David J. Harris (DavHarris@UCDavis.edu)
PhD Candidate: UC Davis Population Biology
Curriculum Vitae (March 22, 2015)

Research interests

I develop methods for analyzing high-dimensional ecological data, such as the abundances of all the species in large assemblages. I am especially interested in designing models that can explain why radically different communities can occur under apparently-similar environmental conditions. I use a combination of theory-driven statistical modeling and machine learning techniques to ensure that my predictions are consistent with both ecological knowledge and with the data. My work also focuses on combining information from a variety of incomplete data sources, including data from aerial sensors and citizen scientists to make stronger inferences than would be possible from a single source of occurrence data.

Current work:

Postdoctoral researcher at University of Florida

Doctoral work:

2008-2015: PhD student in Population Biology at UC Davis

Previous Education:

2008 A. B. (Biology). Washington University in St. Louis

Additional training:

2013: NCEAS Summer Institute (*3 weeks training in data management and statistics*)

2012: UCLA IPAM Graduate Summer School (*3 weeks training in machine learning*)

2005-2006: MSU ELME Fellowship (*2 summers of training in field ecology and statistics*)

Awards:

Best Poster Award for the UC Davis Graduate Symposium in Ecology (2014)

Ruth Patrick Student Poster Award for best student poster at the American Society of Naturalist's "21st Century Naturalists" meeting (2014)

E. C. Pielou Award for best student oral presentation in statistical Ecology at the Ecological Society of America meeting (2012)

National Science Foundation Graduate Research Fellowship (Awarded 2009)

Michigan State University summer fellowship for Enhancing Linkages between Mathematics and Ecology (Awarded 2005)

Peer-reviewed publications:

DJ Harris. Inferring species interactions from co-occurrence data with Markov networks. In press at *Ecology*.

DJ Harris 2015. Generating realistic assemblages with a Joint Species Distribution Model. *Methods in Ecology and Evolution*.

A Lack of Crowding? Body Size Does Not Decrease with Density for Two Behavior-Manipulating Parasites. 2014. KL Weinersmith, CB Warinner, V Tan, **DJ Harris**, AB Mora, AM Kuris, KD Lafferty, RF Hechinger. *Integrative and comparative biology.*

I. S. Pearse, **D. J. Harris**, R. Karban and A. Sih 2013. Predicting novel herbivore–plant interactions. *Oikos*, 122: 1554–1564.

Pruitt JN, S. E. Riechert, and **D. J. Harris** 2011. Reproductive consequences of male body mass and aggressiveness depend on females' behavioral types. *Behavioral Ecology and Sociobiology*, 65: 1957-1966.

Harris, D. J., K. G. Smith, and P. J. Hanly. 2011. Occupancy Is Nine-Tenths of the Law: Occupancy Rates Determine the Homogenizing and Differentiating Effects of Exotic Species. *The American Naturalist*, 177: 535-543

Lankau, R., P. S. Jørgensen, **D. J. Harris**, and A. Sih. 2011. Incorporating evolutionary principles into environmental management and policy. *Evolutionary Applications*, 4: 315–325

Sih, A., M. C. O. Ferrari, and **D. J. Harris** 2011. Evolution and behavioural responses to human-induced rapid environmental change. *Evolutionary Applications*, 4: 367–387

Teaching experience (college/graduate level)

Assistant instructor for two Software Carpentry workshops (UC Davis 2014 and Utah State University 2015) and Data Carpentry workshops (UC Davis 2015)

Leader for R workshop, sponsored by the John Muir Institute for the Environment (UC Davis 2014)

Teaching assistant for the graduate course ANT 298, "Statistical Rethinking" (UC Davis, 2012, 2014)

Teaching Assistant for BioSci 2B, introduction to ecology and evolution (UC Davis, 2009, 2013-2015)

Leader for Undergraduate Statistics Workshop (UC Davis, 2010)

Introductions to Monte Carlo and Maximum Likelihood for the Davis R Users Group (2013)

Teaching experience (other)

Volunteer assistant biology teacher at Winters High School (Winters, CA, 2010)

Senior after-school science club leader at Delmar Harvard Elementary School (St. Louis, MO, 2007-2008)

Assistant coach for the Okemos High School debate team (Okemos, MI, 2004-2006)

Invited oral presentations

Invited talk for the organized oral session on "The role of biotic interactions in structuring species distributions" at the 2015 annual meeting of the Ecological Society of America.

Invited talk at the UC Berkeley Museum of Vertebrate Zoology: "Predicting whole avian assemblages with a co-occurrence model," 2014.

Invited talk to the Statistical Learning group at Stanford University. "Multi-species distribution modeling," 2012.

Other oral presentations:

Harris, D. J. Process-driven statistical models of species composition. Ecological Society of America meeting, 2014.

Harris, D. J. Statistical models of community assembly. Gordon Research Conference on Unifying Ecology Across Scales, 2014.

Harris, D. J. Generating realistic species assemblages. Ecological Society of America Meeting, 2013.

Harris, D. J. Interpretable, accurate predictions of species distributions and community composition: Making the most of prior information. Ecological Society of America Meeting, August 9, 2012. *(E.C. Pielou award for best student presentation in ecological statistics)*

Harris, D. J., M. C. O. Ferrari, and A. Sih. Behavior in a changing world: Uniting models and data. Ecological Society of America Meeting, August 2, 2010.

Harris, D. J. and K. G. Smith. When will invasive species homogenize or differentiate communities? An occupancy-based null model of the effects of species invasions. Ecological Society of America Meeting, August 7, 2008.

Posters:

Harris, D. J. Predicting species composition when environmental drivers are missing. American Society of Naturalist's "21st Century Naturalists" meeting, January 2015. (*Ruth Patrick Award for best student poster*)
http://dx.doi.org/10.6084/m9.figshare.899720

Software:

`blender` is an R package for estimating biotic homogenization and differentitaion, as described in Harris et al. (2011). The package is available from the Comprehensive R Archive Network at http://cran.r-project.org/web/packages/blender/index.html.

`mistnet` is an R package for stochastic, nonlinear modeling occupancy and co-occurrence data for large assemblages, as described in Harris (2015). The package is available from Github at https://github.com/davharris/mistnet

`BayesComm` is an R package originally written by Nick Golding that fits a linear version of the models described by `mistnet` (above). My contributions to the software include added functionality and performance improvements. The package is available from https://github.com/goldingn/BayesComm

Service:

Served as a peer reviewer for *Methods in Ecology and Evolution* (x2), *Conservation Letters, Ecography* (x2), *Ecology*, *PeerJ,* and *Proceedings of the Royal Society B*.

For additional service activities, see the "teaching" sections above.

References:

Ethan White: *Associate Professor in Wildlife Ecology and Conservation.* ethanwhite@ufl.edu

Andrew Sih: *Distinguished Professor in Environmental Science and Policy.* asih@ucdavis.edu 530-754-7243

Robert Hijmans: *Associate Professor in Geography.* rhijmans@ucdavis.edu 530-752-6555

Richard McElreath: *Associate Professor in Anthropology.* mcelreath@ucdavis.edu 530-752-2660