Andrew Tredennick

Contact Information

NSF Postdoctoral Fellow
Department of Wildland Resources and
The Ecology Center, Utah State University

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Research Interests

stability of populations, communities, and ecosystems; data–model assimilation; ecology of rangelands and savannas; coexistence of species and functional groups; ecological forecasting

Education

Colorado State University, Fort Collins, CO
Doctor of Philosophy ECOLOGY **2014**

Texas Tech University, Lubbock, TX
Bachelor of Sciences BIOLOGY **2006**

Professional Appointments

Utah State University, Dept. of Wildland Resources, Logan, UT **2014 – Pres.**
Postdoctoral Fellow

Colorado State University, Natural Resource Ecology Lab, Ft. Collins, CO **2011 – 2014**
Graduate Research Fellow

Colorado State University, Natural Resource Ecology Lab, Ft. Collins, CO **2009 – 2011**
Graduate Research Assistant

US Forest Service Rocky Mountain Research Station, Ft. Collins, CO **2009**
Research Assistant

Colorado State University, Ft. Collins, CO **2008**
Graduate Teaching Assistant

Fellowships and Awards

NEON and Powell Center Travel Award **2015**
NSF Postdoctoral Research Fellowship in Biology and Mathematics **2014**
1st Place Oral Presentation, Front Range Student Ecology Symposium **2013**
NSF FORECAST Research Coordination Network Travel Award **2012**
Sustainability Leadership Fellow, School of Global Environmental Sustainability, CSU **2012**
NASA Earth and Space Science Graduate Fellowship **2011**
James E. Ellis Memorial Scholarship, Natural Resource Ecology Lab **2010**
NSF Graduate K-12 Fellowship, Natural Resource Ecology Lab **2009**

Publications

Tredennick, A.T., C. de Mazancourt, M. Loreau, and P.B. Adler. (In press). Environmental responses, not species interactions, determine synchrony of dominant species in semiarid grasslands. *Ecology*.

Kulmatiski, A., P.B. Adler, J.M. Stark, and **A.T. Tredennick**. (2017). Water and nitrogen uptake are better associated with resource availability than root biomass. *Ecosphere* 8(3):e01738.

Tredennick, A.T., M.B. Hooten, and P.B. Adler. (2016). Do we need demographic data to forecast plant population dynamics? *Methods in Ecology and Evolution*, Early View (online).

Tredennick, A.T., M.B. Hooten, C.L. Aldridge, C. Homer, A.R. Kleinhesselink, and P.B. Adler. (2016). Forecasting climate change impacts on plant populations over large spatial extents. *Ecosphere* 7(10):e01525.

Tredennick, A.T., P.B. Adler, J.B. Grace, W.S. Harpole, E.T. Borer, E.W. Seabloom, and 36 co-authors. (2016). Comment on "Worldwide evidence of a unimodal relationship between productivity and plant species richness". *Science* 35(6272):457a-457c.

Tredennick, A.T., M. Karembé, F. Dembélé, J. Dohn, and N.P Hanan. (2015). No effects of fire, large herbivores, and their interaction on regrowth of harvested trees in two West African savannas. *African Journal of Ecology* 53(4):487-495.

Hanan, N. P., **A.T. Tredennick**, L. Prihodko, G. Bucini, and J. Dohn. (2015). Analysis of stable states in global savannas – a response to Staver and Hansen. *Global Ecology and Biogeography* 24(8):988-989.

Tredennick, A.T. and N.P. Hanan. (2015). Effects of tree harvest on the stable-state dynamics of savanna and forest. *The American Naturalist* 5(185):E153-E165.

Hanan, N. P., **A.T. Tredennick**, L. Prihodko, G. Bucini, and J. Dohn. (2014). Analysis of stable states in global savannas: Is the CART pulling the horse? *Global Ecology and Biogeography* 23(3):259-263.

Tredennick, A. T., L.P. Bentley, and N.P. Hanan. (2013). Allometric convergence in savanna trees and implications for the use of plant scaling models in variable ecosystems. *PLoS One* 8(3):e58241.

Rice, J., **A.T. Tredennick**, and L. Joyce. (2011). The climate of the Shoshone National Forest: A synthesis of past changes, future projections, and ecosystem implications. USDA National Forest Service General Technical Report 264.

Sutton, A.E., J. Dohn, K. Loyd, **A.T. Tredennick**, G. Bucini, A. Solrzano, L. Prihodko, and N.P. Hanan. (2010). Letter: Does warming increase the risk of civil war in Africa? *Proceedings of the National Academy of Sciences* 107(25):E102

Publications
in review

Tredennick, A.T., P.B. Adler, and F.R. Adler. The relationship between species richness and ecosystem variability is shaped by the mechanism of coexistence. Invited for revision at *Ecology Letters*.

Manuscripts
in preparation
(available upon request)

Wilcox*, K.R., **A.T. Tredennick***, S.E. Koerner, E. Grman, L.M. Hallett, M.L. Avolio, K.J. La Pierre, G.R. Houseman, F. Isbell, D.S. Johnson, *et al.*. Asynchrony of ecosystem functioning across space increases ecosystem stability through time. In preparation for *Ecology Letters*.
*Shared first authorship by Wilcox and Tredennick

Competitive Funding
External: $297,000
Internal: $17,500

Pending: "Synthesizing time series of plant and animal populations to understand the limits to ecological forecasts", USGS Powell Center Working Group Proposal.

"Diversity-Stability Relationships and Coexistence: New Theory and Empirical Tests," NSF Postdoctoral Research Fellowship in Biology and Mathematics, $207,000 (2014-2017).

"Effective Science Communication and Public Relations at NREL through EcoPress," Natural Resource Ecology Lab, $6,000 (Co-I) (2013)

"NESSF: Fuelwood, Savannas, and Climate Change: Integrating Modeling, Field Experimentation, and Optical and Radar Remote Sensing," NASA, $90,000 (2011-2014).

"Expanding Ecology to Meet Society: Traditional Experiments Coupled with Anthropological Methods in a Savanna Socio-Ecological System," Natural Resource Ecology Laboratory James E. Ellis Memorial Scholarship, $1,500 (2010).

"Building a WCNR 'Partnership for International Research and Education' in African Savannas: Undergraduate and Graduate Field-Based Education in Mali, West Africa," Warner College of Natural Resources, $10,000 (PI–Hanan; collaborative proposal of the Hanan lab group) (2010).

Teaching Experience

Ecological Society of America Annual Meetings Workshop **2013-2016**
Data Visualization in R
Co-organizer and co-instructor (with Naupaka Zimmermann)
Materials: http://github.com/atredennickesa_data_viz_2016

Colorado State University **2013**
Plant Ecology (undergraduate)
Guest Lecture on Tree-Grass Coexistence

Colorado State University **2012**
NREL Skills for Undergraduate Participation in Ecological Research
Data Analysis/Visualization Workshop Leader

Colorado State University **2011**
RS 351, Ecosystem Processes in a Changing World (undergraduate)
Co-Instructor

Colorado State University **2009, 2010, 2012**
RS 351, Wildland Ecosystems (undergraduate)
Guest Lecture on Ecosystem Modeling

Irish Elementary School Ft. Collins, CO **2010-2011**
5th and 4th Grade Science and Advanced Science Program
NSF GK-12 Fellow

Colorado State University **2008**
RS 351, Wildland Ecosystems (undergraduate)
Graduate Teaching Assistant

Professional Service

Reviewer ($\sim$ 8 per year)
Agriculture, Ecosystems, and Environment; *Ecological Applications*; *Ecology*; *Ecology Letters*; *Elementa*; *Environmental Management*; *Forest Ecology and Management*; *Journal of Ecology*; *Journal of Vegetation Science*; *Koedoe: African Protected Area Conservation and Science*; *Oecologia*; *Proceedings of the National Academy of Sciences*; *Proceedings of the Royal Society B*; *PLoS One*; National Research Foundation (South Africa); National Science Foundation (*ad hoc* reviewer; 2/year)

Professional Society Membership
American Society of Naturalists
Ecological Society of America
Rangeland Ecology Section member
Statistical Ecology Section member
Theoretical Ecology Section member

University Service and Public Outreach
Director of Social Media, *NREL EcoPress*: http://nrelscience.org (2012-2013)
Student Review Committee, Ecology Faculty Search, CSU (2011)
Organizing Committee, Global Savanna Workshop, CSU (2009)
Advertising and Outreach Committee, Front Range Student Ecology Symposium (2010)
Graduate Student Representative, Natural Resource Ecology Lab (2010-2011)

Presentations

Tredennick, A.T. C. de Mazancourt, M. Loreau, and P.B. Adler. (2016) "Disentangling the drivers of species synchrony in natural plant communities: Environmental forcing, demographic stochasticity, and interspecific interactions". 2016 Annual Meetings of the Ecological Society of America.

Tredennick, A.T. and P.B. Adler. (2015) "Do we need detailed demographic data to forecast population responses to climate change? 2015 Annual Meetings of the Ecological Society of America.

Tredennick, A.T., Hanan, N.P., Bucini, G., and Parton, W. (2014) "Africa's Fuelwood Footprint and the Biome-Level Impacts of Tree Harvest," Station d'Ecologie Expérimentale du CNRS, Moulis, France.

Tredennick, A.T., Adler, P.B., Aldridge, C.L., Homer C.G., Iles, D.T., Kleinhesselink, A., LaMalfa, E., and Mann, R. (2014) "Forecasting climate change impacts on plant population dynamics at large spatial extents: a test case with sagebrush (*Artemisia*) species." 2014 Annual Meetings of the Ecological Society of America.

Tredennick, A.T., Adler, P.B., Aldridge, C.L., Homer C.G., Iles, D.T., Kleinhesselink, A., LaMalfa, E., and Mann, R. (2013) "Pixel-based modeling of population dynamics at large spatial extents," Climate Change in Sagebrush Steppe Working Group, Park City, UT.

Tredennick, A.T., Hanan, N.P., Bucini, G., and Parton, W. (2013) "Sustainability and Biome-Level Impacts of Fuelwood Harvesting in sub-Saharan Africa," invited seminar, Geospatial Science Center of Excellence, South Dakota State University.

Tredennick, A.T., and Hanan N.P. (2013) "Tree harvest, fire, and drought can drive state transitions in savanna," 2013 Annual Meetings of the Ecological Society of America.

Tredennick, A.T., and Hanan N.P. (2013) "The Theoretical and Integrative Effects of Tree Harvest and Fire on Grassland-Savanna-Forest Transitions," Front Range Student Ecology Symposium, Colorado State University. *Awarded 1st Place Oral Presentation.*

Tredennick, A.T., Hanan, N.P., Bucini, G., and Parton, W. (2012) "Using Diverse Multi-Scale Data to Assess Patterns and Sustainability of Fuelwood Harvest in Sub-Saharan Africa," poster presentation, NSF FORECAST RCN Meeting, Woods Hole, MA.

Tredennick, A.T., Bentley, L.P., and Hanan, N.P. (2012) "Whole-tree and branch-level scaling in savannas: testing Metabolic Scaling Theory in a non-ideal system," Ecological Society of America Annual Meeting, Portland, OR.

Tredennick, A.T., Hanan, N.P., Bucini, G., and Parton, W. (2012) "Patterns and sustainability of fuelwood supply and demand in Sub-Saharan Africa," 10th Annual Savanna Science Network Meeting, Kruger National Park, South Africa.

Tredennick, A.T., Hanan, N.P., and Bentley, L.P. (2012) "Scaling the savannas: Does Metabolic Scaling Theory apply in savannas?," Poster Presentation, 10th Annual Savanna Science Network Meeting, Kruger National Park, South Africa.

Tredennick, A.T., Hanan, N.P., Bucini, G., Parton, W., and Keogh, C. (2011) "Spatially Quantifying Fuelwood Demand and Production in Sub-Saharan Africa," NREL Spring Seminar Series: New Voices in Ecology, Colorado State University.

Tredennick, A.T. and Hanan N.P. (2011) "Allometric Scaling in Savannas: Do the Non-conformists Conform to Ecological Theory?," Front Range Student Ecology Symposium, Colorado State University. *Awarded 2nd Place Oral Presentation.*

Tredennick, A.T. and Coughenour, M.B. (2009) "Economic Incentives for Conservation in Meru, Kenya," Poster Presentation, Front Range Student Ecology Symposium, Colorado State University.