



PETROGLYPHS

NEWSLETTER

Third Issue
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Eastern Connecticut State University
Environmental Earth Science Department, <http://www.easternct.edu/environmentalearthscience/>

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“Educating the
Environmental
Geoscientists
of Tomorrow”

Message from the Chair

Drew Hyatt



GREETINGS on behalf of the Department of Environmental Earth Science at Eastern. Within you will find updates on many changes that have occurred in EES since our last newsletter in the spring of 2011. As you can read about inside, EES students continue their involvement in pre-professional activities such as conference presentations, internship activities, practica, independent study research, and a variety of field trips. Faculty remain engaged in the classroom, lab, field and research activities. In addition, there has been a retirement and several new appointments. The EES founders fund now tips the scales at just over \$25,000, and the department has received “exemplary program development” status. The latter has been critically important in enabling us to search for the three remaining vacant tenure track faculty lines associated with retirements by long-time faculty members Sherm Clebnik, Roy Wilson, and most recently Fred Loxsom. Suffice it to say much has happened over the past two years that we hope you will enjoy reading about. As always, this newsletter, and previous ones, may be accessed from the “newsletters” link on the EES home page, along with images of students going back to the year 2000.



(cont'd on next page)



Congratulations

As alluded earlier, Professor Fred Loxsom, Eastern's first Endowed Chair, retired at the end of the 2011-12 academic year.

As many of you know, Fred was a key driving force in developing the sustainable energy track in our program. Fred developed and has taught all of the energy classes in the major, he supervised dozens of students in internships and independent study projects, as well as leading a service learning course to Jamaica, to name a few items. Outside the department, Fred played important roles chairing the green campus committee, contributing to the redesign of Eastern's first year program, and serving as the inaugural chair on the Liberal Arts Work committee which developed an approach for embedding pre-professional learning activities in all programs. Even in retirement Fred continues to help the department by teaching several advanced energy classes on-line while we search for his replacement and writing first-drafts of two text books on sustainable and alternative energy. One of these days Fred will have to retire from retirement! Needless to say, we wish Fred and Pauline well with their lives in Texas.

I would also like to briefly thank Drs. René Shroat Lewis and Allison Weinstein, both of whom shared their energy and expertise in teaching classes for us as term-limited appointments. René taught Introductory Geology and Environmental Geology classes as well as sharing her passion for paleontology with students in classes and on field excursions. Allison taught Introductory Geology, Structural Geology and Rock and Mineral Analysis for two years often incorporating field trips and other out-of-the-classroom activities in her teaching. Both have moved on to new opportunities and we wish them well.

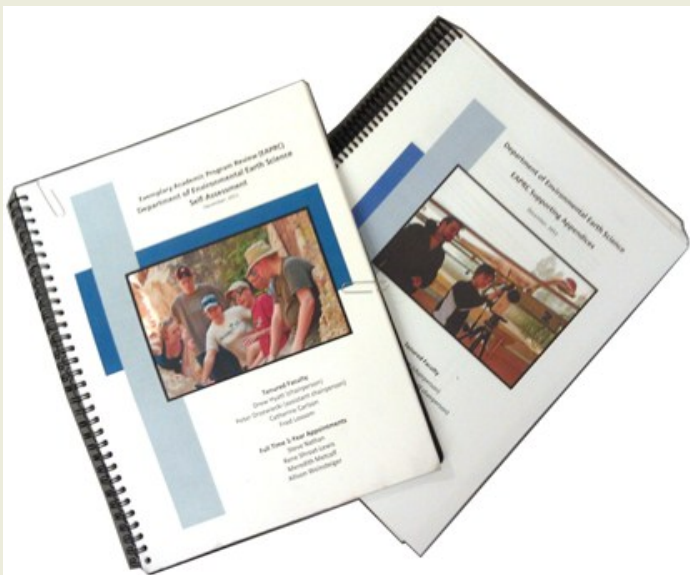
In addition to these departures, we are fortunate to have several new faculty members in both tenure track and term-limited capacities. Each provides a biographical sketch within this newsletter, along with updates from Drs. Carlson, Drzewiecki and myself. New tenure track appointments include Steve Nathan (Energy Geoscience), Dickson Cunningham (Structural Geology), Meredith Metcalf (GIS), and Bryan Oakley (Environmental Geology), while Lea Gilbertson (Sustainable Energy) brings her expertise to the department as a term limited appointment. In summary, a dynamic roster of eight full-time faculty continue to engage EES majors in ways that you can read about inside. Enjoy!

EES Recognized Through the Exemplary Program Review Process



The 2011-12 academic year was exceptionally busy for the department in large part due to our preparing a detailed self-analysis (51 pages plus a 250 page appendix), and undergoing external review as part of Eastern's Exemplary Program process. The self-analysis reported on the continued growth in number of students majoring in EES (between 100 and 120 depending upon when you count), our efforts to involve students in pre-professional activities, learning outcomes and associated activities in EES classes, and our contributions to Eastern's liberal arts mission. All this occurred along with the normal class, laboratory, field, and research activities that are described elsewhere in this newsletter.

It was with great pleasure, therefore, that the department learned in the summer of 2012 that our application in the "program development" category was ultimately successful, resulting in our receiving substantial new support from administration. This has included permission to search and fill 3 tenure track faculty positions and one new full-time laboratory technician. I am thrilled to announce that two of the 3 tenure track searches have been completed and resulted in the appointments of Meredith Metcalf as our incoming GIS tenure track professor and Bryan Oakley as our Environmental Geoscience professor. The remaining faculty search (Endowed Chair for Sustainable Energy) is ongoing and we anticipate that the laboratory technician search, which was frozen due to state budgetary conditions, will resume when fiscal conditions improve. Also, as an offshoot from the exemplary program review process, the department has been given additional resources to enhance undergraduate research activities in the summer.



Of equal or greater value to these much needed resources, the department also received a lengthy and carefully considered external report from reviewers, Dr. James Ebert (Dean at SUNY Oneonta) and Dr. Mark Evans (Chair of Physics and Earth Sciences at Central Connecticut State University). This external report will be helpful as we re-examine the EES program over the coming two years. As such, look for exciting new developments from EES in future newsletters.

EES Hosts the Fall Geological Society of Connecticut Meeting

On November 16, the EES department hosted more than 70 Geological Society of Connecticut (GSC) members for the GSC's annual meeting. Attendees included a mix of academics, consultants and members of the public that share an interest in the Geology of Connecticut. The evening included an opening reception, catered dinner and business meeting, tours of EES facilities, and an excellent presentation on the glacial geology of Connecticut by 2012 GSC president Janet Stone (USGS).

All of the current full-time EES faculty attended the meeting, along with Arts and Science Dean Carmen Cid, who offered words of welcome. We were very pleased to provide brief tours of some EES facilities ranging from the beautiful entrance way to the science building, complete with *Eubrontes* track samples, to a variety of class/laboratory facilities. The latter included basement core storage and hydrology field equipment rooms, a quick pass through the 2nd floor physical hydrology classroom, some student/faculty research space, and our GIS/computing laboratory before heading on to the 4th floor energy science teaching and laboratory rooms. Limited time, regrettably, did not permit viewing of other EES areas such as dedicated classroom and student/faculty research space in support of Geomorphology, Stratigraphy, Hydrogeochemistry, Sustainable Energy, as well as a wing with faculty offices, a conference room, secretary suite and student award displays.

These facilities complement a dramatically improved physical plant across Eastern's campus that, together with a diverse offering of liberal arts programs of study, has attracted strong students to Eastern (many of whom are majoring in EES). At last count approximately 115 students major in one of the three tracks in our Bachelors of Science EES degree. The event allowed us to showcase some research posters by recent graduates, as well as providing a sense of our program to the broader geoscience community in Connecticut. We encouraged attendees to think of Eastern if they are interested in recommendations for strong students in support of temporary, part-time, or full-time work or internships in governmental and private geoscience consulting and geoscience education, or as potential graduate students.



GSC participants enjoying conversations and viewing student research posters (around the room) prior to the beginning of dinner.

NEW ENGLAND INTERCOLLEGIATE GEOLOGICAL CONFERENCES

2011—Middlebury, Vermont

2012—Mount Sunapee, New Hampshire

September 30—October 2, 2011



Left to right: Mimi Cedrone, Assistant Professor Allison Weinstein,
Bonnie Lundblad, Laura Markley, and Calvin Underwood
Back: Assistant Professor Stephen Nathan

Eastern Connecticut State University was well represented at both the 2011 and 2012 New England Intercollegiate Geological Conference (NEIGC) meetings. In late September of 2011 four students and two faculty members from the Department of Environmental Earth Science participated in the annual meeting that was centered at Middlebury College in Middlebury, VT including Mimi Cedrone, Bonnie Lundblad, Laura Markley, and Calvin Underwood, and Assistant Professors Allison Weinstein and Steve Nathan. This group attended the three day meeting that brings together educators, the private sector, government, and other groups to showcase a broad range of fieldtrips exploring all aspects of regional geology. In 2011 Eastern students participated in a fieldtrip that focused on watershed protection, with the highlight of seeing firsthand the extensive damage caused by Hurricane Irene. Participants viewed impressive examples of scoured riverbanks, washed out bridges, and collapsed buildings.

The success of the 2011 NEIGC increased interest for the fall 2012 meeting that was centered in New Hampshire. This time a total of 10 students and 3 faculty attended the field conference. Eight students participated in a return to several sites of erosion caused by Hurricane Irene, while two students along with Professor Oakley attended a glacial field trip.

The Irene field trip was interesting as it provided a sense of the extent to which dramatic erosion since it was viewed the previous year had been addressed.

This also was an opportunity for new EES students to meet a previous EES major, David Cicalone, who attended the field trip as a graduate student affiliated with the University of Rhode Island. This was most useful as David could provide his sense of the value in pursuing graduate studies after students graduate from the EES program.

Participants in the Irene field trip in 2012

From left to right include:
Cody Lorentson
Bethany Ingraham
Rachel Dern
Kelli O'Brien
Dr. Steve Nathan,
Bonnie Lundblad
Alex Bly
Laura Markley
and Sean Kellerson



Former EES major David Cicalone (black fleece) discusses exposures with new EES majors also providing insights into activities that can be helpful in pursuing employment or graduate school after graduating from Eastern.



EES Students in Action



Plane beds/silt drapes on the Climbing Ripples



Bryon Stone, Lauryn Griscti, Vicky Szamocki (Varves Collapse feature)

New England Intercollegiate Geological Conference

October 2012
New Hampshire

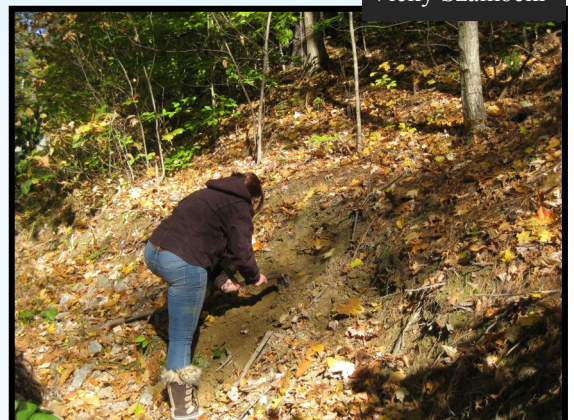


Lauryn Griscti and Vicky Szamocki joined Professor Bryan Oakley on the trip to look at Glacial deltas in and around Glacial Lake(s) Merrimack and Franklin. Being the ONLY two students on this trip, they held their own with Byron Stone (U.S. Geological Survey), and even got a couple of good lessons in cleaning pit faces (see the nice draped plane beds/silt drapes on the climbing ripples).



Our EES majors getting an earful from the 'infamous' Byron Stone at a small varve outcrop where he explained how to make a 'wire' with clay, and in a nice esker-fan pit looking at collapse features.

Vicky Szamocki



ECSU EES was well represented by Lauryn and Vicky on the trip!

STUDENT RESEARCH

2011-2013 STUDENT PROJECTS

EES Faculty supervised a wide variety of research experiences, internships, and practica over the 2011-12 and 2012-13 academic years. The following provides a brief summary of some of these activities:

Nate Belke completed an internship with Legrand Ortonics. His task was to develop and implement an energy conservation plan for the company so that they would comply with Energy Star standards. Nate presented a poster describing this work at the Arts and Sciences symposium (Loxsom).

Lindsey Belliveau is conducting an independent study research project that examines the geologic setting and form of meltwater erosion marks that occur at Bailey's Ravine in North Franklin. She will present this research at the upcoming Northeastern Geological Society of America meeting (Hyatt).

Tim Budgen is beginning a thesis project to investigate historical patterns in global climate change. Using marine microfossils as a proxy, his anticipated stable isotope analyses may provide clues to the development of the East Asian Monsoon and the Western Pacific Warm Pool. Tim's research provides great experience with techniques that are routinely used in energy exploration (Nathan).

Kristina (Mimi) Cedrone completed an independent study that utilized GPR and vibracoring to map the character and distribution of glacial sediments beneath Andover Lake (Hyatt).

David Cook (EES alumnus) of Fuss & O'Neal and John Hankins, Vice President—Environmental Due Diligence, Fuss & O'Neal visited the EES 450 Hydrological Research Methods class Feb. 22 to speak about working in the environmental consulting field. The presentation was well attended by many EES majors (Carlson).

Students conducted a preliminary investigation of Park Spring located in Alex Caisse Park in Willimantic, CT as part of the hydrology course Fall 2012. They compiled available data on the surrounding topography, geology, soils, water bodies, precipitation, and water quality. Students measured spring discharge over a 6-week period and correlated discharge with precipitation; they also used water quality data to infer the rocks through which the water traveled before discharging at the spring. **Nicolas Denegre** plans to present the results of this research project at the 2013 Arts and Sciences Conference (Carlson).

Nicolas Denegre applied for a Science Undergraduate Laboratory Internship through the Department of Energy (DOE) for summer 2013. Selected students participate as interns appointed at one of 15 participating DOE laboratories. They perform research, under the guidance of laboratory staff scientists or engineers, on projects supporting the DOE mission (Carlson).

Daniel Grondin is currently completing an internship with the Tolland, CT office of the USDA-NRCS, under the supervision of Marissa Theve. He is using Microsoft Access to enter soil pedon descriptions in the Soil Survey's PedonPC software. He will hopefully be able to partake in soils fieldwork with NRCS in the spring.

Students, **as yet identified**, will be involved with summer research and follow-up study examining volcanic rocks and rifting in Idaho, as well as new research examining aspects of the structural geology of sites in Eastern Connecticut. This work may lead to future student participation in structural geology research in China (Cunningham).

Students **as yet identified** will be involved in research on Park Spring in Willimantic, CT beginning summer 2013. This study will focus on identifying the source of the spring, the area that recharges the spring, seasonal variations in water quantity and quality, the spring's response to precipitation events, and sources of potential contamination (Carlson).

Bethany Ingraham digitized fault and bedding plane orientation data from the Hartford South Quadrangle collected in the 1960's and 1970's. These data were combined with more recent structural data in order to complete and test a structural model developed for the bedrock geological map of the quadrangle. This was the first bedrock map completed for the quadrangle. (Drzewiecki and Metcalf)

2011-2013 STUDENT PROJECTS

Emily Kapostas is working on an independent study project that utilizes geographic information systems to develop a virtual walking tour of Rome, Italy. The animated 3-D walking tour requires Emily to apply her advanced knowledge and skills in geographic information systems by integrating the history, culture, and architecture of Rome obtained during a study abroad program to create a useful and unprecedented product for the travelling industry (Metcalf).

Lauren Kostak, Bonnie Lundblad, and Megan Maher are designing and conducting a collaborative research project comparing the nitrogen and phosphorous loads in an agricultural versus a non-agricultural watershed in eastern Connecticut in the hydrological research methods course. They will be using GIS to assess the location and extent of agricultural activity within the watershed; and they will be collecting and analyzing water samples for nitrogen and phosphorous along the streams in each watershed (Carlson).

Emily Kapostas developed a GIS database for the Naubesatuck Watershed as an internship with the Naubesatuck Watershed Council Fall 2012. The GIS database will be used by the Council for monitoring and planning purposes (Carlson).

Emily Lallier collected trace element data from cores collected from the lower Portland Formation in South Hartford with the goal of resolving questions regarding correlation of one core to the next. Certain elements were very useful for identifying and correlating Jurassic black shale beds that represent ancient lake deposits. Her data solved a long-standing correlation issue that could not be resolved with sedimentology alone, and provide a robust stratigraphic framework for interpreting the depositional history of the lakes (Drzewiecki).

Eric Lindquist completed a honors thesis project determine that analyzed the effect geological parameters on the performance of geothermal heating and cooling systems. The result of this project was presented at the arts and science symposium and at the Geological Society of America Northeast section meeting in January 2012. Eric's poster and presentation won a top award at this conference (Loxsom).

Jacqueline Lorange is undertaking an internship under the direction of state Geologist Margaret Thomas in which Jacqueline is developing on-line materials describing the geologic significance of select building stone sites in Hartford (Hyatt).

Cody Lorentson has completed two practicums collecting and analyzing glacial deposits in collaboration with the Connecticut Geological and Natural History Survey and Massachusetts Geologic Survey. His grain size data has contributed to the National Geothermal Data System. Cody is now continuing this research as his senior thesis; using ArcGIS to look for significant spatial patterns in the data (Nathan).

Anna Loss completed an internship with the town on East Lyme. Her project involved using GIS to complete a coastal inundation risk and vulnerability study. Anna presented a poster describing this work at the Arts and Sciences symposium (Loxsom).

Megan Maher, Laura Markley, and Tim Bugden are conducting practicum projects that train them on splitting, sampling, analyzing and describing vibracores that were collected as part of team-oriented field work in the Eastern Arboretum in the summer of 2012 (Hyatt).

Laura Markley has also been conducting background reading related to field work in Spain in the summer of 2013. Laura will conduct independent research describing and interpreting the facies, depositional environments, and geological history of the Collades de Basturs carbonate platform, exposed in the south-central Pyrenees, Spain (Drzewiecki).

Ian McCary completed an independent study that examined the subsurface architecture of sediments beneath Andover Lake beach, relating those findings to the history of the deposit and its influence on the potential for seepage into the lake (Hyatt)

Kelli O'Brien obtained an internship opportunity with the Town of Stonington's Architectural Design Review Board. Kelli was utilized on professional projects that required the integration of ArcGIS®, Google SketchUp®, and AutoCAD® and the resulting products were used on the professional stage. Her work was presented at a municipal design review committee and used for a hearing on Planning and Zoning (Metcalf).

2011-2013 STUDENT PROJECTS

Jeff Olandt has begun an Independent Study project that will provide an opportunity to conduct research describing and interpreting the facies, depositional environments, and geological history of the Collades de Basturs carbonate platform, exposed in the south-central Pyrenees, Spain. This will include studying facies and their distribution in outcrops of the Collades de Basturs carbonate platform, measuring stratigraphic sections, field mapping stratigraphic surfaces, and collecting geological samples in Spain in the summer of 2013 (Drzewiecki).

Hannah Pallein, Patrick McNamara, and Stephen Tutto are designing and conducting a collaborative research project investigating the influence of the Windham Water Pollution Facility on water quality of the Willimantic, Natchaug, and Shetucket rivers in the hydrological research methods course. They will be collecting and analyzing water samples for nitrogen and phosphorous from the facility's discharge and from the rivers upstream and downstream of the facility (Carlson).

Laura Panno spent countless hours looking at thin sections from a Silurian-aged mud-mound (an ancient type of reef that appears to have been constructed from carbonate mud) in an attempt to identify the processes by which the mound originated. Her efforts paid off, as she was able to identify microscopic evidence of microbial activity. These microbes (algae and bacteria) bound carbonate mud and developed into the mounds preserved today. The origin of these mounds had been an enigma since the late 1800's when they were first described (Drzewiecki).

Ben Woupio completed an internship with the Institute of Sustainable Energy. His task was to develop techniques for using digital dashboards to develop sustainability within a secondary school environment. Ben presented a poster describing this work at the Arts and Sciences symposium (Loxsom).

Student Presentations at NE Geological Society of America Meeting, 2012

ANALYSIS OF THE INTERNAL STRUCTURE OF ANDOVER LAKE BEACH (CT) USING 3D GROUND PENETRATING RADAR (GPR): MCCARY, Ian A. and HYATT, James A.

CHARACTERIZING THE SUB-BOTTOM GEOLOGY AT ANDOVER LAKE, CT USING GROUND PENETRATING RADAR: CEDRONE, Kristina M.I, and HYATT, James A.

FACIES ANALYSIS OF A CARBONATE MUD-MOUND IN THE UPPER SILURIAN WABASH FORMATION, NORTH-CENTRAL INDIANA: PANNO, Laura, and DRZEWIECKI, Peter.

CORRELATING LOWER JURASSIC LAKE CYCLES USING X-RAY FLUORESCENCE SPECTROMETRY, PORTLAND FORMATION, HARTFORD BASIN, CONNECTICUT: LALLIER, Emily, DRZEWIECKI, Peter, STEINEN, Randolph, and GARDNER, Nichole.

FACIES ARCHITECTURE AND CORRELATION OF JURASSIC LAKE CYCLES FROM THE LOWER PORTLAND FORMATION, HARTFORD RIFT BASIN, CONNECTICUT: DRZEWIECKI, P. A., LALLIER, Emily, and STEINEN, Randolph.

GIS-BASED ASSESSMENT OF GROUND-SOURCE HEAT PUMP POTENTIAL IN THE WILLIMANTIC QUADRANGLE, CONNECTICUT: LINDQUIST, Eric K., and LOXSOM, Fred.

TEXTURAL ANALYSIS AND CRYSTAL SIZE DISTRIBUTIONS OF PLAGIOCLASE AND CLINOPYROXENE FROM ATLANTIS MASSIF, MID-ATLANTIC RIDGE: WEINSTEIGER, Allison, and BELLIVEAU, Lindsey.

NEWS FLASH



Drzewiecki Wins Statewide Teaching Award

Peter A. Drzewiecki, associate professor of environmental earth science and assistant chair of the department of Environmental Earth Science, was named the Connecticut State Colleges and Universities System “Winner of the Board of Regents/CSU Teaching Award”

Peter was recognized for his innovative use of outside-the-classroom education, including a mix of lab, field trips and student research projects. He has established an internship program for geology majors at the CT Geological Survey, and his students frequently present the results of research from his class at regional professional conferences and campus symposia. Students uniformly consider his classroom teaching to be accessible and engaging.

The BOR/CSU Teaching Award is granted to faculty members who have distinguished themselves as outstanding teachers for at least five years and have a minimum of a two-year track record of promoting instructional improvements for their programs or departments.

Founders Fund Continues to Make a Difference for EES Students

As you may recall from previous newsletters an endowed fund, entitled the “EES Founders Fund” named after the original EES department members (Sherman Clebnik, Henry Snider, Raymond Smith, and Roy Wilson) was established in 2010 to support undergraduate research and travel to professional meetings for our students. I am pleased to report that the fund has now reached approximately \$27,500 thanks to the generous contributions of EES alumni. Interest from this fund is used in ways that directly benefit existing students. For example, in the fall of 2011 EES faculty members Dr. Steve Nathan and Dr. Allison Weinstein took four EES students to the New England Intercollegiate Geological Conference (NEIGC, Sept. 30– Oct. 2) at Middlebury College in Vermont. This conference consists of several field trips that bring together educators, the private sector, government and other groups to explore the geology of the region. Students and faculty attended a watershed protection field trip that featured jaw-dropping effects of Hurricane Irene including scoured riverbeds, washed out bridges, and collapsed buildings. Founders funding supported transportation and accommodations over a wet but fun weekend. In addition, founders funds covered registration fees and travel to the 2012 Northeast Geological Society of America meeting in Hartford, CT for eleven students.

Six of these students presented their own research (Lindsey Belliveau, Kristina Cedrone, Emily Lallier, Eric Lindquist, Ian McCary, and Laura Panno), two participated in a professional field trip (Emily Lallier and Laura Panno), and five additional EES students attended several days of the meetings (Matt Gonsalves, Cody Lorentson, Bonnie Lundbald, Laura Markley, and Joe Ventura). Also, two students (Ian McCary and Joe Ventura) participated in an intensive two-day short course taught by ExxonMobil scientists. In addition to these activities, Prof. Steve Nathan arranged for a private meeting between all Eastern students and Bob Stewart, the short course instructor and chief global recruiter for ExxonMobil. This was an outstanding pre-professional experience that gave EES students insight into workings and hiring opportunities at a large multinational corporation. To top it all off, graduating senior Eric Lindquist (supervised by Dr. Fred Loxsom), won a coveted “best poster” award for his geothermal research. Eric was one of only eight winners in a field of 158 undergraduate presenters. Needless to say it was an exciting and eye-opening experience for all the students. We also anticipate making some use of founders fund to support travel to the Northeast Geological Society of America meeting at Breton Woods, New Hampshire this coming spring.



In closing, rest assured that contributions to the EES Founders Fund will continue to enrich the experiences of our students through undergraduate research, travel, and related pre-professional experiences. 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!

Ian McCary '12



EES Explores Wyoming Basin

In July, Ian McCary '12 and assistant professor Steve Nathan participated in a field trip to the Bighorn Basin in Wyoming. The trip was sponsored by ExxonMobil Corporation and the Geological Society of America.

Fifteen undergraduate students, eight graduate students and two professors from across the United States and Great Britain gained hands-on field experience under the guidance of globally renowned exploration geologists.

The students worked in teams and one-on-one with experts to learn how to read the rocks and determine the suitability of a hydrocarbon prospect.

More importantly, through this pre-professional experience, students gained marketable skills that were directly connected to a prospective employer. For Nathan, the field trip provided new materials for his introductory courses and a new, advanced class in EES.

After returning from the field trip, McCary said Eastern and field opportunities like this can shape careers: "The professors in the Environment Earth Science Department taught me the fundamentals of geoscience in the classroom, and this lab allowed me to apply these skills to my undergraduate research project, and motivated me to pursue a career in petroleum geology."

Undergraduate Research in the Pyrenees Mountains, Spain

Peter Drzewiecki

Carabonate rocks exposed along Sierra del Montsec, foothills of the Spanish Pyrenees



The "Orcau Castle" sitting on Cretaceous aged rocks within the field area.

The Spanish Pyrenees have been a playground for European geologists studying carbonate rocks for several decades. I was fortunate to complete my PhD in the region in the 1990's (my advisor grew up in Barcelona). Recently, I have been

contacted by a former colleague, now working for Statoil (the Norwegian national oil company), who has asked that I go back to the region and develop an in-house training school for Statoil on carbonate geology, based on the outcrops exposed in the region.

Although the details still need to be worked out, I anticipate that this will be a wonderful opportunity for conducting undergraduate student research and to rejuvenate my own research for years to come. The carbonate rocks exposed in the area we will be visiting are Cretaceous in age, and are ancient reefs that were built by an unusual group of clams called "rudists". These reefs thrived in a narrow seaway between what is now Spain and France that formed in the early Cretaceous during a major greenhouse climatic episode. By the late Cretaceous time, this seaway was closing due to collision between Iberia and Europe (eventually resulting in the Pyrenees Mountains), and the evolution of the reefs reflect these tectonic and climatic controls. Research will focus on understanding the tectonic and climatic controls on deposition of these reefs. The students will enjoy many cultural experiences as well.

2012 GSA NORTHEASTERN MEETING

March 18-20, Hartford, CT

Five faculty and 11 Environmental Earth Science students were busy during spring break in 2012 at the 47th Northeastern Sectional meeting of the Geological Society of America. Students and faculty presented research, attended field trips and presentations, and participated in a variety of professional activities. Of note, graduating senior Eric Lindquist, supervised by Dr. Fred Loxsom, won a coveted “best poster” award for his geothermal research. Eric was one of only 8 winners in a field of 158 undergraduate presenters. The meeting was held at the Marriott downtown in Hartford involving some 1075 professionals and students over a four day period. Of the Eastern attendees, six students and five faculty members gave either poster or oral presentations on a wide variety of geological and energy topics.

Faculty presentations described ongoing research on the use of digital maps (Dr. Steve Nathan), paleontological research (Dr. Rene Shroat-Lewis), microscopic analyses (Dr. Allison Weinstein and student Lindsey Belliveau), stratigraphic analyses (Dr. Peter Drzewiecki) and the use of ground penetrating radar (Drs. Drew



**EES Student
Eric Lindquist
Wins Award**

Hyatt and Peter Drzewiecki). In addition, 6 EES students presented their own research (Lindsey Belliveau, Kristina Cedrone, Emily Lallier, Eric Lindquist, Ian McCary, and Laura Panno), two participated in a professional field trip (Emily Lallier and Laura Panno), and five additional EES students attended several days of the meetings (Matt Gonsalves, Cody Lorentson, Bonnie Lundbald, Laura Markley, and Joe Ventura). Also, two students (Ian McCary and Joe Ventura) participated in an intensive two-day short-course taught by ExxonMobil.

Peter Drzewiecki co-led a field trip examining fluvial and lacustrine rocks from central Connecticut. Drs. Hyatt and Drzewiecki presided over a session pertaining to GPR data and its use in resolving environmental earth science problems.

In addition to these activities, Dr. Steve Nathan (EES) arranged for a private meeting between the Eastern students and Bob Stewart, the short course instructor and chief global recruiter for ExxonMobil. This was an outstanding pre-professional experience that gave EES students insight into workings and hiring opportunities at a large multinational corporation. Needless to say it was an exciting and eye-opening experience for all the students involved.

EES students continue to be involved with pre-professional activities that enable them to present research at student and professional meetings. Each year a number of students present their work at the annual Arts and Science student conference. In 2011 presentations were made by Toni Langevin and Katie Kehogreen while the spring 2012 meeting, featured presentations by Eric Lindquist, Nate Belke, Kristina Cedrone, Anna Loss, Emily Lallier, Laura Panno, Ian McCary, Joe Zambo, and Ben Woupio (left to right below, present at meeting but absent in photo: Bethany Ingraham).



In fact the student conference is a great chance to come back to your Alma Mata and catch up with faculty, meet current students, and see some of the many changes on Eastern's campus. Photo at left depicts some former students who came to a recent meeting.

(left to right: Justin Milardo, Kevin Bieler, Troy Schinkel, Jennifer Vinci, Megan Parr, Kate McAndrews). We hope to see more Alumni at the meeting this coming spring on Saturday morning April 13, 2013 in the science building.

EES Students Presentations at the Arts and Science Student Conference



Alum News

Troy Schinkel (*Class of 2003*)—Work as an Earth and Environmental Science teacher for the Southington Public School system. Recently finished a Master's degree in Earth Science and am also an adjunct professor at Central Connecticut State University. Looking to pursue a career as a full-time professor at a community college.

Justin Milardo (*Class of 2008*)—After graduation in May of 2008, I was hired as an Environmental Scientist at Geolnsight, Inc. (Geolnsight) in Middletown, Connecticut. I worked at Geolnsight for four years on the Investigation & Remediation team. In early 2012, I began employment as an Environmental Analyst with the Connecticut Department of Public Health (DPH) in the Drinking Water Section (DWS). I currently work on grants administration and Drinking Water State Revolving Fund (DWSRF) projects for the DWS. I am engaged to Katie Duggan, EES Class of 2007.

Amberlee Nicoulin (*Class of 2011*)—Pursuing a Master's of Science degree in Geosciences at the University of Connecticut. I am currently working on a project with my advisor, William Ouimet, which will present an analysis of fill and cutfill terraces adjacent to rivers in three watersheds in Connecticut and two watersheds in Massachusetts.

Eric Lindquist (*Class of 2012*)—Since graduating from the EES sustainable energy science track in 2012, I have continued my intern work (which began in summer 2011) as a research assistant for the Connecticut Department of Energy and Environmental Protection's Inland Fisheries division. While I did not go to school for fisheries, much of our work is directly related to my EES courses, including hydrology, GIS, landform analysis, and sedimentology among others. I have gained additional skills in natural resource management, GIS, statistical analysis, and standard research techniques during my time with DEEP. Moving forward, I am continuing to search for a full-time, permanent position related to my field of study. I also continue to consider graduate school as a viable alternative.

Erica Tefft (*Class of 2012*)—Since graduating Eastern in the Spring of 2012, I have been busily working on my M.S. in Environmental Science and Management with a concentration in Remote Sensing and Spatial Analysis at the University of Rhode Island. I am currently working as an intern at the National Park Service out of the URI Environmental Data Center to create a fire modeling database for Gateway National Park in New York City based upon documented wildfires in the park from 1976 to 1991. For my major paper to complete my degree I will be completing a project in conjunction with Rhode Island Department of Environmental Management division of Freshwater Fisheries to create a public GIS mapping interface for dams with completed fish passage projects, as well as a state maintenance document for all dams with complete fish passages in the state.

Faculty Updates

Dickson Cunningham



In northernmost Tibet with the snow-capped 15,000-18,000' summits of the Daxue Shan in the distance.

I joined the EES faculty in August this year as an Associate Professor specializing in structural geology and tectonics. I am originally from Stony Brook, Long Island and attended Dartmouth, University of Arizona (Masters) and University of Texas at Austin (PhD). I spent all of my childhood in the north eastern US (including Connecticut) and I am delighted to be back in New England. That is especially true because for the last 18 years I have been in “Old England” – living in the United Kingdom and teaching at the University of Leicester, 70 miles north of London. It was a wonderful experience living in Britain and I am grateful that I had the opportunity to be part of the UK and European scientific community for 18 years, and to explore much of Europe. However, for a whole variety of professional and personal reasons, I decided to shift my career back to America instead of seeing out the remainder of my professional life in Europe, and happily, I was hired at ECSU. I AM DELIGHTED TO BE HERE!

At Leicester, I predominantly taught structural geology, global tectonics, remote sensing, and some mineralogy and economic geology. I was fortunate in that I ran a number of exciting undergraduate field trips including geotraverses across the Swiss and Austrian Alps, a structural mapping trip in Wales (which I led 26 times!), an introductory geology trip in southern Spain, and several other trips to Scotland and the English Peak district. At Eastern, I am teaching structural geology with a bit of tectonics and environmental flavor thrown in, mineralogy and petrology, and some introductory geology courses. In future years, I hope to start an annual department field trip to an exciting destination in the US or Europe and will pursue organizing a trip to Arizona for 2014. Other possible future destinations include Oregon, Idaho, Iceland, Wales and possibly the eastern Alps.

Moving to Connecticut was not simple. Changing jobs, countries, homes, settling finances and saying goodbye to friends and family across the pond was complicated enough, but having a British wife who also had to go through the US Customs and Immigration Services 8-month procedure of qualifying for a US Immigration visa really tested our patience. We were forcibly separated by almost 3 months before she finally obtained her visa. Our five-year old son stayed with his mother the whole time, so the separation was hard for all of us, but we got through it. The only positive side of our situation was that during this period, I was alone here in Connecticut and so was able to fully immerse myself in my new job.



Me and my main Chinese collaborator, Dr Zhang Jin from the Chinese Academy of Sciences on a snowy day in the Daxue Shan, northern Tibet during late May, 2012. We are in front of a glacier at 4500ms.

I had grown tired of living on top of poorly exposed, flat-lying Jurassic sediments in England that occasionally erode out a broken muddy belemnite and not much else. So, I am very pleased to have shifted to the polydeformed metamorphic core of the Appalachians. Since arriving at Eastern, I have spent parts of most weekends exploring the local geology and landscapes, and becoming familiar with the current state of knowledge about the region's structural and metamorphic history. I appreciate that I still have a lot to learn about the geology of eastern Connecticut, but hope to set up local research projects in the future with undergraduate researchers. The geology around the Willimantic area is truly spectacular with world-class examples of ductile shear zones, boudinage and gneissic fabrics. It really is a mouth-watering place for a hard-rock geologist. I keep emailing photos of incredible local outcrops to structural geology friends I left behind in the UK!

Throughout my career, I have been intrigued with the tectonic evolution of the world's great mountain ranges. My research into crustal evolution and orogenesis has always been field-based and interdisciplinary involving structural geology/tectonics, tectonic geomorphology, remote sensing, petrology, geochronology and sedimentology. I have had major externally funded research projects in the Andes, western Arizona, Brazilian Highlands, eastern Alps and especially Central Asia where I have worked 15 out of the last 18 summers. I have led major projects in Mongolia and western China and have supervised 6 PhD students, 4 postdocs and numerous masters and undergraduate projects. Some of these projects are on-going and focused on documenting the modern deformation field and intraplate mountain building processes north of Tibet, driven by the distant Indo-Eurasia collision to the south. I currently have a collaborative project with Chinese geologists looking at the geology of the north Tibetan foreland and another project will begin in summer, 2013 investigating the evolution of the Helan Shan range in north-central China. I intend to keep my China research going while at Eastern, and in the future, I hope to bring a few talented undergraduate students with me to carry out exciting summer field research in western China. In addition, I am currently funded on another project looking at the history of huge silicic caldera eruptions in the Snake River Plain, Idaho and will spend a few weeks there in summer, 2013.

Although much of what I have written is about my research interests, I am passionate about teaching and believe strongly in Eastern's liberal arts mission. I look forward to all aspects of my new job at ECSU and feel fortunate to have joined such a friendly and forward-looking department within such a positive university community.

Investigations into the Tectonic Evolution of the Gobi Corridor and Tibetan Margin, Central Asia

Working in western China is a wonderful experience for a geologist interested in the way that continental interiors deform far from a plate boundary. In remote regions of Central Asia, geologically young mountain ranges are actively forming today throughout a huge region of western China and Mongolia. This vast area, which is more than three times the size of Texas, is one of the last great frontier regions on Earth for understanding mountain building processes within an intraplate setting. I was fortunate to begin investigating this vast region nearly 20 years ago and have maintained a research presence there since 1994.



On crumbly variegated ridges of the Altyn Tagh Fault Zone – one of the largest continental strike-slip fault zones on Earth with a 2km-wide breccia zone that marks the northern boundary of Tibet.



This is the northern margin of Tibet which is one Earth's greatest topographic escarpments. The peak in the distance at approximately 5500ms is 4000ms above the alluvial plain in the foreground.

The fundamental questions that we are trying to address can be boiled down to the following: why are mountains forming in the heart of Asia far from any plate boundary? What is controlling the distribution of reactivated crust in the region? How are the active faults connected to accommodate the crustal displacements and orogenic uplift? What can we learn about the intraplate earthquake hazards in the region? And, what can intraplate deformation in Central Asia tell us about the evolution of all continents throughout earth history? These are big questions, but we are learning a lot of the answers and in late 2012, I published a major review paper in the Journal of Structural Geology on this topic that summarizes our current state of understanding.

Working in Mongolia is logistically complicated because it is all expedition-style fieldwork with jeeps, trucks, hired drivers, cooks, camp assistants, and we typically carry the food and gasoline we will need for the entire trip. There is almost no infra-structure outside of the capitol Ulaan Baatar and few people in the countryside except for scattered nomadic families living a traditional pastoral lifestyle. The nomadic culture is fascinating and we have had many memorable evenings with local families in their cozy yurts singing songs with them while sipping fermented mare's milk (their local tippie). On the other hand, working in China is a completely different experience. My Chinese collaborators dislike camping and so we stay in good hotels which have great restaurants with delicious local food which can be exotic at times (fried scorpions, chicken feet, goat's heads and snakes have all been on the menus!). The road system in China is extensive and we are treated very hospitably and our field seasons are always great experiences. The scenery around the northern edges of Tibet is stunning with huge glacier-covered peaks rising 4000+ meters above the lowlands to the north. The deserts have dramatic dune fields and rugged mountain ranges with great exposures that are ripe for making geological discoveries. Every season so far has brought research and personal rewards and I hope to continue working in Central Asia for the rest of my career. SO, STAY TUNED!



Roads and bridges in northern Tibet make a lot of people religious!



Yak traffic jams are also not uncommon



A surprise visitor



Directly north of Tibet is a hyperarid region with huge dune fields and stunning oases

Stephen Nathan

I am delighted to join the EES department at Eastern. I came to the department as a one-year hire in the fall of 2011 and now I am a tenure track assistant professor.

My teaching and research interests cover a broad swath of energy geoscience. I teach introductory classes and labs in sustainable energy and climate change as well as an advanced energy class.

Since arriving at Eastern I have been involved in a wide range of energy related activities. Last July Ian McCary (a May 2012 EES graduate) and I were chosen from an international pool of applicants to participate in a field excursion to the Bighorn Basin in Wyoming. The all expenses paid, week-long trip was sponsored by the Geological Society of America and ExxonMobil Corporation. The trip provided experiences in exploration geology to undergraduates, graduate students, and faculty. For the 22 students on the trip this was also an opportunity to meet and work directly with industry scientists and recruiters. For me the field trip provided a wealth of material to use in my energy classes and for a new applied energy class that I am developing.



I am now beginning another research project with a second EES honors student. This project will investigate global climate change by looking at the historical development of the East Asian Monsoon and the Western Pacific warm pool, key components to the waxing and waning of El Niño and La Niña. Studying this region of the world and the techniques used in this research are of vital interest to the energy industry and policy makers. The project also has the potential for producing several student theses.

I look forward to engaging all my students in energy geoscience; in the classroom and in the laboratory. My goal is to give all students at Eastern the strongest possible preparation so they can succeed in the rapidly growing and competitive fields of sustainable energy and energy geoscience.



Over the past year I have been working on a research project in geothermal energy with EES honors student, Cody Lorentson. This research is part of the National Geothermal Data Initiative, a multi-year, US Department of Energy funded project that is coordinated locally by the Massachusetts and Connecticut Geological Surveys. Cody has joined me in the field to collect glacial sediment samples and we have been measuring the physical properties of these samples in the laboratory. This on-going research will help better determine glacial sediment thermal conductivity, a key parameter needed in the design of efficient ground source heat pump (GSHP) systems. For Cody, the project will become his honors thesis.

Meredith Metcalf

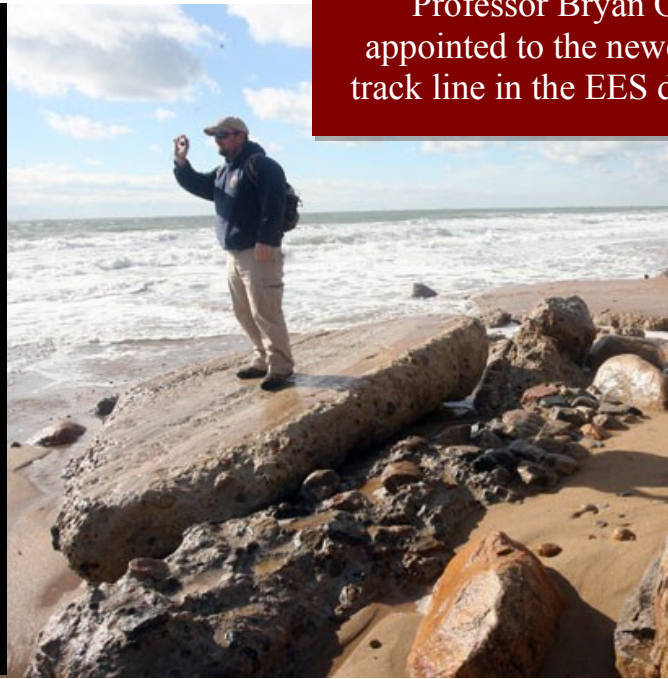
Recently appointed tenure-track professor Meredith Metcalf is a native of Connecticut with a diverse background in the natural sciences. She has degrees in Geology, Geophysics and Natural Resources and the Environment, both of which are from the University of Connecticut and grounded in the area of hydrogeology. Her research interests in mapping bedrock and analyzing ground water sustainability, ground water quality, and ground water flow patterns in fractured rock have provided her with a strong background in geographic information systems. She joined the Department of Environmental Earth Science in the Fall of 2011 and has taught Geographic Information Systems, Advanced Geographic Information Systems, and GIS Applications in Environmental Science. Her diverse background is also observed in her teaching as she has taught courses in the disciplines of Geology, Environmental Engineering, Architecture, Civil Engineering, and Computer Science.



EES senior Kelli O'Brien obtained an internship opportunity with the Town of Stonington's Architectural Design Review Board during the Fall 2012 semester. Kelli has worked closely with the department's newest addition, Meredith Metcalf, who recently was hired as an assistant professor with expertise in GIS. Kelli was majoring in Environmental Earth Science and knew very little about architecture, but she was well prepared for all tasks given her liberal arts background, her research capabilities, and her self-motivation. An intrinsic quality about Kelli is her ability to understand "concept-to-product" production and the various data and applications at her disposal to express project outcomes. This keen attribute of hers led to Kelli being utilized on professional projects that required the integration of ArcGIS®, Google SketchUp®, and AutoCAD®. Kelli approached these projects with alacrity and the resulting products were used on the professional stage. One of her greatest accomplishments during this internship was completing an architectural model of a proposed structure for William Roehl, a well-known local architect. She created a replica of the structure in three-dimensions and incorporated the surrounding properties for scale. Her work was presented at a municipal design review committee and used for a hearing on Planning and Zoning decisions regarding the structure (as shown).



Bryan Oakley is part of a team that has been monitoring erosion on Charlestown Beach for decades.



Professor Bryan Oakley appointed to the newest tenure track line in the EES department

Bryan completed his Ph.D. in April 2012 at the University of Rhode Island, with a focus on the Late Wisconsinan deglaciation of southern New England. Questions addressed included isostatic rebound and sea-level rise, the timing of deglaciation in southeastern New England using glacial varves, and the depositional characteristics and hydrology of the Laurentide Ice Sheet.

Beyond his dissertation, Bryan has been involved in numerous projects with the Department of Geosciences at the University of Rhode Island and Rhode Island Geological Survey, mapping benthic geologic habitats and Quaternary depositional environments for a variety of applications including planning dredge projects, habitat restoration, siting of offshore wind farms and beach replenishment. He also works closely with the Rhode Island Coastal Resources Management Council on a variety of issues regarding erosion and shoreline change, and the potential management implications.

Current research projects involve interpreting the Quaternary Geology and modern processes acting on the sea floor from side-scan sonar records in Rhode Island Sound as part of the Rhode Island Ocean Special Area Management Plan and the compilation and interpretation of legacy data from Rhode Island for a federal project promoting geothermal heating/cooling systems. Future planned work involves examining the Rhode Island shoreline and identifying areas at particular risk from frontal erosion and storm surge inundation.

Professor Oakley is currently teaching two sections of Dynamic Earth and one section of Environmental Geology. Students in his section of Environmental Geology just wrapped up a month long project examining the potential loss of a section of road in Matunuck, Rhode Island due to coastal erosion, based on a very controversial, real-world issue. Students participated in a team-based assignment to write a proposal outlining one possible way to protect the road. This project culminated with the students giving a presentation to the class outlining a different strategy to deal with this erosion issue.

Hurricane Sandy Press Coverage

In the aftermath of Hurricane Sandy, Professor Oakley met with a reporter and photographer from the Providence Journal to discuss the erosion and damage to coastal structures along the Rhode Island coastline. This article, titled *Sandy was 'a warning bell' on erosion along the R.I. coastline* was featured 'above the fold' on the Sunday, 4 November 2012 edition of the Providence Journal. As a follow up to the story in the Providence Journal, Professor Oakley was interviewed by Andrew Gobeil on the 5 November 2012 live broadcast of the 'WPRO-News Talk 630 Morning News' program.

During his graduate career and continuing to the present, Oakley has been actively involved in documenting shoreline change at a variety of scales along the Rhode Island south shore. He has been the lead field researcher, and currently oversees (remotely) the long-running beach profiling program conducted by Rhode Island Geological Survey at URI. He has even been known to don a dry suit and collect the occasional profile himself. Professor Oakley continues to work closely with Rhode Island's coastal management agency, the Rhode Island Coastal Resources Management Council on issues of erosion, beach replenishment, and coastal management.

On 28 November 2012, Jennifer Pagach, a Climate Specialist with the Connecticut Department of Energy and Environmental Protection spoke to Professor Oakley's Environmental Geology course. Her talk focused on climate change impacts and actions. This talk was open to all EES students, and was well attended. Ms. Pagach represents an excellent contact within CT DEEP, and is a potential source for student internships in the future.

On 30 November 2012, Professor Oakley gave a talk on *Present and future sea level rise and storm surge in southern New England* at the Peter B. Lord Seminar on the Environment at the Graduate School of Oceanography at the University of Rhode Island. These daylong seminars are designed to increase news coverage of important environmental concerns facing southern New England, by enhancing journalists' understanding of the science behind the stories and introducing them to sources representing a wide variety of perspectives on scientific topics. This is done as part of the Metcalf Institute, which promote clear and accurate reporting of scientific news and environmental issues and works to strengthen scientific understanding and working relationships between the scientific community and news media. Professor Oakley has been involved in the Metcalf Institute for much of his professional career.



Lea Gilbertson

I joined the ECSU geology department in a one-year position fall, 2012. Currently, I'm teaching global climate change, sustainable energy resources and sustainable energy resources lab. I enjoy teaching such courses because they reach a lot of students, and it is important students are aware of scientific issues at a time when our world faces significant challenges related to climate change and dwindling energy resources.

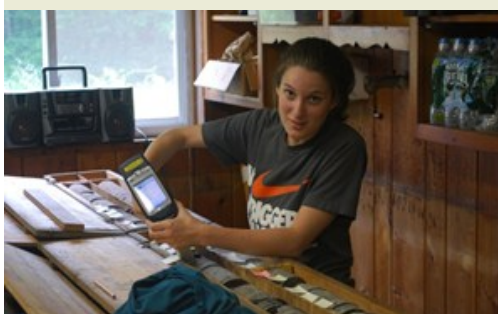
Even though I'm teaching energy and climate, I'm a petrologist and mineralogist by training, with master's studies in mineralogy, economic geology, and geochemistry from Western Washington University. My thesis focused on tourmaline as an indicator of ore mineralization. Previous to ECSU, I taught mineralogy, petrology, and introductory geoscience courses at Lafayette College, and University of Minnesota-Morris (my alma mater), as well as introductory geoscience courses at Indiana University Kokomo. The EES department is a fabulous place to work, and I'm enjoying my colleagues and students at ECSU!

Peter Drzewiecki

The last two years have been busy both in the department and in my personal life. I continue to teach EES 130 (Ancient Environments) and EES 344 (Sedimentology and Stratigraphy), but have time for little else. With the increased number of majors, more sections of these courses must be offered, and the rest of my time is spent performing assistant chair duties. I still have time, though, for the most enjoyable teaching experience - interacting with students to conduct independent research projects. These are listed in an earlier part of this Newsletter.



Laura Panno (left) presents her research on the microbial origin of Silurian reefs at the 2012 NE GSA meeting in Hartford.



Emily Lallier collects geochemical data with a handheld XRF spectrometer in the state's core repository in Farmington, CT.



My children and I near the summit of Mount Rainier in Washington. The clouds parted briefly, allowing us a glimpse of the peak.

Other professional events of the last few years include traveling to the GSA conferences in Charlotte, NC and Minneapolis, MN, and NE GSA meetings in Pittsburgh, PA and Hartford, CT. The Hartford meeting was particularly exciting because we were able to bring many students. In addition, I lead a field trip to look at fluvial and lacustrine rocks in the central part of the state, and Drew and I presided over an oral session pertaining to the use of GPR data to resolve environmental problems. I also finished a long term project creating the Hartford South bedrock quadrangle map with former EES professor Tim Schroeder, DEEP geologists Margaret Thomas (CT State Geologist) and Randy Steinen, and five EES students (Justin Milardo, Brian Clark, Matthew DePan, Kevin Beiler, and Allen Dwyer III). It is an online publication, and can be viewed at: <http://www.ct.gov/deep/lib/deep/geology/qr40.pdf>

Two significant strides have been made in my own research. First, for years I have been looking at rock samples collected from an ancient deep-water reef now preserved in Indiana. For over 100 years, these reefs have baffled sedimentologists because they could not find any organisms that appear to have built the reefs. More recently, the idea that microbes (algae and bacteria) built reefs in the past has become popular. After a tedious thin section search, my student (Laura Panno) and I found some petrographic evidence of microbes within the reef. It was like looking for a needle in a haystack (except that the microbes are smaller than needles, and the reef is bigger than a haystack)!

Second, my work on correlating cores from the lower Portland Formation in South Hartford took a giant step forward when my student (Emily Lallier) and I discovered that hand-held geochemical sampling instruments can be used to correlate lake beds in the strata better than the human eye. They pick up small changes in lake geochemistry that are not obvious in the rock record. This was used to resolve one of the biggest correlation issues pertaining to the cores, and created a robust stratigraphy within which to interpret part of the geological history of the Hartford Basin.

Finally, I have taken on additional responsibilities at home as my wife prepares to return to the workforce after many years raising children. Between her internships and coursework at Eastern (in Accounting), more of my time was required at home. This, coupled with the all the work at Eastern, has resulted in many short

nights. The kids are growing like weeds. Many of you may remember humorous antidotes about their childhood that I shared in class while you were in college here. Well, my oldest daughter is now looking into colleges, and about to take her driving test! Do not be surprised if I have more gray hair when you see me next! We have had plenty of family fun along the way, including trips to Seattle and Vancouver, Washington D.C. and coastal Virginia, Maine, and a cruise to Honduras and Cozumel, Mexico. If you are ever in the area, please stop by for a visit. Or, you can always e-mail...

Catherine Carlson – In the last newsletter, I informed you about a new course, EES 450 Hydrological Research Methods, that was being offered on a trial basis spring 2011. It was an overwhelming success. Eight students conducted three research projects that spring: David Cook, Emily Lallier, and Breton MacLeod designed and completed their project, entitled *Using Heat Transfer as an Additional Analytical Tool for Understanding Groundwater and Surface Water Interaction in a Wetland Pond*. Toni Langevin and Jeremy Willcox did an *Examination of Road Deicers on Echo Lake in Mansfield, Connecticut* and Lauren Daulizio, Brian Clark, and Amberlee Nicoulin studied *The Effect of Deicers on the Atlantic White Cedar Bog, Windham, Connecticut*. What a great group of undergraduate researchers!



Since then, EES 450 has been approved as a permanent course. It is both writing intensive and designated as a ECSU Liberal Arts Work experience. This spring (2013) the course is running again with six students working on two research projects. Hannah Pallein, Patrick McNamara, and Stephen Tutto are designing a study to investigate the influence of the Windham Water Pollution Facility on nitrogen and phosphorous concentrations in the Willimantic, Natchaug, and Shetucket rivers. Lauren Kostak, Bonnie Lundblad, and Megan Maher are designing a study to compare nitrogen, phosphorous, and coliform loads in stream flow in an agricultural versus a non-agricultural watershed in eastern Connecticut. The stormy weather has put us a bit behind schedule, but sampling should begin before the end of February.

Hydrologic research has become a component of EES 322 Hydrology as of fall 2012. The class participated in a preliminary investigation of Park Spring in Alex Caisse Park, Willimantic. Students measured stream discharge over a 6-week period as part of the study and then analyzed and interpreted discharge-precipitation data as well as available water quality data. Although previous hydrology classes have not examined the spring, they have conducted field work in Alex Caisse Park investigating the soils, infiltration rates, and field saturated hydraulic conductivity of the soils near the spring. All these preliminary data will aid in the development of a conceptual model of Park Spring's hydrology. I will be pursuing this project in greater depth during a sabbatic leave spring 2014, and I'm looking for a couple of good students to help with the project this coming summer and fall.





New this spring, on a trial basis, I am offering an EES Seminar course for upper-level majors. I've wanted to do this for some time and finally have the opportunity. In this seminar we investigate current issues and developments in earth science with special emphasis on environment and sustainability. The course involves reading primary and secondary sources, student oral presentations, brief article critical reviews, and lots of discussion. I love the seminar format because it allows discussion on a wide range of environmental geology topics/research—students are actively participating in the discussions and clearly developing their scientific thinking skills.

I continue to teach non-major environmental courses that attract students from a broad range of backgrounds: environmental geology, watershed management, drinking water management, and environmental management. Starting fall 2012, students in EES 220 Environmental Geology are participating in an interdisciplinary newsletter with students in English courses as authors and peer reviewers. The newsletter is open to the public for comments (<http://ees0eng0ecsu.wordpress.com/>), and students from all classes provide feedback to each other to improve their presentation/writing. English professor Rothausser proposed the collaborative newsletter, I designed it, and English professor Smith joined us in publishing the newsletter. EES students post articles in three GeoNews categories: Earth Resources, Geologic Hazards, and Geology in My Backyard.

The Environmental Management major concentration for the BGS continues to attract students who are graduating with the concentration. Although the Environmental Management Certificate has been discontinued (all certificates at the university were discontinued for administrative reasons beyond the control of programs), EES major Emily Lallier was able to complete it spring 2012. Along the environmental management vein, Emily Kapostas completed an internship with the Naubesatuck Watershed Council fall 2012 for which she developed a GIS for the Naubesatuck Watershed. The GIS will be used by the Council for monitoring and planning purposes.

As you can see, it has been a busy couple of years. But I am never too busy to hear from alumni! Please drop me line and let me know where you are and how you are doing.

Drew Hyatt



It has been a busy time since I described my activities in teaching and research in our last newsletter two years ago. Of course the highlight for me, as always, has been the opportunity to work closely with several talented EES majors. Last year, I supervised Kristina (Mimi) Cedrone and Ian McCary on two separate but related ground penetrating radar (GPR) studies. Mimi focused her efforts on using GPR to image beneath Andover Lake and in so doing to establish a context to several previous student projects that collected sediment cores at locations throughout the lake. Ian's work examined the three-dimensional architecture of deposits at the Andover Lake beach. Both studies were done very well and can, in their entirety, be viewed on-line through the "eastern students" link on my home page. Mimi's work was interesting as it revealed the presence of ice-ponded sediments and changing glacial drainage pathways that reflect deglaciation in the Hop River drainage basin. Ian's 3D work provided insight into the character of an ice-pond delta and is of particular relevance to the Andover Lake Manage-

ment Association as they consider whether or not to consider construction of a clubhouse at the beach. Both Ian and Mimi presented their work at the Northeastern Geological Society of America meeting in Hartford (spring 2012), as well as at the annual Arts and Science student conference.

More recently (i.e. during the summer of 2011) I worked with 5 students on GPR studies in the Eastern Arboretum as well as detailed surface mapping using total stations and our terrestrial laser scanner at Bailey's Brook in North Franklin. This field work involved Lindsey Belliveau, who will present on the Bailey's Brook scanning project at the upcoming NE GSA, as well as Tim Bugden, Laura Markley, Megan Maher, and Bonnie Lundblad. Tim, Laura and Megan have been working up several vibracores collected from the Arboretum and they will present on this at the spring 2013 student conference. Lindsey is hard at work processing airborne Lidar data, ground based scanning, and total station survey results as she prepares for a presentation that examines the character of spectacular glacial meltwater erosion forms that occur along Bailey's brook.

In addition to these undergraduate research activities I have continued to greatly enjoy teaching EES majors in my field methods classes (EES 350), and Landform Analysis (EES 224). I also eagerly await teaching process geomorphology (EES 440) this coming fall after a 3 year hiatus. Landform Analysis has evolved as I incorporate more writing activities to reflect the new "writing enhanced" aspect of this course. With field methods, I have added a new site (Bailey's Ravine), and we have broken new records on the number of students taking the class – actually necessitating splitting the class into two sections for the first time in the fall of 2011 (and again for classes this coming 2013 fall semester). I have also begun new work, involving students, that focuses on mapping in great detail the trackway at Dinosaur State Park in Rocky Hill using terrestrial laser scanning. To date, I have collected >400,000 survey points from the trackway and am analyzing these data to build 3-dimensional computer models and some physical models of the tracks. In fact, I will present a collaborative study on these data with co-author Joel Rosiene (Math and Computer Science at Eastern) that describes our approach to modeling, measuring, and analyzing these trackway forms at the upcoming Northeastern Geological Society of America meeting in New Hampshire this coming spring. One of the unusual spin-offs for this project has been to work with 3D printing capabilities, which curiously enough resulted in printing and molding a scanned track to produce small chocolate dinosaur foot prints (shared as a gift with the park staff).



(left to right): Dr. Peter Drzewiecki, Emily Lallier, and Ian McCary work as a team to collect 3D radar data from Andover Lake Beach.

Mimi Cedrone
collects subsurface
GPR records from
beneath the lake
as part of summer
student research



In closing, and on a more personal note, it has also been a time of change for myself and Trudy as our children make their way off to pursue their own interests. My son Jake is in his 3rd year of computer engineering at a university in Canada, while my daughter Hannah will be off to study and play volleyball in New Hampshire. So, whether we are ready for it or not, Trudy and I will be empty-nesters next fall. It will be good to remain busy and I have no doubt teaching two sections of field methods and process geomorphology in the fall semester will take care of that. All the best and please send us your alumni updates as explained on the last page of this newsletter.

Send us your Updates for Future Newsletters

We would very much like to include more updates from EES alumni in our next newsletter (the 2013-14 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 (hyattj@easternct.edu).

All the best for a great year! Drew Hyatt, Chair, Department of Environmental Earth Science.

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).

Special Thanks to
Zosia Carlquist, Department Secretary
for her creative contributions to the newsletter

