

Andrew T. Tredennick

POSTDOCTORAL FELLOW · QUANTITATIVE ECOLOGIST

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Education

Colorado State University

PH.D. IN ECOLOGY

Fort Collins, CO

2014

Texas Tech University

B.S. IN BIOLOGY

Lubbock, TX

2006

Professional Appointments

Dept. of Wildland Resources, Utah State University

POSTDOCTORAL FELLOW III

Logan, UT

Aug. 2017 - PRESENT

Dept. of Wildland Resources, Utah State University

NSF POSTDOCTORAL FELLOW

Logan, UT

Aug. 2014 - July 2017

Natural Resource Ecology Lab, Colorado State University

NASA GRADUATE RESEARCH FELLOW

Fort Collins, CO

Aug. 2011 - May 2014

Natural Resource Ecology Lab, Colorado State University

GRADUATE RESEARCH ASSISTANT

Fort Collins, CO

Aug. 2009 - July 2011

U.S. Forest Service Rocky Mountain Research Station

RESEARCH ASSISTANT

Fort Collins, CO

Jan. 2009 - Aug. 2009

Dept. of Forest, Rangeland, and Watershed Stewardship, Colorado State University

GRADUATE TEACHING ASSISTANT

Fort Collins, CO

Aug. 2008 - Dec. 2008

Publications

Asynchrony among local communities stabilizes ecosystem function of metacommunities

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, 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 (*SHARED FIRST AUTHORSHIP)

Ecology Letters

In press | 201x

The relationship between species richness and ecosystem variability is shaped by the mechanism of coexistence

TREDENNICK, A.T., P.B. ADLER, & F.R. ADLER

Ecology Letters

20(8):958-968 | 2017

Do we need demographic data to forecast plant population dynamics?

TREDENNICK, A.T., M.B. HOOTEN, & P.B. ADLER

Methods in Ecology & Evolution

8(5):541-551 | 2017

Environmental responses, not species interactions, determine synchrony of dominant species in semiarid grasslands

TREDENNICK, A.T., C. DE MAZANCOURT, M. LOREAU, & P.B. ADLER

Ecology

98(4):971-981 | 2017

Water and nitrogen uptake are better associated with resource availability than root biomass

KULMATISKI, A., P.B. ADLER, J.M. STARK, & A.T. TREDENNICK

Ecosphere

8(3):e01738 | 2017

Forecasting climate change impacts on plant populations over large spatial extents

TREDENNICK, A.T., M.B. HOOTEN, C.L. ALDRIDGE, C. HOMER, A.R. KLEINHESSELINK, & P.B. ADLER

Ecosphere

7(10):e01525 | 2016

Comment on “Worldwide evidence of a unimodal relationship between productivity and plant species richness”

TREDENNICK, A.T., P.B. ADLER, J.B. GRACE, W.S. HARPOLE, E.T. BORER, E.W. SEABLOOM, & 36 CO-AUTHORS

Science

35(6272):457a-457c | 2016

No effects of fire, large herbivores, and their interaction on regrowth of harvested trees in two West African savannas

TREDENNICK, A.T., M. KAREMBÉ, F. DEMBÉLÉ, J. DOHN, & N.P. HANAN

African Journal of Ecology

53(4):487-495 | 2015

Analysis of stable states in global savannas – a response to Staver and Hansen

HANAN, N.P., A.T. TREDENNICK, L. PRIHODKO, G. BUCINI, & J. DOHN

Global Ecology and Biogeography

24(8):988-989 | 2015

Effects of tree harvest on the stable-state dynamics of savanna and forest

TREDENNICK, A.T. & N.P. HANAN

The American Naturalist

5(185):E153-E165 | 2015

Analysis of stable states in global savannas: Is the CART pulling the horse?

HANAN, N.P., A.T. TREDENNICK, L. PRIHODKO, G. BUCINI, & J. DOHN

Global Ecology and Biogeography

23(3):259-263 | 2014

Allometric convergence in savanna trees and implications for the use of plant scaling models in variable ecosystems

TREDENNICK, A.T., L.P. BENTLEY, & N.P. HANAN

PLoS One

8(3):e58241 | 2013

The climate of the Shoshone National Forest: A synthesis of past changes, future projections, and ecosystem implications

RICE, J., A.T. TREDENNICK, & L. JOYCE

USFS General Technical Report

264 | 2011

Letter: Does warming increase the risk of civil war in Africa?

SUTTON, A.E., J. DOHN, K. LOYD, A.T. TREDENNICK, G. BUCINI, A. SOLRZANO, L. PRIHODKO, & N.P. HANAN

PNAS

107(25):E102 | 2010

Manuscripts in Review

Iterative near-term ecological forecasting: Needs, opportunities, and challenges

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

PNAS

Major Revisions | In review

Ecosystem functional response across precipitation extremes in a sagebrush steppe

TREDENNICK, A.T., A.R. KLEINHESSELINK, J.B. TAYLOR, & P.B. ADLER

PeerJ

| In review

Funding

TOTAL EXTERNAL: \$297,000 · TOTAL INTERNAL: \$17,500

PRFB: Diversity-Stability Relationships and Coexistence: New Theory and Empirical Tests

PI: A.T. TREDENNICK

NSF, Fellowship

\$207,000 | 2014-2017

Effective Science Communication and Public Relations at NREL through EcoPress

PI: S. ASAO; CO-I: A.T. TREDENNICK, JULIE KRAY

Nat. Res. Ecol. Lab

\$6,000 | 2013

NESSF: Fuelwood, Savannas, and Climate Change: Integrating Modeling, Field Experimentation, and Optical and Radar Remote Sensing

PI: A.T. TREDENNICK

NASA, Fellowship

\$90,000 | 2011-2014

Expanding Ecology to Meet Society: Traditional Experiments Coupled with Anthropological Methods in a Savanna Socio-Ecological System

PI: A.T. TREDENNICK

Nat. Res. Ecol. Lab, J. Ellis 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

PI: N.P. HANAN; COLLABORATIVE PROPOSAL OF THE HANAN LAB GROUP

Warner College of Nat. Res.

\$10,000 | 2010

Honors & Awards

- 2015 **Travel Award**, NEON and Powell Center Workshop on 'Ecological Forecasting'
- 2014 **Postdoctoral Research Fellowship in Biology and Mathematics**, National Science Foundation
- 2013 **First Place Oral Presentation**, Front Range Student Ecology Symposium
- 2012 **Travel Award**, NSF FORECAST Research Coordination Network Meeting
- 2012 **Sustainability Leadership Fellow**, School of Global Environmental Sustainability, Colorado State University
- 2011 **Earth and Space Science Graduate Research Fellowship**, NASA
- 2010 **James E. Ellis Memorial Scholarship**, Natural Resource Ecology Lab, Colorado State University
- 2009 **NSF Graduate K-12 Fellowship**, Natural Resource Ecology Lab, Colorado State University

Teaching

Weekly R help sessions for graduate students

CO-ORGANIZER WITH TOM EDWARDS

- Introduced graduate students to data management and analysis in R.

Utah State University

2015-2017

Community Ecology (graduate)

GUEST LECTURE

- Led unit (lecture and lab) on the diversity-stability relationship.

Utah State University

2016

Data Visualization in R

CO-ORGANIZER AND CO-INSTRUCTOR

- Introduce diverse group of ecologists to ggplot2 for data viz in R.

ESA Meeting Workshop

2013-2017

Plant Ecology (undergraduate)

GUEST LECTURE

- Guest lecture on tree-grass coexistence in savannas.

Colorado State University

2013

Ecosystem Processes in a Changing World (undergraduate)

CO-INSTRUCTOR

- Taught course for half of semester and co-developed lectures, labs, and exams.

Colorado State University

2011

Wildland Ecosystems (undergraduate)

GUEST LECTURE

- Guest lecture and computer lab on ecosystem modeling.

Colorado State University

2009, 2010, 2012

4-5 Grade Science & Advanced Science Program

NSF GK-12 FELLOW

- Help teach elementary science and developed teaching materials.

Irish Elementary

2010-2011

Wildland Ecosystems (undergraduate)

GRADUATE TEACHING ASSISTANT

- Gave several lectures, assisted with grading, and helped draft exams.

Colorado State University

2008

Professional Service

REVIEWER (~8 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; Oecologia; Oikos; Pest Management & Science; Proceedings of the National Academy of Sciences; Proceedings of the Royal Society B; PLoS One; Restoration Ecology; Scientific Reports; 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)
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)

Recent Presentations

The relationship between species richness and ecosystem variability is shaped by the mechanism of coexistence

TREDENNICK, A.T., P.B. ADLER, & F.R. ADLER

ESA Annual Meeting
Portland, OR | 2017

Disentangling the drivers of species synchrony in natural plant communities: Environmental forcing, demographic stochasticity, and interspecific interactions

TREDENNICK, A.T., C. DE MAZANCOURT, M. LOREAU, & P.B. ADLER

ESA Annual Meeting
Ft. Lauderdale, FL | 2016

Do we need detailed demographic data to forecast population responses to climate change?

TREDENNICK, A.T. & P.B. ADLER

ESA Annual Meeting
Baltimore, MD | 2015

Africa's Fuelwood Footprint and the Biome-Level Impacts of Tree Harvest

TREDENNICK, A.T., N.P. HANAN, G. BUCINI, & W. PARTON

CBTM, CNRS
Moulis, France | 2014

Forecasting climate change impacts on plant population dynamics at large spatial extents: a test case with sagebrush (*Artemisia*) species

TREDENNICK, A.T., P.B. ADLER, C.L. ALDRIDGE, C. HOMER, D.T. ILES, A.R. KLEINHESSELINK, E. LAMALFA & R. MANN

ESA Annual Meeting
Sacramento, CA | 2014

Pixel-based modeling of population dynamics at large spatial extents

TREDENNICK, A.T., P.B. ADLER, C.L. ALDRIDGE, C. HOMER, D.T. ILES, A.R. KLEINHESSELINK, E. LAMALFA & R. MANN

Climate-SageSteppe Working Group
Park City, UT | 2013

Invited: Sustainability and Biome-Level Impacts of Fuelwood Harvesting in sub-Saharan Africa

TREDENNICK, A.T., N.P. HANAN, G. BUCINI, & W. PARTON

Geospatial Center of Excellence
South Dakota State University | 2013

Tree harvest, fire, and drought can drive state transitions in savanna

TREDENNICK, A.T. & N.P. HANAN

ESA Annual Meeting
Minneapolis, MN | 2013

Skills

Programming R, Stan, JAGS, Python, LaTeX

Scientific computing Hierarchical Bayesian modeling, numerical simulations, Integral Projection Models, population modeling