Elizabeth F. Waring
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Professional Appointments and Education

Post-Doctoral Researcher, Department of Biological Sciences, Texas Tech University September 2017 to Present – Nick Smith, advisor

Instructor, Department of Biological Sciences, Texas Tech University 2016-2017 – Taught Freshman-level non-majors plant biology lecture

2017: **PhD**, Department of Biological Sciences, Texas Tech University
Dissertation title: **Environmental changes affect carbon assimilation to different degrees for wetland plants differing in nitrogen use strategies**
Advisor: A. Scott Holaday

Graduate Teaching Assistant, Texas Tech University, 2013-2017

Awarded Excellence in Graduate Student Teaching, 2017 by Texas Tech University Graduate School

Graduate Research Assistant, recipient of a Provost's Research Assistantship, 2010-2013

2010: **Master of Science in Biology**, Department of Biological Sciences, Fort Hays State University Thesis title: **Flooding tolerance of native and nonnative grasses: variation in photosynthesis, transpiration, respiration, and carbon isotope discrimination**
(Awarded outstanding Thesis/Field Study in Graduate School, 2010)
Advisor: Brian R. Maricle

Fleharty Fellow, Project title: Mechanisms of cold-tolerance in C4 photosynthetic plants, 2009-2010

Graduate Wetlands Assistantship, Kansas Wetlands Education Center, 2008- 2009

2007: **Bachelor of Science in Biology**, University of Wisconsin-Milwaukee

Publications

Italics indicate undergraduate authors

Waring, E.F. and A.S. Holaday. 2017. Rise in growth temperatures and nitrogen availability may reduce the gap in carbon gain and structural leaf traits between an invasive and a native wetland species. American Journal of Botany. doi: 10.3732/ajb.1600339

Holaday, A.S., D.W. Schwilk, **E.F. Waring**, H. Guvvala, *C.M. Griffin, O.M. Lewis*. 2015. Plasticity of nitrogen allocation in the leaves of the invasive wetland grass, *Phalaris arundinacea* and co-occurring *Carex* species determines the photosynthetic sensitivity to nitrogen availability. Journal of Plant Physiology. 177:20-29. doi:10.1016/j.jplph.2015.01.008

Waring, E.F. and D.W. Schwilk. 2014. Plant dieback under exceptional drought driven by elevation, not by plant traits, in Big Bend National Park, Texas USA. PeerJ 2:e477 doi:http://dx.doi.org/10.7717/peerj.477

Waring, E.F. and B.R. Maricle. 2013. Stomatal conductance correlates with flooding tolerance
in *Pharagmites australis* and *Sorghum halepense*. Transactions of the Kansas Academy of Science 115:161- 166.

Waring, E.F. and B.R. Maricle. 2012. Photosynthetic variation and carbon isotope discrimination in invasive wetland grasses in response to flooding. Environmental and Experimental Botany 77:77-86

Published Datasets

Waring, E.F. and A.S. Holaday. 2017. Data from: High growth temperatures and high soil nitrogen do not alter differences in CO2 assimilation between invasive *Phalaris arundinacea* (reed canarygrass) and *Carex stricta* (tussock sedge). figshare. https://doi.org/10.6084/m9.figshare.5005280.v1

Waring, E.F. and D.W. Schwilk 2014. Data from: Plant dieback under exceptional drought driven by elevation, not by plant traits, in Big Bend National Park, Texas USA. GitHub repo. https://github.com/schwilklab/BBNP20102011Data

Classes Taught

As course instructor or co-instructor
Instructor Biology 1401- Biology of Plants for Non-Majors; Summer 2016, 2017
Co-instructor Biology 1401- Biology of Plants for Non-Majors; Autumn 2016, Spring 2017

As a lab teaching assistant
Biology 3306- Plant Biology: Summer 2013, Autumn 2013-2016
Biology 1401-Biology of Plants for Non-Majors Lab: Autumn 2013-Spring 2016 Biology 250L- Botany Lab, Fort Hays State University, Autumn 2009

Professional Development

TEACH (Teaching Effectiveness And Career enHancement) Fellow 2013-2014
"Program assists Ph.D. students in further developing teaching skills and exploring faculty roles. Program activities include one-on-one consultation, instructor videotaping, comprehensive class feedback, peer observations, project work with a faculty mentor, workshop attendance, and the development of a professional teaching portfolio."-from TEACH program website (http://www.tlpd.ttu.edu/teach/index2.asp)

Invited participant to PHYS-fest 2016 at the Konza Prairie Biological Station in Manhattan, KS.

Early Career Mentorship participant 2016 at the 101st meeting of the Ecological Society of America

Selected Grants/Fellowships

Travel Funds to attend the 101st meeting of the Ecological Society of America as part of the Early Career Mentorship Program, 2016 ($200)
Student Travel Fund to attend PHYS-fest, 2016 ($500)
Student Research Grant from the Society of Wetland Scientists, 2014
($1000) Student Travel Grant from The Wetland Foundation ,2013
($1200)
Student Travel Grant to attend the 97th meeting of the Ecological Society of America from the Physiological Ecology Section, 2012 ($500)
Field Travel Grant 2011 from The Wetland Foundation ($800)
AT&T Chancellor's Fellowship: Texas Tech University, 2010-2014 ($3500 per year)
Provost Doctoral Fellowship: Texas Tech University, 2010-2013 ($30,000 per year stipend and benefits)
Student Travel Grant to attend the Weed Science Society of America Annual Meeting, 2010 ($750) Fleharty Fellowship, Fort Hays State University, 2009-2019 ($7000)

Selected Oral Presentations

Waring, E.F. and N.G. Smith. Nitrogen fertilization does not consistently increase leaf-level influencers of net primary productivity. Presented at the 103rd meeting of the Ecological Society of America, New Orleans, LA, August 2018

Waring, E.F. Whether they are new or old, green things eat the air and ground in different ways. Presented in the Up-Goer Five Challenge: Using common language to communicate your science to the public session at the 101st meeting of the Ecological Society of America, Ft. Lauderdale, FL, August 2016

Waring, E.F. Teaching science to those who don't want to learn it. Presented during the Science Communication ignite session at the 99th meeting of the Ecological Society of America, Sacramento, CA, August 2014

Waring, E.F., J. Moore-Kucera, D.W. Schwilk and A.S. Holaday. Differences in nitrogen-use strategies and soil nitrogen availability throughout the growing season in native *Carex stricta* and invasive *Phalaris arundinacea*. Presented at the 99th meeting of the Ecological Society of America, Sacramento, CA, August 2014

Waring, E.F., J. Moore-Kucera and A.S. Holaday. Examining the relationship between seasonal variation in soil nitrogen and nitrogen-use strategies in native and invasive wetland plants. Presented at the Joint Aquatic Sciences Meeting, Portland, OR, May 2014

Waring, E.F.and D.W. Schwilk. Influence of drought on canopy cover and plant dieback on an elevational gradient at Big Bend National Park Presented at the 98th Meeting of the Ecological Society of America, Minneapolis, MN, August 2013

Waring, E.F. and A.S. Holaday. Seasonal change effects on photosynthesis, nitrogen metabolism and soil nitrogen in competing invasive *Phalaris arundinacea* and native *Carex stricta*. Presented at the Annual Meeting of the Society of Wetland Scientists, Duluth, MN, June 2013 http://dx.doi.org/10.6084/m9.figshare.717199

Waring, E.F. and A.S. Holaday. Effects of seasonal change on photosynthesis, nitrogen metabolism and soil nitrogen in competing invasive grass and native sedge Presented at the Southern Section American Society of Plant Biology, Little Rock, AR, April 2013

Waring, E.F., Z. He and A.S. Holaday. Photosynthetic response of the invasive grass, Phalaris arundinacea, and the native sedge Carex stricta that it replaces to climate change and nitrogen availability. Presented at the Southern Section American Society of Plant Biology, Ocean Springs, MS, April 2011

Waring, E.F. and B.R. Maricle. Photosynthetic variation and carbon isotope discrimination in response to flooding in native and invasive grasses of central Kansas. Presented at Society of Wetland Scientist annual meeting, Salt Lake City, UT, June 2010 **Awarded Honorable Mention Student Paper Presentation: Society of Wetland Scientists Annual Meeting, 2010**

Waring, E.F. Mechanisms of chilling tolerance in C4 plants. Fleharty Fellowship Series. Fort Hays State University, May 2010

Waring, E.F.and B.R. Maricle. Effects of flooding on photosynthesis and respiration in native and invasive wetland grasses of central Kansas. Presented at Society of Range Management/Weed Science Society of America Joint Annual Meeting, Denver, CO, February 2010

Poster Presentations

Italic indicates undergraduate researcher

Waring, E.F. and A.S. Holaday. Competition and nitrogen availability affect nitrogen-use strategies in native and invasive wetland plants. Presented at the 100th Meeting of the Ecological Society of America in Baltimore, MD, August 2015.http://dx.doi.org/10.6084/m9.figshare.1500792

Griffin, C.M., **E.F. Waring**, A.S. Holaday. The effects of soil nitrogen availability on the allocation of nitrogen to leaf processes for an invasive grass, *Phalaris arundinacea*, and native *Carex* species.
Presented at the 99th Meeting of the Ecological Society of America in Sacramento, CA, August 2014. http://f1000.com/posters/browse/summary/1096701

Waring, E.F. and A.S. Holaday. The response of leaf nitrogen metabolism to seasonal changes in ammonium and nitrate for competing invasive *Phalaris arundinacea* and native *Carex stricta*. Presented at the 97th Meeting of the Ecological Society of America in Portland, OR, August 2012

Waring, E.F. and B.R. Maricle. Differences in photosynthesis and respiration due to flooding in native and nonnative wetland grasses of central Kansas. Presented at the Society of Wetland Scientists Annual Meeting, Madison, WI, June 2009

Waring, E.F. and B.R. Maricle. Effects of flooding on light harvesting and CO2 fixation in native and nonnative wetland grasses of central Kansas. Presented for Fort Hays State University's Research and Creative Activities Week, Hays, KS, April 2009

Waring, E.F. and B.R. Maricle. Effects of flooding on light harvesting and CO2 fixation in native and nonnative wetland grasses of central Kansas. Presented at the Kansas Academy of Science Annual Meeting, Topeka, KS, March 2009