Tedward Erker

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tedwarderker

Summary of Qualifications and Skills

Biometry M.S. and Forestry Ph.D. (expected spring 2019) with 5 years of research and statistical analysis experience

Education

2013–Present **Ph.D.**, *Universifty of Wisconsin–Madison*, *3.929*.
Forestry, Department of Forest and Wildlife Ecology
Committee: Phil Townsend, Jun Zhu, Chris Kucharik, Eric Kruger, Annemarie Schneider.

2013–2018 **M.S.**, *University of Wisconsin–Madison*.
Biometry, Department of Statistics

2006–2010 **B.A.**, *Washington University in St. Louis*, *3.83*.
Environmental Studies–Ecology/Biology, Summa Cum Laude

Relevant Graduate Coursework and Workshops

2017	Hierarchical Modeling and Analysis of Spatial-Temporal Data	*Workshop*
S 2016	Multilevel Models (STAT 679)	*A*
	Software Carpentry	*Workshop*
F 2015	Statistical Methods for Spatial Data (STAT 575)	*AB*
Su 2015	Statistical Consulting (STAT 699)	*A*
S 2015	Teaching Statistics (STAT 692)	*A*
	Intro Mathematical Statistics II (STAT 312)	*AB*
	Remote Sensing Digital Image Processing (ENVIR ST 556)	*A*
	Tools for Reproducible Research (BMI 826)	*A*
F 2014	Intro Mathematical Statistics I (STAT 311)	*A*
S 2014	Statistical Methods for Bioscience II (STAT 572)	*A*
	Advanced Data Analysis with R (STAT 692)	*A*
	Intermediate Data Analysis with R (STAT 692)	*A*
	Teaching Biology: Special Topics (PL PATH 801)	*A*
	Inquiry-Based Biology Teaching (PL PATH 800)	*A*
F 2013	Statistical Methods for Bioscience I (STAT 571)	*A*

Research Experiences

2015–Present **Research Assistant**, *UW-Madison*.

- Map Urban Forests of Wisconsin
  - Tested 3 machine learning algorithms to classify terabytes of imagery
  - Processed imagery in parallel at UW's Center for High Throughput Computing
  - Geospatial analysis in R and image segmentation in python.
- Carbon Budget of Urban Forest
  - Assessed impact of tree canopy on residential building energy use and carbon emissions of ~30,000 Madison homes.
- Canopy Foliar Trait Mapping with Imaging Spectroscopy.
  - Applied partial least squares regression models to predict foliar canopy traits (e.g. nitrogen content) from imaging spectroscopy data
  - Explored anthropogenic and environmental drivers of trait variation across Madison, WI.

May–Aug 2008 **Research Assistant**, *Tyson Research Center*, Eureka, MO.

- Sampled vegetation, identified over 100 plant species as part of study to explore phylogenic relationships in invasiveness.

Statistical Consulting Experiences

2015 **Student Statistical Consultant**, *CALS Statistical Consulting Lab*.

- N_2O flux from maize fields
  - Determined the best time of day to measure N_2O flux in order to predict total daily flux.
- Bee foraging behavior
  - Visualized individual bee length of time inside and outside hive
  - Advised on how to test for differences between honey and bumble bee behavior

2015-Present **Informal within Lab Consulting**, *Townsend Lab*.

- Designed sampling for study of leaf traits across species and seasons
- Compared algorithms for predicting leaf foliar traits from reflectance spectroscopy

Teaching Experiences

2013–2015 **Teaching Assistant**, *UW-Madison*.

- Stat 572: Statistical Methods for Bioscience II, Spring 2015
  - Led 2 weekly discussion groups, graded homework and exams for this graduate-level course largely covering multiple linear and logistic regression
  - Rated 4.53 / 5.00 in student evaluations (n = 46)
  - Prof. Murray Clayton.
- FWE 550/551: Forest Ecology, Fall 2013 and Fall 2014
  - Redesigned, created and independently implemented lab lessons in field and computer lab for ~70 students.
  - Prof. Tom Gower (2013) and Prof. Phil Townsend (2014).
- FWE 110: Living With Wildlife, Spring 2014
  - Graded journals and exams, assisted students during office hours.
  - Prof. Stan Temple.

2010–2012 **Chemistry and Biology Teacher**, *Confluence Prep Academy*, St. Louis.

- Educated over 120 students in six classes daily.
- As first year teacher, developed chemistry curriculum for new charter school integrating College Readiness Standards with Missouri Science Standards.
- Cross-country coach

2010–2012 **Corps Member**, *Teach For America*, Chicago & St. Louis.
- Selected from over 46,000 applicants nationwide
- Commited two years to teach in under-resourced public schools

Apr–Aug 2009 **Farm Education Intern and Farmer**, *Farm And Wilderness*, Plymouth, VT.
- Organized and guided trips of 16-40 students at farm and wilderness education center.
- Managed 3/4 acre garden and cared for sheep, goats, chickens, pigs, and cows as part of farm team.

Jan–May 2008 **Undergraduate Teaching Assistant**, *Washington University in St. Louis*.
- Brave New Crops, Environmental Studies 3322
- Prof. Glenn Davis Stone

Publications

Erker T., Townsend P.A., Wang L., Lorentz L., and Stoltman A. *(in review)*. A statewide urban tree canopy mapping method. *Remote Sensing of Environment*

Erker T., Townsend P.A., *(in prep)*. For much of the US, urban shade trees in residential areas may be an atmospheric carbon source

Erker T., Townsend P.A., *(in prep)*. Environmental drivers of urban tree canopy foliar traits derived from imaging spectroscopy

Presentations and Posters

Dec 2018 For much of the US, urban shade trees in residential areas may be an atmospheric carbon source (abstract submitted). American Geophysical Union Fall Meeting, Washington, D.C.

Apr 2018 Functional and Species Diversity of Trees in Urban Streets. NASA Biodiversity and Ecological Forecasting Team Meeting, Washington, D.C.

Nov 2016 Mapping Urban Tree Canopy of Wisconsin. Society of American Foresters National Convention, Madison, WI

May 2016 How Does the Urban Forest Affect the Urban Heat Island and Building Energy Use? NASA Biodiversity and Ecological Forecasting Team Meeting, Silver Springs, MD.

Awards, Grants, and Fellowships

Jan 2018 Stan Conference Scholarship

2015-2018 NASA Earth and Space Science Fellowship

Sep 2016 Wisconsin DNR Research Grant: Mapping Wisconsin's Urban Tree Canopy

Oct 2016 George Kress Award for Outstanding Contribution of a Graduate Student

May 2016 Travel Award, UW-Madison Department of Forest and Wildlife Ecology

Mar 2016 Cool Science Image contest winner, "Madison Lakes"

May 2010 Outstanding Overall Achievement in Environmental Studies

Jun 2008 Tyson Research Center Summer Undergraduate Research Fellowship

Service

Department and University

2015–2018	Graduate Student Representative	*Department of Forest and Wildlife Ecology*
2017	Software Carpentry Volunteer	*UW-Madison*

Community

2014, 2015	Guest Lab Instructor, Sustainability by the Numbers	*Shabazz High School*
2017	Guest Lab Instructor, AP Environmental Studies	*East High School*

Undergraduate Mentoring

2017	Cheyenne Brandt	*Effect of Leaf Area and Tree Canopy on the Urban Heat Island of Madison, WI.*
2015	Bobby Shepherd	*Investigating the influence of the urban heat island on autumn phenology of* Acer platanoides *with smartphone hemispherical photos.*

Languages and Software

Spoken:	English, Spanish
Programming:	R, Python, Stan, SAS
Other Software:	Emacs, QGIS, Microsoft Office, git

Professional Affiliations

2016–Present	Society of American Foresters
2018–Present	American Geophysical Union

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May 1, 2019

Dear Search Committee Members,

I am applying to the applied statistician position in the CALS Biometry Statistical Consulting Facility because I'm passionate about people and statistics. I know first-hand the dedication researchers have for their work, and I'm excited by the opportunity to help them apply statistical methods to gain insight into new problems. From my time as a student statistical consultant, I learned the process is driven first by human considerations, meeting people at their level of knowledge and recognizing their feelings towards statistics. From Nick Keuler, my consulting supervisor, I learned the importance of listening. When given space to talk, researchers not only clarify their own thinking, but also identify objectives and needs for the consultant to address. My years as a high school teacher and a TA, especially for Stat 572, taught me that building relationships based on trust and respect is the foundation of success, learning, and the proper application of statistics.

My statistical training at UW-Madison and my dedication to constant improvement would serve me well as a consultant. Coursework taught me how to think probabilistically and how to apply a variety of methods such as spatial statistics and multilevel models. My research in forestry has extended the breadth and depth of methods I use. For example, I have compared several machine learning algorithms for classification and analyzed data with more predictors than observations. My biometry project uses Stan to fit nonlinear Bayesian multilevel models of urban tree growth. I know how to meet the varied needs of researchers including modeling for inference, prediction and experimental design, and how to provide advice on statistical limitations and assumptions. When clients need or request methods unfamiliar to me, I look forward to diving into a new challenge and learning.

I have extensive experiences working with large datasets, multiple programming languages, and reproducible workflows. For my dissertation, I classified 4 terabytes imagery at the UW Center for High Throughput Computing. I have used many R packages for big data and also use smart data management techniques to ease the computational burden. I work routinely with R and am familiar with several other programming languages including Stan and SAS. I have not used SAS much outside of coursework, but I would enjoy the opportunity to improve my SAS skills to meet the needs of clients. All my work is fully reproducible and version controlled, and I love sharing literate programming with others. Outreach seminars on best statistical and data visualization practices would leverage my excellent teaching and presenting skills.

I am very grateful to be considered for this opportunity and am confident I have the skills and mindset to contribute to the success of CALS Biometry.

Yours Sincerely,

Tedward Erker

Attached: resume

References

- Jun Zhu
  - Biometry MS Advisor
  - Professor, Department of Statistics and Department of Entomology
  - jzhu@stat.wisc.edu
  - 608-262-1287 (statistics office), 608-890-3916 (entomology office)
- Phil Townsend
  - Forestry PhD Advisor
  - Professor, Department of Forest and Wildlife Ecology
  - ptownsend@wisc.edu
  - 608-263–9107
- Bret Larget
  - Statistics Instructor
  - Professor, Department of Statistics and Department of Botany
  - bret.larget@wisc.edu
  - 608-262-7979 (statistics office), 608-265-6799 (botany office)