

David J. Harris (DavHarris@UCDavis.edu)
PhD Candidate: UC Davis Population Biology
Curriculum Vitae (updated Jan 31, 2014)

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 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 unexpected patterns in the data. My work also focuses on combining information from a variety of incomplete data sources to make stronger inferences than would be possible from a single source.

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:

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

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)

Publications:

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)

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)

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)

Oral presentations:

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 differentiation, 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 I am currently developing to model occupancy and co-occurrence data for large assemblages. To be made open source in February 2014.

References:

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

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

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