Derek Sonderegger
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Education

Ph.D.	Statistics, Colorado State University, 2010
M.S.	Statistics, Montana State University, 2004
B.S.	Mathematics, Montana State University, 2000
B.S.	Computer Science, Montana State University, 2000

Academic Positions

Aug 2011 to present – Assistant professor, Northern Arizona University

Feb 2010 to Aug 2011 – Post-doctoral research assistant, Washington State University and University of Wyoming

Honors

2010 – Boes Award for Excellence in Teaching – CSU Statistics Dept

2008 – James L., M. Leslie & Edna Madison Memorial Award for Outstanding Graduate Student in Mathematics or Statistics – CSU

2004 – NSF IGERT Fellowship under CSU PRIMES program

2000 – Montana State University Outstanding Undergraduate Mathematics Student

Publications

Olivas, S., Hornstra, H., Priestley, R.A., Kaufman, E., Hepp, C., **Sonderegger, D.L.**, Handady, K., Massung, R.F., Keim, P., Kersh, G.J., Pearson, T. (Accepted) Massive dispersal of Coxiella burnetii among cattle across the United States. *Microbial Genomics*

Chase, J., Fouquier, J., Zare, M., **Sonderegger, D.L.**, Knight, R., Kelly, S.T., Siegel, J., Caporaso, J.G. (2016) Geography and Location are the Primary Drivers of Office Microbiome Composition *mSystems* **1**(2) DOI:10.1128/mSystems.00022-16

Wigington, C., **Sonderegger, D.**, Brussaard, C.B.D., Buchan, A., Finke, J.F.., Fuhrman, J.A., Lennon, J.T., Middelboe, M., Suttle, C.A., Stock, C., Wilson, W.H., Wommack, K.E., Wilhelm, S.W., and Weitz, J.S. (2016) Re-examination of the relationship between marine virus and microbial cell abundances. *Nature Microbiology* 2:15024.

Guerrero, S., Beal, M., Lamb, C., **Sonderegger, D.**, and Baumgartel, D. (2015) Flipping undergradute finite mathematics: Findings and implications. *Problems, Resources, and Issues in Mathematics Undergraduate Studies* 9: 814-832.

Weitz, J. S., Stock, C. A., Wilhelm, S. W., Bourouiba, L., Buchan, A., Coleman, M. L., Follows, M. J., Fuhrman, J. A., Jover, L. F., Lennon, J. T., Middelboe, M., **Sonderegger, D. L.**, Suttle, C. A., Taylor, B. P., Thingstad, T. F., Wilson, W. H., Wommack, K. E. (2015) A multitrophic model to quantify the effects of marine viruses on microbial food webs and ecosystem processes. *ISME Journal* **9**: 1352-1364.

Evans, R. D., Koyama, A., **Sonderegger, D. L.**, Charlet, T. N., Newingham, B. A., Fenstermaker, L. F., Harlow, B., Jin, V. L., Ogle, K., Smith, S. D., Nowak, R. S. (2014) Greater ecosystem carbon in the Mojave Desert after ten years exposure to elevated CO2. *Nature Climate Change* **4**(5): 394-397.

Shiefer, E., Petticrew, E. L., Immell, R., Hassan, M. A., and **Sonderegger, D. L**. (2013) Land use and climate change impacts on lake sedimentation rates in western Canada. *Anthropocene*. 3: 61-71.

Sonderegger, D.L. and Hannig, J. (2013). Fiducal theory for free-knot splines. In *Contempory Developments in Statistical Theory: A Festschrift for Hira Lai Koul.* Springer International Publishing, pp 155-189.

Sonderegger, D.L., Ogle, K., R. D. Evans, Ferguson, S. and Nowak, R.S, (2013). Temporal dynamics of root growth under long-term exposure to elevated CO_2 in the Mojave Desert. *New Phytologist* **198**(1): 127-138

Clements, W. H., Vieira, N. K. M., and **Sonderegger, D. L.** (2010). The use of ecological thresholds to assess recovery in lotic ecosystems. *Journal of the North American Benthological Society* **29**(3):1017-1023

Sonderegger, D.L., Wang, H., Huang, Y., and Clements, W.H. (2009). Effects of measurement error on the strength of concentration-response relationships in aquatic toxicology. *Ecotoxicology* **18**:824-828

Sonderegger, D.L., Wang, H., Clements, W.H., and Noon, B.R. (2009). Using SiZer to detect thresholds in ecological data. *Frontiers in Ecology and the Environment* **7**:190-195

Grants

USDA-BRAG – Understanding the impacts of Roundup-Ready versus traditional dual-purpose Canola within a multi-trophic ecological landscape design. Co-PI. $1,000,000. Submitted Spring 2016.

NSF – An integrative multi-state machine learning computational framework to hardware security enhancement. Co-PI. $499,462. Submitted Spring 2016.

NIF – R15 *Cell Signaling and Resistance to Oxidative Stress: Effects of aging and fitness.* (Resubmisson). Personnel. $300,000. Submitted June 2015.

NPS – Cooperative Research and Training Programs *Development of Phenological Data Visualization Techniques to Support Long-Term Monitoring of Ecosystems in National Park Service Units of the Southern Colorado Plateau and Greater Yellowstone Networks.* PI. $16,327. Aug 2015 – March 2017.

NSF S-STEM *Transfers to Graduates in Engineering, Math and Science*. CO-PI. $627,064. June 2013 – May 2017.

NIH – R15 *Exercise-induced resistance to oxidative stress: Effects of aging and fitness*. Personnel. $300,000. Submitted June 2013, Denied Funding.

NAU Faculty Grants Program. *Synthesizing global viral abundances.* PI. $7500. July 2013 – June 2014.

Consulting

Fall 2012, Spring 2014, Spring 2015. Primary consulting statistician for NAU's Statistical Consulting Lab, providing consulting services to researchers across the university.

Fall 2009. Worked in the Graybill Statistical Laboratory at CSU, which provides statistical consulting to researchers across the university.

Teaching - NAU

STA 270, Introduction to Statistics

STA 473, Mathematical Statistics I (Probability)
STA 474, Mathematical Statistics II (Math/Stat)
STA 570, Statistical Methods I
STA 570L, Introduction to R
STA 571, Statistical Methods II
STA 575, Sampling
STA 578, Statistical Computing
STA 599, Introduction to R

Talks

JSM Annual Meeting 2015 – A comparison of models for analyzing occupancy data collected utilizing multiple detectors.
NAU Math Dept Colloquium 2014 – A comparison of models for analyzing occupancy data collected utilizing multiple detectors.
ESA Annual Meeting 2014 – Analyzing occupancy data collected utilizing multiple detectors over a single time period.
JSM Annual Meeting 2012 – Fiducial Inference for Free-Knot Splines
NAU Forestry Dept. Coloquium 2012 – Temporal effects under long-term elevated CO_2 in the Mojave Desert.
NAU Math Dept Colloquium 2011 – Using smoothing splines and bootstrapping to address measurement error with application in aquatic toxicology.
ESA Annual Meeting 2010 – Temporal dynamics of root growth under long-term exposure to elevated CO2 in the Mojave Desert.
Sandia National Labs February 2009 - Regression Splines: Applications and Fiducial Theory.
CSU SOARS April 2009 – Introduction to the Bootstrap.
CO/WY ASA Fall Meeting 2007 – Using SiZer to detect features in ecological data.
CSU SOARS March 2007 – Introduction to smoothing.

Conference Posters

AGU annual meeting 2011 – Leaf δ15N and δ13C as temporal integrators of biogeochemical processes at the Mojave Desert FACE experiment
Graybill Conference 2007 – Identifying and estimating uncertainty in ecological thresholds
ESA 2002 – Water transport, conduit size variation and cascading cavitation in *Pinus albicaulis*: Results from a model.

Dissertation – Co-advisors Jan Hannig and Haonan Wang

We are interested in estimating the number and location of knot points for smoothing splines using fiducial inference. We show the asymptotic normality of the fiducial distribution of the model parameters in the case where the number of knot points is known. We then provide a method for picking the correct number of knot points and demonstrate the methods effectiveness.

R-Packages

Sonderegger, D.L. (2008) SiZer. (CRAN) version 0.1-3
Sonderegger, D.L. (2015) OccupancyModels (github) version 0.1

Professional Memberships – ASA