

Fiona M Soper

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PROFESSIONAL EXPERIENCE

2018- **Postdoctoral Research Associate**, Dept of Ecology and Evolutionary Biology, Cornell University
2017- **Faculty Affiliate**, College of Forestry and Conservation, University of Montana
2016-2018 **Postdoctoral Research Associate**, College of Forestry and Conservation, University of Montana
2010 **Research Technician**, School of Biological Sciences, University of Queensland, Australia
2009 **Research Projects Officer**, Plant Industry Division, Commonwealth Scientific and Industrial
 Research Organisation, Australia

EDUCATION

Ph.D. **Cornell University (Ecology and Evolutionary Biology)**, May 2016

B.Sc. Hons **University of Queensland, Australia (Botany)**, 2008

PUBLICATIONS

In review or revision (available upon request)

AH Halbritter, H de Boeck... **FM Soper** et al. Handbook for standardized field measurements in terrestrial global change experiments
AE Eller, **FM Soper**, JP Sparks. The influence of elevated CO₂ on phenology of *Arabidopsis thaliana* is altered by common air pollutants (NO₂ and O₃) and soil nitrogen
BB Osborne, MK Nasto, **FM Soper**, GP Asner, CS Balzotti, CC Cleveland, PG Taylor, AR Townsend, S Porder. Leaf litter inputs reinforce islands of nitrogen fertility in a lowland tropical forest

Peer-reviewed

1. B Sullivan, RL Nifong, MK Nasto, S Alvarez Clare, C Dencker, **FM Soper**, KT Shoemaker, FY Ishida, J Zaragoza-Castells, EA Davidson, CC Cleveland (2019) Biogeochemical recuperation of lowland tropical forest during succession *Ecology* In press
2. PG Taylor, C Cleveland, **FM Soper**, W Wieder, SZ Dobrowski, CE Doughty, AR Townsend (2019) Greater stem growth, woody allocation and above ground biomass in Paleotropical versus Neotropical forests *Ecology* In press
3. **FM Soper**, B Sullivan, B Osborne, A Shaw, C Cleveland (2019) Leaf cutter ants engineer large N₂O hot spots in tropical forests *Proceedings of the Royal Society B* 286:1-7
*Featured in *New Scientist* and *Science* magazine
4. **FM Soper**, S Chamberlain, S Gregor, J Crumsey, L Dery, JP Sparks (2018) Biological cycling of mineral nutrients in a temperate forested shale catchment. *JGR Biogeosciences* 123:3204-3215
5. **FM Soper**, M Nasto, BB Osborne, CC Cleveland. Nitrogen fixation and foliar nitrogen do not predict phosphorus acquisition in tropical trees (2018) *Journal of Ecology* 107:118-126
*Featured in the *Ecological Society of America Bulletin*
6. **FM Soper**, B Sullivan, M Nasto, BB Osborne, D Bru, C Balzotti, P Taylor, G Asner, A Townsend, L Philippot, S Porder, CC Cleveland (2018) Remotely sensed canopy nitrogen influences N₂O emissions in a lowland tropical rainforest *Ecology* 99:2080-2089
7. SM Freund, **FM Soper**, SR Poulson, PC Selmants, BW Sullivan (2018) Actinorhizal species influence plant and soil nitrogen in semiarid shrub-dominated ecosystems in the western Great Basin *Journal of Arid Environments* 157:48-56

8. **FM Soper**, PG Taylor, W Wieder, S Weintraub, C Cleveland, S Porder, A Townsend (2017) Low rates of gaseous nitrogen loss point to conservative nitrogen cycling in a lowland tropical forest watershed. *Ecosystems* 21:901-912
9. **FM Soper**, JP Sparks (2017) Estimating ecosystem nitrogen addition by a leguminous tree: a mass balance approach using a woody encroachment chronosequence *Ecosystems* 20:1164-1178
10. **FM Soper**, CK McCalley, K Sparks, JP Sparks (2016) Soil carbon dioxide emissions from the Mojave Desert: isotopic evidence for a carbonate source, *Geophysical Research Letters* 44: 245-251
11. **FM Soper**, PM Groffman, JP Sparks (2016) Denitrification in a subtropical, semi-arid savanna: field measurements and intact soil core incubations *Biogeochemistry* 128:257-266
12. **FM Soper**, TW Boutton, PM Groffman, JP Sparks (2016) Nitrogen trace gas fluxes from a semi-arid subtropical savanna under woody legume encroachment *Global Biogeochemical Cycles* 30:614-628
13. **FM Soper**, AE Richards, I Siddique, MPM Aidar, GD Cook, LB Hutley, N Robinson, S Schmidt (2015) Natural abundance ($\delta^{15}\text{N}$) indicates shifts in nitrogen relations of woody taxa along a savanna-woodland continental rainfall gradient *Oecologia* 178:297-308
14. **FM Soper** TW Boutton, JP Sparks (2015) Investigating patterns of symbiotic nitrogen fixation during vegetation change from grassland to woodland using fine scale $\delta^{15}\text{N}$ measurements *Plant, Cell & Environment* 38: 89-100
15. **FM Soper**, C Paungfoo-Lonhienne, R Brackin, D Rentsch, S Schmidt, N Robinson (2011) *Arabidopsis* and *Lobelia anceps* access small peptides as a nitrogen source for growth *Functional Plant Biology* 38: 788-796
16. N Robinson, R Brackin, K Vinall, **FM Soper** et al (2011) Nitrate paradigm does not hold up for sugarcane *PloS ONE* 6(4): e19045.

Educational Resources

- FM Soper**, JP Sparks, HW Greene, C McLinn (2014) 'Empowering tomorrows field instructors: A coupled graduate-undergraduate course for teaching research mentorship in a field context' *Cornell University Centre for the Integration of Research, Teaching and Learning*

RESEARCH GRANTS (As Principal Investigator unless indicated)

2018	National Science Foundation Research Co-Ordination Network Grant (Co-PI) <i>"INCYTE: Investigating Nutrient Cycling in Terrestrial Ecosystems: Integrating Observations, Experiments and Models"</i>	\$499,910
2014	Cornell University Betty Miller Francis '47 Fund for Field Research	\$1,540
2013	National Science Foundation Doctoral Dissertation Improvement Grant	\$20,000
	Cornell University Cross-Scale Biogeochemistry and Climate Program Small Grant (4 total, 2010, 2011, 2012, 2013)	\$12,000
	Sigma Xi Student Research Grant (2 total, 2012, 2013)	\$800
	Andrew W. Mellon Student Research Grant (2 total, 2012, 2013)	\$2,000
2012	Southwestern Association of Naturalists Howard McCarley Research Award	\$1,000
	Cornell University Graduate School and Department Research Funds (2 total)	\$3,000
2011	American Australian Association Education Fellowship (research portion)	\$2,980
	Kieckhefer Adirondack Fellowship	\$5,000
2010	Cornell University Biogeochemistry and Environmental Complexity Small Grant	\$4,000

FELLOWSHIPS AND AWARDS

2018	Plant, Cell & Environment Postdoctoral Award (Best Oral Presentation), Ecological Society of America Annual Meeting
2016	Erskine Stewart Young Alumna of the Year, Stuartholme School, Australia
2015	Whittaker Award (Best Oral Presentation), Cornell University Department of Ecology and Evolutionary Biology
2014	Cornell University Betty Miller Francis '47 Graduate Fellowship
2013	Billings Award (Best Oral Presentation), Ecological Society of America Annual Meeting
2011	American Australian Association Education Fellowship

2010 Cornell University Graduate Fellowship
2008 D.A. Herbert Prize in Botany, University of Queensland

TEACHING EXPERIENCE

Guest Lecturer
2014 BIOEE668 'Principles of Biogeochemistry', Cornell University
Head Teaching Assistant
2015 BIOEE1610 'Ecology and Environment', Cornell University
Teaching Assistant
2015 BIOEE1610 'Ecology and Environment', Cornell University
2014 BIOEE668 'Principles of Biogeochemistry', Cornell University
BIOEE4940 'Deserts, Snakes and Mentorship in the Field', Cornell University
2011-2012 BIOG1440 'Introduction to Comparative Physiology', Cornell University

PRESENTATIONS

Invited

2019 "Novel applications of $\delta^{15}\text{N}$ for measuring symbiotic nitrogen fixation" *University of Michigan, Ann Arbor* (scheduled)
"Linking plant traits and ecosystem processes in a changing world" *Boston University*
2018 "Leaves to Landscapes: How tree traits drive soil processes" *University of Wisconsin, Madison*
2017 "Leaves to Landscapes: How plant traits drive soil processes" *Cary Institute of Ecosystem Studies*
"Linking pattern and process: Nitrogen dynamics in a lowland tropical rainforest" *University of Montana*

Contributed

2018 "Tree-driven cycling of mineral nutrients in a temperate forested shale catchment" *American Geophysical Union Fall Meeting, Washington, DC*
"Nitrogen status does not predict phosphorus acquisition strategies in tropical trees" *Ecological Society of America Annual Meeting, New Orleans, LA* ***Plant, Cell & Environment Postdoctoral Award**
2017 "Canopy foliar nitrogen heterogeneity influences denitrification rates in a tropical lowland forest" *Ecological Society of America Annual Meeting, Portland, OR*
2016 "Woody encroachment impacts on ecosystem nitrogen cycling: fixation, storage and gas loss" *American Geophysical Union Fall Meeting, San Francisco, CA* (poster)
"Woody encroachment: a pervasive influence on ecosystem nitrogen cycling" *Special seminar, College of Forestry and Conservation, University of Montana*
Porder Lab, Brown University
Schmidt Lab, University of Queensland
"Nitrogen in a changing landscape: Woody encroachment as a pervasive influence on ecosystem function" *Doctoral Dissertation Seminar, Cornell University*
2015 "Abiotic drivers, not woody legume encroachment, predict nitrogen trace gas flux from a semi-arid subtropical savanna" *Ecological Society of America Annual Meeting, Baltimore, MD*
2014 "Soil nitrogen gas fluxes during woody legume encroachment: Does encroachment increase gaseous losses?" *American Geophysical Union Fall Meeting, San Francisco, CA*

“Coupling graduate mentorship with undergraduate research in a field context” *Ecological Society of America Annual Meeting, Sacramento, CA* (education section)

2013 “Seasonal and individual variation in leguminous tree nitrogen fixation in a natural ecosystem” *Ecological Society of America Annual Meeting, Minneapolis, MN* *Billings Award

2012 “Temporal variation in nitrogen fixation during woody encroachment of *Prosopis glandulosa* into grasslands of the Rio Grande Plains” *Ecological Society of America Annual Meeting, Portland, OR*

2011 “The support of plant growth by small peptides in two functionally different plant species” *Ecological Society of America Annual Meeting, Austin, TX*

“Natural abundance ($\delta^{15}\text{N}$) indicates shifts in nitrogen relations of woody taxa along a savanna-woodland continental rainfall gradient” *Ecological Society of Australia Annual Meeting, Alice Springs, Australia* (co-author)

2010 “*Arabidopsis* and *Lobelia anceps* access small peptides as a nitrogen source for growth” 5th *International Nitrogen Conference, New Delhi, India* (co-author)

WORKING GROUPS

National Science Foundation Research Coordination Network ‘Investigating Nutrient Cycling in Terrestrial Ecosystems: Integrating Observations, Experiments and Models’

United States Geological Survey Powell Center ‘Novel multi-scale synthesis of nitrogen fixation rates and drivers across the terrestrial biosphere’

SELECTED PROFESSIONAL SERVICE

Reviewership

Editorial Review Board, Biogeochemistry

Nature Ecology and Evolution	Ecology Letters	New Phytologist
Global Change Biology	Ecology	Journal of Arid Environments
JGR Biogeosciences	Ecosphere	PLoS ONE
Soil Biology and Biochemistry	Ecosystems	Austral Ecology
Biogeosciences	Functional Ecology	Geoderma Regional
Plant and Soil	Oecologia	Methods in Ecology and Evolution
ISME Journal		

Leadership

Student President, Sigma Xi: The Scientific Research Society (Cornell chapter), 2014-2015

President, Cornell Biogeochemistry, Environmental Science and Sustainability GSA, 2012-2013

Mentorship

Mentorship Program Coordinator, Ecological Society of America Early Career Ecologist Section 2016-2018

Mentor, Cornell University Enviro-mentor Program, 2010-2011

Outreach

Co-presenter ‘Science Communication for Advocacy’ Ecological Society of America Annual Meeting, 2018

Presenter, ‘What can you do with a career in Science?’ Stuartholme School, 2016

Chair, Sigma Xi Distinguished Lecture and Reception committee, 2013-2015

Organizer and presenter, Sigma Xi ‘Science From the Slope’, Ithaca Applefest, 2010-2011

Organizational Committees

Cornell Biogeochemistry and Environmental Biocomplexity Seminar Series, 2011-2014

Cornell Ecology and Environmental Biology Annual Symposium, 2010-2013, Chair, 2014

Cornell Biogeochemistry and Environmental Biocomplexity Symposium, 2010-2012

Publicity Co-Chair, Graduate Women in Science National Meeting, 2011

Grant/Prize/Fellowship Review Panelist

Science Ambassador Scholarship Advisory Board, 2017-
Ecological Society of America Billings Student Presentation Award, 2018
Ecological Society of America New Phytologist Student Presentation Award, 2017
Montana State Science Fair, 2017
University of Montana Interdisciplinary Collaborative Network Grants Program, 2017
American Australian Association Education Fellowship, 2016
Cornell University Biogeochemistry Small Grants Program, 2011-2012, 2014-2015
Cornell University Orenstein Endowment Fund, 2012-2015
Sigma Xi National Meeting Student Research Showcase, 2014
Cornell University Mellon/Kieckheffer Grants, 2014

UNDERGRADUATE MENTEES

Lab and Field Research Assistants

Haley Hodge, University of Montana, 2016-2017
McKenzie Dillard, University of Montana, 2017
Shauntle Barley, Cornell University, 2011-2015
Chase Brett, Cornell University, 2013

Honors Thesis

Shauntle Barley, Cornell University, 2014

PROFESSIONAL AFFILIATIONS

Ecological Society of America

American Geophysical Union