We have had another exciting year in EEB. The Hunter Lab renovation to house our conservation biologists, the Earth Lab, the Environmental Change Initiative, and our new rooftop greenhouse is scheduled to open in November (see page 7).

We ran two searches this year: an ECI search for a landscape ecologist, and a search for an evolutionary plant biologist. Jim Kellner from the University of Maryland was recruited for the landscape ecology position, and we are in the process of negotiating with our top candidate for the plant biology position. Needless to say, we are thrilled to welcome amazing new faculty members to the EEB family.

There have also been many champagne toasts in the Walter conference room to celebrate our first wave of faculty promotions from tenure-track assistant professors to associate professors with tenure. So here’s to associate professors Stephen Porder, Dan Weinreich, Erika Edwards and Dov Sax. Congratulations all around. Casey is at bat next year.

After 11 years as EEB chair I am also riding off into the sunset and passing the reigns to the capable hands of the young Professor Rand, who promises to morph from deadline Dave into visionary David. I’ll be off on sabbatical next year working on the organization of Sardinian sand dunes communities and visiting European colleagues. It’s been a privilege leading EEB and I thank all of you for your support and making it a great ride. Here’s to an even brighter future.

Mark

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**Recent EEB Graduates**

**Joseph Bahlman, Ph.D.**
July 19, 2012
Variation in morphology, kinematics, and performance in flight of mammals

**Caroline Harper, Ph.D.**
May 7, 2013
Morphology and mechanics of the tongue of a nectar-feeding bat (*Glossophaga soricina*)

**Shelby Hayhoe Riskin, Ph.D.**
May 30, 2012
The hydrological and biogeochemical consequences of conversion to soybean cultivation on the Amazonian agricultural frontier

**R. Matthew Ogburn, Ph.D.**
July 16, 2012
Succulence: A unifying theme in studies of ecology, physiology, and evolution in the plant clade *Porulaceae*
Eutrophication is one of the major environmental problems that we currently face. Despite retention and removal by mangroves and salt marshes, much terrestrial nitrogen from sewage and fertilizer ends up in coastal ecosystems. Once in coastal waters, instead of fertilizing the crops and lawns for which it was intended, the nitrogen fertilizes macroalgae. Macra...
Mark Bertness received a faculty Fulbright to support his sabbatical work on Sardinian sand dunes.

Lindsay Brin received an NSF Postdoctoral Fellowship in Biology to study winter N cycling in agricultural fields at the Potato Research Centre in Fredericton, New Brunswick, Canada, where she will start in October.

Tyler Coverdale (Bertness lab) is the lead author of a paper in *Frontiers in Ecology and the Environment* (see p.6), which was featured on the Brown website of 25 January. The paper investigates the role of historical human impact in driving current salt marsh loss on Cape Cod. It was also featured in an ESA press release (*ESA Ecotone* 24 January), a Cape Cod Broadcasting radio segment (10 March), and a *Cape Cod Times* article (22 February). Tyler will be leaving EEB this summer to begin his PhD work at Princeton University.

Erika Edwards was awarded a five-year NSF Career award, NSF’s most prestigious award in support of junior faculty.

Nick Gidmark, lead author of a paper in Biology Letters, was featured on the Brown Website of 22 February.

Michael Goldberg, a senior Biology student working with Kate Smith and Sohini Ramachandran, was awarded a US Fulbright fellowship to France.

Visiting student Qiang He in the Bertness lab is the lead author of a paper in *Ecology Letters* (in press) featured on the Brown web site of 30 January. The paper analyzes hundreds of previous studies on the Stress Gradient Hypothesis and demonstrates its generality across ecosystems, taxa and gradient length.

Christine Janis was presented the President’s Award for Excellence in Faculty Governance.

Heather Leslie, along with Leila Sievanen, participated in a symposium at AAAS in February 2013.

Eric LoPresti (former undergrad in the Morse Lab), Tyler Coverdale (research assistant in the Bertness Lab), and Julia Olszewski (former undergrad in the Brainerd Lab) were awarded NSF Graduate Research Fellowships to pursue their PhDs.

Stephen Porder was awarded an Aldo Leopold Fellowship, a program that selects 20 fellows per year and trains them in translating their knowledge into action.

Sohini Ramachandran and her husband Jeremy Mumford are happy to announce the arrival of their first “practical genetics experiment” — Anarkali Grace Mumford, who was born on January 31, 2013. Her first name is botanical, meaning “pomegranate flower” in Persian and Sanskrit. Welcome Anarkali to the EEB family!

Sohini has also joined the Faculty of 1000 as a contributing member to the Evolutionary/Comparative Genomics section. In addition, she was invited in December by the Trinity Repertory Company to be a panelist at an evening entitled, “She Blinded Me With Science: the (r)evolutionary biology and relationships of The How and the Why,” a play written by Sarah Treem (of HBO’s *In Treatment*) centering around two female evolutionary biologists.

Dov Sax has published two papers with his former Ph.D. student, Matt Heard (see p.6). One of these was published in *Ecology Letters*, the leading ecology journal; the other, in *Diversity and Distributions*, was recommended by the Faculty of 1000.

Kate Smith is collaborating with the University of Georgia as a Co-PI; she was awarded a grant from the NSF-NIH Ecology and Evolution of Infectious Diseases Program that will fund a new research coordination network on the Macroecology of Infectious Disease. In the fall she will offer a new course on Lyme Disease Ecology and Epidemiology.

Bertness Lab undergraduate Elena Suglia received an UTRA to experimentally examine predator depletion in salt marsh die-off; undergraduates Sinead Crotty and Matt Bevil both received Voss Fellowships to investigate the spread of salt marsh die-off into Narragansett Bay.

This May, Marc Tatar travels to Seoul, Korea to present a plenary talk at the 2013 Asian Pacific Drosophila Research Conference.

The Tatar Lab welcomes Wenjing Zheng, who will work with Ana Hernandez on their innate immune aging project, and develop her own work on the cellular mechanisms by which germ line stem cells modulate systemic insulin signaling.

Trevor Young has been named a Beckman Scholar and will study insulin signaling in the Tatar Lab under the direction of Galia Karaschuck. He will also spend the summer working in David Mark Welch’s lab at Woods Hole.

EEB continues to appear regularly on the Brown web page. In addition to those noted above, they include topics as diverse as phosphorus in agroecosystems and building a robotic bat wing. 2012 Ph.D. Shelby Riskin, adviser Stephen Porder and others evaluated the various roles of phosphorus in different crop soils. 2012 Ph.D. Matt Ogburn and advisor Erika Edwards investigated the recurrent development of 3-D venation of leaves. The Bertness lab has discovered the facilitative role played by the often-vilified invasive green crab in limited marsh recovery. And another 2012 Ph.D., Joe Bahlman, with advisers Sharon Swartz and Kenneth Breuer (Engineering), has built a robotic bat wing that facilitates study of flapping flight in real bats.
It might come as a surprise to learn that Brown University has an herbarium. Since the mid-1980’s, our historic collections of over 100,000 plants, fungi, and algae have been locked away in a small room in the basement of Arnold Lab. But we are currently in the midst of a great botanical renaissance- Brown has invested in constructing a beautiful new facility for the collection- 1,600 sq ft of prime real estate on the second floor of the BioMed building, with 100 state-of-the-art herbarium cabinets and climate-controlled rooms. Construction was complete last summer, and over the past year Collections Manager Kathleen McCauley has been carefully and methodically moving the collection to its new home. The move requires patience- all specimens must be thoroughly frozen for many days to kill any potential pests as we transition them from our dusty old basement to our gorgeous, clean facility. We are also undertaking a massive reorganization of the collection by adopting a modern-day phylogenetic arrangement. Many have stopped to peer into the beautiful new space, visible through the glass walls, and wondered, what’s inside all those boxes? What’s going on in there?

The boxes contain mountains of priceless specimens, most of them gathered during the ‘glory days’ of botany at Brown- 1880s to 1920s. The botanists Stephen T. Olney, William Whitman Bailey, James Bennett, and James Collins have been especially important contributors, by donating their private herbaria and actively acquiring collections from others. We have unearthed many lovely sets of specimens from this time period: a full set of Cyrus Guernsey Pringle’s *Plantae Mexicanae* (1892); a partial set of Moses Ashley Curtis’ mycological specimens; James and John Macoun’s *Catalogue of Canadian Plants* (1883-1902); Thomas Howell’s *Pacific Coast Plants* (1880); Oscar Dana Allen’s *Flora of the Cascade Mountains, WA* (1893); Benjamin Robinson & Hermann von Schrenk’s *Flora of Newfoundland* (1894); and Arthur & Elizabeth Heller’s collections from the American west, the Hawaiian Islands and Puerto Rico. Our oldest known set of specimens is from 1818, a collection of British mosses. Of course these are just the things that Kath has noticed- the collection has never been databased and so we don’t really know what other treasures might be waiting for us to find.

After the move is complete we will begin in earnest to digitize the entire collection, with help from a large, collaborative NSF grant we share with 6 other institutions. Together, we will image and database over 1.2 million specimens from the New England area, and make all data available online for anyone who wishes to use them. We hope to use these collections to piece together a broad picture of how the timing of spring flowering and leafing has shifted over the past 150 years- but these data will be extremely useful for many areas of research. We are also currently searching for a full-time PhD-level Collections Manager to join Kath and restore the herbarium as a central hub of research in the natural sciences here at Brown. Stay tuned!!

*Pellaea pringlei*, a fern (Pteridaceæ) from central Mexico
2013 Spring Seminars

Tuesday Colloquia
*A formal colloquium that features guest speakers from outside Brown University*

1/28 Andrew Leslie, University of Chicago
Form, function, and fossils: exploring the evolution of morphological diversity in seed plants

2/4 David DesMarais, University of Texas
GxE and the genomic basis of local adaptation in plants

2/12 Peter Groffman, University of Georgia
Denitrification in terrestrial ecosystems: A tale of misery and woe

2/19 Ted Garland, University of California-Riverside
The ecology and evolution of mutualism

2/20* Pam Matson, Stanford University
Transitions to sustainability in agriculture: Ecosystem science meets sustainability science

2/25 David Ackerly, University of California-Berkeley
The geography of climate change: Plants and people in the San Francisco Bay Area

3/5 Karen Sears, University of Illinois
The role of development in morphologic evolution: Evidence from mammalian limbs

3/12 Jarrett Byrnes, University of Massachusetts-Boston
Causes and consequences of ecological complexity

3/19 John Long, Vassar College
Biorobotics: Building biomimetic models of vertebrates to investigate propulsion, behavior, and evolution

4/2 Eric Tytell, Tufts University
Forces, fluids, and feedback: Sensorimotor integration in swimming fishes

4/9 Mitch Sogin, Marine Biological Laboratory
Who are we overlooking in microbial diversity surveys and does it really matter?

4/16 Loren McClennenachan, Colby College
Why historical ecology matters

Brown Bag Seminars
*Talks that cover research and work within the EEB department*

2/1 Christine Janis, Professor
Evolution of the grassland biome in North America: New information from old fossils

2/8 Daniel Field, Yale University
Evolutionary paleornithology: The evolution of birds and their characteristic innovations

2/14 Robin Hopkins, University of Texas
The genetic basis of reinforcement and the role of natural selection in speciation

2/21 Stacey Smith, University of Nebraska
Ecology and genetics of floral diversification in Andean *Lochroma*

3/1 Jorn Cheney, Graduate Student
Bat wing architecture

3/8 Stephen Gatesy, Professor
Lines, triangles, and locomotion

3/15 Stefan Siebert, Postdoctoral Research Associate
How to form a colony? Growth zones in siphonophores

3/22 Raquel Garcia Perez, Visiting Research Fellow
Multiple evolutionary origins of bat papillomaviruses

4/5 Angus Angermeyer, Graduate Student
Bacterial communication in the deep-sea

4/12 Scott Wylie, Postdoctoral Research Associate
Mutation rate evolution in asexuals

4/19 Undergraduate Thesis talks (p.6)

4/23 Undergraduate Thesis talks (p.6)

4/26 Undergraduate Thesis talks (p.6)

4/30 Undergraduate Thesis talks (p.6)

*Graduate student speaker*


Witman JD. 2013. Are regional effects on local diversity more important in marine than in terrestrial communities? Oikos 122:301-305.

2013 EEB Undergraduate Thesis Talks

Harriet Booth (Deegan)

Does Chronic Nutrient Enrichment Result in a Trophic Bottleneck in a Salt Marsh?

Alexandra Brown (Weinreich)

Effect of Variance in Time to Lysis on Mutational Growth Rate of Lytic Bacteriophage in a Two-Stage Chemostat

Nati Chen (Brainerd)

The Biomechanics of Head Lateral Expansion during Fish Suction Feeding

Catherine Freije (Sartz)

Statistical Analysis of Multiple Bat Flight

Jenn Ge (Rand)

How Do Mitochondrial Genomes Influence the Nuclear Transcriptional Response to Hypoxia in *Drosophila*?

Michael Goldberg (Smith)

Building and Implementing a Global Disease Outbreak Geodatabase

Maddie Johnston (Sax)

Comparison of Native and Horticultural Ranges of Woody Plants

Lei Ma (Weinreich)

The Microbiome Composition of a Shelter Building Moth

Liz Ryan (Sax)

Re-evaluating Climactic Limitations of Plants through Naturalizations

Katherine Siegel (Leslie)

Integrating Ecological and Institutional Consideration into Marine Conservation Planning in Mexico’s Gulf of California

Tanayott Thaweetai (Weinreich)

Evolutionary Opportunities for Horizontal Transmission of Antibiotic Resistance Across Bacterial Species

Stephanie Yin (Bertness)

Decades of Salt Marsh Die-off Reverse Centuries of Carbon Sequestration in Cape Cod Salt Marshes

Eric Young (Bertness)

The Mechanism of Habitat Loss for Sesarma-driven Salt Marsh Die-off on Cape Cod, MA
The EEB marine ecology crowd had a good excuse to leave the chilly temperatures of early spring in Providence behind them to give talks at the 42nd Benthic Ecology Meeting in Savannah on March 20-23rd. The Bertness lab helped get the meetings off to a great start with Tyler Coverdale’s presentation illustrating how green crabs are turning around the invasion and subsequent demise of New England salt marshes by evicting the destructive herbivorous crab *Sesarma* from their burrows.

The burrowing activities of this crab causes large losses of sequestered carbon in the salt marsh peat as Caitlin Brisson demonstrated in her talk on the second morning. Eric Axelman presented a cool summary of life and research in the Bertness lab in a video of his rap “Bertness Rock Anthem” in the film festival associated with the meeting. Jon Witman finished off the talks from the EEB group on the last morning describing how important species identity is in the functioning of trophic cascades in Galapagos Marine Reserve.

As always, it was great to catch up with all the former Brown undergrads and grad students at the meeting.

They included former postdoc Geoff Trussell, grad students Brian Silliman and Andrew Altieri, and former undergraduate research students Christine Angelini (nee Holdredge), Skylar Bayer, Safran Altman, and Anya Brown, all of whom have either gone on to or have completed (Safra) Ph.D. programs in marine ecology.

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**In the Greenhouse**

by Fred Jackson

Left: Fred and a friend checking out progress on our new greenhouse atop Hunter Lab.

Right: views of the research space.
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