John Tipton | Curriculum Vitae

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Education

Colorado State University **Fort Collins**
Ph.D. in Statistics *March 2016*
Advisors: Mevin Hooten and Jean Opsomer

Improved estimation and prediction for computationally expensive ecological and paleoclimate models.

Colorado State University **Fort Collins**
Masters of Science in Statistics *December 2011*
Advisor: Jean Opsomer

Colorado State University **Fort Collins**
Bachelors of Science in Mathematics and Zoology *December 2005*

Publications

Published and In Review

2017: Connor Nolan et. al. Past and future global transformation of terrestrial ecosystems under climate change. *Science*. In Review

2017: Erin Belval, Yu Wei, David Calkin, Crystal Stonesifer, Matt Thompson and John Tipton. Studying interregional wildland engine assignments for large fire suppression. *International Journal of Wildland Fire*.

2017: John Tipton, Mevin Hooten, and Simon Goring. Reconstruction of spatio-temporal temperature processes from sparse historical records using probabilistic principal component regression. *Advances in Statistical Climatology, Meteorology and Oceanography*.

2017: Trevor Hefley, Kristin Broms, Brian Brost, Frances Buderman, Shannon Kay, Henry Scharf, John Tipton, Perry Williams, and Mevin Hooten. The basis function approach to modeling dependent ecological data. *Ecology*.

2016: John Tipton, Mevin Hooten, Neil Pederson, Martin Tingley and Daniel Bishop. Reconstruction of late Holocene climate based on tree growth and mechanistic hierarchical models. *Environmetrics*, 27(1):42-54.

2016: Douglas Silver, Brett Johnson, William Pate, Kyle Christianson, John Tipton, James Sherwood, Brian Smith, Yun Hao, and Patrick Martinez. Effect of net size on estimates of abundance, size/age, and sex of *Mysis diluviana*. *Journal of Great Lakes Research*, Volume 42, Issue 3, June 2016

2013: John Tipton, Jean Opsomer, and Gretchen Moisen. Properties of endogenous post-stratified estimation using remote sensing data. *Remote Sensing of Environment*, 139:130-137.

2012: John Tipton, Gretchen Moisen, Paul Patterson, and Thomas Jackson. Sampling intensity and normalization: Exploring cost-driving factors in nationwide mapping of tree canopy cover.

In: *McWilliams, Will and Roesch, Frank, (compilers). 2010 Forest Inventory and Analysis (FIA) Symposium.*

2012: Thomas Jackson, Gretchen Moisen, Paul Patterson and John Tipton. Repeatability in photo-interpretation of tree canopy cover and its effect on predictive mapping. In: *McWilliams, Will and Roesch, Frank, (compilers). 2010 Forest Inventory and Analysis (FIA) Symposium.*

2005: David Gammon, Myron Baker, and John Tipton. Cultural divergence within novel song in the black-capped chickadee (*Poecile atricapillus*). *The Auk*, 122, 853-871.

In Prep

2017: John Tipton, Mevin Hooten, Connor Nolan, Bob Booth, Jason McLachlan. A reconstruction of water depth from assemblages of testate Amoeba species data in peat bogs.

2017: John Tipton, Mevin Hooten, Connor Nolan, Bob Booth, McLachlan. BayesComposition: An *R* package for fitting compositional data and performing inverse prediction.

2017: John Tipton, Mevin Hooten, Connor Nolan. Combining bog and lake level reconstructions into a joint climate reconstruction using latent Gaussian processes.

Presentations

Invited

2015: Presentation: ASA - ENVR Student Paper Award: Reconstruction of late Holocene climate based on tree growth and mechanistic hierarchical models

2015: Poster: ASA - STATMOS: Reconstruction of late Holocene climate based on tree growth and mechanistic hierarchical models

2014: Presentation: American Geophysical Union: A statistical reconstruction of bivariate climate from tree ring width measurements using scientifically motivated process models

Contributed

2016: Presentation - ASA: Inverting the Gaussian process: A Bayesian multispecies ecological model for paleoclimate reconstruction

2016: Poster: Robust spatio-temporal reconstruction of temperature processes from sparse historical data

2014: Poster: American Geophysical Union - co-author: Effects of European land use on contemporary tree-climate relationships in the northeastern United States: Implications for predictive models

2014: Presentation: ASA: Reconstruction of historical climate using a reduced rank predictive process model

2012: Presentation: Forest Inventory and Analysis Symposium: Properties of the endogenous post-stratified estimator using a random forest model

2012: Presentation: ASA: Endogenous post-stratification using random forests

Research Experience

PalEON

Postdoctoral Researcher *2016–Present*

Developed Bayesian hierarchical models for reconstruction of paleoclimate using proxy data.

Detailed achievements:

- Spatially explicit reconstruction of average July temperature in the U.S.
  - Data from historical military fort records
  - EOF regression with spatial random effects
  - Model selection techniques to provide shrinkage of estimates
  - Validation of predictive ability in a simulation experiment
- Inverse Gaussian Process models for prediction of latent climate given species composition data
  - Data from testate Amoeba in peat bogs
  - Gaussian Process regression model where the covariate location is to be predicted
  - Dimension reduction for computational efficiency

PalEON

Graduate Research Assistant *2013–2016*

Developed Bayesian hierarchical models for reconstruction of paleoclimate using proxy data.

Detailed achievements:

- Reconstruction of temperature and precipitation from tree rings
  - Data assimilation from different sources and scales in the Hudson Valley, New York
  - Extension of cutting edge modeling techniques to increase predictive skill
  - Use of model selection to choose between non-linear process models for tree ring growth

United States Forest Service

Graduate Research Assistant *2009–2013*

Research on sampling methods for pilot study of tree canopy cover and application of state of the art survey sampling methodologies to aid in development of the National Land Cover Database.

Detailed achievements:

- Inclusion of powerful machine learning methods in a statistical framework
- Analysis of remote sensing and statistical techniques for creation of land cover maps
- Sample size and power calculations to improve sampling methods and decrease cost

Teaching Experience

Colorado State University Statistics Department
Graduate Instructor/Teaching Assistant *2009–2015*
Instructor of record for:
- ST 307 Intro to Biostatistics, three semesters
- ST 204 Business Statistics, two semesters

Teaching assistant for:
- ST 472 Statistical Consulting, one semester
- ST 301 Intro to Statistics Online, one semester
- ST 204 Business Statistics, one semester

Discussant
Workshop on Parallel Computing, CU/CSU, 2015 *2015*

Teaching Assistant
Building Capacity in Bayesian Modeling for Ecologists (NSF), 2 days *2016 and 2014*

Teaching Assistant
R Workshop (CSU-CCFRWU), 1 day *2015 and 2013*

Honors/Awards

2016: Colorado State University Statistics Department Poster Symposium - Best Poster

2015: American Statistical Association ENVR Student Paper Competition Award

2014: Thomas J. and Eileen C. Boardman Statistical Consulting Award

2014: American Statistical Association Student Travel Award

2012: American Statistical Association Wray Jackson Smith Award

Software and Computing

- R
- C++
- LaTeX
- Linux