Nicholas G. Smith
nick.smith@ttu.edu
+1-806-834-7363
http://smithecophyslab.com/
Google Scholar

Texas Tech University
Department of Biological Sciences
2901 Main St.
Lubbock, TX 79409

Education

Ph.D. Biological Sciences, Purdue University, 2016
B.S. Biological Sciences, Purdue University, 2010

Professional Appointments

Assistant Professor, Texas Tech University, 2017 – Present
Adjunct Assistant Professor, Purdue University, 2016 – Present
Postdoctoral Fellow, Lawrence Berkeley National Laboratory, 2016 – 2017
Postdoctoral Research Assistant, Purdue University, 2016
NASA Earth and Space Science Fellow, Purdue University, 2013 – 2016

Citation Statistics as of May 26, 2020 (Google Scholar)

First Publication: 2013
Peer-reviewed Journal Articles: 31
Peer-reviewed Book Chapters: 1
Peer-reviewed Meeting Reports: 2
Total Citations: 888
h-index: 11
i-10 index: 12

Peer-reviewed Journal Articles; * = corresponding author; JIF = ISI journal impact factor

31. Paillassa, J, IJ Wright, IC Prentice, S Pepin, **NG Smith**, G Ethier, A Westerband, LJ Lamarque, H Wang, WK Cornwell, and V Maire (Accepted). When and where soil is important to modify the carbon and water economy of leaves. *New Phytologist* (JIF: 7.299).

30. **Smith, NG***, RE McNellis, and JS Dukes (Accepted). No acclimation: Instantaneous responses to temperature maintain homeostatic photosynthetic rates under experimental warming across a precipitation gradient in *Ulmus americana*. *Annals of Botany – Plants* (JIF: 2.238).

29. Chen, L, H Hänninen, S Rossi, **NG Smith**, S Pau, Z Liu, G Feng, J Gao, and J Liu (Accepted). Leaf senescence exhibits stronger climatic responses during warm than during cold autumns. *Nature Climate Change* (JIF: 21.722).

28. Licht, J and **NG Smith** (In Press). Pyrogenic carbon improves the physiological performance of a C_3 species planted on a green roof. *Israel Journal of Ecology & Evolution* (JIF: 0.870).

27. Licht, J and **NG Smith** (In Press). Pyrogenic carbon increases pitch pine seedling growth, soil moisture retention and photosynthetic water use efficiency in the field. *Frontiers in Forests and Global Change*.

26. Stocker, BD, H Wang, **NG Smith**, SP Harrison, TF Keenan, D Sandoval, T Davis, and IC Prentice (2020). P-model v1.0: An optimality-based light use efficiency model for simulating ecosystem gross primary production. *Geoscientific Model Development* (JIF: 5.154) 13: 1545-1581.

25. Wang, H, OA Atkin, TF Keenan, **NG Smith**, IJ Wright, K Bloomfield, J Kattge, PB Reich, and IC Prentice (2020). Acclimation of leaf respiration consistent with optimal photosynthetic capacity. *Global Change Biology* (JIF: 8.880) 26(4): 2573-2583.

24. Kattge, J and the TRY plant traits database contributors (including **NG Smith**) (2020). TRY plant trait database – enhanced coverage and open access. *Global Change Biology* (JIF: 8.880) 26(1): 119-188.

23. Liu, Z, L Chen, **NG Smith**, W Yun, X Chen, G Zhou, SA Alam, K Lin, T Zhao, P Zhou, C Chu, H Ma, and J Liu (2019). Global divergent responses of primary productivity to water, energy, and CO_2. *Environmental Research Letters* (JIF: 6.192) 14(12): 124044.

22. **Smith, NG***, G Li, and JS Dukes (2019). Short-term thermal acclimation of dark respiration is greater in non-photosynthetic than in photosynthetic tissues. *Annals of Botany – Plants* (JIF: 2.238) 11(6): plz064.

21. Kumarathunge, DP, BE Medlyn, JE Drake, MG Tjoelker, MJ Aspinwall, M Battaglia, FJ Cano, KR Carter, MA Cavaleri, LA Cernusak, JQ Chambers, KY Crous, MG De Kauwe, DN Dillaway, E Dreyer, DS Ellsworth, O Ghannoum, Q Han, K Hikosaka, AM Jensen, JWG Kelly, EL Kruger, LM Mercado, Y Onoda, PB Reich, A Rogers, M Slot, **NG Smith**, L Tarvainen, DT Tissue, HF Togashi, ES Tribuzy, J Uddling, A Varhammar, G Wallin, JM Warren, and DA Way (2019). Acclimation and adaptation components of the temperature dependence of plant photosynthesis at the global scale. *New Phytologist* (JIF: 7.299) 222(2): 768-784.
****Thomson Reuters "Highly cited paper" (top 1% in Plant & Animal Science discipline)****

20. Liang, M, J Chen, **NG Smith**, X Bai, C Jia, Z Li, and C Liang (2019). Changes and regulations of net ecosystem CO_2 exchange across temporal scales in the Alxa Desert. *Journal of Arid Environments* (JIF: 1.825) 164: 78-84.

19. **Smith, NG***, TF Keenan, IC Prentice, H Wang, IJ Wright, Ü Niinemets, KY Crous, TF Domingues, R Guerrieri, FY Ishida, J Kattge, EL Kruger, V Maire, A Rogers, SP Serbin, L Tarvainen, HF Togashi, PA Townsend, M Wang, LK Weerasinghe, and S Zhou (2019). Global

photosynthetic capacity is optimized to the environment. *Ecology Letters* (JIF: 8.699) 22(3): 506-517.
****Faculty of 1000 recommended****
****Thomson Reuters "Highly cited paper" (top 1% in Environment/Ecology discipline)****
****Ecology Letters Top Downloaded Paper 2018-2019 (top 10%)****

18. **Smith, NG*** and JS Dukes (2018). Drivers of leaf carbon exchange across biomes at the continental scale. *Ecology* (JIF: 4.285) 99(7): 1610-1620.

17. Lombardozzi, DL, **NG Smith**, SJ Cheng, JS Dukes, T Sharkey, A Rogers, RA Fisher, and GB Bonan (2018). Triose phosphate limitation in photosynthesis models reduces leaf photosynthesis and global terrestrial carbon storage. *Environmental Research Letters* (JIF: 6.192) 13(7): 074025.

16. Rodgers, VL, **NG Smith**, SS Hoeppner, and JS Dukes (2018). Warming increases the sensitivity of seedling growth capacity to rainfall in six temperate deciduous species. *Annals of Botany – Plants* (JIF: 2.238) 10(1): ply003.

15. Licht, J, **NG Smith** (2018). The influence of lignocellulosic and hemicellulosic biochar on photosynthesis and water use efficiency in seedlings from a Northeastern U.S. pine-oak ecosystem. *Journal of Sustainable Forestry* (JIF: 1.242) 37(1): 25-37.

14. Li, G, Y Mu, Y Liu, **NG Smith**, and S Sun (2017). Effect of microtopography on soil respiration in an alpine meadow of the Qinghai-Tibetan plateau. *Plant and Soil* (JIF: 3.259) 421(1): 147-155.

13. **Smith, NG*** and JS Dukes (2017). Short-term acclimation to warmer temperatures increases leaf carbon exchange processes across plant types. *Global Change Biology* (JIF: 8.880) 23(11): 4840-4853.

12. **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* (JIF: 3.457) 9(1): 536-547.

11. **Smith*, NG** and JS Dukes (2017). LCE: Leaf carbon exchange dataset for tropical, temperate, and boreal species of North and Central America. *Ecology* (JIF: 4.285) 98(11): 2978.

10. Licht, J, **NG Smith**, P Mitchell, and F Shields (2017). Impact of lignocellulosic and hemicellulosic biochar on soil moisture in low clay soils. *Journal of Plant Nutrition and Soil Science* (JIF: 2.057) 180(5): 576-584.

9. **Smith, NG***, SL Malyshev, EN Shevliakova, J Kattge, and JS Dukes (2016). Foliar temperature acclimation reduces simulated carbon sensitivity to climate. *Nature Climate Change* (JIF: 21.722) 6(4): 407-411.

8. **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* (JIF: 5.782) 53(2): 579-586.

7. **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. *Annals of Botany – Plants* (JIF: 2.238) 8: plw066.

6. 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* (JIF: 3.406) 129(3): 389-400.

5. 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* (JIF: 4.578) 42(20): 8624-8631.

4. Atkin, OA and the GlobResp team (including **NG Smith**) (2015). Global variability in leaf respiration among plant functional types in relation to climate and leaf traits. *New Phytologist* (JIF: 7.299) 206(2), 614-636.
****Thomson Reuters "Highly cited paper" (top 1% in Plant & Animal Science discipline)****

3. **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* (JIF: 2.282) 8(3): 333-334.

2. **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* (JIF: 16.725) 52(3): 412-434.

1. **Smith, NG***, and JS Dukes (2013). Plant respiration and photosynthesis in global scale models: incorporating acclimation to temperature and CO_2. *Global Change Biology* (JIF: 8.880) 19(1), 45-63.
****Thomson Reuters "Highly cited paper" (top 1% in Environment/Ecology discipline)****

Book Chapters; * = corresponding author

Smith, NG* (2017). Plant respiration responses to elevated CO_2: an overview from cellular processes to global impacts. In *Plant Respiration: Metabolic Fluxes and Carbon Balance* (Eds: G. Tcherkez and J. Ghashghaie). Pp. 69-87. New York: Springer-Verlag New York, Inc.

Peer-reviewed Meeting Reports

Cheng, SJ, **NG Smith**, and A Marklein (2018). Modeling global change ecology in a 400+ ppm world. *Eos*, 99.

Sanders-Demott, R, **NG Smith**, PH Templer, and JS Dukes (2016). Towards an integrated understanding of terrestrial ecosystem feedbacks to climate change. *New Phytologist* (JIF: 7.299) 209(4): 1363-1365.

Preprints

Stocker, BD, H Wang, **NG Smith**, SP Harrison, TF Keenan, D Sandoval, T Davis, and IC Prentice (2019). P-model v1.0: An optimality-based light use efficiency model for simulating ecosystem gross primary production. *Geoscientific Model Development Discussions*. DOI: 10.5194/gmd-2019-200.

Wang, H, OK Atkin, TF Keenan, **NG Smith**, IJ Wright, KJ Bloomfield, J Kattge, PB Reich, and IC Prentice (2018). Thermal acclimation of leaf respiration consistent with optimal plant function. *BioRxiv*. DOI: 10.1101/434084.

Published code and datasets

Smith, NG (2020). BACE 2016 gas exchange dataset. *Zenodo/GitHub*. DOI: 10.5281/zenodo.3600547.

Smith, NG (2019). Multi-tissue respiratory thermal acclimation dataset. *Zenodo/GitHub*. DOI: 10.5281/zenodo.3445984.

Smith, NG (2018). Optimal V_{cmax} calculation in R. *Zenodo/GitHub*. DOI: 10.5281/zenodo.1482044.

Smith, NG (2018). Purdue University Growth Chamber Dataset. *Zenodo/GitHub*. DOI: 10.5281/zenodo.2621230.

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.

Atkin, OA and 62 others (including **NG Smith**) (2015). GlobResp – Global Leaf Respiration Database. DOI: 10.1111/nph.13253.

Active External Funding

Defining the drivers of plant nitrogen across resource gradients to improve agricultural, ranch, and wildlife management

- Funder: Braun and Gresham Attorneys at Law
- Program: Texas Ecological Laboratory
- Role: PI
- Total amount: $15,459.55 (100% to TTU)
- Dates: 2020
- Percent contribution: 100%
- Status: Notified of award; funding not yet allocated
- Cayuse award #: A20-0156-001

Proposal to Host the Department of Interior's South-Central Climate Science Center

- Funder: United States Department of the Interior
- Role: Key Participant
- Total amount: $124,427 (100% to TTU)
- Dates: 2019-2020
- Percent contribution: 5%
- Cayuse award #: A19-0286-001

Potato Cropping System Intervention – Kenya

- Funder: United States Department of Agriculture – Foreign Agricultural Service
- Program: Norman E. Borlaug International Agricultural Science and Technology Fellowship Program
- Role: PI and primary mentor
- Total amount: $49,999 (100% to TTU)
- Dates: 2019-2021 (following NCE)
- Percent contribution: 99%
- Cayuse award #: A19-0053-001

Decadal prediction of sustainable agricultural and forest management - Earth system prediction differs from climate prediction

- Funder: US Department of Agriculture- National Institute of Food and Agriculture
- Program: NSF-USDA EaSM-3
- Role: Key participant
- Total amount: $2,569,544 ($500,000 to Purdue University)
- Dates: 2015-2020
- Percent contribution: 0%

Active Internal Funding

Creating Livable Futures

- Funder: Texas Tech University Center for Global Communication
- Role: Collaborator
- Total amount: $40,500
- Dates: 2019-2021
- Percent contribution: 8%

Pending External Funding († = mentee funding for work done in Smith Lab)

Collaborative Research: The physiological responses underlying grassland community and ecosystem responses to soil nitrogen

- Funder: US National Science Foundation
- Program: Division of Environmental Biology Core Program
- Role: PI
- Total amount: $901,521 (100% to TTU)
- Dates: 2020-2023
- Percent contribution: 100% of TTU amount
- Status: Full proposal pending
- Cayuse proposal #: 20-0228

Land Ecosystem Models based On New Theory, obseRvations, and ExperimEnts (LEMONTREE)

- Funder: Schmidt Futures Virtual Earth Systems Research Institute
- Role: Co-PI
- Total amount: $9,997,983 ($612,599 to TTU)
- Dates: 2020-2025
- Percent contribution: 100% of TTU amount
- Status: Preproposal encouraged; full proposal recommended; award pending

- Cayuse proposal #: 20-0377

Quantifying the mechanisms underlying coupled aboveground-belowground responses to elevated CO_2 through resource optimization theory

- Funder: US Department of Energy
- Program: Biological and Environmental Research Earth System Science
- Role: PI
- Total amount: $1,000,000 ($905,000 to TTU)
- Dates: 2020-2023
- Percent contribution: 78% of TTU amount
- Status: Preproposal encouraged
- Cayuse proposal #: 20-0499

Understanding and manipulating the mechanisms of respiratory temperature responses and acclimation to improve crops†

- Funder: United Kingdom Medical Research Council
- Program: UKRI Future Leaders Fellowship
- Role: Project partner
- Total amount: $1,922,240.78 (0% to TTU)
    - Project includes funds for non-TTU collaborators to work in the Smith lab
- Dates: 2020-2024
- Status: Full proposal pending

Previous External Funding († = mentee funding for work done in Smith Lab)

The effects of soil salinity on the growth and nutrient quality of several native Texas grasses†

- Funder: Beta Beta Beta Research Foundation
- Program: Beta Beta Beta Research Grant
- Role: Primary undergraduate student mentor
- Total amount: $400 (100% to TTU)
- Dates: 2019-2020

Photosynthetic acclimation of balsam polar (Populus balsamifera) under drought and nitrogen stress†

- Funder: National Sciences and Engineering Research Council of Canada
- Program: Canada Graduate Scholarships – Michael Smith Foreign Study Supplements Program
- Role: Primary graduate student mentor
- Total amount: $6,000 (0% to TTU)

    - Student received this funding to perform research in the Smith Ecophysiology Lab
- Dates: 2019

Improving Earth System Models via incorporation of temperature acclimation of plant carbon exchange

- Funder: National Aeronautics and Space Administration
- Program: Earth and Space Science Fellowship
- Role: Co-PI
- Total amount: $90,000 (100% to Purdue University)
- Dates: 2013-2016

Acclimation of photosynthesis and respiration under climate change: understanding variation among species and biomes to improve climate models

- Funder: National Science Foundation
- Program: Doctoral Dissertation Improvement Grant
- Role: Co-PI
- Total amount: $19,903 (100% to Purdue University)
- Dates: 2013-2015

Previous Internal Funding († = mentee funding for work done in Smith Lab)

Travel Funding to the American Society of Plant Biologists Meeting†

- Funder: Texas Tech University Honors College
- Program: Texas Tech University Honors College Travel Funding
- Role: Primary undergraduate student mentor
- Total amount: $500 (100% to TTU)
- Dates: 2020

Impacts of cover crop albedo and evapotranspiration on local temperature†

- Funder: Texas Tech University Association of Biologists
- Program: Texas Tech University Association of Biologists Grants in Aid of Research
- Role: Primary graduate student mentor
- Total amount: $700 (100% to TTU)
- Dates: 2019

Purdue Climate Change Research Center Graduate Fellowship

- Funder: Purdue University Climate Change Research Center
- Program: Purdue Climate Change Research Center Graduate Fellowship
- Role: Co-PI
- Total amount: $17,605 (100% to Purdue University)

- Dates: 2013

Purdue Climate Change Research Center Incentive Grant
- Funder: Purdue University Climate Change Research Center
- Program: Purdue Climate Change Research Center Incentive Grant
- Role: Co-PI
- Total amount: $5,000 (100% to Purdue University)
- Dates: 2012

Alton A. Lindsey Graduate Fellowship in Ecology
- Funder: Purdue University Department of Biological Sciences
- Program: Alton A. Lindsey Graduate Fellowship in Ecology
- Role: PI
- Total amount: $1,000 (100% to Purdue University)
- Dates: 2011

Ross Graduate Fellowship
- Funder: Purdue University Graduate School
- Program: Ross Graduate Fellowship
- Role: PI
- Total amount: $16,793 (100% to Purdue University)
- Dates: 2010

Selected External Proposals Not Chosen for Funding

Quantifying the mechanisms underlying coupled aboveground-belowground responses to elevated CO_2 through resource optimization theory
- Funder: US Department of Energy
- Program: Biological and Environmental Research Terrestrial Ecosystem Science
- Role: PI
- Total amount: $1,000,000 ($888,938 to TTU)
- Dates: 2019-2022
- Percent contribution: 78% of TTU amount
- Status: Preproposal encouraged; full proposal not selected for funding
- Cayuse proposal #: 19-0488

INFEWS/T1: The impact of land management DEcisions across the Food, Energy, and Water Systems nexus (DEFEWS)
- Funder: United States National Science Foundation
- Program: Innovations at the Food, Energy, and Water Systems Nexus
- Role: PI

- Total amount: $2,499,997 ($1,183,811 to TTU)
- Dates: 2019-2024
- Percent contribution: 54% of TTU amount
- Status: Full proposal not selected for funding
- Cayuse proposal #: 19-0069

Collaborative Research: RoL: Quantifying the mechanisms underlying terrestrial ecosystem responses to elevated CO_2 through resource optimization theory

- Funder: United States National Science Foundation
- Program: Rules of Life via the Division of Environmental Biology
- Role: PI
- Total amount: $1,068,971 ($857,941 to TTU)
- Dates: 2019-2022
- Percent contribution: 73% of TTU amount
- Status: Full proposal not selected for funding
- Cayuse proposal #: 19-0041

Quantifying the mechanisms underlying coupled aboveground-belowground responses to elevated CO_2 through resource optimization theory

- Funder: US Department of Energy
- Program: Biological and Environmental Research Earth System Science
- Role: PI
- Total amount: $999,725 ($904,725 to TTU)
- Dates: 2018-2021
- Percent contribution: 50% of TTU amount
- Status: Preproposal encouraged; full proposal not selected for funding
- Cayuse proposal #: 18-0362

Invited First Author Oral Presentations († = student or postdoctoral mentee)

Smith, NG (upcoming in 2020; *Invited*). Refining plant ecophysiological theory using ecological networks and databases. Annual meeting of the Ecological Society of America. Salt Lake City, UT, USA.

Smith, NG (2020; cancelled due to COVID-19; *Invited*). Plants aren't dumb: Using optimality theory to address big questions in plant ecophysiology. Department of Ecosystem Science and Management. Texas A&M University. College Station, TX, USA.

Smith, NG (2020; *Invited*). Plants aren't dumb: Using optimality theory to address big questions in plant ecophysiology. Ecology and Evolutionary Biology Seminar. Texas Tech University. Lubbock, TX, USA.

Smith, NG (2020; *Invited*). The resilience of West Texas flora. Climate Change and Effects in Trans-Pecos Texas. Big Bend Chapter of the Texas Native Plant Society. Alpine, TX, USA.

Smith, NG, EF Waring†, HG Scott†, and TF Keenan (2019; *Invited*). Using optimization to better understand leaf-to-whole plant acclimation. Fall meeting of the American Geophysical Union. San Francisco, CA, USA.

Smith, NG (2019; *Invited*). Plants aren't dumb: Using optimality theory to address big questions in plant ecophysiology. Department of Microbiology and Plant Biology. University of Oklahoma. Norman, OK, USA.

Smith, NG (2019; *Invited*). Plants aren't dumb: Using optimality theory to address big questions in plant ecophysiology. Department of Integrative Biology. University of Texas - Austin. Austin, TX, USA.

Smith, NG, EF Waring†, and HG Scott† (2019; *Invited*). Photosynthetic acclimation through the lens of optimality. Annual meeting of the Society for Mathematical Biology. Montreal, Quebec, Canada.

Smith, NG, H Wang, TF Keenan, IC Prentice, and JS Dukes (2018; *Invited*). Photosynthetic acclimation to warming: theory, data, and projections. Annual meeting of the Ecological Society of America. New Orleans, LA, USA.

Smith, NG (2018; *Invited*). Resilience of Texas Flora. Seminar on rhetoric, technical communication, and the story of water and place. Lubbock, TX, 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 (2017; *Invited*). Plants in the climate system. Texas Tech Climate Science Center Symposium. Texas Tech Climate Science Center. Lubbock, TX, 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.

Other Selected Oral Presentations († = student or postdoctoral mentee)

Smith, NG (2020). Using least cost optimality to reliably simulate plant acclimation. CESM Land Model and Biogeochemistry Working Group Meeting. Boulder, CO, USA.

Chavana-Bryant, C, TF Keenan, and **NG Smith** (2019; *Invited*). Examining optimal photosynthetic profiles within vegetation canopies. Fall meeting of the American Geophysical Union. San Francisco, CA, USA.

Dong, N, IJ Wright, IC Prentice, OK Atkin, KJ Bloomfield, SM Gleason, H Wang, V Maire, and **NG Smith** (2019; *Invited*). Global bioclimatic controls of leaf nitrogen: an implementation of least-cost optimality theory. Fall meeting of the American Geophysical Union. San Francisco, CA, USA.

Smith, NG, EF Waring†, and HG Scott† (2019). Understanding photosynthetic acclimation over space and time using optimality theory. Annual meeting of the Ecological Society of America. Louisville, KY, USA.

Waring, EF† and **NG Smith** (2019). Allocation responses to nitrogen addition depend on photosynthetic demand and nitrogen acquisition strategy. Annual meeting of the Ecological Society of America. Louisville, KY, USA.

Scott, HG† and **NG Smith** (2019). Novel theoretical model for optimal C_4 photosynthesis: Implications for Earth System Modeling. Annual meeting of the Ecological Society of America. Louisville, KY, USA.

Waring, EF† and **NG Smith** (2019). Nitrogen fertilization does not increase leaf-level carbon assimilation. Gordon Research Symposium: CO_2 Assimilation in Plants from Genome to Biome. Newry, ME, USA.

Perkowski, EA† and **NG Smith** (2019). The influence of microbial symbioses on leaf- and whole-plant-level acclimation to elevated carbon dioxide. Texas Tech Annual Biological Sciences Symposium. Lubbock, TX, USA.

Wang, H, IC Prentice, OK Atkin, TF Keenan, **NG Smith**, and IJ Wright (2018). Acclimation of respiration to warming consistent with optimal plant function. Fall meeting of the American Geophysical Union. Washington, DC, USA.

Waring, EF† and **NG Smith, NG** (2018). Nitrogen fertilization does not consistently increase leaf-level influencers of net primary productivity. Annual meeting of the Ecological Society of America. New Orleans, LA, USA.

Wang, H, IC Prentice, OK Atkin, TF Keenan, **NG Smith**, and IJ Wright (2018). Acclimation of respiration to warming consistent with optimal plant function. European Geophysical Union General Assembly 2018. Vienna, Austria.

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 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.

Lich, J, F Shields, H Mclaughlin, and **NG Smith** (2016). Cardboard and chipboard biochar – impact on episodic drought and reversing soil contamination. International Biochar Initiative. Corvallis, OR, USA.

Smith, NG and JS Dukes (2015). Understanding and quantifying foliar temperature acclimation for Earth System Models. Fall 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.

Selected poster presentations († = student or postdoctoral mentee)

Bell, A† and **NG Smith** (2020; cancelled due to COVID-19). The effects of soil salinity on the growth and nutrient quality of several native Texas grasses. Texas Tech University Undergraduate Research Conference. Lubbock, TX, USA.

Ortiz, L† and **NG Smith** (2019). Mesquite effects on microhabitat alter community structure but not productivity in short grass prairie. Annual meeting of the Ecological Society of America. Louisville, KY, USA.

Smith, NG, EF Waring†, HG Scott†, TF Keenan, H Wang, and IC Prentice (2019). Using optimization theory to answer big questions in plant ecophysiology. Gordon Research Conference: CO_2 Assimilation in Plants from Genome to Biome. Newry, ME, USA.

Waring, EF† and **NG Smith** (2019). Nitrogen fertilization does not increase leaf-level carbon assimilation. Gordon Research Conference: CO_2 Assimilation in Plants from Genome to Biome. Newry, ME, USA.

Ortiz, L† and **NG Smith** (2019). Mesquite effects on microhabitat alter community structure but not productivity or diversity in short grass prairie. Texas Tech Annual Biological Sciences Symposium. Lubbock, TX, USA.

McNellis, RM† and **NG Smith** (2019). Potential impacts of cover crops on winter albedo: preliminary results and future research. Texas Tech Annual Biological Sciences Symposium. Lubbock, TX, USA.

Scott, HG† and **NG Smith** (2019). Optimal acclimation of C_4 photosynthesis has limited response to temperature CO_2. AAAS Annual Meeting. Washington, DC, USA.

Liu, Z, L Chen, W Yuan, **NG Smith**, and SA Alam (2019). Contrasting long-term influence of energy and water on global gross primary productivity. European Geophysical Union General Assembly 2019. Vienna, Austria.

Smith, NG, TF Keenan, H Wang, and IC Prentice (2017). Photosynthetic capacity regulation is uncoupled from nutrient limitation. Annual meeting of the American Geophysical Union. New Orleans, LA, USA.

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; *Invited*). 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; *Invited*). 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. San Francisco, CA, USA. December 2019.

Vegetation canopies: physiology, structure, function. Annual meeting of the American Geophysical Union. Washington, DC, USA. December 2018.

Land Management in the Earth System: Measurements and Models. Annual meeting of the American Geophysical Union. Washington, DC, USA. December 2018.

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

Land Management in the Earth System: Measurements and Models. 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.
Meeting report published in *Eos*

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

Lecture Courses as Instructor of Record

- **Biology of Plants.** Texas Tech University, Fall 2017 - Present.
    - Average university evaluation score: 4.63/5 (average n per semester = 85)
    - Average departmental evaluation score: 4.51/5 (average n per semester = 70)
- **Physiological Plant Ecology.** Texas Tech University, Spring 2019 - Present.
    - Average university evaluation score: 4.57/5 (average n per semester = 7)
    - Average departmental evaluation score: 4.43/5 (average n per semester = 7)
- **Advanced Physiological Plant Ecology.** Texas Tech University, Spring 2019 - Present.
    - Average university evaluation score: 4.87/5 (average n per semester = 5)
    - Average departmental evaluation score: 4.64/5 (average n per semester = 11)
- **Special Topics: Principles of Terrestrial Ecosystem Ecology.** Texas Tech University, Spring 2019 - Present.
    - Average university evaluation score: 5/5 (average n per semester = 6)
    - Average departmental evaluation score: 4.91/5 (average n per semester = 11)
- **Special Topics: Advanced Principles of Terrestrial Ecosystem Ecology.** Texas Tech University, Spring 2019 - Present.
    - Average university evaluation score: 4.93/5 (average n per semester = 6)
    - Average departmental evaluation score: 4.67/5 (average n per semester = 9)
- **Environmental Conservation and Introduction to Environmental Science**. Purdue University, Spring 2016.

Lab Courses as Instructor of Record

- **Biology of Plants.** Texas Tech University, Fall 2017 - Present.
    - Average university evaluation score: 4.39/5 (average n per semester = 85)
- **Undergraduate Research.** Texas Tech University, Spring 2018 - Present.

Courses as Teaching Assistant

- **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.

Postdocs mentored as faculty advisor

- Elizabeth Waring. Texas Tech University. 2017 – 2019. Currently an Assistant Professor at Northeastern State University.

Graduate students mentored as major advisor

- Evan Perkowski (Ph.D. – Biological Sciences). Texas Tech University. 2018 – Present.
- Risa McNellis (M.S. – Biological Sciences). Texas Tech University. 2018 – Present.
- Helen Scott (M.S. – Biotechnology). Texas Tech University. 2018 – 2019. Graduated with M.S. in Biotechnology in 2019. Currently working in industry for Raytheon/BBN.

Graduate students mentored as committee member

- Morgan Long (M.S. – Biological Sciences). Texas Tech University. 2019 – Present.
- Jordan Brown (Ph.D. – Biological Sciences). Texas Tech University. 2019 – Present.
- Shiva Aghdam (Ph.D. – Biological Sciences). Texas Tech University. 2019 – Present.
- Ezinne Osuji (Ph.D. – Biological Sciences). Texas Tech University. 2019 – Present.
- Nan Hu (Ph.D. – Biological Sciences). Texas Tech University. 2019 – Present.
- Minghao Guo (Ph.D. – Biological Sciences). Texas Tech University. 2019 – Present.
- Juan García-Cancel (Ph.D. – Natural Resources Management). Texas Tech University. 2018 – Present.
- Xiulin Gao (Ph.D. – Biological Sciences). Texas Tech University. 2017 – Present.
- Haley Hale (M.S. – Biological Sciences). Texas Tech University. 2017 – 2018.

Graduate students mentored as dean's representative

- Julie Gerdes (Ph.D. – Technical Communication and Rhetoric). Texas Tech University. 2019.
- Lale Asik (Ph.D. – Mathematics). Texas Tech University. 2020.

Undergraduates mentored as faculty advisor

- McKenna Whaley, Texas Tech University, 2020.
- Bryan Vasquez, Texas Tech University, 2020.
- Taylee Reyes, Texas Tech University, 2020.
- Abigail Bell, Texas Tech University, 2019-2020.
- Mitej Dongarkar. Texas Tech University. 2019-2020.
- Jorge Ochoa. Texas Tech University. 2018-2020.
- Bryn Rice. Texas Tech University. 2019.
- Tyler Do. Texas Tech University. 2019.
- Zachary Bailey. Texas Tech University. 2018 - 2019.
- Leah Ortiz. Texas Tech University. 2018 - 2019.
- Angel Barron. Texas Tech University. 2018 - 2019.
- Amanda Pinal. Texas Tech University. 2018.

- Kobe Young. Texas Tech University. 2018.
- Dave Baychoo. Texas Tech University. 2018.
- Mahum Haque. Texas Tech University. 2018.
- Austin Cooper. Texas Tech University. 2018.
- Joshua Gutierrez. Texas Tech University. 2018.
- Joe Hinnant. Texas Tech University. 2017.

Undergraduates mentored as graduate advisor

- Kyle Puls. Purdue University. 2014-2015.
- John Park. Purdue University. 2014-2015.
- Ryan Rafalski. Purdue University. 2013-2015.
- Kylie Jungles. Purdue University. 2014.
- Chen Shen. Purdue University. 2013.
- Siying Long. Purdue University. 2012.
- Ben Ramsey. UMass-Boston. 2011.

Visiting scholars mentored as faculty advisor

- Dinah Borus (International Potato Center, Kenya). USDA Borlaug Fellow. 2019-2020.
- Ricky Kong (University of Western Ontario, Canada). NSERC CGS-MSFSS Scholar. 2019.

Selected Awards

Open Access Data Award (2019). Texas Tech University Libraries.
Plant, Cell, & Environment Postdoctoral Award (2017). Ecological Society of America.
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.

Professional Service

Associate Editor, *Frontiers in Forests and Global Change*, 2018 – Present
Member, *National Ecological Observatory Network (NEON) Foliar Sampling Technical Working Group*, 2018 – Present

Departmental Service

Member, Seminar Committee, Texas Tech University, 2018 – Present
Member, Plant Biology Curriculum Committee, Texas Tech University, 2018 – Present
Member, Plant Growth Chamber Coordinating Group, Texas Tech University, 2018 – Present

Grant Review Panels

National Science Foundation – Division of Integrative Organismal Systems, June 2019

Grant External Review

National Science Foundation – Division of Environmental Biology

Publication Review

Agriculture and Forest Meteorology, Ecological Modelling, Ecological Monographs, Environmental Pollution, Global Change Biology, Journal of Experimental Botany, Journal of Geophysical Research –Atmospheres, Journal of Geophysical Research – Biogeosciences, Geoscientific Model Development, Journal of Geophysical Research- Biogeosciences, Journal of Plant Ecology, Nature Geoscience, Nature Communications, New Phytologist, Photosynthesis Research, Plant, Cell & Environment, PLoS One, Tree Physiology, Trends in Plant Science

Other reviews

Expert Reviewer, *Intergovernmental Panel on Climate Sixth Report (AR6)*

International Networks

Nutrient Network (site PI; lbb.us)

Professional Memberships

Ecological Society of America
American Geophysical Union

Institutional Affiliations

Texas Tech University Climate Science Center
Purdue Climate Change Research Center