

Jennifer L. Soong, PhD

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Climate and Ecosystem Sciences
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(a) EDUCATION

- 2014** Ph.D., Ecology, Colorado State University, Fort Collins, CO
Dissertation: *Moving beyond mass loss: advancing understanding about the fate of decomposing leaf litter and pyrogenic organic matter in the mineral soil*
- 2013** National Center for Atmospheric Research Advanced Study Program- Summer Colloquium, "Carbon-climate connections in the Earth system", Boulder, CO
- 2007** B.A., Oberlin College, Oberlin, OH
Major- Biology; Major- Environmental Studies, Minor- Politics
- 2006** School for International Training- Mekong Delta: Natural and Cultural Ecology Study Abroad Program
Independent research project: *Soil fertility and changes in fertilizer use for intensive rice cultivation in the Red River Delta and the Mekong Delta of Vietnam*

(b) RESEARCH AND PROFESSIONAL EXPERIENCE

- Aug 2017- Present Post-Doctoral fellow, Lawrence Berkeley National Laboratory, Climate and Ecosystem Sciences
- Jan 2015- Aug 2017 Post-Doctoral researcher, University of Antwerp, Department of Biology, Center of Excellence PLECO (Plant and Vegetation Ecology), European Research Council Synergy Grant 610028 "*Effects of phosphorus limitations on Life, Earth System and Society*"
- Fall 2014 Instructor/program assistant, Department of Soil and Crop Sciences, Colorado State University, Fort Collins, CO
- 2011-2014 National Science Foundation (NSF) Graduate Research Fellow
- 2009-2011 USDA National Needs Graduate Research Fellow
- 2008 Research assistant- Colorado Wetlands Assessment Program, Colorado Natural Heritage Program, Fort Collins, CO
- 2007-2009 Naturalist, YMCA of the East Bay at Camp Arroyo, Livermore, CA
- 2007 Restoration Ecology Intern, Presidio Trust, San Francisco, CA

(c) AWARDS

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| Flemish Research Association lead agency grant-GOF2217N (Co-PI, €440,000) | 2017-2020 |
| National Science Foundation, Graduate Research Fellowship (\$166,720) | 2011-2014 |
| European Geophysical Union, Young Scientist's Travel Award | 2014, 2015 |
| Natural Resource Ecology Laboratory- Student Travel Award | 2014 |
| National Center for Atmospheric Research ASP- Summer Colloquium Scholarship | 2013 |
| 4 th International Soil Organic Matter 2013, Nanjing, China, Best Poster Award | 2013 |
| Graduate Degree Program in Ecology- Student Travel Award | 2013 |
| Front Range Student Ecology Symposium- Best Poster Award | 2013, 2010 |

Martin Luther King Jr. Scholarship, Colorado State University (\$32,000)	2011-2012
Front Range Student Ecology Symposium- Best oral Presentation Award	2012
USDA National Needs (Ecosystem Science and Sustainability) Fellow (\$100,000)	2009-2011
Program of Research and Scholarly Excellent Award, Colorado State University (\$5000)	2009
Shansi Memorial Foundation Prize for research in Asia, Oberlin College, OH (\$1000)	2007

(d) RESEARCH INTERESTS

I am a soil ecologist, biogeochemist and ecosystem ecologist. My research focuses on pressing issues on the functioning of terrestrial ecosystems under various natural and human-influenced environmental conditions. I am most interested in the interface between plant and soil processes with a focus on soil organic matter formation and decomposition processes. I conduct observational and empirical studies in field and laboratory setting across a broad range of ecosystem types. I utilize a range of techniques including stable isotope probing, molecular techniques and modeling to quantify how organic and inorganic materials are transported and transformed as they move through plant-soil-microbial-atmospheric interfaces and the consequences of those processes on ecosystem functioning and ecosystem services. I work closely with modelers to scale new mechanistic insights across ecosystem and global scales.

(e) PUBLICATIONS

16) Courtois E.A., Stahl C., Van den Berg J., Bréchet L., Van Langenhove L., Richter A., Urbina I., **Soong J.L.**, Peñuelas J., Janssens I.A., (In Press) Spatial variation of soil CO₂, CH₄ and N₂O fluxes across topographical positions in tropical forests of the Guiana shield. *Ecosystems*.

15) Guenet B., Carmino-Serrano M., Ciais P., Tifafi M., Maignan F., **Soong J.L.**, Janssens I.A. (In Press) Impact of priming on global carbon emissions from soils. *Global Change Biology*

14) Verbruggen E., **Soong J.L.**, Pena R., Fernandez C.W. (2016) Mycorrhizal interactions with decomposers and impact on soil carbon storage. In: *Mycorrhizal mediation of soil: fertility, structure, and carbon storage*, First Edition, Editors: Johnson N.C., Gehring C., Jansa J. Elsevier Press, 2016 [Book Chapter]

13) **Soong J.L.** and Nielsen U.N., (2016) The role of microarthropods in emerging models of soil organic matter. *Soil Biology and Biochemistry* special issue on Soil Food webs doi:10.1016/j.soilbio.2016.06.020

12) Campbell E.E., **Soong J.L.**, Parton W.J., Hobbs N.T., Cotrufo M.F., Paustian K. (2016), Tracking the fate of litter C into CO₂, microbial products and DOC by the Litter Decomposition and Leaching (LIDEL) model using a Hierarchical Bayesian approach to estimate parameters and variability. *Soil Biology and Biochemistry* 100,160-174

11) **Soong J.L.**, Dam M., Wall D.H., Cotrufo M.F. (2017), Fire in the tallgrass prairie: effects on soil communities and trophic transfers of carbon during litter and pyrogenic organic matter decomposition. *Functional Ecology* 31, 260-269 DOI:10.1111/1365-2435.12693

10) McKee G.A., **Soong J.L.**, Caldron F.J., Borch T., Cotrufo M.F., (2016) An integrated spectroscopic and wet chemical approach to investigate grass litter decomposition chemistry. *Biogeochemistry*. 128(1) 107-123

9) **Soong J.L.**, Vandegheuchte M.L., Horton A.J., Nielsen U.N., Deneff K., Shaw E.A., de Tomasel C.M., Parton W.J., Wall D.H., Cotrufo M.F., (2016) Soil microarthropods support ecosystem productivity and soil C accrual: evidence from a litter decomposition study in the tallgrass prairie. *Soil Biology and Biochemistry* 92, 230-238. doi: 10.1016/j.soilbio.2015.10.014

8) Cotrufo M.F., **Soong J.L.**, Horton A.J., Campbell E.E., Haddix M.L., Wall D.H., Parton W.J., (2015) Soil organic matter formation from biochemical and physical pathways of litter mass loss. *Nature Geosciences* 8,776-779. doi:10.1038/ngeo2520

7) **Soong J.L.**, Parton W.J., Calderon F.J., Campbell E.E., Cotrufo M.F. (2015) A new conceptual model on the fate and controls of fresh and pyrolyzed plant litter decomposition. *Biogeochemistry*. 10.1007/s10533-015-0079-2

6) **Soong J.L.**, Cotrufo M.F. (2015) Annual burning of a tallgrass prairie inhibits C and N cycling in soil, increasing recalcitrant pyrogenic organic matter storage while reducing N availability. *Global Change Biology*, DOI: 10.1111/gcb.12832

5) **Soong J.L.**, Calderon F.J., Betzen J., Cotrufo M.F. (2014) Quantification and FTIR characterization of dissolved organic carbon and total dissolved nitrogen leaching from litter: a comparison of methods across litter types. *Plant and Soil* DOI: 10.1007/s11104-014-2232-4

4) **Soong J.L.**, Reuss, D., Pinney, C., Boyack, T., Haddix, M., Stewart, C.E., Cotrufo, M.F. (2014) 'Design and operation of a continuous ¹³C and ¹⁵N labeling chamber for uniform or differential, metabolic and structural, plant tissue isotope labeling', *Journal of Visualized Experiments*, e51117, doi:10.3791/51117

3) Cotrufo, M.F., **Soong, J.L.**, Nguyen, T., Vandegehuchte, M.L., Deneff, K., Shaw, A.E., Sylvain, Z.A., de Tomasel, C.M., Nielsen, U.N., Wall, D.H. (2013) 'Naphthalene addition to soil surfaces: an effective method to suppress soil micro-arthropods with negligible direct effects on soil C dynamics'. *Applied Soil Ecology*. DOI: 10.1016/j.apsoil.2013.09.008

2) Porter E.M., Bowman W.D., Clark C.M., Compton J.E., Pardo L.H., **Soong J.L.** (2012) 'Interactive effects of anthropogenic nitrogen enrichment and climate change on terrestrial and aquatic biodiversity'. *Biogeochemistry*. DOI: 10.1007/s10533-012-9803-3

1) Frey M., **Soong J.**, Feeser J., Dishy S. (2008) 'Identifying control techniques for *Rumex acetosella* in the Presidio of San Francisco (California)'. *Ecological Rest.* 26(2):107-109. DOI: 10.3368/er.26.2.109

(f) PUBLICATIONS in PREPARATION, REVIEW or REVISION

Soong, J.L., Marañón-Jimenez, S., Cotrufo, M.F., Boeckx, P., Bodé, S., Guenet, B., Peñuelas, J., Richter, A., Stahl, C., Verbruggen, E., Janssens, I.A. (In Review), Decoupling of microbial P and C:N responses to nutrient amendments: evidence from a tropical soil incubation, *Soil Biology and Biochemistry*

Leblans N.I.W., Sigurdsson B.D., Maljanen M., Marañón-Jiménez S., **Soong J.L.**, Vicca S., Poeplau C., Van de Velde K., Verbruggen E., Wallander H., Zhanfeng L., Dauwe S., Gundersen P., Holmstrup M., Ilieva-Makulec K., Kätterer T., Ostonen I., Penuelas J., Richter A., Weedon J., Janssens I.A. (In Revision) Large, fast and permanent SOC losses in naturally warmed Icelandic grasslands. *Nature Geoscience*

Marañón-Jiménez S., **Soong J.L.**, Leblans N., Sigurdsson B. D., Dauwe E., Fransen E., Janssens I. (In Review) Soil warming increases metabolic quotients of soil microorganisms without changes in temperature sensitivity of soil respiration. *Soil Biology and Biochemistry*

Machmuller M., Mueller C.W., **Soong J.L.**, Boot C.M., Deneff K., Hoschen C., Cotrufo M.F., (In Review) Submicron investigation reveals the dynamic nature of soil orano-mineral interactions. *Science*

Huang Y., Guenet B., Ciais P., Janssens I.A., **Soong J.L.**, Wang Y., Goll D., Blagodatskaya E., Huang Y. (In Review) ORCHIMIC, a microbe-driven model for soil organic matter decomposition designed for large-scale applications. Geoscientific Model Development

Poepflau C., Don A., Six J., Kaiser M., Benbi D., Chenu C., Cotrufo M.F., Derrien D., Gioacchini P., Grand S., Gregorich E., Griepentrog M., Gunina A., Haddix M., Kuzyakov Y., Kühnel A., Macdonald L.M., **Soong J.L.**, Trigalet S., Vermeire M-L., Rovira P., van Wesemael B., Wiesmeier M., Yaesmin S., Yevdomikov I., Nieder R. Isolating soil organic carbon fractions with varying turnover rates- A comprehensive comparison of fractionation methods. Soil Biology and Biochemistry

(g) SELECTED SCIENTIFIC MEETING PRESENTATIONS (first author only)

Soong J.L., Verbruggen E., Janssens I. Soil biogeochemical and fungal patterns across a precipitation gradient in the lowland tropical rainforests of French Guiana. American Geophysical Union Fall meeting. 2016. San Francisco, CA, USA. (*presentation*)

Soong J.L., Janssens I. C:N:P:K stoichiometric constraints on litter and soil organic matter decomposition. Joint European Stable Isotope Users Meeting. 2016. Ghent, Belgium (*Invited oral presentation*)

Soong J.L. Decomposition and soil carbon cycling. 2016. ForHot project meeting. Antwerp, Belgium (*oral presentation*)

Soong J.L. Soil carbon stocks and soil organic matter formation along the Guyafor network. 2016. Imbalance-P annual project meeting. Vienna, Austria (*oral presentation*)

Soong J.L., Parton, W.J., Calderon, F.J., Campbell, E.E., Cotrufo M.F. 'Partitioning of carbon fluxes between CO₂ and DOC during litter decomposition'. 5th International Symposium on Soil Organic Matter. 2015. Gottingen, Germany (*oral presentation*)

Soong J.L., Dam M., Wall D.H., Cotrufo M.F. 'Limited utilization of pyrogenic organic matter by soil microbes and nematodes reduced soil C and N cycling in tallgrass prairie soils with different fire history'. 5th International Symposium on Soil Organic Matter. 2015. Gottingen, Germany (*presentation*)

Soong J.L., Vandegehuchte M.L., Horton A.J., Nielsen U.N., Deneff K., Shaw E.A., de Tomasel C.M., Parton W.J., Wall D.H., Cotrufo M.F. 'Soil microarthropods support ecosystem productivity and soil C accrual: evidence from a litter decomposition study in the tallgrass prairie'. European Geophysical Union. 2015. Vienna, Austria (*oral presentation*)

Soong J.L., Cotrufo M.F. 'Annual burning of a tallgrass prairie inhibits C and N cycling in soil, increasing recalcitrant pyrogenic organic matter storage while reducing N availability'. American Geophysical Union. 2014 Fall meeting. San Francisco, CA, USA (*presentation*)

Soong J.L. [INVITED] 'Moving beyond mass loss: advancing understanding about the fate of decomposing leaf litter and pyrogenic organic matter into the mineral soil'. 2014. Department of Biology, University of Antwerp, Belgium (*oral presentation*)

Soong J.L., Parton W.J., Calderon F.J., Campbell N., Guilbert K., Cotrufo M.F. 'From litter decomposition to soil organic matter formation: using leaf traits to predict dissolved organic carbon leaching'. European Geophysical Union. 2014 Spring Meeting. Vienna, Austria (*oral presentation*)

Soong J.L., Parton W.J., Calderon F.J., Campbell N., Guilbert K., Cotrufo M.F. 'Quantifying litter decomposition losses to dissolved organic carbon and carbon dioxide'. American Geophysical Union 2013 Fall Meeting. San Francisco, CA, USA (*presentation*)

Soong, J.L. [INVITED] 'Tracking the fate of pyrogenic organic matter decomposition in grassland soils: a stable isotope approach'. Front Range Isotope Day. 2013. Fort Collins, CO, USA (*oral presentation*)

Soong, J.L., Horton, A.J., Nielsen, U.N., Deneff, K., Vandegehuchte, M.L., Wall, D.H., Parton, W., Cotrufo, M.F. 'How do microarthropods impact soil carbon sequestration during litter decomposition in a tallgrass prairie?' National Center for Atmospheric Research, Advanced Studies Program Summer Colloquium: Carbon-climate connections in the earth system, 2013, Boulder, CO, USA (*presentation*)

Soong, J. [INVITED] 'Black carbon in soils'. Northwest Agriculture and Forestry University. Yangling, China. 2013 (*oral presentation*)

Soong, J., Cotrufo, M.F. 'Tracking the fate of pyrogenic organic matter decomposition in grassland soils: a stable isotope approach'. 4th International Symposium on Soil Organic Matter 2013, Nanjing, China (*oral presentation*)

Soong J, Vandegehuchte M, Horton AJ, Nielsen UN, Deneff K, Wall DH, Parton W, Cotrufo MF. 'Tracking the fate of litter derived carbon: why does soil biodiversity matter?' EuroSoil 2012 meeting, Bari, Italy (*oral presentation*)

Soong J.L., and Cotrufo M.F. 'How are soil carbon dynamics affected by black carbon vs. litter inputs' EuroSoil 2012 meeting, Bari, Italy (*presentation*)

Soong J, Deneff K, Nielsen U, Vandegehuchte ML, Parton W, Wall DH, Cotrufo MF. 'Biological mechanisms controlling loss vs. belowground storage of decomposing litter carbon: a stable isotope approach'. Front Range Student Ecology Symposium. 2012. Fort Collins, CO (*oral presentation*)

Soong J, Deneff K, Nielsen U, Vandegehuchte ML, Parton W, Wall DH, Cotrufo MF. 'Biological mechanisms controlling loss vs. belowground storage of decomposing litter carbon: a stable isotope approach'. American Geophysical Union 2011 Fall Meeting. San Francisco, CA (*oral presentation*)

Soong J., Nielsen U., Wall D.H., Parton W., Cotrufo M.F. 'Tracking litter derived carbon into soil and atmosphere using stable isotopes: examining the role of soil fauna'. Ecological Society of America 2011 Meeting. Austin, TX (*presentation*)

Soong J, Stewart C, Reuss D, Pinney C, Cotrufo MF. 'A novel design for a dual stable isotope continuous labeling chamber: results on labeling efficiency and C and N allocation in *Andropogon gerardii*'. American Geophysical Union 2010 Fall Meeting, San Francisco, CA (*presentation*)

(h) TEACHING EXPERIENCE

Invited guest lecturer- Microbial Ecology (2001WETMEC) University of Antwerp, 2016

Co-Instructor- Soils and Global Change (SOCR 400) Colorado State University, 2014

Teaching Assistant- Soil Ecology (SOCR 441) Colorado State University, 2013

Teaching Assistant- Stable Isotope Ecology (SOCR 670) Colorado State University, 2012, 2013

Teaching Assistant- Summer Soils Institute, Colorado State University, 2013, 2012, 2011, 2010

Curriculum development for NSF Research Experience for a Teacher (RET) program, 2012, 2011, 2010

Science Olympiad-Ecology instructor, Preston Middle School, 2009-2011

Outdoor Educator, YMCA of the East Bay, CA, 2007-2009

(i) SYNERGISTIC ACTIVITIES

Convener at the American Geophysical Union Fall meeting 2017

Mentor for undergraduate researchers: Logan Daniels, Jacob Betzen, Elisa Baebler, Michael Jurich, Isabelle Leoni, Mattias Janssens, Elien De Schutter

Mentor for graduate students: Xavier Riera, Antonio Valente, Teresita Gravina, Sabina Marciano, Qiang Li, Steven Dauwe, Lore Verrycke, Leandro Van Hoeveren, Niki Leblens, Kris Meus, Bart De Roeck, Bertold Marien

Imbalance-P junior scientist workshop organizer, 2016-2017

Organizer of the Graduate Degree Program in Ecology Graduate Student Forum, 2013-2014

Student Representative on the Executive Committee of the Graduate Degree Program in Ecology at Colorado State University, 2012-2013

Student Representative, Natural Resource Ecology Laboratory, Colorado State University, 2011-2012

Journal reviewer for: *Global Change Biology*, *Biogeochemistry*, *Soil Biology and Biochemistry*, *Plant and Soil*, *PLOS ONE*, *iForest*,

Research proposal referee for government of Wales 2016, and the French National Research Agency 2017

Founding member of the Colorado State University chapter of Minorities in Agriculture Natural Resources and Related Sciences (**MANRRS**) 2009, member from 2009-2014, vice-president 2009-2010, president 2010-2011

Blog: jennifersoong.wordpress.com/

Contributing author to EcoPRESS science blog (nrelscience.org)