

# JESSE B. NIPPERT

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## Appointments

Mar. 2019 Professor, Division of Biology, Kansas State University  
Feb. 2013 Associate Professor, Division of Biology, Kansas State University  
Aug. 2007 Assistant Professor, Division of Biology, Kansas State University  
Aug. 2007 Director, Stable Isotope Mass Spectrometry Laboratory (*SIMSL*), KSU  
Jan. 2007 Post-doctoral fellow; *Advisor: James J. Butler Jr.*, Kansas Geological Survey  
Jan. 2006 Post-doctoral fellow; *Advisor: Joy K. Ward*, Department of Ecology and Evolutionary Biology, University of Kansas.

## Special Appointments

2015-present Research Fellow, Ndlovu Node, South African Environmental Observation Network  
2008-2015 Adjunct Professor, Biological Sciences, Fort Hays State University  
2010-2012 Adjunct Faculty, Dept. Biology, St. Joseph's University (Philadelphia)  
2010-2012 Adjunct Faculty, Dept. Biology, University of New Mexico  
2009-2015 Graduate Faculty, Ecology & Evolutionary Biology, University of Kansas

## Education

2004-2006 Colorado State University Ph.D. Ecology  
2002-2004 Kansas State University Biology  
*Advisor: Alan K. Knapp*  
2000-2002 University of Idaho M.S. Forest Resources  
*Advisor: John D. Marshall*  
1994-1998 Kansas State University B.S. Park Resource Management &  
Environmental Science (*w/ honors, cum laude*)

## Academic Experience

2004-2005 Graduate Research Assistant Colorado State University  
2002-2003 Graduate Teaching Assistant Kansas State University  
2001-2002 Graduate Teaching Assistant University of Idaho  
2000-2001 Graduate Research Assistant University of Idaho  
Sum. 1998 NSF-REU Fellowship Ecosystems Center, Woods Hole, MA--Abisko  
Scientific Research Station, Abisko, SWEDEN  
Sum. 1997 SCA Fellowship Wrangell-St. Elias National Park, AK  
1996-1998 Laboratory Research Assistant Kansas State University  
Spr. 1996 Study Abroad Program Univ. Western Sydney-Hawkesbury, AUSTRALIA

## Awards & Recognition

2015 Distinguished Alumnus, Graduate Degree Program in Ecology, Colorado State Univ.  
2014 Frontiers of Science (Arab- American) invited presenter and panelist in Muscat, Oman  
2011 Big 12 Faculty Fellowship: research exchange w/ Dr. Tim Seastedt, Univ. Colorado  
2011 H. Henley Haymaker Teaching Excellence Award, Division of Biology, KSU  
2010 William L. Stamey Teaching Award, College of Arts & Sciences, KSU  
2006 General Research Award, Ecology & Evol. Biology, Univ. Kansas  
2005 Graduate Travel Award, Department of Biology, CSU

## Research Interests

Eco-physiology, grassland ecology, stable isotope ecology (specifically,  $\delta D$ ,  $\delta^{18}O$  &  $\delta^{13}C$ ), global climate change (changing precipitation patterns, elevated  $CO_2$ , & altered biogeochemistry), eco-hydrology, physiological mechanisms of species invasion, paleo-ecology

## Publications (all peer-reviewed)

- Bachle S, **JB Nippert** (2018) Physiological and anatomical trait variability of dominant  $C_4$  grasses. *Acta Oecologia* 93:14-20
- Bachle S, Griffith DM, **JB Nippert** (2018) Intraspecific trait variability in *Andropogon gerardii*, a dominant grass species in the US Great Plains. *Frontiers in Ecology and Evolution* 6:217
- O'Keefe K, **JB Nippert** (2018) Drivers of nocturnal water flux in a tallgrass prairie. *Functional Ecology* 32: 1155-1167 doi: 10.1111/1365-2435.13072
- Vero, SE, GL Macpherson, PL Sullivan, AE Brookfield, **JB Nippert**, MF Kirk, S Datta, P Kempton (2018) Developing a conceptual framework of landscape and hydrology on tallgrass prairie: a critical zone approach. *Vadose Zone Journal* 17:170069 doi:10.2136/vzj2017.03.0069
- Holdo, RM, **JB Nippert**, MC Mack (2018) Rooting depth varies differentially in trees and grasses as a function of mean annual rainfall in an African savanna. *Oecologia* 186: 269-280 doi:10.1007/s00442-017-4011-4
- Gokool, S, ES Riddell, AM Swemmer, **JB Nippert**, R Raubenheimer, KT Chetty. (2018) Estimating groundwater contribution to transpiration using satellite-derived evapotranspiration estimates coupled with stable isotope analysis. *Journal of Arid Environments* 152: 45-54 doi: 10.1016/j.jaridenv.2018.02.002
- Brunsell, NA, ES Van Vleck, M Nosschi, Z Ratajczak, **JB Nippert** (2017) Assessing the roles of fire frequency and precipitation in determining woody plant expansion in central US grasslands. *Journal of Geophysical Research-Biogeosciences* 122: 2683-2698 doi:10.1002/2017JG004046
- Griffith, DM, CER Lehmann, CAE Stromberg, CL Parr, RT Pennington, M Sankaran, J Ratnam, CJ Still, RL Powell, NP Hanan, **JB Nippert**, CP Osborne, S Good, TM Anderson, R Holdo, JW Veldman, G Durigan, KW Tomlinson, WA Hoffmann, S Archibald, WJ Bond. (2017) Response to Comment on 'The extent of forest in dryland biomes'. *Science* 358: 1-3.
- Concilio, AL, TR Seastedt, **JB Nippert** (2017) Changing edaphic conditions and exploitation of an expanded phenological niche allows for increased exotic (introduced) plant species dominance. *Plant and Soil* doi:10.1007/s11104-016-3167-8
- Ratajczak, Z, P D'Odorico, SL Collins, B Bestelmeyer, F Isbell, **JB Nippert** (2017) The interactive effects of press/pulse intensity and duration on regime shifts at multiple scales. *Ecological Monographs* doi: 10.1002/ecm.1249
- O'Keefe, K, **JB Nippert** (2017) An assessment of diurnal water uptake in a mesic prairie: evidence for hydraulic lift? *Oecologia* 183: 963-975 doi: 10.1007/s00442-017-3827-2
- Ratajczak, Z, P D'Odorico, **JB Nippert**, SL Collins, NA Brunsell, S Ravi (2017) Changes in spatial variance during grassland-shrubland state transition. *Journal of Ecology* 105: 750-760 doi:10.1111/1365-2745.12696
- O'Keefe, K, **JB Nippert** (2017) Grazing by bison is a stronger driver of plant ecohydrology in tallgrass prairie than fire history. *Plant and Soil* 411: 423-436 doi:10.1007/s11104-016-3048
- Klodd, AE, **JB Nippert**, Z Ratajczak, H Waring, GK Phoenix (2016) Tight coupling of leaf area index to canopy nitrogen and phosphorus across heterogeneous tallgrass prairie communities. *Oecologia* 182(3): 889-898 doi:10.1007/s00442-016-3713-3
- Concilio, AL, **JB Nippert**, S Ehrenfeucht, K Cherwin, TR Seastedt (2016) Imposing antecedent global change condition rapidly alters plant community composition in a mixed-grass prairie. *Oecologia* 182(3) 899-911 doi:10.1007/s00442-016-3684-4

- Ratajczak, Z, JM Briggs, D Goodin, L Luo, R Mohler, **JB Nippert**, BK Obermeyer (2016) Assessing the potential for transitions from tallgrass prairie to woodlands: are we operating beyond critical fire thresholds? *Rangeland Ecology and Management* 69:280-287
- Raynor, EJ, A Joern, **JB Nippert**, JM Briggs (2016) Foraging decisions underlying restricted space-use: effects of fire and forage maturation on large herbivore nutrient uptake. *Ecology and Evolution* 6: 5843-5853 doi: 10.1002/ece3.2304
- Li, H, K Yu, Z Ratajczak, **JB Nippert**, D Tondrob, D Xu, G Du (2016) When variability outperforms the mean: trait plasticity predicts plant cover and biomass in an alpine wetland. *Plant and Soil* doi: 10.1007/s11104-016-2898-x
- Muench, AT, K O'Keefe, **JB Nippert**. (2016) Comparative ecohydrology between *Cornus drummondii* and *Solidago canadensis* in upland tallgrass prairie. *Plant Ecology* 217: 267-276 doi: 10.1007/s11258-016-0567-z
- Ocheltree, TW, **JB Nippert**, PVV Prasad (2016) A safety vs. efficiency trade-off identified in the hydraulic pathway of grass leaves is decoupled from photosynthesis, stomatal conductance, and precipitation. *New Phytologist* 210: 97-107 doi:10.1111/nph.13781
- O'Keefe, K, **JB Nippert**, AM Swemmer (2016) Savanna tree seedlings are physiologically tolerant to nighttime freeze events. *Frontiers in Plant Science* 7:art46 doi:10.3389/fpls.2016.00046
- Mahama GY, Prasad PVV, Roozeboom KL, **JB Nippert**, and Rice CW. (2016) Response of maize to cover crops, fertilizer nitrogen rates, and economic return. *Agronomy Journal* 108:17-31 doi:10.2134/agronj15.0136
- Mahama GY, Prasad PVV, Roozeboom KL, **JB Nippert**, and Rice CW. (2016) Cover crops, fertilizer nitrogen rates, and economic return of grain sorghum. *Agronomy Journal* 108: 1-16 doi:10.2134/agronj15.013
- Concilio, AL, JS Prevéy, P Omasta, J O'Connor, **JB Nippert**, & TR Seastedt (2015) Response of a mixed grass prairie to an extreme precipitation event: Introduced species, soil nitrogen and previous precipitation patterns influence responses. *Ecosphere* 6 (10) 1-12.
- Holdo RM, & **JB Nippert** (2015) Transpiration dynamics support resource partitioning in African savanna trees and grasses. *Ecology* 96: 1466-1472
- Nippert, JB**, & RM Holdo (2015) Challenging the maximum rooting depth paradigm in grasslands and savannas. *Functional Ecology* 29: 739-745 doi: 10.1111/1365-2435.12390
- Lin Y-S, BE Medlyn, RA Duursma, IC Prentice, OK Atkin, CVM Barton, J Bennie, A Bosc, MSJ Broadmeadow, LA Cernusak, P De Angelis, JE Drake, D Eamus, DS Ellsworth, M Freeman, O Ghannoum, TE Gimeno, Q Han, K Hikosaka, LB Hutley, JW Kelly, K Kikuzawa, P Kolari, K Koyama, J-M Limousin, M-L Linderson, M Löw, C Macinins-Ng, NK Martin-StPaul, P Meir, TN Mikkelsen, P Mitchell, **JB Nippert**, TW Ocheltree, Y Onoda, M Op de Beeck, V Resco de Dios, A Rey, A Rogers, L Rowland, SA Setterfield, W Sun, L Tarvainen, S Tausz-Posch, DT Tissue, J Uddling, G Wallin, JM Warren, L Wingate, J Zaragoza-Castells (2015) Optimal stomatal behaviour around the world. *Nature Climate Change* 5: 459-464 doi:10.1038/nclimate2550
- Ratajczak, Z, **JB Nippert**, JM Briggs, & JM Blair (2014) Fire dynamics distinguish grasslands, shrublands, and woodlands as alternative attractors in the Central Great Plains of North America. *Journal of Ecology* 102: 1374-1385
- Ratajczak, Z, **JB Nippert**, TW Ocheltree (2014) Abrupt transition of mesic grassland to shrubland: evidence for thresholds, alternative attractors, and regime shifts. *Ecology* 95: 2633-2645
- McLauchlan, KK, JM Craine, **JB Nippert**, TW Ocheltree (2014) Lack of eutrophication in a tallgrass prairie ecosystem over 27 years. *Ecology (in press)*.
- Thomas, RB, SE Spal, KR Smith, **JB Nippert** (2014) Reply to Schaberg et al.: Applying stable isotope analyses to examine the influence of acid deposition on *Juniperus virginiana*. *Proceedings of the National Academy of Sciences, USA* doi:10.1073/pnas.1321343111

- Brunsell NA, **JB Nippert**, T Buck (2014) Impacts of seasonality and surface heterogeneity on water-use efficiency in mesic grasslands. *Ecohydrology* doi:10.1002/eco.1455
- Nippert, JB**, TW Ocheltree, GL Orozco, Z Ratajczak, B Ling, AM Skibbe (2013) Evidence of physiological decoupling from grassland ecosystem drivers by an encroaching woody shrub. *PLoS ONE* 8(12): e81630 doi:10.1371/journal.pone.0081630
- Thomas, RB, SE Spal, KR Smith, **JB Nippert** (2013) Evidence of recovery of *Juniperus virginiana* trees from sulfur pollution after the Clean Air Act. *Proceedings of the National Academy of the Sciences, USA*. 110 (38) 15319-15324; doi:10.1073/pnas.1308115110
- Craine, JM, **JB Nippert** (2013) Cessation of burning dries soils long-term in a tallgrass prairie. *Ecosystems (in press)*.
- Ocheltree, TW, **JB Nippert**, MB Kirkham, PVV Prasad (2013) Partitioning hydraulic resistance in *Sorghum bicolor* leaves reveals unique correlations with stomatal conductance during drought. *Functional Plant Biology (in press)*
- Ocheltree, TW, **JB Nippert**, PVV Prasad. (2013) Stomatal responses to changes in vapor pressure deficit reflect tissue-specific differences in hydraulic conductance. *Plant, Cell, and Environment (in press)*
- O'Keefe, K, N Tomeo, **JB Nippert**, CJ Springer. (2013) Population origin and genome size do not impact *Panicum virgatum* (switchgrass) responses to variable precipitation. *Ecosphere* 4(3):37.
- Nippert, JB**, TSF Culbertson, GL Orozco, TW Ocheltree, BR Helliker (2013) Identifying the water sources consumed by bison: implications for large mammalian grazers worldwide. *Ecosphere* 4(2):. <http://dx.doi.org/10.1890/ES12-00359.1>
- Hartman JC, **JB Nippert** (2012) Physiological and growth responses of switchgrass (*Panicum virgatum* L.) in native stands under passive air temperature manipulation. *Global Change Biology-Bioenergy*
- Craine JM, TW Ocheltree, **JB Nippert**, EG Towne, AM Skibbe, SW Kembel, and JE Fargione (2012) Global diversity of drought tolerance and grassland climate-change resilience. *Nature Climate Change* doi: 10.1038/nclimate1634
- Craine, JM, EG Towne, D Tolleson, **JB Nippert** (2012) Precipitation timing and grazer performance in a tallgrass prairie. *Oikos* doi: 10.1111/j.1600-0706.2012.20400.x
- Ratajczak Z, **JB Nippert** (2012) Comment on 'Hirota et al. 2011, Global Resilience of Tropical Forest and Savanna to Critical Transitions'. *Science* 336:541, doi:10.1126/science.1219346
- Craine, JM, EG Towne, TW Ocheltree, **JB Nippert** (2012) Community traitscape of foliar nitrogen isotopes reveals N availability in a tallgrass prairie. *Plant and Soil* doi:10.1007/s11104-012-1141-7
- Ratajczak Z, **JB Nippert**, SC Collins (2012) Woody encroachment decreases diversity in North American grasslands *Ecology* 93:697-703
- Craine, JM, **JB Nippert**, AJ Elmore, AM Skibbe, SL Hutchinson, NA Brunsell (2012) The timing of climate variability and grassland productivity. *Proceedings of the National Academy of the Sciences, USA* doi:10.1073/pnas.1118438109
- Gerhart, LM, JM Harris, **JB Nippert**, DR Sandquist, JK Ward (2012) Glacial trees from the La Brea tar pits show physiological constraints of low CO<sub>2</sub>. *New Phytologist* doi: 10.1111/j.1469-8137.2011.04025.x
- Hartman, JC, **JB Nippert**, CJ Springer (2012) Ecotypic responses of switchgrass to altered precipitation. *Functional Plant Biology* doi: 10.1071/FP11229
- Nippert, JB**, RA Wieme, TW Ocheltree, JM Craine (2012) Root characteristics of C4 grasses limit reliance on deep soil water in tallgrass prairie. *Plant and Soil* doi: 10.1007/s11104-011-1112-4
- Carter, JM & **JB Nippert** (2012) "Leaf level physiological responses of *Tamarix ramosissima* to increasing salinity" *Journal of Arid Environments* 77:17-24 doi:10.1016/j.jaridenv.2011.10.00

- Petrie MD, NA Brunsell, **JB Nippert**. (2012) Climate change alters growing season flux dynamics in mesic grasslands. *Theoretical and Applied Climatology* 107:427-440 doi: 10.1007/s00704-011-0484-y.
- Craine JM, EG Towne, TW Ocheltree, **JB Nippert** (2012) “Community traitscape of foliar nitrogen isotopes in a North American tallgrass prairie” *Plant and Soil* doi: 10.1007/s11104-012-1141-7
- Ocheltree, TW, **JB Nippert**, & PVV Prasaad (2012) “Changes in stomatal conductance along a grass leaf reflects changes in leaf structure” *Plant Cell and Environment* doi: 10.1111/j.1365-3040.2011.02470.x
- Carter, JM & **JB Nippert** (2011) “Physiological responses of *Tamarix ramosissima* to a NaCl gradient” *American Journal of Plant Sciences* 2: 808-815. doi:10.4236/ajps.2011.26095
- Fay PA, JM Blair, MD Smith, **JB Nippert**, JD Carlisle, AK Knapp (2011) “Coupled effects of precipitation variability and warming on grassland ecosystem function” *Biogeosciences* 8:3053-3068 doi:10.5194/bg-8-3053-2011
- Ratajczak Z, **JB Nippert**, JC Hartman, TW Ocheltree (2011) “Positive feedbacks amplify rates of woody encroachment in mesic tallgrass prairie” *Ecosphere* 2(11):121. doi:10.1890/ES11-00212.1
- Hartman, JC, **JB Nippert**, RA Orozco, CJ Springer. (2011) Potential ecological impacts of switchgrass (*Panicum virgatum* L.) biofuel cultivation in the Central Great Plains, USA *Biomass and Bioenergy* 35: 3415-3421
- Tucker, SS, JM Craine, **JB Nippert** (2011) Physiological drought tolerance and the structuring of tallgrass prairie assemblages *Ecosphere* 2(4):art48. Doi:10.1890/ES11-00023.1
- Nippert, JB**, TW Ocheltree, AS Skibbe, L Kangas, J Ham, K Arnold, & NA Brunsell. (2011) Linking plant growth responses across topographic gradients in tallgrass prairie. *Oecologia* 166: 1131-1142
- Craine, JM, **JB Nippert**, EG Towne, SS Tucker, S Kembel, A Skibbe, & K McLaughlan. (2011) Functional consequences of climate change-induced plant species loss in a tallgrass prairie. *Oecologia* DOI: 10.1007/s00442-001-1938-8
- Kawakami, T, TJ Morgan, **JB Nippert**, TW Ocheltree, R Keith P Dhakal MC Ungerer (2011) Natural selection drives clinal life history patterns in the perennial sunflower species, *Helianthus maximiliani* *Molecular Ecology* 11:2318-28 doi: 10.1111/j.1365-294x.2011.05105x
- Travers, SE, Z Tang, D Caragea, KA Garrett, SH Hulbert, JE Leach, J Bai, A Saleh, AK Knapp, PA Fay, **JB Nippert**, PS Schnable, & MD Smith (2010) Variation in gene expression of *Andropogon gerardii* in response to altered environmental conditions associated with climate change. *Journal of Ecology* doi: 10.1111/j.1365-2745.2009.01618.x
- Nippert, JB**, M. Hooten, D. Sandquist, & JK Ward. (2010) A statistical model for predicting El Niño events using tree-ring widths and  $\delta^{18}\text{O}$ . *Journal of Geophysical Research-Biogeosciences* doi:10.1029/2009JG001101
- Craine, JM, EG Towne, and **JB Nippert** (2010) Climate controls on grass flowering over a quarter century in a tallgrass prairie. *Ecology* doi: 10.1890/09-1242
- Nippert, JB**, JJ Butler Jr, GJ Kluitenberg DO Whittmore, D Arnold, SA Spal, & JK Ward. (2010) Patterns of *Tamarix* water use during a record drought. *Oecologia* 162:283-292.
- Nippert, JB**, PA Fay, J.D. Carlisle, AK Knapp, & MD Smith. (2009). Ecophysiological responses of two dominant grasses to altered temperature and precipitation regimes. *Acta Oecologia* 35: 400-408.
- Fay, PA, DM Kaufman, **JB Nippert**, JD Carlisle, CW Harper. (2008) Changes in ecosystem function due to extreme precipitation events in grassland. *Global Change Biology* 14: 1-9.
- Nippert, JB** & AK Knapp (2007) Linking water uptake with rooting patterns in grassland species. *Oecologia* 153: 261-272.

- Nippert, JB** & AK Knapp (2007) Soil water partitioning contributes to species coexistence in tallgrass prairie. *Oikos* 116: 1017-1029.
- Nippert, JB**, PA Fay & AK Knapp. (2007) Photosynthetic traits in C<sub>3</sub> and C<sub>4</sub> grassland species in mesocosm and field environments. *Environmental and Experimental Botany* 60: 412-420.
- Nippert, JB**, AK Knapp & JM Briggs. (2006) Intra-annual rainfall variability and grassland productivity: can the past predict the future? *Plant Ecology* 184: 65-74.
- Duursma, RA, JD Marshall, **JB Nippert**, CC Chambers, & AP Robinson. (2005) Estimating leaf-level parameters for ecosystem process models: a study in mixed conifer canopies on complex terrain. *Tree Physiology* 25: 1347-1359.
- Nippert, Jesse** and John Blair. (March 2005, posting date) Comparing the Influence of Precipitation, Fire, and Topography on Plant Productivity in the Tallgrass Prairie, *Teaching Issues and Experiments in Ecology*, Vol. 3: Issues: Data Set #1 [online].  
[http://tiee.ecoed.net/vol/v3/issues/data\\_sets/konza/abstract.html](http://tiee.ecoed.net/vol/v3/issues/data_sets/konza/abstract.html)
- Nippert, JB**, RA Duursma, & JD Marshall. (2004) Seasonal variation in the photosynthetic potential of montane conifers. *Functional Ecology* 18: 876-886.
- Morgan, J. et al. (2004) Water relations in grassland and desert ecosystem exposed to elevated atmospheric CO<sub>2</sub>. *Oecologia* 140: 11-25
- Nippert, JB** & JD Marshall (2003) Sources of variation in ecophysiological parameters in Douglas-fir and grand fir canopies. *Tree Physiology* 23: 591-601.

### Book Chapters

- Blair, JM, **JB Nippert**, JM Briggs. Grassland Ecology. IN: "The Plant Sciences: Ecology and the Environment", Russell Monson (ed.) Springer, (*In press*).
- Seastedt, T.R., L Hartley **JB Nippert**. Ecosystem transformations along the Colorado Front Range: Prairie dog interactions with multiple components of global environmental change. IN: Richard Hobbs, Eric Higgs and Carol Hall (eds). Novel Ecosystems: Intervening in the New Ecological World Order. Wiley Press ISBN: 978-1-1183-5422-3.

### Funded External Proposals

- NSF-EAR, "Collaborative Research: Digging deeper: Do deeper roots enhance deeper water and carbon fluxes and alter the trajectory of chemical weathering in woody-encroached grassland? 2019-2022, \$147,259
- NSF-DEB, "Collaborative Research: Rainfall variability and the axes of tree-grass niche differentiation." 2019-2022, \$240,749
- NSF-MRA, "Collaborative Research: MRA: A lineage-based framework to advance grassland macroecology and Earth system modeling." 2019-2022, \$298,621
- DOE-Terrestrial Ecosystems Science Program, "Using root and soil traits to forecast woody encroachment dynamics in mesic grassland", 2018-2021, \$998,261
- NSF-IOS, "MEETING: Phys-Fest 2, Holden Arboretum, July 15-19, 2018" \$49,000
- NSF-IOS, "MEETING: Phys-Fest: Advancing the Field of Plant Physiological Ecology; Konza Prairie, June 6-10, 2016" 9/1/15-8/30/16, \$31,000
- NSF-DEB, "Konza Prairie LTER VII: Long-Term Research on Grassland Dynamics- Assessing Mechanisms of Sensitivity and Resilience to Global Change" 11/01/14-10/31/20, \$6M (John Blair – PI)
- NSF Dimensions: Collaborative Research: The biogeography and evolution of drought tolerance in grasses" 01/01/14-12/31/17 \$1.3M (Mark Ungerer- PI)
- LTER Network Office Synthesis Proposals, "Bi-stability in North American ecosystems: analyzing woody plant cover for temporal stable-state dynamics" \$12K

- NSF-DEB, “Konza Prairie LTER VI: Grassland Dynamics and Long-Term Trajectories of Change”, 11/01/08-10/31/14, \$5.64M (John Blair – PI)
- NSF-MSP, “Global Environmental Change and Local Ecosystems: A Kansas MSP-Start Project for P-20 Students”, 09/01/2009-08/31/11, \$299K, (Joy Ward, PI – Univ. Kansas).
- NSF-DEB, “Ecosystem transformations along the Colorado Front Range: Prairie dog interactions with multiple components of global environmental change” 09/01/11-08/30/14 \$851K (Tim Seastedt, PI – Univ. Colorado)
- NSF-DEB, “LTER International Supplement: Drivers of Mopane expansion in South Africa Savannah”, 2010, \$9,700

### **Funded Internal Proposals**

- KSU-FDA, “Travel support to the First ILTER Meeting”, October, 2016, \$2200
- KSU-FDA, “Travel support the Savanna Science Networking Meeting, Skukuza, South Africa” Spring 2012 \$3500
- KSU-USRG, “Linking Water Availability to *Tamarix* Ecophysiology in SW Kansas”, 7/01/08-9/01/08, \$2.5K
- KSU-BRIEF – “Providing for the long-term stability and quality of analyses at the Stable isotope mass spectrometry laboratory (SIMSL). 10/30/ 07, \$2.7K
- KSU-BRIEF – “Moving SIMSL to the field: in situ of isotopic analysis of liquid and water vapor samples with high precision and throughput”, 12/21/08, \$30K.
- KSU-FDA, “Travel support to attend the 2009 Joint Assembly 'The Meeting of the Americas' in Toronto, CAN.” Spring 2009, \$500
- KSU-BRIEF, “Travel support to attend the 2009 Joint Assembly 'The Meeting of the Americas' in Toronto, CAN.” Spring, 2009, \$1000

### **Invited Platform Presentations** (*presented by Nippert*)

- 2019 Bush encroachment alters grassland ecohydrology and requires novel solutions for management. *KEYNOTE SPEAKER*, 54th Annual Congress, Grassland Society of Southern Africa, Uppington, South Africa.
- 2019 Mechanisms and consequences of woody plant encroachment in grassland ecosystems. Missouri Dept. of Conservation Stakeholders Meeting, Sedalia, MO
- 2019 Ecohydrology of the Konza Prairie. Department of Geology, Kansas State University
- 2018 Revisiting paradigms of C4 grass ecophysiology, Division of Biology, Kansas State University
- 2018 Revisiting paradigms of C4 grass ecophysiology, Odum School of Ecology, University of Georgia
- 2018 Climate change impacts in grassland ecosystems, Lawrence, KS Public Library, Invited by the Grassland Heritage Foundation.
- 2018 Drivers and consequences of woody encroachment in mesic grassland. *Next-Generation Ecosystems Experiments - Arctic*, Science Talks, Oak Ridge National Laboratory, Tennessee.
- 2017 Fire and grazing in tallgrass prairie: woody encroachment, Grassland Restoration Networking Meeting.
- 2016 Fight Night: Pain on the Plains. Department of Biology Seminar Series, University of Pennsylvania.
- 2016 Grass ecophysiology responses to water manipulations. Drought-Net Research Coordination Network; Utilizing ongoing experiments to understand terrestrial ecosystem sensitivity to precipitation change and drought. Sevilleta National Wildlife Refuge, New Mexico
- 2016 Woody encroachment of tallgrass prairie. 12th Annual Tallgrass Prairie Management Seminar. Beatrice, NE

- 2015 Fight Night: Pain on the Plains, Graduate Degree Program in Ecology, Colorado State University
- 2014 Adaptive management of water resources in grasslands: Challenges in a changing world. Arab - American Frontiers of Science, Muscat, Oman.
- 2014 Altered land use and ecohydrology drive community change: lessons from South African forest and Kansas prairie. Dept. Horticulture, Kansas State University
- 2014 Ecohydrological change in grassland and woodland systems. Dept. Biology, West Virginia University
- 2014 Adaptive management of water resources in grasslands: challenges in a changing world. Nature Conservancy of Kansas Annual Meeting.
- 2012 Mechanisms and consequences of ecohydrologic change in mesic grasslands. Dept. Geography, University of Kansas
- 2012 Mechanisms and consequences of ecohydrologic change in mesic grasslands School of Natural Resources, University of Nebraska- Lincoln
- 2012 Mechanisms and consequences of ecohydrologic change in mesic grasslands. Division of Biology, Kansas State University
- 2012 Attack of the Clones: Woody plant expansion in grasslands. Dept. Biology, St. Joseph's University, Philadelphia, PA
- 2012 Source water partitioning among multiple species in mesic grassland. Dept. Biology, University of Missouri, Columbia, MO
- 2011 Grasslands in a Global Context: International Symposium Celebrating Konza Prairie, Manhattan, KS
- 2011 Water – Plants- Konza – Baboons – the UNIVERSE!, EEB Seminars, Division of Biology, KSU
- 2011 Water source partitioning among coexisting grassland species. Dept. Ecology and Evolutionary Biology, University of Colorado-Boulder, Boulder, CO
- 2011 Water source partitioning among coexisting grassland species Dept. Botany, Oklahoma State University, Stillwater, OK
- 2009 Local hydrological processes recorded in plant water  $\delta^2\text{H}$  and  $\delta^{18}\text{O}$ . Department of Geology Seminar Series, Kansas State University.
- 2009 Environmental variability as a primary driver of tallgrass prairie plant eco-physiology. Department of Biology Seminar Series, Wichita State University, KS
- 2008 Global Change and the Future of Ecophysiology. Department of Biology Seminar Series, Emporia State University, Emporia, KS
- 2007 *Tamarix ramosissima* physiology and groundwater use during a record drought. GSA Annual Meeting: Ecohydrology of Riparian Zones Session. Denver, CO
- 2006 The influence of water and  $\text{CO}_2$  variability on plant ecophysiology from past to future climates. EEB Colloquium, University of Kansas, Lawrence, KS.
- 2006 Global change and the future of ecophysiology. Division of Biology Forum, Kansas State University, Manhattan, KS.
- 2006 Life by the drop: water as a physiological driver of plant productivity. EEB Seminar Series, Kansas State University, Manhattan, KS.

### **Research Presentations** (*presented by Nippert*)

- 2019 Can't see the grassland for the trees: rooting dynamics in tallgrass prairie. ESS PI Breakout Session, Dept. of Energy Annual Meeting, Potomac, MD
- 2019 Using ecophysiology to draw inference into grassland ecosystem management. Society of Range Management. Minneapolis, MN



- 2018 Repeated cutting alters tree-grass interactions in Mopane veld. Savanna Science Networking Meeting, Skukuza, South Africa.
- 2017 A new paradigm for plant water uptake and use in grasslands and savannas. Savanna Science Networking Meeting, Skukuza, South Africa.
- 2015 LAI predicts canopy N & P in annually-burned tallgrass prairie. International LTER 1st Open Science Conference. Skukuza, South Africa.
- 2016 LAI predicts canopy N & P in Annuallyburned tallgrass prairie. Konza Prairie LTER Annual Meeting
- 2016 Plant physiology influences the conversion of C4 grassland to shrubland. Society of Range Management. Corpus Christi, Texas
- 2015 Trajectories of change in long-term experimental controls: Konza Prairie. LTER All-Scientist's Meeting, Estes Park, CO.
- 2015 Using IRT's to assess changes in plant physiology, LTER All-Scientist's Meeting, Estes Park, CO.
- 2015 Drivers of Riparian Forest Change in Mapungubwe National Park. Savanna Science Meeting, Skukuza, South Africa.
- 2013 Variation in water sources used among riparian forest tree species in Mapungubwe National Park. Savanna Science Meeting, Skukuza, South Africa.
- 2012 Ecohydrologic mechanisms of Mopane in Kruger National Park. Savanna Science Meeting, Skukuza, South Africa.
- 2010 Scaling carbon fluxes in tallgrass prairie; 2010 ESA Annual Meeting, Pittsburg, PA
- 2009 Patterns of  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  in a woody shrub distributed along a topoedaphic gradient in burned and grazed grassland; 2009 Joint Assembly American Geophysical Union, Toronto, CAN
- 2008 Sensor networks for measuring spatial variability in the landscape energy balance; Geological Society of America Annual Meeting, Houston, TX
- 2008 *Tamarix ramosissima* physiology and groundwater use during a record drought. Kansas Natural Resources Conference, Wichita, KS
- 2007 Comparing the effects of climate variability and ENSO on tree growth at glacial and modern times. South-central and North-central Joint Section Meeting Geological Society of America, Lawrence, KS
- 2007 Salt-cedar water use in the presence of a falling water table. Water & the Future of Kansas Conference, Topeka, KS.
- 2006 Comparing the effects of climate variability and ENSO on tree growth at glacial and modern times. Ecological Society of America, Memphis, TN
- 2005 Water-use strategies of tallgrass prairie plant species: an isotopic approach. Ecological Society of America, Montreal, CAN.
- 2004 Resource-use or photochemistry: what confers C<sub>4</sub> dominance in tallgrass prairies? Ecological Society of America, Portland, OR
- 2002 Sources of variation in ecophysiological parameters in Douglas-fir and grand fir. Ecological Society of America, Tucson, AZ

### **Courses Instructed**

- Fall 2016, 2018: BIOL897, Stable Isotope Ecology
- Fall 2008-2018: BIOL500 / 501, Plant Physiology, Plant Physiology Lab, KSU
- Fall 2007: BIOL198, Principles of Biology, KSU

### **Post-doctoral Scholars Advised**

Amy Concilio, 2013-2015

## **Graduate Students Advised**

### *Current*

- Rachel Keen, Ph.D., pending graduation May 2023
- Seton Bachle, Ph.D., pending graduation May 2021
- Marissa Zaricor, M.S., pending graduation Dec 2019
- Emily Wedel, M.S., pending graduation May 2019

### *Completed*

- Rory O'Connor, Ph.D., 2019
- Seton Bachle, M.S., 2017
- Kimberly O'Keefe, Ph.D., 2016
- Zak Ratajczak, Ph.D., 2014
- Jeff Hartman, M.S., 2011
- Sally Tucker, M.S. 2010
- Jacob Carter, M.S. 2010

## **Graduate Student Committee Member**

### *Current*

- Mohammad Rahman, Ph.D., KSU-Genetics (outside chair)
- Andrew Auld, Ph.D., KSU- Agronomy (outside chair)
- Javier Fernandez, Ph.D., Agronomy
- Caitlin Broderick, Ph.D., KSU-Biology
- Samantha Sharpe, Ph.D., KSU-Biology
- Ryan Estes, M.S., KSU- Biology,
- Bre Waterman, M.S., KSU-Geology
- Madelon Case, Ph.D., Yale
- Joshua Pool, Ph.D., KSU-Horticulture

## **Graduate Student Committee Member**

### *Completed*

- Monica Shaffer, M.S., KSU-Biology
- Regina Enniful, Ph.D., 2019, KSU-Agronomy
- Maged Nosshi, Ph.D., 2019, Geography, Univ. Kansas
- Adela Annis, M.S., 2018 KSU-Biology
- Kelly Logan, Ph.D., 2018, Geography, Univ. Kansas
- Rodrigo Pedroza, Ph.D., 2017, Plant Pathology, KSU
- Dillooshi Weerosooryia, 2016, Horticulture, KSU
- Kyle Stropes, M.S., 2016, KSU-Agronomy
- Jacob Carter, Ph.D., 2015, EEB, University of Kansas
- Kyle Shroyer, Ph.D., 2015, KSU-Agronomy
- George Mahama, Ph.D., 2015, KSU-Agronomy
- Cole Thompson, Ph.D., 2014, KSU-Horticulture
- Jackie Ott, Ph.D., 2014, KSU-Biology
- Michael Carson, M.S., 2013, KSU-Biology
- Paul Killian, M.S., 2012, KSU-Biology
- Jennifer Shelton, M.S., 2012, KSU-Biology
- Meghan Avolio, Ph.D., 2012, EEB – Yale

- Alexis Reed, Ph.D., 2012, EEB – University of Kansas
- Raymond Mutava, Ph.D., 2012, KSU- Agronomy
- Troy Ocheltree, Ph.D., 2012, KSU – Agronomy
- Michell Thomey, Ph.D., 2012, Biology –University of New Mexico
- O.C. Eke, M.S., 2011, KSU-Geology
- Kristin Polacik, 2010, Biology, Fort Hays State University

### **Undergraduate Research Projects**

- Lizeth Telleria (summer 2017): REU fellowship at Konza LTER (Cal St. Poly-Pomona)
- Mira Ensley-Field (summer 2016): REU fellowship at Konza LTER (Macalester College)
- Braden Hoch (summer 2015): REU fellowship at Konza LTER (KSU)
- Andy Muench (summer 2014): REU fellowship at Konza LTER (U. Wisconsin)
- Rachel Lease (2013-2016): Riparian water use in a tallgrass prairie ecosystem (KSU)
- Ben Ketter (2012-2014): Quantifying water flux of shrubs in mesic grassland (KSU)
- Gracie Orozco (2009-2014): Isotopic analysis of bison diet (KSU)
- Teall Culbertson (2009-11): Predicting bison source-water use (KSU)
- Annie Klodd (summer 2011): REU fellowship at Konza LTER (Grinnell)
- Rachel Wieme (summer 2010): REU fellowship at Konza LTER (St. Olaf's)
- Zak Ratajczak (summer 2009): REU fellowship at Konza LTER (Vassar)
- Laura Kangas (summer 2008): REU fellowship at Konza LTER (Michigan Tech)
- David Martin (summer 2008): Problems in Biology (BIOL 698) Independent Research
- Joe Brillhart (summer 2008): Problems in Biology (BIOL 698) Independent Research