Fiona M Soper

Assistant Professor
Department of Biology + School of Environment
McGill University
fiona.soper@mcgill.ca | www.fionasoper.com

PROFESSIONAL EXPERIENCE

2020-	**Assistant Professor**, Department of Biology and School of Environment, McGill University
2018-19	**Postdoctoral Research Associate**, Dept of Ecology and Evolutionary Biology, Cornell University
2016-18	**Postdoctoral Research Associate**, College of Forestry and Conservation, University of Montana
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)

K Covey, **FM Soper** et al. (In review) Carbon and Beyond: The biogeochemistry of climate in a rapidly changing Amazon.

Published or accepted

1. BB Osborne, MK Nasto, **FM Soper**, GP Asner, CS Balzotti, CC Cleveland, PG Taylor, AR Townsend, S Porder (2020) Leaf litter inputs reinforce islands of nitrogen fertility in a lowland tropical forest. ***Biogeochemistry*** 147:293-206

2. AE Eller, **FM Soper**, JP Sparks (2020) The influence of elevated CO_2 on phenology of Arabidopsis thaliana (Brassicaceae) is altered by common air pollutants (NO_2 and O_3) and soil nitrogen. ***Journal of the Torrey Botanical Society*** In press

3. **FM Soper**, RA MacKenzie, S Sharma, TG Cole, CM Litton, JP Sparks (2019) Non-native mangroves support carbon storage, sediment carbon burial and accretion of coastal ecosystems. ***Global Change Biology*** 25:4315-4326
   ****Gene E. Likens Outstanding Publication Award, Ecological Society of America*

4. AH Halbritter, H de Boeck… **FM Soper** et al. (2019) The handbook for standardized field and laboratory measurements in terrestrial climate change experiments and observational studies. ***Methods in Ecology and Evolution*** 11:22-37

5. **FM Soper** (2019) Three's a crowd: Triple-isotope analysis traces alternate plant nitrogen nutrition pathways. ***New Phytologist*** 223:1687-1689

6. 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*** 100:e02641

7. 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*** 100:e02589

8. **FM Soper**, B Sullivan, B Osborne, A Shaw, C Cleveland (2019) Leaf cutter ants engineer large N_2O hot spots in tropical forests. ***Proceedings of the Royal Society B*** 286:1-7
   ****Featured in New Scientist and Science magazine*

9. **FM Soper**, S Chamberlain, S Gregor, J Crumsey, L Derry, JP Sparks (2018) Biological cycling of mineral nutrients in a temperate forested shale catchment. ***JGR Biogeosciences*** 123:3204-3215

10. **FM Soper**, M Nasto, BB Osborne, CC Cleveland (2018) Nitrogen fixation and foliar nitrogen do not predict phosphorus acquisition in tropical trees. ***Journal of Ecology*** 107:118-126
    ****Featured in the Ecological Society of America Bulletin*

11. **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 N_2O emissions in a lowland tropical rainforest. ***Ecology*** 99:2080-2089

12. 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

13. **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

14. **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

15. **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

16. **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

17. **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

18. **FM Soper**, AE Richards, I Siddique, MPM Aidar, GD Cook, LB Hutley, N Robinson, S Schmidt (2015) Natural abundance ($\delta_{15}N$) indicates shifts in nitrogen relations of woody taxa along a savanna-woodland continental rainfall gradient. ***Oecologia*** 178:297-308

19. **FM Soper** TW Boutton, JP Sparks (2015) Investigating patterns of symbiotic nitrogen fixation during vegetation change from grassland to woodland using fine scale $\delta_{15}N$ measurements. ***Plant, Cell & Environment*** 38:89-100

20. **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

21. N Robinson, R Brackin, K Vinall, **FM Soper** et al (2011) Nitrate paradigm does not hold up for sugarcane. ***PloS ONE*** 6(4):e19045.

RESEARCH GRANTS (*As Principal Investigator unless indicated. Pre-2020 values in $USD)*

2020	NSERC Discovery Grant and Launch Supplement	$152,500
2018	National Science Foundation Research Co-Ordination Network Grant (Co-PI) *"INCyTE: Investigating Nutrient Cycling in Terrestrial Ecosystems: Integrating Observations, Experiments and Models"*	$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

2020 Gene E. Likens Outstanding Publication Award, Ecological Society of America
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

WORKING GROUPS

National Science Foundation Research Coordination Network '*Investigating Nutrient Cycling in Terrestrial Ecosystems: Integrating Observations, Experiments and Models'* 2019-present

United States Geological Survey Powell Center '*Novel multi-scale synthesis of nitrogen fixation rates and drivers across the terrestrial biosphere'* 2019-present

National Geographic '*Beyond Carbon: Towards a more holistic understanding of the biogeochemistry of forest climate interactions in the Amazon Basin'* 2019-present

TEACHING EXPERIENCE

Instructor
2020 Directed Reading in Biology, McGill University
Guest Lecturer
2020 Biology of Organisms, McGill University
2019 Forest Ecosystem Analysis, Skidmore College
2014 Principles of Biogeochemistry, Cornell University
Teaching Assistant, Cornell University
2015 Ecology and Environment
2014 Principles of Biogeochemistry
Deserts, Snakes and Mentorship in the Field
2011-12 Introduction to Comparative Physiology

PRESENTATIONS

Invited

2019 "Novel applications of $\delta_{15}N$ for measuring symbiotic nitrogen fixation" *University of Michigan, Ann Arbor*

2017 "Linking pattern and process: Nitrogen dynamics in a lowland tropical rainforest" *University of Montana*

Contributed

2020 *"Interactive global change impacts on Amazon biogeochemical cycles" Ecological Society of America Annual Meeting*

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*

SELECTED PROFESSIONAL SERVICE

Reviewership

Editorial Review Board, Biogeochemistry

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

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

Outreach

Presenter, Soup and Science, McGill University
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

Organizational Committees

Cornell Biogeochemistry and Environmental Biocomplexity Seminar Series, 2011-2014
Cornell Biogeochemistry and Environmental Biocomplexity Symposium, 2010-2012
Publicity Co-Chair, Graduate Women in Science National Meeting, 2011

Grant/Prize/Fellowship Review Panelist

National Science Foundation: Division of Environmental Biology, 2020
Early Career Ecologist Outstanding Paper Award Selection Committee, 2018-2019
Science Ambassador Scholarship Advisory Board, 2017-2018
Ecological Society of America Billings and New Phytologist Student Presentation Awards, 2017, 2018
American Australian Association Education Fellowship, 2016
Cornell University Biogeochemistry Small Grants Program, 2011-2012, 2014-2015
Cornell University Orenstein Endowment Fund, 2012-2015

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