

**Department of Ecology, Evolution, and Natural Resources
and
Ecology and Evolution Graduate Program Newsletter**

November 2011

Previous newsletters may be found at:

<http://www-rci.rutgers.edu/~deenr/news.html>

Presentations:

Josh Caplan, a post-doc working with Jason Grabosky, gave a seminar at Temple University on September 22nd titled "Invasive plants and environmental resources: the case of Himalayan blackberry"

Siobain Duffy gave the following invited presentations:

- The speed and mechanisms of geminivirus molecular evolution. 22nd Brazilian Virological Society Annual Meeting, Atibaia, Brazil (10/25/11)
- How do geminiviruses viruses evolve as quickly as RNA viruses? 4th European Whitefly Symposium, Faculty of Agriculture, Rehovot, Israel (9/15/11)
- How do ssDNA viruses evolve as quickly as RNA viruses? DIMACS/MBI US-African BioMathematics Workshop on Genetics and Disease Control (8/8/11-8/12/11)

And the following posters:

- D.J. Cardinale and S. Duffy. Bacteriophage genomic architecture constrains optimal codon usage. DIMACS Conference on Effects of Genome Structure and Sequence on the Generation of Variation and Evolution, Piscataway, NJ 8/11
- E.S. Ho and S. Duffy. Co-evolution of polyadenylation site between DNA viruses and hosts. DIMACS Conference on Effects of Genome Structure and Sequence on the Generation of Variation and Evolution, Piscataway, NJ 8/11
- Y.M. Seah and S. Duffy. Evolutionary dynamics of viruses in tropical and non-tropical regions. DIMACS/MBI US-African BioMathematics Workshop on Genetics and Disease Control. Elmina, Ghana, 8/11
- A.L. Hicks and S. Duffy. Genus-specific substitution rate variability among picornaviruses. American Society for Virology, Minneapolis, MN 7/11
- J.A. McConnell and S. Duffy. Evolution of chicken anemia virus. American Society for Virology, Minneapolis, MN 7/11



There was a good turnout of Rutgers fisheries scientists at the annual meeting of the American Fisheries Society in Seattle during the first week of September. From left to right in the photo: Mikaela Provost (grad student, Oceanography), Philipp Neubauer (post-doc, IMCS), **Talia Young** (E&E grad student working with Olaf Jensen), **Olaf Jensen** (IMCS), John Wiedenmann (Research associate, IMCS), and Matt Yergey (grad student, Oceanography). **Olaf Jensen** gave a presentation titled "Understanding the Portfolio Effect"

Judy Weis (Rutgers, NJIT Federated Departments of Biology) gave a talk on her recent book [Do Fish Sleep?](#) at the Aquarium of the Pacific in Long Beach CA on Oct. 18th.

Steven Handel was invited to present the 2011 Howland Memorial Lecture at the University of Virginia School of Architecture on November 6. He lectured on the links between restoration ecology and designing sustainable landscapes.

Rebecca Jordan gave the following presentations:

- 2011 New Jersey Science Convention; Biology Teachers Association of New Jersey invited speaker. October 12. Rubrics, Case Studies, Enduring Understanding...Oh My! (Co presented with Judith McLoughlin)
- 2011 University of North Carolina. Citizen Science and Outreach Seminar. September 20. Public Participation in Ecological Research: Promoting Collaborative Science and Learning.

Nick Pollock, a Ph.D. student, in the Henry John-Alder lab, gave herpetology presentations to middle school students in a 4-H program at Rutgers on October 15th. Nick talked about herps from around the world, but focused mainly on those from California and New Jersey. The live animals he brought to show the students included crested geckos, his Russian tortoise (named Norman), and a Columbian red-tail boa.

Publications:

Siobain Duffy reports new publications:

- Sharma, J. Wang, S. Duffy, S. Zhang, M. Wong, A. Rashed, M. Cooper, K. Daane, R. Almeida. 2011. Hierarchical genetic analysis of a plant disease caused by a virus complex. *PLoS One*. 6:e26227.
- R. Acosta-Leal, S. Duffy, Z. Xiong, R. Hammond. And S.F. Elena. 2011. Advances in plant virus evolution: Translating evolutionary insights into better disease management. 2011. *Phytopathology*. 101:1136-1148.

Jeremy Feinberg, a Ph.D. candidate working with Joanna Burger, reports a publication:

- Feinberg, J., K. Bartlett, D. Howe, J. Burger, and T. Green. 2011. Potential connections between mosquitoes and the demise of a regional frog population on Long Island, New York. In H. Rupp (Ed.), *Proceedings of the 98th Annual Meeting of the New Jersey Mosquito Control Association, Inc.*, pp. 50-53. New Jersey Mosquito Control Association, Inc., Lindenwold, NJ.

Steven Handel and **Myla Aronson** (Ph.D. 2006, Steven Handel advisor) have the following publication:

- Aronson, M. F. J., and S. N. Handel. 2011. Deer and invasive plant species suppress forest herbaceous communities and canopy tree regeneration. *Natural Areas Journal* 31: 500-507.

Karlo Hock, a post-doc in the Nina Fefferman lab, reports the following publications:

- Hock, K. & Fefferman, N.H. Extending the role of social networks to study social organization and interaction structure of animal groups. *Annales Zoologici Fennici*, in press.
- Hudina, S., Hock, K. Zganec, K. & Lucic, A. Changes in population characteristics and structure of the signal crayfish at the edge of its invasive range in a European river. *Annales de Limnologie - International Journal of Limnology*, in press.
- Daws, A.G., Hock, K. & Huber, R. (2011). Spatial structure of hierarchical groups: testing for processes of aggregation, clustering, and spatial centrality in crayfish (*Orconectes rusticus*). *Marine and Freshwater Behaviour and Physiology* 44:209-222.
- Hock, K. & Fefferman, N.H. (2011). Violating social norms when choosing friends: how rule-breakers affect social networks. *PLoS ONE* 6:e26652.

The above paper from *PLoS ONE* has also been featured on the SciGuru website under the title "Choosing Friends Wisely? Rule-breakers Affect Social Networks"; for more information :

<http://www.sciguru.com/newsitem/10870/Choosing-Friends-Wisely-Rule-breakers-Affect-Social-Networks>

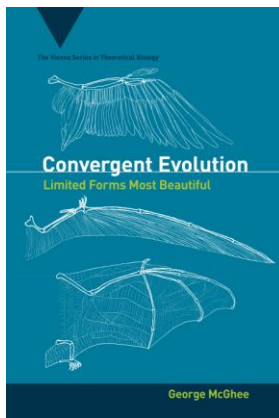
Rebecca Jordan reports the following publications:

- Jordan, RC, D Howe, S Gray, WR Brooks, & JG Ehrenfeld. Knowledge gain and behavioral change in citizen science programs. *Conservation Biology*. Early View DOI: 10.1111/j.1523-1739.2011.01745.x
- Jordan, R.C., M. Ruibal-Villasenor, and E. Etkina. 2011 Laboratory materials: Affordances or constraints. *Journal of Research in Science Teaching* 48: 1010-1025.
- Vattam, S., A. Goel, S. Rugaber, C. Hmelo-Silver, R. Jordan, S. Gray, and S. Sinha. 2011. Understanding complex natural systems by articulating Structure-Behavior-Function models. *Educational Technology and Society* 14: 66-81.

- Hmelo-Silver, C. R. Jordan, L. Liu, and E. Chernobilsky. 2011. Representational Tools for Understanding Complex Computer-supported Collaborative Learning Environments: Chapter 4. Pgs 83-106. Computer Supported Collaborative Learning Methodology Manual (Hmelo-Silver et al., eds.).

Julie Lockwood reports her two latest publications:

- Kuebbing, S., Simberloff, D. and Lockwood J.L. Species origins do matter. *The Scientist*. September 28, 2011
- Blackburn, T.M., T.A.A. Prowse, J.L. Lockwood and P. Cassey. Passerine introductions to New Zealand show a positive effect of propagule pressure on establishment success. *Biodiversity and Conservation*, 20: 2189-2199.



George McGhee (Department of Geology) has written a new book in evolutionary theory that has just been published.

McGhee, G. R. 2011. Convergent Evolution: Limited Forms Most Beautiful. Vienna Series in Theoretical Biology; Massachusetts Institute of Technology Press, Cambridge (MA), 322 pp.

The MIT Press website describing the book is:

<http://mitpress.mit.edu/catalog/item/default.asp?type=2&tid=12726>

Marci Meixler reports the following publication

- Meixler, M. S. and M. B. Bain. 2011. Predicting ecological outcomes of stream creation using fish community attributes. *Ecological Engineering* 37: 1420-1424.

Rachael Winfree (Department of Entomology) reports the following publication which was dedicated to Joan Ehrenfeld:

- Winfree, R., I. Bartomeus, and D. P. Cariveau. Native Pollinators in Anthropogenic Habitats, *Annual Review of Ecology, Evolution and Systematics*. 2011. 42:1–22

The Winfree labs research is also featured in this Nature Commentary in the November 10th issue. <http://www.nature.com/news/the-pollinator-crisis-what-s-best-for-bees-1.9308>

Chengyi Yan, a Ph.D. student working with Paul Falkowski, has the following publication:

- Yan, C, O Schofield, Z Dubinsky, D Mauzerall, PG Falkowski and MY Gorbunov. 2011. Photosynthetic energy storage efficiency in *Chlamydomonas reinhardtii*, based on microsecond photoacoustics. *Photosynthesis Research* 108: 215-224. DOI: 10.1007/s11220-011-9682-9

Faculty Achievements and Activities:

There is an in-depth news article in last week's issue of *Science* about our colleague, Robert Trivers.



<http://www.sciencemag.org/content/334/6056/589.full>

The BioBlitz at Sandy Hook on Sept 16-17, 2011, was an intense effort by over 150 scientists and volunteers to find as many species as possible in 24 hours. Organized by the American Littoral Society and National Park Service, Rutgers was one of the partners that provided taxonomic expertise.

The plant team was lead by **Lena Struwe** with great help from the Rutgers' Naturalist Club, Nancy Slowik, and **Laura Shappell** (below left). The fungi were inventoried by a team lead by Rutgers E&E graduate student **Chris Zambell** (right). They discovered over 20 different species of fungi.



Additional teams were lead by DEENR's **Richard Lathrop** (nocturnal animals and birds), and IMCS's **Olaf Jensen** (fishes). Many additional Rutgers faculty and students were involved in species observation and identification. The most species were found by the invertebrate group, who counted 450 species, the bird team also counted an impressive 104 species.

The recent flooding from Hurricane Irene had destroyed large parts of the vegetation, but the terrestrial plant team of over 30 botanical enthusiasts managed to find at least 200 plant species. The flora at Sandy Hook is unique in its combination of a harsh coastal environment together with large human disturbance. The most common woody plant was probably poison ivy, but there were also several more uncommon species. Due to the flooding of many New Jersey rivers, the devil's head-like horned fruits of the invasive aquatic plant water caltrop, normally found in lakes in the New Jersey Highlands, had washed out to sea and stranded on Sandy Hook where it was found during the BioBlitz.



Lena Struwe was part of a collaborative effort in the discovery of a new plant species in Bahia, Brazil.

"It is very easy to think we have found and described most plant species of the world already, but this discovery shows that there are so much left out there without name and recognition," says Struwe, adding: "This discovery shows that the most amazing living things can be found when you least expect it, during times and places when you really aren't looking for something new, and suddenly it is right there in front of you. How many of us haven't had the most brilliant ideas in the shower? The art of taxonomy is finding as well as being able to recognize something as new or different, which is hard when the world is home to millions of species and very few species experts."

For the Science Daily story please visit:

<http://www.sciencedaily.com/releases/2011/09/110914115842.htm>

Judy Weis (Rutgers, NJIT Federated Departments of Biology) is in Paris, France the week of November 7 for the committee writing the Water chapter for the 5th Global Environment Outlook (GEO-5) for the United Nations Environment Programme (UNEP).

Grants:

Steven Handel and **Christina Kaunzinger** (Ph.D. 2000; advisor Peter Morin) received \$9,000 from the American Chestnut Foundation for 1 year, to explore the performance of chestnut strains in restoration of local woodland biodiversity.

Molly MacLeod, a Ph.D. student in the Rae Winfree lab, received a \$500. travel grant from the Rutgers Women in Science (STEM) to attend and present at the Entomological Society meeting in Reno NV later this month.

Transitions:

Congratulations to the following the successful defense of their Ph.D. Dissertations:

- **Maria Stanko**, advisor Peter Morin, on September 16th
- **Ileana Perez-Rodriguez**, advisor Costantino Vetriani, September 30th.

Congratulations to **Paul Reiss**, advisor Ken Able, on the successful defense of his Preliminary Proposal on September 2nd.

Congratulations to the following the successful completion of their Qualifying Exam:

- **Karen Wylie**, advisor Nina Fefferman, on September 20th.
- **Curtis Burkhalter**, advisor Julie Lockwood, on November 7th.
- **Kevin Aagaard**, advisor Julie Lockwood, on November 14th.

Alumni:

Marielle Anzelone, (M.S. 2000, advisor JeanMarie Hartman) has a 13-week series in the New York Times City Room column where she is describing the changes in a patch of forest in Inwood Hill Park each week.

<http://cityroom.blogs.nytimes.com/2011/09/23/autumn-unfolds-in-a-patch-of-urban-forest/>

Martin Cipollini (Ph.D. 1991, advisor Ted Stiles) was named Dana Professor of Biology at Berry College. The endowed chair honors those "long history of excellence in teaching, scholarly work, and service."

Dom D'Amore (Ph.D. 2009, advisor Kathleen Scott) has the following publication:

- D'Amore DC, Moreno K, McHenry CR, Wroe S (2011) The Effects of Biting and Pulling on the Forces Generated during Feeding in the Komodo Dragon (*Varanus komodoensis*). *PLoS ONE* 6(10): e26226. doi:10.1371/journal.pone.0026226

John H. Graham (Ph.D. 1986, advisor Robert Vrijenhoek) Reid Professor of Biology at Berry College, Mount Berry, Georgia, has the following publications and presentations:

- Graham, J.H and Duda, J.J. 2011. The hump-backed species richness curve: a contingent rule for community ecology. *International Journal of Ecology* 2011, 1-15, doi:10.1155/2011/868426
- Ostberg, C.O., Duda, J.J., Graham, J.H., Zhang, S., Haywood, K.P. III, Miller, B., and Lerud, T.L. 2011. Growth, morphology, and developmental instability of rainbow trout, Yellowstone cutthroat trout, and four hybrid generations. *Transactions of the American Fisheries Society* 140: 334-344.
- Raz, S., Graham, J.H., Hel-Or, H., Pavlíček, T. and Nevo, E. 2011. Developmental instability of vascular plants in contrasting microclimates at "Evolution Canyon." *Biological Journal of the Linnean Society* 101: 786-787, doi: 10.1111/j.1095-8312.2011.01615.x
- Raz, S., Graham, J.H., Hel-Or, H., Pavlíček, T., and Nevo, E. Environmental stress and fluctuating asymmetry of vascular plants in contrasting microclimates at "Evolution Canyon." 6th FISEB, Federation of the Israel Societies for Experimental Biology, Eilat, Israel, 7-10 February 2011 (poster by Raz)
- Graham, J.H., Poe, A., Tarpley, L., Lanning, S., and Schwartz N. RNAi silencing of neurotransmitters and their degradative enzymes increases fluctuating asymmetry of sensory bristles in *Drosophila melanogaster*. Annual Meeting of the Society for the Study of Evolution, Norman, OK. 17-21 June 2011 (Oral by Graham)

David La Puma, Ph.D 2009, advisor Julie Lockwood) I was featured in a documentary produced by New Hampshire Public Television entitled Saving Songbirds. You can read about it here: <http://www.nhptv.org/songbirds/>

The program has been airing in the New England region for the last month, and will be going national after Jan 1.

David talked about nocturnal migration and the use of radar and acoustics (microphones) to characterize and quantify migration 100s - 1000s of feet overhead, under the cover of darkness.

You can watch the program in its entirety at the following link:

<http://video.pbs.org/video/2148904255>

Amy Tuninga (Ph.D. 2000, advisor John Dighton) has been named the Associate Dean in the Graduate School of Arts and Science at Fordham University. They have some exciting new initiatives that Amy is working on with the New York Botanical Garden, The Bronx Zoo, The Central Park Zoo, The American Museum of Natural History, and Albert Einstein School of Medicine. Her latest adventure involved a trek into the world of improv. There were some folks from Rutgers at a week-long summer institute she attended at SUNY Stony Brook School of Journalism. The intent is to improve scientists' communication through improv training. She is working with folks at Fordham now to start a program there.

The E&E family continues to grow:

Lillian Mellor Thompson arrived November 4. Lillian is the daughter of **David Mellor** (Ph.D 2010, advisor Rebecca Jordan) and Cami Thompson. Her dad describes her this way: “3.2 kg, blond hair, blue eyes, powerful lungs and an engaging conversationist.” Mom and Lillian are reported to be doing very well.

