

HENRY R. SCHARF

CONTACT INFORMATION Department of Mathematics (520) 360-9579
University of Arizona hscharf@math.arizona.edu
Tucson, AZ <https://www.math.arizona.edu/~hscharf/>

RESEARCH EMPLOYMENT *Assistant Professor* 2023–Current
University of Arizona, Tucson, Arizona
Assistant Professor 2019–2023
San Diego State University, San Diego, California
Postdoctoral Fellow 2018–2019
Colorado State University, Fort Collins, Colorado

EDUCATION **Colorado State University, Fort Collins, Colorado USA**
PhD in Statistics 2017
Advisor: Mevin Hooten
MS in Statistics 2014
University of Arizona, Tucson, Arizona USA
MEd in Teaching and Teacher Education 2008
BS in Mathematics and Physics 2007
Cum laude with Honors

PUBLICATIONS **Scharf, H. R.**, J. Schierbaum*, H. Matsumoto, T. Assal (2024). Predicting species-level vegetation cover using large satellite imagery data sets. *Journal of Agricultural, Biological and Environmental Statistics*.

McFadden A. J.*, A. D. Stow, P. J. Riggan, R. Tissell, J. O’Leary, **H. R. Scharf** (2024). Estimating Fire Radiative Energy Density with Repeat-Pass Aerial Thermal-Infrared Imaging of Actively Progressing Wildfires. *Fire*, 7(6):179.

Williams, P. J., X. Lu, **H. R. Scharf**, M. B. Hooten (2023). Embracing asymmetry in nature: How to account for skewness in ecological data. *Ecological Informatics*, 75: 102085.

Boulil, Z. L.*, J. W. Durban, H. Fearnbach, T. W. Joyce, S. G. M. Leander, **H. R. Scharf** (2023). Detecting changes in dynamic social networks using multiply-labeled movement data. *Journal of Agricultural, Biological and Environmental Statistics*, 28: 243–259.

Scharf, H. R. (2022). Local indicators of spatial association (LISA). *Wiley StatsRef: Statistics Reference Online*.

Scharf, H. R., X. Lu, P. J. Williams, M. B. Hooten (2022). Constructing flexible, identifiable and interpretable statistical models for binary data. *International Statistical Review*, 90: 328–345.

*Student contributor

Raiho, A. M., **H. R. Scharf**, C. A. Roland, D. K. Swanson, S. E. Stehn, and M. B. Hooten (2022). Searching for refuge: A framework for identifying site factors conferring resistance to climate-driven vegetation change. *Diversity and Distributions*, 28(4), 793–809.

Scharf, H. R., A. M. Raiho, S. Pugh, C. A. Roland, D. K. Swanson, S. E. Stehn, M. B. Hooten (2022). Multivariate Bayesian clustering using covariate-informed components with application to boreal vegetation sensitivity. *Biometrics*, 78: 1427–1440.

Reimer, J. R., J. Arroyo-Esquivel, J. Jiang, **H. R. Scharf**, E. M. Wolkovich, K. Zhu, C. Boettiger (2021). Noise can create or erase long transient dynamics. *Theoretical Ecology*, 14: 685–695.

Scharf, H. R. (2021). Statistical analysis of animal movement: Understanding behavior through hierarchical parametric models. *Notices of the American Mathematical Society*, 68(6), 911–924.

Scharf, H. R., F. Buderman (2020). Animal movement models for multiple individuals. *Wiley Interdisciplinary Reviews: Computational Statistics*, e1506.

Scharf, H. R., M. B. Hooten, R. R. Wilson, G. M. Durner, T. C. Atwood (2019). Accounting for phenology in the analysis of animal movement. *Biometrics*, 75: 810–820.

Hooten, M. B., **H. R. Scharf**, J. M. Morales (2019). Running on empty: Recharge dynamics from animal movement data. *Ecology Letters*, 22, 377–389.

Hooten, M. B., **H. R. Scharf**, T. J. Hefley, A. T. Pearse, M. D. Weegman (2018). Animal movement models for migratory individuals and groups. *Methods in Ecology and Evolution*, 9, 1692–1705.

Scharf, H. R., M. B. Hooten, D. S. Johnson, J. W. Durban (2018). Process convolution approaches for modeling interacting trajectories. *Environmetrics*, e2487.

Scharf, H. R., M. B. Hooten, D. S. Johnson (2017). Imputation approaches for animal movement modeling. *Journal of Agricultural, Biological and Environmental Statistics*, 22(3), 335–352.

Hefley, T. J., K. M. Broms, B. M. Brost, F. E. Buderman, S. L. Kay, **H. R. Scharf**, J. R. Tipton, P. J. Williams, and M. B. Hooten. (2017). The basis function approach to modeling autocorrelation in ecological data. *Ecology*, 98(3), 632–646.

Scharf, H. R., M. B. Hooten, B. K. Fosdick, D. S. Johnson, J. M. London, and J. W. Durban. (2016). Dynamic social networks based on movement. *Annals of Applied Statistics*, 10(4), 2182–2202.

**SPONSORED
RESEARCH**

*Focused Next Steps for Behavioral and Physiological Response
Studies with Social Delphinids off Southern California*
Office of Naval Research, Marine Mammals and Biology.
Primary Institution: Southall Environmental Associates, Inc.
Sub-Award to UofA: \$130,000. Role: Co-PI.
Status: Funded

2024–2026

	<i>Factors affecting provisioning and foraging in rapidly changing landscapes</i>	2023–2026
	National Science Foundation, SBE. Total Award: \$329,849. Role: Co-PI. Status: Funded	
	<i>Collaborative Research: Pacific Alliance for Low-Income Inclusion in Statistics & Data Science</i>	2022–2028
	National Science Foundation, S-STEM. Total Award: \$5,000,000. Role: Co-PI 2022–2023. Status: Funded	
	<i>Visualizing trajectory uncertainty</i>	2021–2022
	University Grants Program, SDSU. Total Award: \$10,000. Role: PI. Status: Funded	
	<i>Broadening the impact and accessibility of animal movement models</i>	2020–2021
	University Grants Program, SDSU. Total Award: \$10,000. Role: PI. Status: Funded	
INVITED CONFERENCE PRESENTATIONS	<i>Predicting fine-scale taxonomic variation in landscape vegetation using large satellite imagery data sets</i>	2023
	EnviBayes Workshop on Complex Environmental Data, Fort Collins, CO, USA	
	<i>Detecting changes in dynamic social networks using unlabeled movement data</i>	2022
	Joint Statistical Meetings, Washington D.C., USA	
	<i>Detecting changes in dynamic social networks based on unlabeled movement data</i>	2021
	CMStatistics, London, UK	
	<i>Multivariate Bayesian clustering using covariate-informed components with application to boreal vegetation sensitivity</i>	2021
	Joint Statistical Meetings, Seattle, WA, USA	
	<i>Statistical models for dependent trajectories with application to animal movement</i>	2019
	Joint Statistical Meetings, Denver, CO, USA Topic contributed session for ISBA Savage Award finalists	
	<i>Animal movement models for migratory individuals and groups</i>	2018
	The Wildlife Society Annual Conference, Cleveland, OH Symposium: <i>Animal movement: Advances in movement modeling and their applications</i>	
	<i>Imputation approaches for animal movement modeling</i>	2018
	Joint Statistical Meetings, Vancouver, BC, Canada Invited session	

	<i>Dynamic Social Networks Based on Movement</i> Joint Statistical Meetings, Chicago, IL Student paper award winner (ENVR)	2016
DEPARTMENTAL SEMINARS	<i>Hierarchical statistical models can fuse multiple data sources and account for dependence in observational data</i> School of Natural Resources and the Environment, University of Arizona	2024
	<i>Detecting changes in dynamic social networks based on unlabeled movement data</i> Department of Mathematics and Statistics, California State University Long Beach	2021
	<i>Movement data reveal dynamic social relationships</i> Department of Statistics, University of British Columbia	2021
	<i>Movement data reveal dynamic social relationships</i> Department of Statistics, Kansas State University	2021
	<i>Multi-layered convolutional Gaussian process models for animal movement</i> Computational Sciences Research Center, San Diego State University	2020
	<i>Statistical models for heterogeneous animal movement</i> Department of Statistics & Data Science, University of Texas at Austin	2019
CONTRIBUTED PRESENTATIONS	<i>Identifying species-level vegetation cover using Sentinel-2 imagery</i> ASA Section on Statistics and the Environment Workshop, Provo, Utah	2022
	<i>Accounting for phenology in the analysis of animal movement</i> International Statistical Ecology Conference, University of St. Andrews, Scotland	2018
	<i>Process convolution approaches for modeling interacting trajectories</i> Joint Statistical Meetings, Baltimore, MD	2017
	<i>Process convolution approaches for modeling interacting trajectories</i> Statistics Department at Colorado State University, Fort Collins, CO. Poster	2017
	<i>Dynamic Social Networks Based on Movement</i> International Statistical Ecology Conference, Seattle, WA	2016
	<i>Spatiotemporal Models for Animal Social Structure</i> Joint Statistical Meetings, Seattle, WA	2015
	<i>Spatiotemporal Models for Animal Social Structure</i> Statistical and Applied Mathematical Sciences Institute ECOL: Transitional Workshop Research Triangle Park, NC	2015
	<i>Dynamic social networks based on movement</i> Graduate Student Showcase, Fort Collins, CO. Poster	2015

	<i>Spatiotemporal models for animal social structure</i>	2015
	Statistics Department at Colorado State University, Fort Collins, CO. Poster	
	<i>Novel visualization and analysis for extreme-scale wind turbine simulations</i>	2014
	Conference on Data Analysis, Santa Fe, NM. Poster	
TEACHING	<i>Design of Experiments</i> (Arizona: MATH/STAT 571B)	Spring 2024
	<i>Advanced Statistical Regression Analysis</i> (Arizona: MATH/STAT 571A)	Fall 2023
	<i>R Programming and Data Science</i> (SDSU: STAT 410)	Spring 2023 Fall 2022
	<i>Bayesian Statistics</i> (SDSU: STAT 676)	Spring 2022
	<i>Applied Spatio-Temporal Statistics</i> (SDSU: STAT 596/696)	Spring 2023 Spring 2021 Spring 2020
	<i>Statistical Computing</i> (SDSU: STAT 580)	Fall 2022 Fall 2021 Fall 2020
	<i>Introduction to Statistical Learning</i> (SDSU: STAT 596)	Fall 2019
ADVISING	<i>Masters students</i>	
	Hugo Rosales Portillo	Summer 2023
	Angelica Rivera	Spring 2023
	Navid Nezamabadi	Summer 2022
	Jonathan Schierbaum	Spring 2022
	Zaineb Boulil	Spring 2021
	Jennifer Betancourt	Spring 2021
	Kristine Dinh	Spring 2021
	<i>Undergraduate students</i>	
	Elena Dubocanin	Winter 2022
WORKSHOPS & SHORT COURSES	<i>Workshop: Statistical Models for Animal Movement</i> Co-instructor Day-long workshop on animal movement modeling with examples in R	
	International Association for Landscape Ecology annual meeting Fort Collins, CO, USA	2019
	International Statistical Ecology Conference University of St. Andrews, Scotland	2018

	<p><i>Training in Bayesian Modeling for Practicing Ecologists.</i> 2016 Co-instructor NSF-supported two-week workshop Intensive training in Bayesian modeling Colorado State University, Fort Collins, CO</p>	
	<p><i>R Workshop</i> 2015 Co-instructor Day-long tutorial on R for ecologists Colorado State University, Fort Collins, CO</p>	
	<p><i>Tutorial on Parallel Programming in R</i> 2015 Co-Developer Workshop on Parallel Computing, UC Boulder/CSU</p>	
	<p><i>Tutorial on Parallel Programming in R</i> 2015 Co-Developer Conference on Statistical Practice 2015, New Orleans, LA</p>	
AWARDS	<p>ISBA Savage Award - Applied Methodology 2018 <i>The Savage Award, named in honor of Leonard J. "Jimmie" Savage, is bestowed each year to two outstanding doctoral dissertations in Bayesian econometrics and statistics.</i> Amount: \$750 + \$500 travel support</p>	
	<p>James L., M. Leslie, & Edna Madison Memorial Award 2017 <i>This award is given each year to the student selected by the statistics faculty at Colorado State University as the outstanding graduate student in the Department of Statistics and/or the Department of Mathematics</i> Amount: \$675</p>	
SERVICE	<p>Program Officer: International Society for Bayesian Analysis Section on Environmental Statistics (EnviBayes) 2023-2024</p>	
	<p>Award committee for ISBA Savage Award - Applied Methodology for outstanding dissertations in Bayesian econometrics and statistics 2021</p>	
	<p>Secretary: American Statistical Association Section on Statistics and the Environment (ENVR) 2020</p>	
	<p>Treasurer: American Statistical Association Section on Statistics and the Environment (ENVR) 2019</p>	
	<p>Associate Editor: <i>Data Science in Science</i> 2021–Current <i>Stat</i> 2023–Current</p>	

Reviewer for the following journals:

Annals of Applied Statistics

Advances in Statistical Analytics

Bayesian Analysis

Biometrics

Computational Statistics and Data Analysis

Environmetrics

Environmental and Ecological Statistics

Journal of Agricultural, Biological, and Environmental Statistics

Journal of Computational and Graphical Statistics

Journal of the Royal Statistical Society: Series C

Network Science

Ecological Monographs

Ecology

Ecology and Evolution

Ecosphere

Methods in Ecology and Evolution

Movement Ecology

Network Science

Proceedings of the Royal Society: Series B

PLOS ONE

SOFTWARE

Scharf, H. R., K. Dinh*, H. Rosales*, A. Rivera* (2023). anipaths: Animation of observed trajectories using spline- or state-space model-based interpolation. R package version 0.10.2.

COMMITMENT TO DIVERSITY

Panelist: 2019 Career Issues Panel Women in Science Symposium 2019

Panel moderator, organizer: Women in Science Symposium 2018

Topics of discussion included:

Practical suggestions for recruiting, retaining, and promoting women

Insight into implicit and explicit bias

Tips to initiate your own Career Issues small group

Networking opportunities with men and women from academic, industry and the Front Range community to promote gender equality

Career issues

2015–Current

Graduate student-initiated discussion group made up of students, and junior, mid-career, and senior faculty from multiple departments.

Topics included: strategies for career advancement for women, awareness of systemic sexism in academia, and increasing participation of women in academia and STEM fields in particular.

OTHER CONFERENCES & WORKSHOPS

Participant in NIMBioS Investigative Workshop *Transients in Biological Systems*. 2019

Member of the working group *Network Models* in the SAMSI 2014-15 Program on Mathematical and Statistical Ecology (ECOL). 2014–2015

*Student contributor

Pan-American Advanced Studies Institute (Buzios, Brazil) 2014
Workshop focused on spatiotemporal statistics, with a special
emphasis on international collaboration.

Design and Analysis of Experiments Conference 2012

**PROFESSIONAL
AFFILIATIONS**

International Biometric Society 2017–Current
WNAR region

International Society for Bayesian Analysis 2017–Current

Institute of Mathematical Statistics 2015–Current

American Statistical Association 2013–Current
ENVR section