Andrew T. **Tredennick**

Postdoctoral Research Associate · Quantitative Ecologist

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Education

Colorado State University — *Fort Collins, CO*

Ph.D. in Ecology — *2014*

Texas Tech University — *Lubbock, TX*

B.S. in Biology — *2006*

Professional Appointments

Odum School of Ecology, University of Georgia — *Athens, GA*

Postdoctoral Research Associate — *June 2018 - PRESENT*

Department of Wildland Resources, Utah State University — *Logan, UT*

Postdoctoral Fellow III ('17-'18) & NSF Postdoctoral Fellow ('15-'17) — *Aug. 2014 - May 2018*

Natural Resource Ecology Laboratory, Colorado State University — *Fort Collins, CO*

NASA Graduate Fellow ('11-'14), Graduate Research Assistant ('09-'11), & Graduate Teaching Assistant ('08-'09) — *Aug. 2008 - July 2014*

U.S. Forest Service Rocky Mountain Research Station — *Fort Collins, CO*

Research Assistant — *Jan. 2009 - Aug. 2009*

Publications

Adler, P.B., D. Smull, K.H. Beard, R.T. Choi, T. Furniss, A. Kulmatiski, **A.T. Tredennick**, & K.E. Veblen. (2018). Competition and coexistence in plant communities: intraspecific competition is stronger than interspecific competition. *Ecology Letters*.

Tredennick, A.T.*, A.R Kleinhesselink*, J.B. Taylor, & P.B. Adler. (2018). Ecosystem functional response across precipitation extremes in a sagebrush steppe. *PeerJ* 6:e4485.
**Authors contributed equally.*

Dietze, M.C., A. Fox, L. Beck-Johnson, J.L. Betancourt, M.B. Hooten, C.S Jarnevich, T. Keitt, M.A. Kenney, C.M. Laney, L.G. Larsen, H.W. Loescher, C.K. Lunch, B. Pijanowski, J.T. Randerson, E.K. Read, **A.T. Tredennick**, R. Vargas, K.C. Weathers, & E.P. White. (2018). Iterative near-term ecological forecasting: Needs, opportunities, and challenges. *Proceedings of the National Academy of Sciences* 115(7):1424-1432.

Wilcox*, K.R., **A.T. Tredennick***, S. Koerner, E. Grman, L. Hallett, M. Avolio, K. La Pierre, G. Houseman, F. Isbell, D. Johnson, J. Alatalo, A. Baldwin, E. Bork, E. Boughton, W. Bowman, A. Britton, J. Cahill, S. Collins, G-Z. Du, A. Eskelinen, L. Gough, A. Jentsch, C. Kern, K. Klanderud, A. Knapp, J. Kreyling, Y. Luo, J. McLaren, P. Megonigal, V. Onipchenko, J. Prevéy, J. Price, C. Robinson, O. Sala, M. Smith, N. Soudzilovskaia, L. Souza, D. Tilman, S. White, Z. Xu, L. Yahdjian, Q. Yu, P. Zhang, Y, Zhang. (2017). Asynchrony among local communities stabilizes ecosystem function of metacommunities. *Ecology Letters* 20(12):1534–1545.
**Authors contributed equally.*

Tredennick, A.T., P.B. Adler, & F.R. Adler. (2017). The relationship between species richness and ecosystem variability is shaped by the mechanism of coexistence. *Ecology Letters* 20(8):958-968.

Tredennick, A.T., M.B. Hooten, & P.B. Adler. (2017). Do we need demographic data to forecast plant population dynamics? *Methods in Ecology & Evolution* 8(5):541-551.

Tredennick, A.T., C. de Mazancourt, M. Loreau, & P.B. Adler. (2017). Environmental responses, not species interactions, determine synchrony of dominant species in semiarid grasslands. *Ecology* 98(4):971-981.

Kulmatiski, A., P.B. Adler, J.M. Stark, & **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, C.L. Aldridge, C. Homer, A.R. Kleinhesselink, & 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, & 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, & 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, & 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. & 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, & 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, & 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**, & L. Joyce. (2011). The climate of the Shoshone National Forest: A synthesis of past changes, future projections, and ecosystem implications. USFS General Technical Report No. 264.

Sutton, A.E., J. Dohn, K. Loyd, **A.T. Tredennick**, G. Bucini, A. Solrzano, L. Prihodko, & 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.

Manuscripts in review

A.T. Tredennick, B.J. Teller, P.B. Adler, G. Hooker, & S.P. Ellner. (In review). Size-by-environment interactions: a neglected dimension of species' responses to environmental variation.

Manuscripts in preparation

Available upon request

A.T. Tredennick, P.B. Adler, G. Hooker, & S.P. Ellner. (In preparation). A practical guide to selecting models for exploration, understanding, and prediction in ecology.

Bucini, G., N.P. Hanan, **A.T. Tredennick**, S. Saatchi, M.A. Lefsky, E. Mitchard, & L-J Theron. (In preparation). Woody cover mapping in Africa: combining optical and radar remote sensing for improved prediction in open savannas.

Tredennick, A.T., N.P. Hanan, G. Bucini, & L. Prihodko. (In preparation). No evidence that savanna and forest are alternative stable states at large spatial scales in sub-Saharan Africa.

Funding

Total External: $297,000 · Total Internal: $17,500

2015 **NSF Postdoctoral Fellowship in Biology and Mathematics**, $207,000
2013 **Natural Resource Ecology Lab Development Grant for EcoPress (https://nrelscience.org/)**, $6,000
2011 **NASA Earth and Space Science Graduate Fellowship**, $90,000
2010 **Natural Resource Ecology Lab James E. Ellis Scholarship**, $1,500
2010 **Warner College of Natural Resources Grant (Collaborative proposal of Hanan Lab)**, $10,000

Honors & Awards

2015 **Travel Award**, NEON and Powell Center Workshop on 'Ecological Forecasting'
2013 **First Place Oral Presentation**, Front Range Student Ecology Symposium
2012 **Travel Award**, NSF FORECAST Research Coordination Network Meeting
2012 **Sustainability Leadership Fellow**, Schoold of Global Environmental Sustainability, Colorado State University
2009 **NSF Graduate K-12 Fellowship**, Natural Resource Ecology Lab, Colorado State University

Teaching

Weekly R help sessions for graduate students — *Utah State University*
Co-organizer with Tom Edwards — *2015-PRESENT*
- Introduced graduate students to data management and analysis in R.

Community Ecology (graduate) — *Utah State University*
Guest Lecture — *2016 & 2017*
- Led unit (lecture and lab) on the diversity-stability relationship.

Data Visualization in R — *ESA Meeting Workshop*
Co-organizer and Co-instructor — *2013-2017*
- Introduce diverse group of ecologists to ggplot2 for data viz in R.

Plant Ecology (undergraduate) — *Colorado State University*
Guest Lecture — *2013*
- Guest lecture on tree-grass coexistence in savannas.

Ecosystem Processes in a Changing World (undergraduate) — *Colorado State University*
Co-instructor — *2011*
- Taught course for half of semester and co-developed lectures, labs, and exams.

Wildland Ecosystems (undergraduate) — *Colorado State University*
Guest Lecture — *2009, 2010, 2012*
- Guest lecture and computer lab on ecosystem modeling.

4-5 Grade Science & Advanced Science Program — *Irish Elementary*
NSF GK-12 Fellow — *2010-2011*
- Help teach elementary science and developed teaching materials.

Wildland Ecosystems (undergraduate) — *Colorado State University*
Graduate Teaching Assistant — *2008*
- Gave several lectures, assisted with grading, and helped draft exams.

Professional Service

Synergistic Activities

Leader: Forecasting Working Group, Center for the Ecology of Infectious Diseases, University of Georgia

Founding Member: The Ecological Forecasting Initiative

Editorships

Academic Editor at *PeerJ*

Reviewer (~12 per year)

Agriculture, Ecosystems, and Environment; *Ecological Applications*; *Ecology*; *Ecology Letters*; *Elementa*; *Environmental Management*; *Forest Ecology and Management*; *Journal of Applied Ecology*; *Journal of Ecology*; *Journal of Vegetation Science*; *Koedoe: African Protected Area Conservation and Science*; *Land Degradation & Development*; *Nature Climate Change*; *Oecologia*; *Oikos*; *Pest Management & Science*; *Proceedings of the National Academy of Sciences*; *Proceedings of the Royal Society B*; *PLoS One*; *Restoration Ecology*; *Scientific Reports*

Proposal Reviewer

National Research Foundation (South Africa; 1 time)
National Science Foundation (*ad hoc* reviewer; 3 total)
Graduate Women in Science National Fellowship (2 total)

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)
Advertising and Outreach Committee, Front Range Student Ecology Symposium (2010)
Graduate Student Representative, Natural Resource Ecology Lab (2010-2011)
Organizing Committee, NASA Global Savanna Workshop, CSU (2009)

Invited Working Groups

iDiv	From Species Coexistence to Ecosystem Functioning: A Theoretical and Empirical Synthesis. *Lead PIs: Christiane Roscher, Yanhao Feng, Stan Harpole* (2018)
NCEAS	Community Responses to Resource Experiments: Communities to Ecosystems. *Lead PIs: Kimberly La Pierre, Meghan Avolio, Kevin Wilcox* (2016 & 2017)
NEON	Operationalizing Ecological Forecasts. *Lead PIs: Michael Dietze, Andy Fox* (2015)

Recent Presentations & Seminars

Invited

2018 TBD. *American Statistical Association ENVR Workshop: Statistics for the Environment: Research, Practice and Policy*, Asheville, NC.
2018 Advancing ecological forecasting. *Center for the Ecology of Infectious Diseases*, University of Georgia.
2018 What determines ecosystem stability in theory and in nature? *Department of Botany*, University of Hawai'i at Mānoa.
2017 What determines ecosystem stability in theory and in nature? *Quinney College of Natural Resources*, Utah State University.
2013 Sustainability and Biome-Level Impacts of Fuelwood Harvesting in sub-Saharan Africa. *Geospatial Center of Excellence*, South Dakota State University.

Contributed

2017 The relationship between species richness and ecosystem variability is shaped by the mechanism of coexistence. *ESA Annual Meeting*, Portland, OR.
2016 Disentangling the drivers of species synchrony in natural plant communities: Environmental forcing, demographic stochasticity, and interspecific interactions. *ESA Annual Meeting*, Fort Lauderdale, FL.
2015 Do we need detailed demographic data to forecast population responses to climate change? *ESA Annual Meeting*, Baltimore, MD.
2014 Africa's Fuelwood Footprint and the Biome-Level Impacts of Tree Harvest. *Center for Biodiversity Theory & Modeling, CNRS*, Moulis, France.
2014 Forecasting climate change impacts on plant population dynamics at large spatial extents: a test case with sagebrush (*Artemisia*) species. *ESA Annual Meeting*, Sacramento, CA.
2013 Pixel-based modeling of population dynamics at large spatial extents. *Climate-SageSteppe Working Group*, Park City, UT.
2013 Tree harvest, fire, and drought can drive state transitions in savanna. *ESA Annual Meeting*, Minneapolis, MN.

Skills

Programming R, Stan, JAGS, Python, LaTeX
Scientific computing Hierachical Bayesian modeling, numerical simulations, Integral Projection Models, population modeling