Nicholas G. Smith

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Education

Ph.D. Biological Sciences, Purdue University - West Lafayette, May 2016
Dissertation title: Terrestrial Vegetation in the Earth System
Advisor: Dr. Jeffrey S. Dukes
B.S. Ecology and Evolutionary Biology, Purdue University- West Lafayette, May 2010

Professional Appointments

Assistant Professor, Texas Tech University – Biological Sciences, Beginning Fall 2017
Postdoctoral Fellow, Lawrence Berkeley National Lab – Climate and Ecosystems, 2016-Present
Adjunct Assistant Professor, Purdue University – Forestry and Natural Resources, 2016-Present
Postdoctoral Research Assistant, Purdue University – Forestry and Natural Resources, 2016
NASA Earth and Space Science Fellow, Purdue University – Biological Sciences, 2013-2016

Research Interests

Plant ecology and physiology, Global change, Biogeochemistry, Climate, Mathematical modeling, Earth system science

Peer-reviewed publications

Smith, NG and JS Dukes (Accepted). LCE: Leaf carbon exchange dataset for tropical, temperate, and boreal species of North and Central America. *Ecology*.

Smith, NG and JS Dukes (In press). Short-term acclimation to warmer temperatures increases leaf carbon exchange processes across plant types. *Global Change Biology*.

Smith, NG (In press). Plant respiration responses to elevated CO_2: an overview from cellular processes to global impacts. Contribution to *Advances in Photosynthesis and Respiration* special volume on plant respiration. Series editors: T. Sharkey and Govindjee. Volume editors: G. Tcherkez and J. Ghashghaie. New York: Springer-Verlag New York, Inc.

Smith, NG, DL Lombardozzi, A Tawfik, GB Bonan, and JS Dukes (2017). Biophysical consequences of photosynthetic temperature acclimation for climate. *Journal of Advances in Modeling Earth Systems (JAMES)* 9(1): 536-547.

Smith, NG, SL Malyshev, EN Shevliakova, J Kattge, and JS Dukes (2016). Foliar temperature acclimation reduces simulated carbon sensitivity to climate. *Nature Climate Change* 6(4): 407-411.

Smith, NG, MJ Schuster, and JS Dukes (2016). Rainfall variability and nitrogen addition synergistically reduce plant diversity in a restored tallgrass prairie. *Journal of Applied Ecology* 53(2): 579-586.

Smith, NG, GP Pold, CE Goranson, and JS Dukes (2016). Characterizing the drivers of seedling leaf gas exchange responses to warming and altered precipitation: indirect and direct effects. *AoB Plants* 8: plw066.

Sanders-Demott, R, **NG Smith**, PH Templer, and JS Dukes (2016). Towards an integrated understanding of terrestrial ecosystem feedbacks to climate change. *New Phytologist*, 209(4): 1363-1365.

Schuster, MJ, **NG Smith**, and JS Dukes (2016). Responses of aboveground C and N pools to rainfall variability and nitrogen deposition are mediated by seasonal precipitation and plant community dynamics. *Biogeochemistry* 129(3): 389-400.

Lobardozzi, D, GB Bonan, **NG Smith**, JS Dukes, and RA Fisher (2015). Temperature acclimation of photosynthesis and respiration: a key uncertainty in the carbon cycle-climate feedback. *Geophysical Research Letters*, 42(20): 8624-8631.

Atkin, OA and 62 others (including **NG Smith**) (2015). Global variability in leaf respiration among plant functional types in relation to climate and leaf traits. *New Phytologist*, 206(2), 614-636.
Thomson Reuters "Highly cited paper" (top 1% in Plant & Animal Science discipline)

Smith, NG (2014). Testing for temperature acclimation of plant carbon exchange: a comment on "Global patterns of the responses of leaf-level photosynthesis and respiration in terrestrial plants to experimental warming". *Journal of Plant Ecology*, 8(3): 333-334.

Smith, NG, VL Rodgers, ER Brzostek, A Kulmatiski, ML Avolio, DL Hoover, SE Koerner, K Grant, A Jentsch, S Fatichi, and D Niyogi (2014). Towards a better integration of biological data from precipitation manipulation experiments into land surface models. *Reviews of Geophysics*, 52(3): 412-434.

Smith, NG, and JS Dukes (2013). Plant respiration and photosynthesis in global scale models: incorporating acclimation to temperature and CO_2. *Global Change Biology*, 19(1), 45-63.
Thomson Reuters "Highly cited paper" (top 1% in Environment/Ecology discipline)

Published datasets

Smith, NG and JS Dukes (2017). LCE: Leaf carbon exchange dataset for tropical, temperate, and boreal species of North and Central America. *GitHub*. DOI: 10.5281/zenodo.826930.

Smith, NG (2017). Growth chamber acclimation dataset. *Purdue University Research Repository (PURR)*. DOI: 10.4231/R77H1GKS.

Smith, NG (2017). Biophysical consequences of photosynthetic temperature acclimation for climate data. *Purdue University Research Repository (PURR)*. DOI: 10.4231/R7V69GK9.

Smith, NG and JS Dukes (2016). BACE gas exchange 2011. *Purdue University Research Repository (PURR)*. DOI: 10.4231/R7959FJ4.

Smith, NG, MJ Schuster, and JS Dukes (2015). *PRICLE community composition and soil moisture 2012-2013. Purdue University Research Repository (PURR)*. DOI: 10.4231/R7TQ5ZG3.

Selected Funding (≥$1,000)

NSF-USDA EaSM-3 (2015). US Department of Agriculture- National Institute of Food and Agriculture. Decadal prediction of sustainable agricultural and forest management - Earth system prediction differs from climate prediction. To: Multi-institutional including Purdue University. 2015-2020. Primary author of Purdue section (not PI). PI: R. Quinn Thomas (Virginia Tech). $2,569,544 ($500,000 to Purdue University).

NASA Earth and Space Science Fellowship (2013). National Aeronautics and Space Administration. Improving Earth System Models via incorporation of temperature acclimation of plant carbon exchange. To: Purdue University. 2013-2016. Co-PI with Jeffrey S. Dukes. $90,000.

NSF Doctoral Dissertation Improvement Grant (2013). National Science Foundation. Dissertation research: Acclimation of photosynthesis and respiration under climate change: understanding variation among species and biomes to improve climate models. To: Purdue University. 2013-2015. Co-PI with Jeffrey S. Dukes. $19,903.

Purdue Climate Change Research Center Graduate Fellowship (2013). Purdue University Climate Change Research Center. 2013. Co-PI with Jeffrey S. Dukes. $17,605.

Purdue Climate Change Research Center Incentive Grant (2012). Purdue University Climate Change Research Center. 2012. Co-PI with Jeffrey S. Dukes and Michael J. Schuster. $5,000.

Alton A. Lindsey Graduate Fellowship in Ecology (2011). Purdue University Department of Biological Sciences. 2011. $1,000.

Ross Graduate Fellowship (2010). Purdue University Graduate School. 2010. $16,793.

Selected Oral Presentations

Smith, NG, TF Keenan, H Wang, and IC Prentice (2017). Predicting photosynthetic capacity from first principles. Annual meeting of the Ecological Society of America. Portland, OR, USA.

Smith, NG, TF Keenan, H Wang, and IC Prentice (2017; *Invited*). Predicting photosynthetic capacity from first principles. Photosynthesis, carbon fixation, and the environment symposium. University of California Berkeley. Berkeley, CA, USA.

Smith, NG (2017; *Invited*). Plant acclimation to temperature: implications for modeling biosphere-atmosphere feedbacks. Climate Brownbag. Lawrence Berkeley National Lab. Berkeley, CA, USA.

Smith, NG (2017; *Invited*). Using plant physiology to improve understanding of terrestrial biosphere-atmosphere interactions. Department of Biological Sciences. Texas Tech University. Lubbock, TX, USA.

Smith, NG and JS Dukes (2016). Abiotic and biotic determinants of photosynthetic and respiratory capacity from tropical to high boreal biomes. Annual meeting of the Ecological Society of America. Fort Lauderdale, FL, USA.

Smith, NG (2016). Terrestrial vegetation in the Earth system. Department of Biological Sciences. Purdue University. West Lafayette, IN, USA.

Smith, NG and JS Dukes (2015; *Invited*). Understanding and quantifying foliar temperature acclimation for Earth System Models. Annual meeting of the American Geophysical Union. San Francisco, CA, USA.

Smith, NG and JS Dukes (2015). Understanding and quantifying temperature acclimation of plant carbon exchange across multiple plant functional types. Annual meeting of the Ecological Society of America. Baltimore, MD, USA.

Smith, NG, SL Malyshev, EN Shevliakova, and JS Dukes (2014). Foliar temperature acclimation improves model performance while suppressing global carbon uptake. Annual meeting of the Ecological Society of America. Sacramento, CA, USA.

Smith, NG and JS Dukes (2012; *Invited*). The carbon use efficiency of deciduous tree seedling in response to warming and altered precipitation. Annual meeting of the Ecological Society of America. Portland, OR, USA.

Smith, NG and JS Dukes (2011; *Invited*). The influence of altered precipitation and soil moisture on tree photosynthetic acclimation to temperature. Annual meeting of the Ecological Society of America. Austin, TX, USA.

Selected poster presentations

Smith, NG, TF Keenan, H Wang, and IC Prentice (2017). Predicting photosynthetic capacity from first principles. 39th New Phytologist Symposia on Plant Traits. Exeter, UK.

Smith, NG and JS Dukes (2016). Abiotic and biotic determinants of photosynthetic and respiratory capacity from tropical to high boreal biomes. Annual meeting of the American Geophysical Union. San Francisco, CA, USA.

Smith, NG and JS Dukes (2016). Plant temperature acclimation in Earth system models: Scaling from the leaf to the canopy to the globe. 2016 International Land Model Benchmarking (ILAMB) Workshop: Comprehensive evaluation of the carbon cycle, hydrology, and terrestrial ecosystem processes in Earth system models. Washington, D.C., USA.

Smith, NG and JS Dukes (2015). Climate models without foliar temperature acclimation underestimate the land carbon sink and (likely) overestimate global warming. Investigadores de Area de Conservacion Guanacaste Open House. Guanacaste, Costa Rica.

Smith, NG, MJ Schuster, and JS Dukes (2013). Mixed-grass prairie responses to extreme precipitation and nitrogen addition. Annual meeting of the Ecological Society of America. Minneapolis, MN, USA.

Smith, NG, SL Malyshev, EN Shevliakova, and JS Dukes (2013). Does temperature acclimation of plant carbon exchange improve land model performance? INTERFACE/CLIMMANI joint meeting. Mikulov, Czech Republic.

Smith, NG (2011). Plant carbon cycle acclimation and its influence in modeling plant responses to climate change. INTERFACE Workshop. Captiva Island, FL, USA.

Organized Symposia

Vegetation canopies: physiology, structure, function. Annual meeting of the American Geophysical Union. New Orleans, LA, USA. December 2017.

Ecology in a 400+ ppm World: Which Processes Should Rise to the Forefront of Global Change Science? Organized oral session. Annual Meeting of the Ecological Society of America. Portland, OR, USA. August 2017.

Creative approaches for addressing ecological uncertainty in Earth System Models. Organized oral session. Annual Meeting of the Ecological Society of America. August 2015. Baltimore, MD, USA.
Meeting report published in *New Phytologist*

Teaching & Mentoring

Courses:
Environmental Conservation and Introduction to Environmental Science. Purdue University, Spring 2016. Instructor of record.
Ecology, Purdue University, Spring 2013 and Fall 2011. Solo-taught teaching assistantship.
Intro to Diversity, Ecology, and Behavior. Purdue University. Fall 2012. Teaching assistant.
Intro to Ecology and Evolution. Purdue University. Spring 2012. Teaching assistant.
Boot Camp for Biology Students. Purdue University. Fall 2008-Spring 2010. Solo-taught teaching assistant.

Undergraduates mentored:
Kyle Puls. Purdue University. 2014-2015. Undergraduate research for credit.
John Park. Purdue University. 2014-2015. Undergraduate research for credit.
Ryan Rafalski. Purdue University. 2013-2015. Undergraduate research for credit.
Kylie Jungles. Purdue University. 2014. HHMI Research Experience for undergraduates.
Chen Shen. Purdue University. 2013. HHMI Research Experience for undergraduates.
Siying Long. Purdue University. 2012. Summer Undergraduate Research Fellowship.
Ben Ramsay. UMass-Boston. 2011. NSF Research Experience for Undergraduates.

Selected Awards

Outstanding Graduate Student (2014). Purdue University Department of Biological Sciences.
NASA Earth and Space Science Fellowship (2013). Natl. Aeronautics and Space Admin.
NSF Doctoral Dissertation Improvement Grant (2013). National Science Foundation.
PCCRC Graduate Fellowship (2013). Purdue Climate Change Research Center.
NSF GRFP-Honorable Mention (2012). Natl. Science Foundation.
Lindsey Fellowship in Ecology (2011). Purdue University Department of Biological Sciences.
Ross Graduate Fellowship (2010). Purdue University.

Reviewer

Nature Geoscience, Nature Communications, Global Change Biology, New Phytologist, Journal of Experimental Botany, Ecological Monographs, Tree Physiology, Agriculture and Forest Meteorology, Ecological Modelling, Journal of Geophysical Research- Biogeosciences, Journal of Plant Ecology, PLoS One, Photosynthesis Research, Journal of Geophysical Research - Atmospheres, Environmental Pollution

Professional Memberships

Ecological Society of America, American Geophysical Union