

JENNIFER S. POWERS

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PROFESSIONAL INTERESTS

Terrestrial biogeochemistry, ecosystem processes, plant functional traits, and tropical ecology

PROFESSIONAL EXPERIENCE

January 2014-June 2014. Sabbatical Scholar working in Dr. Tom Bruns' Lab, Dept. of Plant and Microbial Biology, University of California-Berkeley.

June 2011-present. Research Associate, Smithsonian Tropical Research Institute.

May 2013-present. Associate Professor, Depts. of Ecology, Evolution & Behavior (75%, tenure home) and Plant Biology (25%), University of Minnesota.

Fall, 2006-May 2013. Assistant Professor, Depts. of Ecology, Evolution & Behavior (75%, tenure home) and Plant Biology (25%), University of Minnesota.

April-June, 2010. Visiting Professor, Institute for Tropical and Subtropical Soil Science, Georg-August University, Goettingen, Germany.

March 2004-2006. NSF ADVANCE Postdoctoral Research Associate & Adjunct Professor, Department of Soil, Water and Climate, University of Minnesota.

August 2002-2004. Adjunct Professor, Escuela de Biología, Universidad de Costa Rica.

December 2001-February 2004. Postdoctoral Research Associate. Department of Ecology and Evolution, State University of New York, Stony Brook, NY.

EDUCATION

Ph.D. 2001. Department of Biology, Duke University, Durham, NC

M.S. 1995. Department of Forest Science, Oregon State University, Corvallis, OR

B.A. 1991. Department of Biology, Reed College, Portland, OR

HONORS AND AWARDS

Outstanding Advisor Award from the Ecology, Evolution, and Behavior Graduate Program (2014)

Eramus Mundus Fellowship (2014)

National Academy Education Fellow in the Life Sciences (2011-2012)

Institute on the Environment Resident Fellow (2009-2012)

McKnight Land Grant Professor, University of Minnesota (2009-2011)

Department of Forest Science Faculty Award for Graduate Student Achievement, OSU (1994)

Outstanding Senior Woman at Reed College from the American Association of University Women (1991)

Commendation for Academic Excellence from Reed College (1990)

EDITORIAL BOARDS

Biotropica (2013-present)

ADDITIONAL TRAINING

Microbial Diversity, Marine Biological Laboratory (Summer, 2004). A 6-week intensive course.

Comparative Neotropical Ecology (Fall, 2001), Organization for Tropical Studies and Smithsonian Tropical Research Institute. A 10-week long field course that visited field stations in Costa Rica, Panama, Peru, and Brazil.

Summer Institute Fellow (1999) at the Center for the Study of Institutions, Population, and Environmental Change (CIPEC). Indiana University, Bloomington.

Geographic Information Systems Laboratory Intern, La Selva Biological Station, Costa Rica. (February 1995 - August 1995).

Tropical Diversity and Conservation, Organization for Tropical Studies (Summer, 1994). A 3-week long field course in Costa Rica.

TEACHING TRAINING

Fall, 2014-Spring, 2015. Internationalizing the Teaching and Learning Faculty Cohort Program, University of Minnesota.

July, 2011. Howard Hughes Medical Institute/National Academies Northstar Summer Institute for Undergraduate Education in Biology, University of Minnesota. A week-long program.

April, 2011. "Teaching and Learning in a Changed World" symposium organized by the Academy of Distinguished Teachers and the Center for Teaching and Learning.

Fall 2007-Spring 2008. Early Career Faculty Learning Community program organized by the Center for Teaching and Learning.

August, 2007. PowerPoint Reconsidered, Center for Teaching and Learning Services

August, 2007. Active Lectures, CTLS.

March 2007. "Getting Beyond Covering Content" - Larry Michaelsen.

August 2005. "Strategies for Large Classes" CTLS.

August 2005. "The First Day & Beyond" CTLS.

August 2005. "Discussions that Work" CTLS.

WORKSHOPS ORGANIZED

*i*ACG- Area de Conservación Guanacaste Research Open House- Communicating the Value of the ACG, June 2nd and 3rd, 2015, Horizontes, Costa, Rica. Approximately 80 participants from Costa Rica, Canada, China, and the United States. Co-organized with Drs. Jeff Klemens and Cathy Hulshof.

Super-model of models, Soil Carbon Dynamics Workshop (sponsored by the Forecast-RCN, NSF). Co-organized with Drs. Kiona Ogle (Arizona State University) and David LeBauer (University of Illinois), November 14-17th, 2014, Biosphere 2, Arizona.

*i*ACG- Area de Conservación Guanacaste Research Open House, May 23-24th, 2012, Costa Rica. Approximately 60 participants from Costa Rica, Canada, and the United States.

*i*ACG Follow-up Workshop. June 6-7th, 2011. Area de Conservación Guanacaste, Costa Rica.

Implementing *i*ACG: Building structures to link academic research, education, conservation and biodevelopment in the Area de Conservación Guanacaste. August 16-21st, 2010 (sponsored by UMN's Institute on the Environment).

INVITED WORKSHOP PARTICIPATION

Invited Participant, Early Career Workshop to identify priorities for long-term ecological experiments, Kellogg Biological Station, MSU (February, 2015), organized by Drs. Jennifer Lau and Mark Bradford.

PARNTERS RCN Working group on effects of climate change and climate variability on reforestation, Columbia University, January 19-23, 2015 (funded by NSF).

PARTNERS RCN Workshop (People and Reforestation in the Tropics a Network for Research, Education, and Synthesis), Storrs, Connecticut, May 21-26th, 2014 (sponsored by NSF).

TropiDry Network Meeting. Alberta, Canada, September 20-22nd, 2010.

Neotropical Secondary Forest Regeneration: Integrating Ecological Processes Across Multiple Scales, Morelia, Mexico 28-30 October, 2009 (sponsored by NSF).

Long-term Soil Ecosystem Experiments Workshop on Global Soil Change, Durham, NC, June 8-11, 2009 (sponsored by NSF, USDA, and Duke University).

Microscale Approaches to Macroscale Issues in Ecology, April 16-18, 2007 (sponsor NSF).

LTER Ecophylogenetic workshop May 31-June 3, 2007 (sponsor NSF-LTER).

TEACHING EXPERIENCE

Spring, 2016. GCC Climate Change: Myths, Mysteries, and Uncertainties; co-taught with Tim Griffis (8 students).

Fall, 2015. HSEM 2105H. Honor Seminar entitled Tropical Forests: Conservation, Carbon, and Conflict (22 students); I taught this entire course alone.

Fall, 2014. EEB 3001 Ecology and Society (23 students); I taught this entire course alone.

Fall, 2014. HSEM 2105H. Honor Seminar entitled Tropical Forests: Conservation, Carbon, and Conflict (19 students); I taught this entire course alone.

Summer, 2013. BIOL 4950 Tropical Ecosystems Ecology Field Course in Costa Rica (9 students).

Spring, 2013. BIOL 4950 Tropical Ecosystems Ecology (9 students); I taught this entire course

alone.

- Fall, 2012. EEB 3001 Ecology and Society (23 students); I taught this entire course alone.
- Fall, 2012. BIOL 1905 Freshman Seminar Climate Change Literacy 101 (6 students).
- Fall, 2012. EEB 8990 Graduate Seminar in Ecosystems Ecology Faculty Sponsor
- Spring, 2012. EEB 8990. Graduate Seminar in Tropical Ecology (6 students).
- Fall, 2011. EEB 8980 Graduate Program Journal Club Faculty Advisor (17 students).
- Fall, 2011. EEB 3001 Ecology and Society, a 3-credit course for non-majors (32 students).
- Fall, 2010. EEB 3001, Ecology and Society, a 3-credit course for non-majors (31 students).
- Fall, 2010. Biology 1905, Freshman Seminar “A Man with a Plan: A Critical Reading of Al Gore’s Book ‘Our Choice: a Plan to Solve the Climate Crisis’ ” (12 students).
- Fall, 2009. Ecology 3001, Ecology and Society, a 3-credit course for non-majors (29 students).
- Fall, 2009. Graduate Seminar on the Ecology and Evolution of Plant Functional Traits, a 2-credit course (lead instructor along with Rebecca Montogemery, Peter Tiffin, Imke Schmidt, Jeannine Cavender-Bares and Sarah Hobbie) (10 students).
- Fall, 2008. Ecology 3001, Ecology and Society, a 3-credit course for non-majors (33 students).
- Fall, 2007. General Biology 1001: Genetics, Evolution & Ecology, a 3-credit course for non-majors (130 students), University of Minnesota.
- Fall, 2007. Seminar on Plant Functional Traits (co-taught with Helene Muller-Landau, Peter Reich, Jeannine Cavender-Bares, and Rebecca Montgomery) (11 students).
- Fall, 2007. Seminar on Biogeochemistry (co-taught with Sarah Hobbie and Jennifer King) (4 students).
- Fall 2006. General Biology 1001 Genetics, Evolution & Ecology, 3-credit course for non-majors (132 students), University of Minnesota.
- Spring 2005. Graduate Seminar in Microbial Diversity (4 students), 1-credit hour, University of Minnesota.
- Spring 1998. Teaching Assistant, Biogeochemistry, Duke University.
- 1995-2004. Resource person for five field courses run by the Organization for Tropical Studies including the Undergraduate Semester Abroad, Agroecología, and Fundamentals of Tropical Ecology (graduate level).
1995. Taught workshops on Geographic Information Systems and Spatial Statistics to researchers at the La Selva Biological Station, Costa Rica.

LEARNINGLIFE COURSES

- Spring 2013. Climate Change Literacy for Beginners (12 participants). I designed and taught a 3 session, 6 hour seminar on climate change for LearningLife, College of Continuing Education, UMN.

FIELD COURSES

- June 2014. Climate Change in the Tropics and Subtropics, Organization for Tropical Studies and Xishuangbanna Tropical Botanical Garden. Contributed to the design and teaching of the course (26 participants from 15 countries).

CURRICULUM DEVELOPMENT

I am developing active learning educational materials for non-majors ecology courses at: <http://ecologyforthepeople.org>.

CURRENT GRANTS

- 2015-2018. Extrapolating carbon dynamics of seasonally dry tropical forests across geographic scales and into future climates: improving simulation models with empirical observations, PI **J.S. Powers**, Co-Pis: D. Medvigy, F. Hoffman, B. Waring, and X. Yang, Department of Energy, \$1,500,000.
2015. UMN Grant-in-Aid of Research, The Biogeography of Tropical Legumes: Diversity, Function, and Distributions, \$30,548.
2014. GPS Alliance International Travel Grant, University of Minnesota, \$2,000 to fund sabbatical work.
- 2011-2016. **Sole Investigator**. Ecosystem processes in regenerating tropical dry forests: linking plant functional traits, stands, and landscapes, NSF CAREER, \$675,000.
2010. Tilman, D., and **J.S. Powers**. Sustainable biofuels: impacts of climate change and management. State of Minnesota LCCMR, \$221,000 (no direct funds to Powers' lab).
2008. **Powers, J.S.**, J. Cavender-Bares, S. Hobbie, R. Montgomery, P. Reich, I. Schmitt, P. Tiffin and G. Weiblen. Ecology, evolution and ecosystem implications of plant traits: a collaborative framework for improving graduate student recruitment and training. Proposal to College of Biological Sciences to improve the quality of EEB and PBS Graduate Programs, \$20,000.

PRIOR GRANTS AND FELLOWSHIPS

- 2010-2016 Schnitzer, S., and **J.S. Powers**, NSF Ecosystem Panel. COLLABORATIVE RESEARCH: Do lianas alter community and ecosystem dynamics in tropical forests? A large-scale experimental test, \$297,466 for Powers (\$750,957 total).
- 10/1/2006 – 9/30/2012. PIs: Tilman, D., P. Reich, S. Hobbie, S. Polasky, J. Cavender-Bares, J. King, L. Kinkel, J. Knops, R. Montgomery, H. Muller-Landau, and **J. Powers**. NSF LTER Program. Biodiversity, environmental change and ecosystem function at the prairie-forest border (\$4,920,000; **\$20,000** per year to **J.S. Powers**).
2007. **Powers, J.S.**, S.E. Hobbie, J. Finlay, J. Cotner, J.Y. King, and D. Larson, Grant-in-Aid of Research, University of Minnesota Graduate School. "Equipment for identification of microbial biomarkers in phospholipid fatty acids", **\$23,573**.
2007. Grant-in-Aid of Research, University of Minnesota Graduate School. Effects of Climatic Change on Soil Carbon Cycling in a Minnesota Prairie, **\$29,410**.
- 2006-2007. May, G. and **J.S. Powers**, UMN IREE Internal Funding, Discovering microbial diversity for biofuel production, **\$49,680**.
- 2006-2009. **Sole Investigator**: National Aeronautics and Space Agency New Investigator Program. A regional-scale analysis of regenerating tropical dry forests in Costa Rica: measurements and models of the linkages among biodiversity, ecosystem function and

- carbon storage, \$267,204.
2006. McLaughlin, D.J., and **J.S. Powers**. Minnesota Agricultural Experiment Station. Acquisition of a MJ Research DNA thermocycler, **\$7,395**.
2005. National Science Foundation Research Experience for Undergraduates Supplement to NSF #0338143, **\$6,000**.
2004. Office of Naval Research Fellowship to attend Microbial Diversity at MBL, **\$540**.
2004. American Association of University Women American Fellowship (declined), **\$30,000**.
- 2004-2008. **Sole Investigator**: National Science Foundation ADVANCE Fellowship Program. A mechanistic understanding of the response of soil carbon pools in tropical forests to increasing global temperatures, \$338,052.
- 2004-2005. **Powers, J.S.**, and J.B. Yavitt. Effects of nutrient augmentation on soil microorganisms and soil carbon and nitrogen storage in a lowland moist forest in Panama. Smithsonian Tropical Research Institute, **\$6,440**.
2003. Center for Tropical Forest Science, **\$1,500**.
2002. **Powers, J.S.**, and R.A. Montgomery, OTS/STRI Comparative Fellowship. The joint influences of climate, litter quality and soil fauna in regulating the decomposition of leaf and root litter: a pan-tropical study, **\$6,000**.
2001. Sigma Delta Epsilon Fellowship, National Chapter of the Graduate Women in Science, **\$3,000**.
- 1999-2001. Dissertation Improvement Grant, National Science Foundation, **\$9,900**.
1999. Andrew W. Mellon Foundation Fellowship for Ecosystem Studies awarded through the Organization for Tropical Studies, **\$3,000**.
- 1998-2001. NASA Graduate Student Researcher Program Fellowship **\$62,500**.
1998. National Security Education Program Boren Fellowship, **\$6,080**.
1998. Sigma Xi, the Scientific Research Society, Grant-in-Aid-of-Research, **\$600**.

DUKE UNIVERSITY FUNDING

2000. Lawrence J. Giles Award for Phytotron Research, Duke University, **\$500**.
2000. Catherine Keever Award, Duke University, **\$700**.
1999. Center for International Studies, Duke University, **\$1,000**.
1998. Center for International Studies, Duke University, **\$1,500**.
1998. Tinker Field Research Grants Program for Latin American Studies, Duke, **\$780**.
1997. Tinker Field Research Grants Program for Latin American Studies, Duke, **\$2,200**.
1997. Center for International Studies, Duke University, **\$1,500**.

PUBLICATIONS (* indicates undergraduate, ** indicates graduate student)

- Sinsabaugh, R. L., B.L. Turner, J.M. Talbot, B.G. Waring, **J.S. Powers**, C.R. Kuske, D.L. Moorhead, J.J. Follstad Shah. Stoichiometry of microbial carbon use efficiency in soils.

In press, Ecological Monographs.

- Poorter, L., F. Bongers, T. M. Aide, A.M. Almeyda Zambrano, P. Balvanera, J.M. Becknell, V. Boukili, P.H.S. Brancalion, E.N. Broadbent, R.L. Chazdon, D. Craven, J.S. de Almeida-Cortez, G.A. L. Cabral, B.H. J. de Jong, J.S. Denslow, D.H. Dent, S.J. DeWalt, J.M. Dupuy, S.M. Durán, M.M. Espírito-Santo, M.C. Fandino, R.G. César, J.S. Hall, J. L. Hernandez-Stefanoni, C.C. Jakovac, A.B. Junqueira, D. Kennard, S.G. Letcher, J.-C. Licona, M. Lohbeck, E. Marín-Spiotta, M. Martínez-Ramos, P. Massoca, J.A. Meave, R. Mesquita, F. Mora, R. Muñoz, R. Muscarella, Y. R. F. Nunes, S. Ochoa-Gaona, A.A. de Oliveira, E. Orihuela-Belmonte, M. Peña-Claros, E. A. Pérez-García, D. Piotta, **J.S. Powers**, J. Rodríguez-Velázquez, I.E. Romero-Pérez, J. Ruíz, J.G. Saldarriaga, A. Sanchez-Azofeifa, N.B. Schwartz, M.K. Steininger, N.G. Swenson, M. Toledo, M. Uriarte, M. van Breugel, H. van der Wal, M.D. M. Veloso, H.F. M. Vester, A. Vicentini, I.C. G. Vieira, T. Vizcarra Bentos, G.B. Williamson & D.M.A. Rozendaal. 2016. Biomass resilience of Neotropical secondary forests. *Nature* doi:10.1038/nature16512.
- Reid, J.P., S.A. Schnitzer, and **J.S. Powers**. 2015. Short and long-term soil moisture effects of liana removal in a seasonally moist tropical forest. *PLoS One* 10(11): e0141891. doi:10.1371/journal.pone.0141891.
- Cowles, J.M. P.D. Wragg, A.J. Wright, **J.S. Powers**, D. Tilman. 2016. Shifting grassland plant community structure drives positive interactive effects of warming and diversity on aboveground net primary productivity. *Global Change Biology* 22:741-749.
- Schnitzer, S.A., van der Heijden, G.M.F., and JS Powers. 2015. REPLY TO VERBEECK AND KEARSLEY: Addressing the challenges of including lianas in global vegetation models. *PNAS* www.pnas.org/cgi/doi/10.1073/pnas.1521823113.
- Van der Heijden, G., **J.S. Powers**, and S.A. Schnitzer. 2015. Lianas reduce forest-level carbon accumulation and storage. *PNAS* doi: 10.1073/pnas.1504869112.
- Waring, B.G., R. Adams, S. Branco, and **J.S. Powers**. 2015. Scale-dependent variation in nitrogen cycling and soil fungal communities along gradients of forest composition and age in regenerating tropical dry forests. *New Phytologist* DOI: 10.1111/nph.13654.
- Waring, B.G., L. Álvarez Cansino, K.E. Barry, K.K. Becklund, S. Dale, M.G. Gei, A. Keller, O.R. Lopez, L. Markesteijn, S. Mangan, C.E. Riggs, M.E. Rodriguez-Ronderos, R.M. Segnitz, S.A. Schnitzer, and **J.S. Powers**. 2015. Pervasive and strong effects of plant individuals and species on soil chemistry: a meta-analysis of individual plant “Zinke” effects. *Proc. Royal Soc. B.* 282: 20151001.
- Martínez-Izquierdo, L., M.M. García-Leon, **J.S. Powers**, and S.A. Schnitzer. Lianas suppress seedling growth and survival of 14 tree species in a Panamanian tropical forest. *In press*, *Ecology*.
- Powers, J.S.**, K.K. Becklund**, M.G. Gei, S. Iyengar**, R. Meyer*, C.S. O’Connell**, E.M.

- Schilling*, C.M. Smith**, B.G. Waring, and L.K. Werden**. 2015. Nutrient addition effects on tropical dry forests: a mini-review from microbial to ecosystem scales. *Front. Earth Science* 3: 34. doi: 10.3389/feart.2015.00034.
- Whittington**, H.R., D. Tilman, P. D. Wragg**, and **J.S. Powers**. 2015. Phenological responses of prairie plants to three years of experimentally elevated temperatures. *Ecosphere* doi.org/10.1890/ES15-00070.1.
- Letcher, S, J. Lasky, R. Chazdon, N. Norden, S.J. Wright, A. Andrade, J.L. Andrade-Torres, P. Balvanera, J.M. Becknell, T. Bentos, R. Bhaskar, F. Bongers, V. Boukili, P. Brancalion, R. César, D.A. Clark, D.B. Clark, D. Craven, A. DeFrancesco, J. Dupuy, B. Finegan, E. González-Jiménez, J. Hall, K. Harms, J.L. Hernández-Stefanoni, P. Hietz, D. Kennard, T. Killeen, S. Laurance, E. Lebrija-Trejos, M. Lohbeck, M. Martínez-Ramos, P. Massoca, J. Meave, R. Mesquita, F. Mora, R. Muñoz, R. Muscarella, H. Paz, E. Pérez-García, F. Pineda-García, **J.S. Powers**, R. Quesada-Monge, R. Rodrigues, E. Romero-Pérez, M. Sandor, L. Sanaphre-Villanueva, E. Schüller, N. Swenson, A. Tauro, M. Uriarte, M. van Breugel, O. Vargas-Ramírez, R. Viani, A. Wendt, and G. Williamson G. Environmental gradients and the evolution of successional habitat specialization: a test case with 14 Neotropical forest sites. 2015. *Journal of Ecology* 103: 1276-1290.
- Schilling, J.S., A. Ayres*, J.T. Kaffenberger**, **J.S. Powers**. 2015. Initial white rot type dominance of wood decomposition and its functional consequences in a regenerating tropical dry forest. *Soil Biology and Biochemistry* 88: 58-68.
- Locatelli, B., C. Catterall, P. Imbach, C. Kumar, R. Lasco, E. Marín-Spiotta, B. Mercer, **J.S. Powers**, N. Schwartz, and M. Uriarte. 2015. Tropical reforestation and climate change: beyond carbon. *Restoration Ecology* doi: 10.1111/rec.12209.
- Waring, B.G., J.M. Becknell, and **J.S. Powers**. 2015. Nitrogen, phosphorus, and cation use efficiency in stands of regenerating tropical dry forest. *Oecologia* doi: 10.1007/s00442-015-3283-9.
- Vargas G., G.*, L.K. Werden**, and **J.S. Powers**. 2015. Explaining legume success in tropical dry forests based on seed germination niches: a new hypothesis. *Biotropica* doi: 10.1111/btp.12210.
- Gei, M.G.**, and **J.S. Powers**. 2015. The influence of seasonality and species effects on surface fine roots and nodulation in tropical legume tree plantations. *Plant and Soil* 388:187-196.
- Álvarez-Cansino L., S.A. Schnitzer, J.P. Reid, and **J.S. Powers**. 2015. Liana competition with tropical trees varies with seasonal rainfall and soil moisture but not tree species identity. *Ecology* 96:39-45.
- Slik JWF, Arroyo-Rodriguez V, Aiba S, Alvarez-Loayza P, Alves LF, Ashton P, Balvanera P, Bastiang ML, Bellingham PJ, van den Berg E, Bernacci L, Bispo PD, Blanc L, Bohning-Gaese K, Boeckx P, Bongers F, Boyle B, Bradford M, Brearley FQ, Hockemba MBN, Bunyavejchewin S, Matos DCL, Castillo-Santiago M, Catharino ELM, Chai SL, Chen YK, Colwell RK, Robin CL, Clark C, Clark DB, Clark DA, Culmsee H, Damas K,

- Dattaraja HS, Dauby G, Davidar P, DeWalt SJ, Doucet JL, Duque A, Durigan G, Eichhorn KAO, Eisenlohr PV, Eler E, Ewango C, Farwig N, Feeley KJ, Ferreira L, Field R, de Oliveira AT, Fletcher C, Forshed O, Franco G, Fredriksson G, Gillespie T, Gillet JF, Amarnath G, Griffith DM, Grogan J, Gunatilleke N, Harris D, Harrison R, Hector A, Homeier J, Imai N, Itoh A, Jansen PA, Joly CA, de Jong BHJ, Kartawinata K, Kearsley E, Kelly DL, Kenfack D, Kessler M, Kitayama K, Kooyman R, Larney E, Laumonier Y, Laurance S, Laurance WF, Lawes MJ, do Amaral IL, Letche SG, Lindsell J, Lu XH, Mansor A, Marjokorpi A, Martin EH, Meilby H, Melo FPL, Metcalfe DJ, Medjibe VP, Metzger JP, Millet J, Mohandass D, Montero JC, Valeriano MD, Mugerwa B, Nagamasu H, Nilus R, Ochoa-Gaona S, Onrizal, Page N, Parolin P, Parren M, Parthasarathy N, Paudel E, Permana A, Piedade MTF, Pitman NCA, Poorter L, Poulsen AD, Poulsen J, **Powers JS**, Prasad RC, Puyravaud JP, Razafimahaimodiso JC, Reitsma J, dos Santos JR, Spironello WR, Romero-Saltos H, Rovero F, Rozak AH, Ruokolainen K, Rutishauser E, Saiter F, Saner P, Santos BA, Santos F, Sarker SK, Satdichanh M, Schmitt CB, Schongart J, Schulze M, Suganuma MS, Sheil D, Pinheiro ED, Sist P, Stevart T, Sukumar R, Sun IF, Sunderland T, Suresh HS, Suzuki E, Tabarelli M, Tang JW, Targhetta N, Theilade I, Thomas DW, Tchouto P, Hurtado J, Valencia R, van Valkenburg J, Do TV, Vasquez R, Verbeeck H, Adekunle V, Vieira SA, Webb CO, Whitfeld T, Wich SA, Williams J, Wittmann F, Woll H, Yang XB, Yao CYA, Yap SL, Yoneda T, Zahawi RA, Zakaria R, Zang RG, de Assis RL, Luize BG, Venticinque EM. 2015. An estimate of the number of tropical tree species. *Proceedings of the National Academy of Sciences of the United States of America* 112: 7472-7477.
- Ceccon, E., I. Sánchez, and **J.S. Powers**. 2014. Biological potential of four indigenous tree species from seasonally dry tropical forest for soil restoration. *Agroforestry Systems*. DOI 10.1007/s10457-014-9782-6.
- Becklund, K.K.***, L.L. Kinkel, and **J.S. Powers**. 2014. Landscape variation in the abundance and activity of pathogen-suppressive *Streptomyces* in secondary tropical dry forests of Costa Rica. *Biotropica* 46: 657-666. (Editor's Choice, *Biotropica*).
- Becknell, J.M.***, and **J.S. Powers**. 2014. Aboveground biomass, plant functional traits, and edaphic variation in secondary tropical dry forests. *Canadian Journal of Forest Research* 44: 603-614. (Editor's Choice, *CJFR*).
- Van der Heijden, G., S.A. Schnitzer, **J.S. Powers**, and O.L. Phillips. Liana impacts on carbon cycle, storage and sequestration in tropical forests. 2013. *Biotropica* 45: 682-692
- Whittington**, H.R., D. Tilman, and **J.S. Powers**. 2013. Consequences of elevated temperatures on legume biomass and nitrogen cycling in a field warming experiment in a North American prairie. *Functional Plant Biology*: 1-12, DOI: 10.1071/FP12345.
- Powers, J.S.**, and D. Pérez-Aviles. 2013. Edaphic factors are a more important control on fine root stocks than stand age in tropical dry forests regenerating following agricultural land use. *Biotropica* 45: 1-9. DOI: 10.1111/j.1744-7429.2012.00881.x.
- Gei**, M.G., and **J.S. Powers**. 2013. Do legumes and non-legumes tree species affect soil properties in unmanaged forests and plantations in Costa Rican dry forests? *Soil Biology and Biochemistry* 57: 264-272.

- Becknell**, J.M., L. Kissing Kucek, and **J.S. Powers**. 2012. Aboveground biomass in mature and secondary seasonally dry tropical forests: a literature review and global synthesis. *Forest Ecology and Management* 276: 88-95.
- Whittington**, H.R., L. Deede*, and **J.S. Powers**. 2012. Growth responses, biomass partitioning, and nitrogen isotopes of prairie legumes in response to elevated temperature and varying nitrogen source in a growth chamber experiment. *American Journal of Botany* 99: 838-846
- Sayer, E.J., S. J. Wright, E.V. J. Tanner, J.B. Yavitt, K. E. Harms, **J.S. Powers**, M. Kaspari, M.N. Garcia and B.L. Turner. 2012. Variable responses of lowland tropical forest nutrient status to fertilization and litter manipulation. *Ecosystems* 15: 387-400.
- Powers, J.S.**, and S. Salute*. 2011. Macro- and micronutrient effects on decomposition of leaf litter from two tropical tree species: inferences from a short-term laboratory incubation. *Plant and Soil* 346: 245-257.
- Powers, J.S.**, M.D. Corre, T.E. Twine, and E. Veldkamp. 2011. Geographic bias of field observations of soil carbon stocks with tropical land-use changes precludes spatial extrapolation. *Proceedings of the National Academy of Sciences* 108: 6318-6322.
- Powers, J.S.** 2010. Building a lasting foundation in ecological literacy in undergraduate, non-majors courses. *Nature Education Knowledge* 1:14.
- Gotsch, S.G., **J.S. Powers**, and M.T. Lerdau. Leaf traits and water relations of 12 evergreen species in Costa Rican wet and dry forests: patterns of intra-specific variation across forests and seasons. 2010. *Plant Ecology* 211: 133-146.
- Kissing, L.B., and **J.S. Powers** (corresponding author). Coarse woody debris stocks as a function of forest type and stand age in Costa Rican tropical dry forest: long-lasting legacies of previous land use. 2010. *Journal of Tropical Ecology* 26: 467-471.
- Powers, J.S.**, and P. Tiffin. Plant functional type classifications in tropical dry forests in Costa Rica: leaf habit versus taxonomic approaches. 2010. *Functional Ecology* 24: 927-936.
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- Powers, J.S.**, J.M. Becknell**, J. Irving**, and D. Perez-Aviles. 2009. Diversity and structure of regenerating tropical dry forests in Costa Rica: geographic patterns and environmental drivers. *Forest Ecology and Management* 258: 959-970.
- Powers, J.S.**, R.A. Montgomery, E.C. Adair, F.Q. Brearley, S.J. DeWalt, C.T. Castanho, J. Chave, E. Deinert, J.U. Ganzhorn, M.E. Gilbert, J. Antonio-Gonzalez, S. Bunyavejchewin, H.R. Grau, K.E. Harms, A. Hiremath, S. Iriarte-Vivar, E. Manzane, A.A. de Oliveira, L. Poorter, J.B. Ramanamanjato, C. Salk, A. Varela, G.D. Weiblen and

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- Powers, J.S.**, and E. Veldkamp. 2005. Regional variation in soil carbon and $\delta^{13}\text{C}$ in paired forests and pasture of Northeastern Costa Rica. *Biogeochemistry* 72: 315-336.
- Powers, J.S.**, K.K. Treseder and M.T. Lerdau. 2005. Fine roots, arbuscular mycorrhizal hyphae and soil nutrients in four Neotropical rain forests: patterns across large geographic distances. *New Phytologist* 165: 913-921.
- Powers, J.S.**, M.H. Kalicin*, and M.E. Newman. 2004. Tree species do not influence local soil chemistry in a species-rich Costa Rican rain forest. *Journal of Tropical Ecology* 20: 587-90.
- Powers, J.S.** 2004. Soil carbon and nitrogen storage following contrasting land-use transitions in Northeastern Costa Rica. *Ecosystems* 7: 134-146.
- Powers, J.S.**, J.M. Read, J.S. Denslow, and S.M. Guzman. 2004. Estimating soil carbon fluxes following land-cover change: a test of some critical assumptions for a region in Costa Rica. *Global Change Biology* 10: 170-181.
- Harms, K.E., **J.S. Powers**, and R.A. Montgomery. 2004. Small sapling densities relative to resources and understory vegetation in four Neotropical forests. *Biotropica* 36: 40-51.
- Powers, J.S.** 2004. New perspectives in comparative ecology of Neotropical rain forests: Reflections on past, present and future. *Biotropica* 36: 2-6.
- Powers, J.S.**, and W.H. Schlesinger. 2002. Relationships between soil carbon distributions and biophysical factors at nested spatial scales in rain forests of Northeastern Costa Rica. *Geoderma* 109: 165-190.
- Powers, J.S.**, and W.H. Schlesinger. 2002. Geographic and vertical patterns of stable carbon isotopes in tropical rainforest soils of Costa Rica. *Geoderma* 109: 141-160.
- Loescher, H.W., **J.S. Powers**, S.F. Oberbauer. 2002. Spatial variation of throughfall in an old growth tropical wet forest, Costa Rica. *Journal of Tropical Ecology* 18: 397-407.
- Powers, J.S.**, P. Sollins, M.E. Harmon, and J.A. Jones. 1999. Plant-pest interactions in time and

space: a Douglas-fir bark beetle outbreak as a case study. *Landscape Ecology* 14: 105-120.

Powers, J.S., J.P. Haggard, and R.F. Fisher. 1997. The effect of overstory composition on understory woody regeneration and species richness in 7-year-old plantations in Costa Rica. *Forest Ecology and Management* 99: 43-54.

MANUSCRIPTS IN REVIEW

Waring, B.G., and **J.S. Powers**. Unraveling the mechanisms underlying pulse dynamics of soil respiration in tropical dry forests. *In review*, *Environmental Research Letters*.

Xu, X., D. Medvigy, **J.S. Powers**, J.M. Becknell and K. Guan. Hydrological niche separation explains seasonal and inter-annual variations of vegetation dynamics in seasonally dry tropical forests. *In revision*, *New Phytologist*.

Gei, M.G., S.C. Reed, and **J.S. Powers** Simultaneous measurements of symbiotic nitrogen fixation using three independent techniques. *In prep for*, *Biology and Fertility of Soils*.

Derroire, G., P. Balvanera, C. Castellanos-Castro, G. Decocq, D.K. Kennard, E. Lebrija-Trejos, J.A. Leiva, P.-C. Odén, **J.S. Powers**, V. Rico-Gray, M. Tigabu and J.R. Healey. Resilience of tropical dry forests – a meta-analysis of changes in species diversity and composition during secondary succession. *In review*, *OIKOS*.

Kaspari, M., and **J.S. Powers**. From Justus to MEL: biogeochemistry as a geographical driver of ecology. *In revision*, *American Naturalist*.

Derroire, G., L.E. Cárdenas Varela, C.M. Hulshof, **J.S. Powers** and J.R. Healey. Sapling leaf trait variation within and across species reveals community assembly processes during tropical dry forest succession. *In prep*.

Waring, B.G., L. Rosenthal, M.G. Gei, and **J.S. Powers**. Plant-microbial interactions along a gradient of soil fertility in tropical dry forest. *In review*, *Journal of Tropical Ecology*.

Schilling, E.M., Waring, B.G., Schilling, J.S., and **J.S. Powers**. Forest composition modifies effects of litter chemistry on decomposition in regenerating tropical dry forests. *In revision*, *Oecologia*.

Gei, M.G., S.C. Reed, and **J.S. Powers**, Cheaper than advertised: No biomass penalty for nitrogen fixation in tropical dry forest legumes. *In revision*, *Ecology*.

Uriarte, M., N. Schwartz, **J.S. Powers**, E. Marín-Spiotta, W. Liao, and L.K. Werden. Impacts of climate variability on tree demography in second-growth tropical forests: the importance of regional context for predicting successional trajectories. *In revision*, *Global Ecology and Biogeography*.

BOOKS EDITED

G.A. Sanchez-Azofeifa and **J.S. Powers**, G.W. Fernandes, and M. Quesada (eds.), *Tropical Dry Forests in the Americas: Ecology, Conservation, and Management*. 2014. CRC Press. 538 pages.

BOOK CHAPTERS

Powers, J.S., and M. Lerdau. 2002. Las relaciones entre características químicas y físicas de hojas y la decomposición de hojarasca de las especies de un bosque seco en el Parque Nacional Santa Rosa, Costa Rica. In *Ecosistemas forestales de bosque seco tropical: investigaciones y resultados en Mesoamérica*, Universidad Nacional, Heredia, Costa Rica, pp. 119-124.

Gei, M.G., and **J.S. Powers**. 2014. Chapter 9: Nutrient cycling in tropical dry forests. In, G.A. Sanchez-Azofeifa and J.S. Powers, G.W. Fernandes, and M. Quesada (eds.), *Tropical Dry Forests in the Americas: Ecology, Conservation, and Management*. CRC Press. Pages 141-155.

Powers, J.S., D.W.P. Manning, and J.M. Becknell. Patterns and drivers of surface soil carbon stocks and isotopic composition in secondary tropical dry forests of Costa Rica. 2015. In, F. Brearley and A. Thomas (eds.), *Land-use Change Impacts on Soil Processes: Tropical and Savanna Ecosystems*. CABI Press. Pages 149-161.

Powers, J.S. Chapter 14: Reciprocal interactions between lianas and forest soils. 2015. In S. Schnitzer, F. Bongers, R. Burnham, and F. Putz (eds.), *Ecology of Lianas*. Wiley Press.

BOOK REVIEWS

Powers, J.S. 2013. I wish I were there... A review of Tropical Ecosystems and Ecological Concepts. *Frontiers in Biogeography* 5(1): 16-17.

MANUSCRIPTS IN PREPARATION (draft available upon request)

Powers, J.S., and R.A. Montgomery. Spatial variation of understory vegetation, fine roots, abiotic resources and seedling abundance in a rain forest in French Guiana.

Powers, J.S., S.G. Gotsch, E.C. Adair, and M.T. Lerdau. Mass loss and nitrogen dynamics in decomposing leaf litter of 26 tropical dry forest species during wet and dry seasons: relative roles of initial litter chemistry versus functional leaf traits.

INVITED TALKS AND SEMINARS

2015 (2) Humboldt Institute, Bogota, Colombia. Instituto de Ecología, UNAM, Mexico City, Mexico. Both talks presented in Spanish.

2014 (6) Dept. of Environmental Sciences, Policy, and Management, University of California at Berkeley, CA. Xishuangbanna Tropical Botanical Garden, Menglun, Yunnan, China. Twin Cities Tropical Network, Institute on the Environment, University of Minnesota. Forest Ecology and Management Group, Wageningen University, the Netherlands.

- Keynote Address, “Vegetation-Soil Interactions Symposium: from Rhizosphere to Ecosystem”, Wageningen University, the Netherlands. Conference on Climbing Plants, Linnaean Society, London, England.
- 2013 (3) Cary Institute for Ecosystems Studies, New York. Quaternary Seminar, University of Minnesota. Centro de Investigación Científica de Yucatán, Merida, Mexico.
- 2012 (1) Frontiers in the Environment, Institute on the Environment, University of Minnesota.
- 2011 (2) Smithsonian Tropical Research Institute, Panama. Northwestern University/Chicago Botanic Garden.
- 2010 (4) Dept. of Soil, Water & Climate, University of Minnesota. Odum School of Ecology, University of Georgia, GA. Biology Department, Carleton College, Northridge, MN. Department of Biological Sciences, Rutgers University, NJ.
- 2009 (4) Plenary Seminar for the Tropi-Dry Meeting, Chamela, Mexico. Biology Dept. Reed College, Portland, OR. Applied Economics Dept. Seminar Series on Resource Economics, University of Minnesota. Biology Department, University of St. Thomas.
- 2008 (2) Smithsonian Tropical Research Institute, Panama; Dept. of Environmental Sciences, University of Virginia.
- 2007 (4) Dept. of Civil Engineering, University of Minnesota; Association for Tropical Biology and Conservation Meeting, Dry Forest Symposium; Latin American Soil Science Meetings, Leon, Mexico; University of Wisconsin Milwaukee Biology Colloquium.
- 2006 (2) Biology Dept., New Mexico State University; Biogeochemistry and Environmental Biocomplexity Program, Cornell University, NY.
- 2005 (9) Dept of Environmental Science, Policy, and Management University of California, Berkeley; Dept. of Plant Biology, University of Minnesota; Biological Sciences, Louisiana State University; Environmental Science and Engineering, Colorado School of Mines; CIRES, University of Colorado, Boulder; College of Natural Sciences, University of California, Merced; Dept. of Biology, Notre Dame University; Dept. of Zoology, University of Hawaii, Manoa; School of Public and Environmental Affairs, Indiana University.
- 2004 (7) Dept. of Biological Sciences, University of Arkansas; Keynote Address at the Land Use and Cover Change in the Tropics Workshop, Institute of Geography, University of Copenhagen, Denmark; Biological Sciences, Louisiana State University; Dept. of Forest Resources, University of Minnesota; Dept. of Biology, University of Pennsylvania; Biology Department, Boston University; Smithsonian Tropical Research Institute.

- 2003 (1) Institute of Ecology, University of Georgia, GA.
- 2002 (1) School of Integrative Biology, University of Illinois, Champagne-Urbana.
- 2001 (3) American Geophysical Union Meetings, Boston; Department of Atmospheric and Environmental Chemistry, Harvard University; Department of Geography, University of North Carolina, Chapel Hill.
- 1996 (1) IUFRO-World Bank-USDA Forest Service Symposium on Accelerating Native Forest Regeneration on Degraded Tropical Lands. Washington, D.C.
- 1992 (1) Smithsonian Environmental Research Center, Edgewater, MD

CONTRIBUTED TALKS AT MEETINGS (since 2005)

2015. Association for Tropical Biology and Conservation, Honolulu, HI. Author: J.S. Powers. Talk title: "Lightning talk: Have we been selling ourselves short by focusing on just one element?"
2013. Society for Ecological Restoration Meetings, Madison, WI. Authors: and J.S. Powers and J.M. Becknell. Talk title: Assessing above- and belowground carbon stocks in regenerating tropical dry forests.
2013. Association for Tropical Biology and Conservation, San Jose, Costa Rica. Authors: M.G. Gei and J.S. Powers. What controls biological nitrogen fixation in the dry forests of Costa Rica?
2013. Association for Tropical Biology and Conservation, San Jose, Costa Rica. Authors: J.M. Becknell and J.S. Powers. Four years of secondary tropical dry forest aboveground net primary productivity: species-specific responses to inter-annual variation.
2013. Association for Tropical Biology and Conservation, San Jose, Costa Rica. Author: J.S. Powers. Fine root dynamics in relation to nutrient availability in regenerating tropical dry forests.
2013. Ecological Society of America, Minneapolis, MN. Authors: M.G. Gei and J.S. Powers. Estimating nitrogen fixation rates and controls in a tropical dry forest.
2012. Ecological Society of America Meetings, Portland, OR. Authors: J.M. Becknell* and J.S. Powers. Talk tile: Aboveground net primary productivity in Costa Rican secondary tropical dry forest over 3 years.
2012. Ecological Society of America Meetings, Portland, OR. Authors: Cowles, J.,M.*, A.T. Clark*, M. Kosmala*, H.R. Whittington*, P.D. Wragg*, A.J. Wright*, J.S. Powers, and D. Tilman. Talk tile: Interactive effects of warming and diversity on grassland community composition and ecosystem productivity.

2012. Ecological Society of America Meetings, Portland, OR. Authors: M.G. Gei* and J.S. Powers. Talk title: Effects of nutrient and light availability on nitrogen fixation in tropical dry forest legume seedlings.

2012. Organized Oral Session, Ecological Society of America Meetings, Portland, OR. Authors: J.S. Powers, J. Schilling, and M.T. Lerdau. Talk Title: Functional trait-based frameworks for understanding leaf litter and wood decomposition in tropical dry forests.

2012. University of Minnesota “Addressing Global Challenges through International Research Inaugural Research Conference”, Talk Title: Connecting Academic Research to Conservation and Education in the Guanacaste Conservation Area, Costa Rica.

2011. Ecological Society of America (Austin, TX). Authors: H. Whittington, D. Tilman, and J.S. Powers. Phenology of grassland plants exposed to elevated temperature.

2010. Ecological Society of America (Pittsburgh, PA). Authors: J.S. Powers and J.M. Becknell. Carbon stocks in regenerating tropical dry forests in Costa Rica: Effects of soil variation and forest age.

2009. Ecological Society of America (Albuquerque, NM). Authors: J.S. Powers and P. Tiffin. Legumes explain more variation in plant functional traits than leaf habit in 87 tree species from a tropical dry forest in Costa Rica.

2008. Association for Tropical Biology and Conservation. Authors: S.G. Gostch, J.S. Powers, M.T. Lerdau. Talk Title: Effects of light availability and water stress on leaf phenology in seasonal forests in NW Costa Rica.

2007. Invited speaker at the Tropical Dry Forest Symposium, meetings of the Association for Tropical Biology and Conservation, Morelia, Mexico. Talk title: Mass loss and nitrogen dynamics in decomposing leaf litter of 26 tropical dry forest species during wet and dry seasons: a trait-based approach.

2007. Association for Tropical Biology and Conservation, Morelia, Mexico. Authors: E. Sayer, J. Powers and E. Tanner. Talk title: Increased aboveground litterfall causes losses of carbon belowground.

2005. Conference on Inositol Phosphates in the Environment, August, 2005 (Sun Valley, ID). Talk title: Diversity and abundance of inositol phosphate-utilizing bacteria in terrestrial and aquatic ecosystems on Cape Cod, Massachusetts USA. Authors: J.S. Powers, H. Reed, and B.L. Turner.

POSTER PRESENTATIONS AT MEETINGS (since 2007)

2015. American Geophysical Union Meetings (San Francisco, CA). Authors: M.G. Gei and J.S. Powers. Poster title: Low carbon costs of nitrogen fixation in tropical dry forests.

2015. American Geophysical Union Meetings (San Francisco, CA). Authors: B.G. Waring, J.S. Powers, S. Branco, R. Adams, and E. Schilling. Poster title: Understanding spatial heterogeneity in soil carbon and nitrogen cycling in regenerating tropical dry forests.

2015. American Geophysical Union Meetings (San Francisco, CA). Authors: L.K. Werden, B.G. Waring, C.M. Smith, and J.S. Powers. Poster title: Maintenance of Leaf Water Potential by Tropical Dry Forest Tree and Liana Species During a Severe Drought.

2015. American Geophysical Union Meetings (San Francisco, CA). Authors: J.S. Schilling, A. Ayers, J.T. Kaffenberger, and J.S. Powers. Poster title: Decomposition of New Woody Inputs as a Tropical Dry Forest Regenerates.

2015. American Geophysical Union Meetings (San Francisco, CA). Authors: J.S. Powers and J.M. Becknell. Poster title: Interannual variability of aboveground net primary productivity in regenerating tropical dry forests.

2015. Association for Tropical Biology and Conservation (Honolulu, HI). Authors: C.M. Smith and J.S. Powers. Poster title: Liana Communities Along Successional Gradients of Seasonally Dry Tropical Forests.

2015. Association for Tropical Biology and Conservation (Honolulu, HI). Authors: J.S. Powers, B.G. Waring, and E. Schilling. Poster title: What Do We Know About Ecosystem Processes and Secondary Succession in Tropical Dry Forests?

2013. American Geophysical Union Meetings (San Francisco, CA). Authors: X. Xu, D. Medvigy, J. S. Powers, Justin M Becknell. Poster title: Seasonality of Tropical Dry Forests and its Sensitivity to Climate Change.

2013. Society for Ecological Restoration (Madison, WI). Authors: L.K. Werden, J.M. Becknell, and J.S. Powers. Poster title: Defining life history strategies of tropical dry forest tree species: Implications for future restoration projects.

2013. Association for Tropical Biology and Conservation (San Jose, Costa Rica). Authors: C.M. Smith, E. Bergstrom, K.K. Becklund, J.M. Becknell, M. G. Gei and J.S. Powers. Poster title: Effects of soil type and light availability on growth and biomass partitioning of 22 species of tropical dry forest tree seedlings.

2013. Association for Tropical Biology and Conservation (San Jose, Costa Rica). Authors: L.K. Werden, J.M. Becknell, and J.S. Powers. Poster title: Using forest inventory data to define life history strategies of tropical dry forest tree species.

2012. Ecological Society of America (Portland, OR). Authors: Becklund, K.K.*, L. Kinkel, and J.S. Powers. Poster title: Landscape variation in the abundance of pathogen-suppressive *Streptomyces* in secondary tropical dry forests of Costa Rica.

2011. Ecological Society of America (Austin, TX). Authors: M. McClellan, R.A. Montgomery,

and J.S. Powers. Poster title: How does land ownership affect biodiversity and biomass stocks in secondary tropical dry forests?

2011. Ecological Society of America (Austin, TX). J.M. Becknell and J.S. Powers. Poster title: Biomass and forest structure across topographic position in a Costa Rican secondary tropical dry forest.

2010. Ecological Society of America Meetings (Pittsburgh, PA). Authors: J. Becknell and J.S. Powers. Poster title: Annual and seasonal aboveground productivity in secondary dry tropical forests in Costa Rica.

2010. Ecological Society of America Meetings (Pittsburgh, PA). Authors: H. Whittington, D. Tilman, and J.S. Powers. Poster title: Impacts of climate warming on prairie legume growth, nitrogen-fixation, and phenology.

2010. Ecological Society of America Meetings (Pittsburgh, PA). Authors: M.A. Gei and J.S. Powers. Poster title: Legume species effects on soil chemistry in unmanaged forests and plantations in Costa Rican dry tropics.

2007. Ecological Society of America Meetings, San Jose, CA. Authors: E. Sayer, J. Powers and E. Tanner. Poster title: Increased aboveground litterfall causes losses of carbon belowground.

2005. Second International Conference on Mechanisms of Organic Matter Stabilization and Destabilization in soils, October, 2005 (Asilomar, CA). Poster title: Soil organic carbon storage in tropical forest soils and potential fluxes under climate change scenarios: preliminary results. Author: J.S. Powers.

GUEST LECTURES

November, 2015. PBIO 8100.

April, 2009. EEB 4068/5068 Plant Physiological Ecology.

March, 2009. CONSBIO 8004.

April, 2007. EEB 4611 Biogeochemical Processes.

SOCIETY MEMBERSHIPS

Ecological Society of America

American Geophysical Union

Association for Tropical Biology and Conservation

Phi Beta Kappa Society

Graduate Women in Science

UNIVERSITY SERVICE (UNIVERSITY OF MINNESOTA)

2015. EEB Annual Merit Review Revision Committee.

2015. EEB Graduate Admissions Committee.

2015-2016 Academic Year. Interdisciplinary Doctoral Fellowship Selection Committee.

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- 2015. Luce Fellowship Committee.
 - 2015-2017. Plant Biological Sciences Graduate Program Advisory Committee.
 - 2015-2017. EEB Salary Committee.
 - 2015. Itasca Biological Station Biologist Selection Committee
 - 2015. Hamm Fellowship Selection Committee
 - 2015. Doctoral Dissertation Fellowship EEB Review Committee (2015)
 - 2014-2015. CBS Conservatory Director Search Committee
 - 2014. Fulbright Selection Committee
 - 2013. Minnesota Agricultural Experiment Station Proposal Reviews.
 - 2013. Ray Anderson Fellowship Committee Co-Chair.
 - 2013. “Linking Plant Processes to Spatial Patterns in Soils”. This is a module I designed and taught for the Nature of Life Program, the College of Biological Science’s undergraduate orientation (July).
 - 2012. Ecology, Evolution & Behavior Graduate Program Written Proposal Committee.
 - 2012. Luce Scholarship Selection Committee.
 - 2012. Ray Anderson Fellowship Committee Co-Chair.
 - 2012. “Linking Plant Processes to Spatial Patterns in Soils”. This is a module I designed and taught for the Nature of Life Program, the College of Biological Science’s undergraduate orientation (July).
 - 2011. “Linking Plant Processes to Spatial Patterns in Soils”. This is a module I designed and taught for the Nature of Life Program, the College of Biological Science’s undergraduate orientation (July).
 - 2011. Ray Anderson Fellowship Committee Chair.
 - 2010. Seminar Committee, Dept. of Ecology, Evolution and Behavior, co-chair.
 - 2009. Pedology Search Committee, Soil, Water & Climate Dept., UMN
 - 2009. Graduate School Fellowship Committee, UMN
 - 2008. College of Biological Sciences TA of the Year Award Committee, UMN
 - 2008. Seminar Committee, Dept. of Ecology, Evolution and Behavior, co-chair.
 - 2007. Exploratory Hiring Committee for Dr. Brandy Toner (Soil, Water & Climate Dept.).

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- 2007. Block Grant Committee for Summer Graduate Student Support for the Ecology, Evolution & Behavior Graduate Program
 - 2007. College of Biological Sciences TA of the Year Award Committee.
 - 2008. Seminar Committee, Dept. of Ecology, Evolution and Behavior, co-chair
 - 2006-2008. College of Food, Agriculture and Natural Resource Science (CFANS) International Programs Steering Committee.
 - 2006-2008. Cedar Creek Ecosystem Science Reserve Monthly Seminar Committee.
 - 2006-2007. Seminar Committee, Dept. of Ecology, Evolution and Behavior.
 - 2006-2008. Plant Biology Graduate Program Steering Committee.
 - 2006-2008. General Biology Advisory Committee.

INTERNATIONAL SERVICE

Organization for Tropical Studies, Science Advisory Committee Member, 2014-present.

External member of faculty search committee for a full professor of Soil Science of Temperate and Boreal Ecosystems, Faculty of Forest Science and Forest Ecology, Georg-August University of Goettingen, Germany (May 2010).

PROPOSAL PANELS

- 2016. Dept. of Energy Early Career Panel.
- 2015. National Science Foundation, Ecosystems Panel.
- 2013. National Science Foundation, Ecosystems Panel (2 panels: preproposal and full panel).
- 2012. National Science Foundation, Ecosystems Panel.
- 2012. USAID-NSF PEER Program Panel.
- 2011. National Science Foundation, Ecosystems Panel.
- 2010. National Science Foundation, Graduate Research Fellowship, Ecology Panel.
- 2009. National Science Foundation, Graduate Research Fellowship, Ecology Panel.

PROFESSIONAL SERVICE AND OUTREACH

- 2015. Gave a talk to the CBS Student Garden Club (December, 2015).
- 2015. Organized a symposium entitled “Seasonally dry tropical forests: current progress and future promise in the study of a unique, overlooked, and major biome” for the annual meetings of the American Geophysical Union Meetings.
- 2015. Co-organized a symposium entitled “Multi-Element Limitation Across the Periodic Table” for the annual meetings of the Association for Tropical Biology and Conservation”, July, Honolulu, HI.

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2015. Attended “Bridge to the Baccalaureate” dinner with prospective STEM students from community colleges (April).
2014. Spoke to 30 second graders at Willett Elementary School about tropical ecology.
2013. Co-organized a symposium with Dr. Robin Chazdon for the annual meetings of the Society for Ecological Restoration (Madison, Wisconsin) entitled “Assessing carbon sequestration during forest restoration and natural regeneration in Neotropical ecosystems: challenge and promise”.
2012. Gave a talk to interns at Cedar Creek Ecosystem Science Reserve (July).
2012. Co-organized a Symposium for the annual meetings of the Association for Tropical Biology and Conservation (Bonito, Brazil) entitled “Understanding the Increase in Lianas in Neotropical Forests”.
2012. Presented a booth on tropical forests for the Groveland Elementary School, St. Paul, MN (April 12th, 2012).
2011. Gave a talk to interns at Cedar Creek Ecosystem Science Reserve (July).
2011. Interviewed and filmed by the Will Steger Foundation as part of their Minnesota's Changing Climate Curriculum (video available at: http://www.youtube.com/user/WillSteger1#p/u/23/T0Lx1nZ73_Q)
2011. Participated in an NSF Graduate Research Fellowship Information session for UMN undergraduates (April 18th) and delivered advice on how to prepare pre-doctoral fellowship applications.
2010. EEB Friday Noon Seminar (September). Gave a talk entitled “Tropical land-use change and the global carbon cycle: patterns and processes at regional and global scales”.
2010. Gave a talk entitled “Carbon, Climate, and Tropical Forests” for the College of Food, Agriculture, and Natural Resource Day on the DNR (Department of Natural Resources) Stage at the Minnesota State Fair (August 29, 2010).
2010. Gave a talk to interns at Cedar Creek Ecosystem Science Reserve (July).
2009. EEB Friday Noon Seminar (October). Gave a presentation entitled “The Why, What and How of Broader Impacts” with Dr. Robert W. Sterner.
2009. College of Food, Agriculture and Natural Resource Science (CFANS) New Student Orientation (September), gave two presentations entitled “Tropical Dry Forests: Putting the Pieces Back Together”.
2009. “How big is a hectare? Resource use and human population density”. This is a module I designed and taught for the Nature of Life Program, the College of Biological Science’s

- undergraduate orientation (July).
2009. “What’s the Dirt on the Tropics? Digging Holes in 7 Tropical Forests?”, public lecture, Bell Museum of Natural History, University of Minnesota, MN.
2009. Gave 45-minute talks on “Ecosystems” to two classes (75 students each) of 5th graders at Oak Point Intermediate School, Eden Prairie. MN (February).
2008. Coordinator (lead author) for NEON (National Ecological Observatory Network) Soil Sampling Protocols.
2007. Gave lecture on ecology in Costa Rican to UMN undergraduates visiting Costa Rica through the YMCA (November).
2007. Gave interns at Cedar Creek Natural History Area a research talk on tropical ecology (August)
2007. “How big is a hectare? Resource use and human population density”. This is a module I designed and taught for the Nature of Life Program, the College of Biological Science’s undergraduate orientation (July).
2006. Committee member on the Center for Tropical Forest Science working group on carbon dynamics.
- 2005-2006. Faculty advisor to the UMN student organization CASH, the Campus Atheists and Secular Humanists.
- 2005-2006. Member of the Fellowship Review Committee of the National Chapter of the Graduate Women in Science.
- 2003-present. Member of the Graduate Women in Science Speaker Bureau, Twin Cities Chapter.
2003. Guest editor for *Biotropica*, Volume 36, March 2004.
- 2003, 2005, 2006. Invited speaker for the Undergraduate Biology Colloquium, University of Minnesota.
- 2003, 2005. Outreach with K-12th grade teachers in the Minneapolis-St. Paul area, administered by the Bell Museum and the Jason Project, University of Minnesota (gave talks on tropical rain forest ecology and the global carbon cycle).
2003. Co-Organizer of a symposium entitled “Element Cycling in Tropical Ecosystems” for the meetings of the Association for Tropical Biology, University of Aberdeen, Scotland.
- 2002 - present. Educational outreach with eighth grade students in Earth Sciences classes at Breck School, Minneapolis, MN. Includes giving annual guest lectures and designing field experiments.

CONGRESSIONAL BRIEFINGS

- 2010 (April). Delivered Testimony for a Congressional Briefing on Tropical Forests and Global Warming: Fulfilling the United States’ Copenhagen Commitment, Co-Sponsored by U.S.

House Representatives Adam Schiff, Barbara Lee, and Betty McCollum.

JOURNAL AND PROPOSAL REVIEWS

Journals

Agriculture, Ecosystems and Environment (4), African Journal of Biotechnology, American Naturalist, Annals of Botany, Austral Ecology, Biogeochemistry (3), Biogeochemistry, Biogeosciences (2), Biological Conservation (2), Biological Reviews (3), Biology & Fertility of Soils, Biotropica (11), Canadian Journal of Forest Research, Caribbean Journal of Science, Ecological Applications (3), Ecology (7), Ecology Letters, Ecosystems (11), Environmental Research Letters, Forest Ecology & Management (7), Frontiers in Plant Science, Frontiers in Functional Plant Ecology (1), Functional Ecology (9), Geoderma (10), Geophysical Research Letters, Global Biogeochemical Cycles, Global Change Biology (11), Global Ecology and Biogeography (1), Journal of Ecology (4), Journal of Environmental Management, Journal of Geophysical Research-Biogeosciences (3), Journal of the Torrey Botanical Society (1), Journal of Tropical Ecology (11), Journal of Tropical Forest Science, Journal of Plant Nutrition and Soil Science (2), Journal of Vegetation Science, Methods in Ecology and Evolution, National Academy of Science Letters-India, Nature-Geoscience (2), Nature-Knowledge (3), New Phytologist (4), Oecologia (8), Pacific Science, Plant & Soil (14), Plant Ecology (2), Plant Ecology and Diversity, PLoSONE (2), Science, Proceedings of the National Academy of Sciences (4), Proceedings of the Royal Society B, Soil Biology and Biochemistry (5), Soil Science, Soil Science Society of America Journal (2), Trees, Tree Physiology, Theoretical Ecology, Water Air & Soil Pollution

Proposals

Aldo Leopold Foundation (Iowa State), Carnegie Trust for the Universities of Scotland, FONDECYT (Chilean National Science Foundation), Kearney Foundation (University of California), National Geographic Society (2), National Science Foundation (12), Canadian NSERC Discovery Grant proposal, Canada-Fonds Québécois de la Recherche sur la Nature et les Technologies, Graduate Women in Science, Natural Sciences and Engineering Research Council of Canada

Postdoctoral Associate Mentees

Dr. Bonnie Waring (Oct. 2013- present)

Dr. Joey Reid (Jan. 2014- May, 2014)

Dr. Maga Gei (January 2015- present)

Dr. Kara Allen (December 2015-present)

PhD GRADUATE STUDENT ADVISEES (Current)

Kristen Becklund (Ecology, Evolution and Behavior), Christina Smith (Plant Biological Sciences), and Leland Werden (Plant Biological Sciences)

PhD GRADUATE STUDENT ADVISEES (Past)

Maria Gei (Ecology, Evolution and Behavior, 2014)

Heather Whittington (Plant Biology, 2012)

Justin Becknell (Ecology, Evolution and Behavior, 2012)

PHD GRADUATE STUDENT COMMITTEES (Current)

Amber Eule-Nashoba (Plant Biology), Laura Felice (Plant Pathology)

GRADUATE STUDENT COMMITTEES (Past)

Bonnie Keeler (EEB), Dan Hernández (EEB), Brett Arenz (Plant Pathology), Harriet Van Vleck (EEB), Kerrie Sendall (Plant Biology), Nikhilesh Desai (Northwestern University), William Eddy (Ecology, Evolution and Behavior), Christine O'Connell (EEB), Charlotte Riggs (EEB)

INTERNATIONAL PhD DISSERTATION EXAMINING COMMITTEES (OPPONENT)

Thilde Bech Bruun, 12/09, University of Copenhagen, Denmark

UNDERGRADUATE HONORS THESIS ADVISOR

2015. Emma Rohleder.

UNDERGRADUATE HONORS THESIS READER

2012. Carl Bergquist, thesis title: Investigating the Possible Role of a Glycosyl Transferase Protein in the Biosynthesis of Long-Chain Hydrocarbons in *Shewanella oneidensis*.

2011. Eleanor Hart, thesis title: An investigation into the *Octopus cyanea* fishery of Tanga District, northern Tanzania.

UNDERGRADUATE DIRECTED RESEARCH SUPERVISEES

2015. Mira Garner. Leaf traits of tropical legume species.

2014. Becky Meyer. Spatial variation in soil properties in forest and grassland soils.

2013. Alexander Schwartz. Diameter growth rates of 31 tropical dry forest tree species in relation to interannual variation in rainfall and functional traits.

2012. Ellie Bergstrom. Relationship between Total and Labile Soil Nutrients Within and Among Four Neotropical Forests.

2011. Ansell Toskas: Active Learning Exercises for High School Ecology Curricula

2011. Allison Driessen: The Effects of Forest Regeneration on Concentrations of Labile Phosphorus in Soil

2010. Nathan Hoekstra, project title: Measuring Changes in Soil Respiration with Changing Temperature Across a Gradient of Initial Soil Conditions.

2010. Bess Rubin, undergraduate Honors Thesis in Applied Economics title: Protecting Costa Rican tropical dry forests: a study of the effects of the beef industry and current and potential forestry policies.

2009. Laura Deede, project title: Spatial variation in N¹⁵ isotopic signature in legumes: temperature and species effects.

2008. Stefani Salute, project title: Micronutrient effects on leaf litter decomposition.

2007-2008. Matthew Schneider, project title: Litter decomposition and microbial dynamics during the winter at Cedar Creek Ecosystem Science Reserve

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2007. Matthew Warner, project title: Depth-dependent patterns of soil carbon, and microbial activity and composition in three weathered Panamanian forest soils
2005. Mentor to Adrienne Keller, an undergraduate from Macalester College completing her senior thesis under my direction.
2003. Mentor to Gwenaelle Lashermes, an agronomy student from L'École Nationale Supérieure Agronomique de Rennes, France. Thesis title: Soil nutrients and forest structure in a chronosequence of tropical dry forest stands.
- 2002 - 2003. Committee Member for Jackeline Vargas, a MS student at the University of Costa Rica. Thesis title: Fungal and bacterial succession on decomposing leaf litter: effects of species and environment.
1999. Mentor to Melissa Kalicin, an undergraduate student at Hartwick College, NY. Thesis title: The effect of tree species on soil chemistry and nutrients in a tropical wet forest of Costa Rica. This undergraduate thesis resulted in a publication in Journal of Tropical Ecology.