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The New Logo of Penn State Ecology



(Designed by Staci Amburgey and Shannon White)

Congratulations to the Ecology Program's recent graduates and defended candidates!

Lauren Chaby (MS, advised by Victoria Braithwaite)
Lillian Hill (MS, advised by Jason Kaye)
Christian John (MS, advised by Eric Post)
Doug Manning (MS, advised by Margot Kaye)
Alexandra (Lexie) Orr (MS, advised by Dave Eissenstat)

Weile Chen (PhD, advised by Dave Eissenstat)
(Research highlighted by Penn State News, click [here](#))
Xin Peng (PhD, advised by Mary Ann Bruns)
Laura Radville (PhD, advised by Dave Eissenstat)
(Research highlighted by Penn State News, click [here](#))
David Watts (PhD, advised by Eric Post)



Panorama of Penn State Russell E. Larson Agricultural Research Center (Photo by Laura Russo)

Andersen award reflection

By Katy Barlow

While walking the streets of Prague in the Czech Republic, a few days prior to the 7th International Weed Science Congress, I imagined I was the only tourist taking photos of roadside weeds. I was wrong. During a conference field trip I was with a tour bus full of weed scientists commenting on and photographing weeds on roadsides and in agricultural fields and forests. And when walking the streets of Prague with some conference attendees I observed that they did seem to notice the gorgeous Baroque and Gothic architecture, in between inspecting the tiniest plant specimen in sidewalk cracks.

Whether in sidewalk cracks or forests, as an ecologist studying weedy plants in eastern North America (NA) I appreciated seeing some of these species in their range of origin, such as *Acer platanoides* and *Cirsium arvense*. I also got to meet new species of familiar genera such as *Plantago media*, a less common *Plantago* species in NA, that looks like a cross between our common lawn weeds *P. lanceolata* and *P. major*. Europe is also home to a large diversity of *Taraxacum* species (dandelion), seeing such variation in leaf morphology continually took me by surprise!

Weed scientists from around the world attended this conference, and I appreciated hearing the varied perspectives on

herbicide resistance, invasion ecology, and conservation. I presented my dissertation work on reclamation of shale gas development at the conference. We have found that perennial grasses native to the NA prairie establish well with minimal weed control and tolerate the soil compaction typical of a reclaimed gas well pad.

I also had the incredible opportunity to shadow researchers in Dr. Petr Pyšek's Invasion Ecology Lab at the Institute of Botany, part of the Academy of Sciences of the Czech Republic. The Institute is located in the majestic Průhonice Castle surrounded by a 250-hectare park and botanical gardens, recently named a UNESCO World Heritage Site. I went on field trips to observe forest understory invasive plants, and hiked through vineyards, old roads, and field edges in southern Moravia searching for *Bromus tectorum*, native to Europe and a notorious invader of the American west.

I would like to thank Dr. Frank A. Andersen and the Andersen Travel Award Committee for their support of this incredible learning adventure.



Left: a male sweat bee (*Agapostemon*) on a thistle (*Carduus acanthoides*)

Right: a cuckoo bee drying off early in the morning

(Photos by Laura Russo).

What is our next move? U.S. investigators formulate coral bleaching research priorities for the National Science Foundation

By Andrea Chan

The recent global coral bleaching event has captured a lot of international headlines, especially with the severe bleaching on the northern sector of the Great Barrier Reef in Australia. This awareness has alarmed the public and scientists alike, and has caused them to ask, "What can be done?"

A group of leading U.S. coral researchers and their graduate students convened in Honolulu last summer to discuss where the scientific community should be headed to close the most significant knowledge gaps in coral bleaching research. Three Penn State professors (Iliana Baums, Todd LaJeunesse, and Roberto Iglesias-Prieto) and one PSU graduate student (myself) attended the workshop.

After some introduction provided by NSF affiliates, we broke into smaller working groups based on primary discipline. There was a molecular based group (where I was placed) as well as an organism-level group and an ecosystem-level group. It was so great to be able to brainstorm solutions for this global issue with a diverse assemblage of scientists bringing their own backgrounds and experiences.

At the end of two days, all of the working groups reconvened and identified their lists of priorities for future funding. Common themes included the need for standardized bleaching experiments, the desire for more collaboration (especially across disciplines), and the need to synthesize existing data on coral bleaching to advance reef conservation. A white paper encompassing the research goals discussed in this workshop is currently being written under the direction of Mark Warner (University of Delaware), and will be presented to NSF once it is complete.

I feel extremely fortunate to have been able to participate in such a worthy effort, and I look forward to continuing my work on corals and thermal tolerance.



A bleached colony of pillar coral, *Dendrogyra cylindrus*, in the Florida Keys. Photo credit: Cindy Lewis, Keys Marine Laboratory

Recent Publications

- Chen W, Koide RT, Adams TS, DeForest JL, Cheng L, Eissenstat DM. 2016. Root morphology and mycorrhizal symbioses together shape nutrient foraging strategies of temperate trees. *Proceedings of the National Academy of Sciences* 113: 8741-8746.
- Cheng L, Chen W, Adams TS, Wei X, Li L, McCormack ML, DeForest JL, Koide RT, Eissenstat DM. 2016. Mycorrhizal fungi and roots are complementary in foraging within nutrient patches. *Ecology* 97: 2815-2823
- Derham K, Henley M, Schulte B. 2016. Wire netting reduces African elephant (*Loxodonta africana*) impact to selected trees in South Africa. *Koedoe* 58.
- Kammerer, MA, Biddinger DJ, Joshi NK, Rajotte EG, Mortensen DA. 2016. Modeling local spatial patterns of wild bee diversity in Pennsylvania apple orchards. *Landscape Ecology* 31 (10): 2459-2469.
- Liang S, Hurteau MD, Westerling AL. 2016. Response of Sierra Nevada forests to projected climate-wildfire interactions. *Global Change Biology*. 10.1111/gcb.13544
- McCormack ML, Iversen CM, Eissenstat DM. 2016. Moving forward with fine-root definitions and research. *New Phytologist* 212: 313. DOI: 10.1111/nph.14100
- McCormick GL, Robbins T, Cavigelli S, Langkilde T. 2017. Ancestry trumps experience: Transgenerational but not developmental stress affects the physiological stress response. *Hormones and Behavior* 87: 115-121.
- Muñoz DJ, Miller DAW, Sutherland C, and Grant EHC. 2016. Using Spatial Capture-Recapture to Elucidate Population Processes and Space-Use in Herpetological Studies. *Journal of Herpetology* 50(4): 570-581.
- Murrell EG, Schipanski ME, Finney DM, Hunter MC, Burgess M, LaChance JC, Baraibar B, White CM, Mortensen DA, and Kaye JP. 2016. Achieving diverse cover crop mixtures: Effects of planting date and seeding rate. *Agronomy Journal*. doi:10.2134/agronj2016.03.0174
- Radville L, Bauerle TL, Comas LH, Marchetto KA, Lakso AN, Smart DR, Dunst RM, Eissenstat DM. 2016. Limited linkages of above-ground with belowground phenology: a study in grape. *American Journal of Botany* 103: 1-15
- Radville L, Post E, Eissenstat DM. 2016. Root phenology in an Arctic shrub-graminoid community: The effects of long-term warming and herbivore exclusion. *Climate Change Responses* DOI: 10.1186/s40665-016-0017-0
- Schrey AW, Robbins TR, Lee J, Dukes D W Jr., Ragsdale AK, Thawley CJ and Langkilde T. 2016. Epigenetic response to environmental change: DNA methylation varies with invasion status. *Environmental Epigenetics* 2: dvw008.
- Smith LA, Eissenstat DM, Kaye MW. 2016. Variability in aboveground carbon driven by slope aspect and curvature in an eastern deciduous forest, USA. *Canadian Journal of Forest Research* DOI: 10.1139/cjfr-2016-0147
- Sullivan P, Ma L, West N, Jin L, Karwan DL, Noireaux J, Steinhofel G, Gaines KP, Eissenstat DM, Gailardet J, Derry LA, Meek K, Hynek S, Brantley SL 2016. CZ-tope at Susquehanna Shale Hills CZO: Synthesizing multiple isotope proxies to elucidate Critical Zone processes across timescales in a temperate forested landscape. *Chemical Geology* 45: 103-119.
- Sutherland C, Muñoz DJ, Miller DAW, and Grant EHC. 2016. Spatial Capture-Recapture: A Promising Method for Analyzing Data Collected Using Artificial Cover Objects. *Herpetologica* 72(1): 6-12.
- Trocha L, Rudy E, Chen W, Dabert M, Eissenstat DM. 2016. Linking the respiration of fungal sporocarps with their nitrogen concentration: variation among species, tissues, and guilds. *Functional Ecology* 30: 1756-1768.
- Williams A, Hunter MC, Kammerer M, Kane DA, Jordan NR, Mortensen DA, Smith RG, Snapp SS, and Davis AS. 2016. Soil water holding capacity mitigates maize production downside risk and volatility in US rainfed maize: Time to invest in soil organic matter? *PLOS ONE* 11: 0160974.
- Williams A, Kane DA, Ewing PM, Atwood LW, Jilling A, Li M, Lou Y, Davis AS, Grandy AS, Huerd SC, Hunter MC, Koide RT, Mortensen DA, Smith RG, Snapp SS, Spokas KA, Yannarell AC, Jordan NR. 2016. Soil Functional Zone Management: A Vehicle for Enhancing Production and Soil Ecosystem Services in Row-Crop Agroecosystems. *Frontiers in Plant Science* 7, Article 65.

Fellowships, Awards, Grants, and Achievements

Katriona Shea elected Fellow of Ecological Society of America

Ken Tamminga was promoted to Distinguished Professor of Landscape Architecture

Erynn Maynard was awarded the Huck Graduate Research Innovation Grant

Laura Russo received a Marie Curie Sklodowska Fellowship to work at Trinity College, Dublin for two years

David Muñoz received College of Agricultural Sciences Competitive Ag Grant

Mitch Hunter was awarded first place in the grad student competition at the Global Climate Change community oral session of the American Society of Agronomy meeting in Phoenix, AZ entitled "Cover Crops and Drought: Implications for Climate Resilience."

Ecology Program Donations:

A gift may be made by phone at 814-863-2052 or toll free 1-888-800-9163. An online gift may be made at giveto.psu.edu by checking the "Other" box under University-wide giving and following the steps, noting one of the following designations in the appropriate box: Andersen Ecology Travel Award or the Ecology Graduate Degree Program.

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