complete.

On the teaching front, I continue to teach structural geology (with some tectonics thrown in), mineralogy, igneous and metamorphic petrology, and an introductory geology course. I have also developed a new EES field course with the help of Drew Hyatt that will involve 12 days travel in May visiting geological and environmental highlights of Arizona. At the time of writing, we are poised to go and we expect an action-packed geo-adventure with 17 students. We will visit many exciting locations including the Grand Canyon, Meteor Crater, Petrified Forest, Saguaro National Park, Biosphere 2 and the huge open-pit Asarco copper mine near Tucson.

On the research front, my efforts have been divided between my own research activities stemming from ongoing projects and new projects involving student researchers. I continue to work in Central Asia and spent 3 weeks in western and northern China during summer, 2013. Our research there involves investigating the distant effects of the Indo-Eurasia collision and processes of intracontinental mountain building. I have a remaining PhD student from my previous job who is investigating the tectonic evolution of the northern margin of Tibet. She is now in her final year and during the last year we carried out joint fieldwork and co-authored 4 presentations at major conferences. I also gave a talk at the Geological Society of America-Geological Society of China joint meeting in Chengdu last July and presented a poster on my Asia research at the American Geophysical Union annual meeting in San Francisco in December.

I worked with 5 undergraduate students on independent research projects during the last year. Four students presented their research as co-authored posters at the Geological Society of America NE section meeting in March in Lancaster, PA and all 5 presented individual posters at the University ASRCE meeting in April. Dan Grondin, Mackenzie Fannon and Anthony Sylvester presented results from field-based research in Idaho carried out last summer as part of a major international project investigating the scale and frequency of super-eruptions along the Yellowstone hotspot track. This project was supported by the British government (NERC) and EES research funding. Our work involved documenting the lithological characteristics and structural geology of ignimbrite successions exposed in mountains along the southern margin of the Snake River Plain. The ignimbrites were unusually hot and voluminous when emplaced and are products of huge caldera-emptying eruptions. All three students worked hard in the field and we had a great time hiking around the stunning Idaho landscapes and seeing impressive, well exposed volcanic geology. As a bonus, we visited Craters of the Moon National Monument and Yellowstone where we came face to face with geysers, sulfurous hot springs and snorting bison!

Back in Connecticut, Matthew Gonsalves carried out undergraduate field-based geological research to better understand the lithological and structural evolution of the Soapstone Mountain metagabbro complex in Somers, CT. His research revealed that the soapstone occurs in altered thrust-sense shear zones within the metagabbro which comprises an intrusive body within the Glastonbury orthogneiss complex. Catherine Carr carried out field-based undergraduate research investigating the mineralogical and petrological diversity of South Glastonbury and North Portland pegmatites. Her research revealed the surprising mineralogical variety that exists between pegmatites that are in close proximity, especially the presence or absence of gem quality beryl and tourmaline. In addition to these student projects, I have continued to explore the superb structural and metamorphic geology around eastern Connecticut in my free time and recently received an AAUP-CSU grant for 2014-2015 to begin carrying out a major geo-transect south of Willimantic across the Honey Hill Fault Zone.

I now serve on a half-dozen committees and am the EES Senator. These positions have allowed me to meet many people outside of the department and better understand how the university operates. I continue to be impressed by the very positive, supportive and forward-looking atmosphere that exists at Eastern. It is a pleasure to be a part of the Department of Environmental Earth Science where I am surrounded by friendly, hard-working colleagues who are dedicated to teaching and undergraduate research. The department is a leader on campus and continues to grow and strengthen on all fronts.



Dan Grondin, Mackenzie Fannon, Anthony Sylvester and Dickson Cunningham at Yellowstone, summer, 2013.

Peter Drzewiecki

I hope this Newsletter finds you all happy, healthy, and enjoying life! The 2013/14 academic year has been a very busy one for me. In addition to teaching two sections each of EES 130 (Ancient Environments) and EES 344 (Sedimentology and Stratigraphy), I have taken on the duties of department chair. This has added a healthy dose of unpredictability to my days, tempered occasionally with a splash of panic. Overall, it has been an adjustment in time management, but the support from my fellow EES faculty has been wonderful.

Research has taken a new turn. I began this year with 6 weeks in Spain during the summer, conducting field work with 2 students and helping to develop a carbonate geology field course for Statoil ASA (a Norwegian oil company) in the Pyrenees where I conducted my PhD research. It was great to visit my old stomping grounds



after being away nearly 20 years. The people I worked with from ECSU, Spain, and Norway have all been wonderful, and have allowed me to open up new avenues for undergraduate research with students. As you can read in another part of this Newsletter, I was able to carve 3 undergraduate projects out of the work. Jeff Olandt investigated the sequence stratigraphy of a small carbonate platform that is spectacularly exposed near the village of Miravete, which is located in the Province of MiddleOfNowhere in the Iberian Range of Spain. Laura Markley examined the depositional controls on a Cretaceous platform composed of rudists (a bizarre Cretaceous clam that made reefs like coral does today) in the south-central Pyrenees. Finally, Sean Kellerson investigated the catastrophic sediment fill in a small Cretaceous basin that developed in response to subsurface salt movement. In addition to the work in Spain, I continue to conduct research on Hartford Basin stratigraphy, looking at a new series of cores that are being drilled in South Hartford.



Top - Picture of me next to some large rudist fossils (they look like big logs).

Bottom – Ruins of the Aliaga castle – one of many such ruins that dot the landscape in northern Spain.

On a personal note, things are busier than ever at home. My wife started working again after about 10 years off, so many of

the “home duties” she took care of have slid over to me. My oldest daughter has been hunting for a college, and I think we visited every one that exists in New England! She finally chose to go to a small liberal arts school in Pennsylvania. The other kids keep us busy with all their activities. I am involved in Boy Scouts and Cub Scouts with my two sons, and I am an avid chauffer for my younger daughter’s many events.

Having spent 7 weeks in Spain over 3 trips has limited the rest of my traveling for the year. I did take a few trips to visit family, and we took our annual vacation in Maine. In addition, I went to one conference this year – the NE Geological Society of America meeting in Lancaster, PA. All three of my students presented their research at the conference.

Balancing teaching, EES chair responsibilities, field course development for Statoil, and being “dad” has certainly kept me busy, but it has also been an exciting year! I wish you and your families the best for the coming year...



The next generation of Drzewiecki’s, enjoying vacation in Honduras.

Drew Hyatt

Hello everyone. This past year has been busy but enjoyable. I have enjoyed being assistant chair, having passed the baton on the chair duties to Peter Drzewiecki. This has been great, prompting me to get off my office chair and drop about 30 lbs! My research interests continue to be driven by activities that enable me to involve our EES majors in undergraduate research. To this end, and as is described in other parts of the newsletter, I worked closely with two talented students on ground penetrating radar (Brian Wicks) and laser scanning (Jacqueline Lorange) work at Dinosaur State Park. This followed up on field work last summer (also involving Samantha Schwarz). Both Brian and Jacqueline presented on their work at the April undergraduate conference at Eastern, and Jacqueline will be conducting follow-up independent study work next year. I am preparing for some new research involving several new students (Samantha Walter, Trent Stevens, Ashley Houle) this coming summer, again making use of GPR and laser scanning equipment, as well as some coring techniques. I'll save description of that for the newsletter next year. Also, I will be on sabbatic leave next spring with projects and presentations related to work at Dinosaur State Park, Bailey's Ravine, Providence Canyon State Park, and perhaps a brief visit to the Maritimes in eastern Canada. Separate from these research activities, it has been an interesting year at home. My son Jake graduated from a computer engineering program in Canada and will be starting a full-time job in Canada in May. Hannah made the varsity volleyball at her school and has declared Biology as her major. She has an upcoming semester abroad in the U.S. Virgin Islands which may require some parental supervision – at least that is my argument (hasn't worked yet though!). Trudy and I are rediscovering our passion for hiking, driven in part by weekend trips to see Hannah play volleyball in New Hampshire.



Drew and Trudy Hyatt

Meredith Metcalf

This year completes my third year at Eastern. Wow...what a busy year it has been! Immediately after graduation last year, I began making my final preparations for my destination wedding in Italy which included sitting in on my soon-to-be husband's lectures on his architectural history course that explores cultures, the built environment, and the many factors that have impacted the world over time. It was interesting to see all of this first hand walking not as a tourist but as academics through the interwoven streets of Venice, Florence, and Rome, all products of their geography and socio-cultural elements. Close family and friends joined us on our wedding tour knowing little about when or where we would be married along this traverse from Venice in the north to the Amalfi Coast in the south. We surprised our guests with an evening of celebration at a farm vineyard in Lucca. Prior to the ceremony our group was given a tour where we were taught the importance of orientation, slope, aspect, soil types, organics, and their respective influence on the quality of the grapes, and wine, they produce. BINGO! What a great GIS project that is easy to understand and lots of fun! A down pour of showers may have been good for the grapes, but not good for the nuptials and drove our ceremony inside.



A wedding in Italy

As such, the vineyard owner graciously offered to have the ceremony take place in his villa overlooking the vineyard. It is a moment I will remember forever (and the wine was great!). I had scheduled our wedding tour accordingly which allowed a day of rest before I began my week of teaching and research as part of the Connecticut Health & Life Sciences Career Initiative at Eastern. Unfortunately, as our plane was about to begin its flight over the Atlantic, the Captain decided to return to London given that the plane was not able to maintain cabin pressure. Our wedding guests enjoyed a night on the floor of a conference room in a nearby

hotel (thank you Wimbledon for taking all the hotel rooms). The week of teaching GIS as it relates to public health was completed last summer and my efforts towards this Initiative continued through the year with necessary preparations for this summer. This year I will participate for several weeks which will incorporate guest speakers, graphic design, poster presentation, and a research component where students will examine the walkability of the City of Willimantic. Matthew Marsie has helped in these preparations this spring and he will be assisting this summer by overseeing the students completing the GIS component of the research required.



Exploring the “streets” of Venice

Over the past year my activism and the Department’s support for the GIS minor to be truly interdisciplinary in nature has been complete! Students expressing an interest in GIS across all disciplines may now pursue this minor. I continue to enhance the GIS courses offered by incorporating project-based real world problems that challenge and reflect the power of the software, ArcGIS, and integrating my first-hand experiences of historical spatial applications. For example, this spring I was able to incorporate my personal photos, experience, and

understanding of the Rose Line after co-leading a travel study program through Switzerland, Italy, and France. It is no longer something I have read or seen in the Da Vinci Code! Additionally, I have participated in committees that have exposed me to other departments across the University. I have enjoyed these roles and I feel that I have a better understanding of what students are experiencing and achieving during their time here at Eastern.

My research interests of groundwater quality and sustainability in fractured rock continue and I have been able to present my findings and demonstrate this modern approach using GIS at various conferences throughout the year. This research is applicable at regional, national, and global scales. This summer I will be working with Laura Markley and Samantha Schwarz to look at local concerns regarding groundwater quality and examine issues that are more common in Connecticut given the geology and the complexity of the fracture system. Additionally, I will be working with a Daniel Grondin this summer to identify areas that are susceptible and vulnerable to slope failure given the engineering characteristics of the soil and rock types for different geomorphic settings across Connecticut.

Steve Nathan

It's been a year full of teaching and research for me. My classes and labs in Sustainable Energy, as well as my writing intensive course, "Energy Issues in Geoscience", have been a lot of fun. Equally so, has been engaging our EES students in my field and laboratory research.

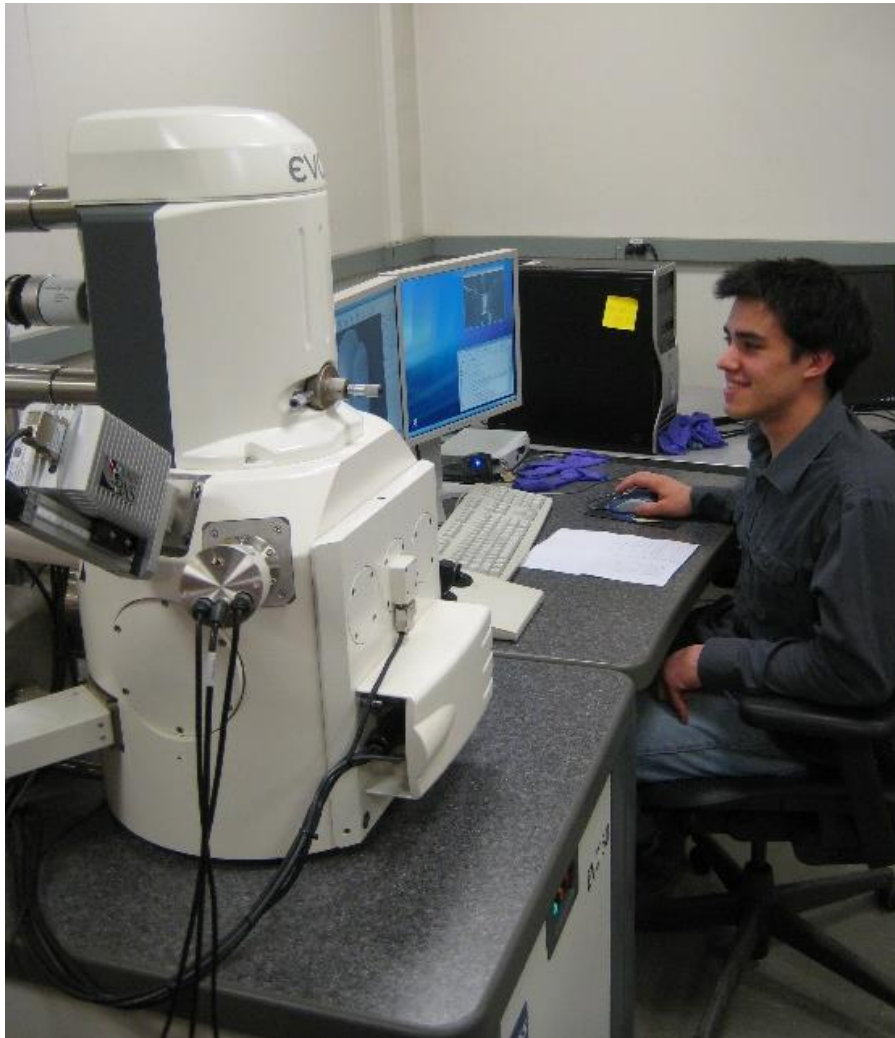


EES major Cody Lorentson, left, discussing his senior Honors Thesis research with Dr. Stephen B. Mabee, Massachusetts State Geologist.

Last summer (2013) EES undergraduates Christopher (Cody) Lorentson and Anthony Sylvester joined me in working on a geothermal research project. For two weeks we collected glacial sediments in central Connecticut. The purpose of the project was to determine the physical properties of these sediments, in particular, their thermal conductivity. Thermal conductivity is a key parameter needed for the design of efficient geothermal systems known as ground source heat pumps.

Cody and Tony gained experience in selecting field sites, collecting and processing samples, record keeping, and data interpretation. The data Cody collected from this field work became a major part of his senior Honors Thesis (completed spring (2014)).

A second area of my research investigates historical changes in climate. For this, EES student Timothy Bugden joined me last summer in studying microfossils found in deep sea sediments collected from a submarine igneous province known as Ontong Java Plateau, located in the western equatorial Pacific Ocean near New Guinea. The project goal was to get a snapshot of climate and ocean structure 5.33 million years ago. For seven weeks Tim studied the remains of microorganisms that record environmental conditions at the time they lived. This in turn, provided us with clues as to the state of climate at the Miocene/Pliocene boundary. Tim built this summer research into his Honors Thesis which he completed this spring 2014.



EES major Tim Bugden at the controls of the scanning electron microscope at UMass Amherst.

Additional research news came this March when my paper investigating microfaunal distributions in the Gulf of Maine was accepted for publication (July 2014). This paper presents a pilot study of mine that was funded by the U.S. Department of Interior and it reveals a number of important and unexpected changes in the local seafloor environment. My results demonstrate that the organisms studied can serve as a valuable proxy of seafloor disruption brought about by human activity (e.g., fishing activity (bottom dragging), and mining of subaqueous sand and gravel deposits).

For the 2014-2015 academic year I am looking forward to more opportunities to work directly with our EES students. Engaging our majors in the classroom and in the field is my top priority.

Bryan Oakley

Whew! Writing this as I wrap up my second year at Eastern (first year in a tenure track role). It has been a busy year, with on-going research projects and a new (to me) course to teach (EES 424 – Glacial and Quaternary Geology). Teaching a glacial geology course has been something I have been looking forward to, so it was great to bring that course back, since the now retired Dr. Clebnik last taught it. I have supervised two student research projects over the last year; two talented EES majors, Michael Manzi and Samantha Boyle worked with me on separate by related projects examining shoreline change on Block Island. Samantha worked on interpreting the crest and tow of the famous bluffs of Block Island, using 2011 (Pre-Superstorm Sandy) and 2012 (Post-Sandy) LiDAR derived digital elevation models. The goal is to understand how the bluffs respond (i.e. erode) to storm events. Mike has been working on compiling, mosaicking and spatially locating photographs of the bluffs, which we will be making public as a Google Earth file, for scientific and

public outreach purposes. Both Mike and Sam presented at the 2014 Eastern Arts and Sciences Research Conference. EES Major Joshua Bartosiewicz helped with the next step of Block Island shoreline change mapping this past semester, and we will be publishing these maps as an open file report with the Rhode Island Geological Survey in the future; on these maps, Mike, Sam and Josh will all be listed as contributors. The Block Island work will continue this summer, with Mike, along with EES Majors Amber McDonald and Brandan Sumeersarnauth will be headed out to Block Island for more mapping in June 2014. Both field seasons on the island have been supported by the Eastern Exemplary Program fund.

Closer to Connecticut, I've been continuing to work on a project at Napatree Point, RI, with various student (and even our own Dr. Hyatt) supporting the work in the field, and I am set to begin a new project, funded by the Connecticut office of the Natural Resource Conservation Service, working on mapping benthic geologic habitats offshore of Branford, CT.

Personally, my wife and I moved this spring, shortening up my now infamous commute (a little), as it turns out it is hard to drag me away from the coastline!. The move has been overall a great experience, but does add to my stress level occasionally, and if I had one piece of advice for all you non-homeowners, it would be to cherish your weekends! This shorter commute has had a measured impact, allowing me to maximize more time on campus, and at home with my family, and has definitely been worth it! As research projects continue to develop, I am always looking for good students to help with field and lab work (strong GIS skills are a plus!) so feel free to drop by my office and chat!



Bryan Oakley at a US Army Corps of Engineers group panel discussion.

For the Alumni

What are you up to?

We would very much like to include updates from EES alumni in our next newsletter (the 2014-15 academic year). Also, we are always interested in knowing what people are up to now. If you would like to contribute, please e-mail responses to the following questions to either Zosia (carlquistz@easternct.edu) or myself (drzewieckip@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 are ok with our including this information in the newsletter).
3. A brief paragraph updating us on what has happened to you since graduating (or over the last year, if you submitted a response for the current newsletter).

Supporting EES Students

The faculty members of the EES Department are committed to providing our students with practical research, field, and presentation experiences as often as possible. As mentioned earlier in this Newsletter, many of the activities our students participate in are supported through the EES Founders Fund, which was established for just such a purpose. We welcome your tax-deductible donations to this fund and encourage you to contact Mr. Peter Dane in University Relations (860-465-4513) if you would like to learn more about how to contribute to experiences that open minds and develop careers for new generations of EES students! Thank you in advance!