

Mary E. Whelan

14 College Farm Road, New Brunswick, NJ 08901
 Department of Environmental Sciences
 Rutgers University
 mary.whelan@rutgers.edu

Research Interests

biosphere-atmosphere interactions, novel approaches for estimating land carbon uptake

Education

Ph.D., Geography, University of California, Berkeley 2013 Fall
 Terrestrial-Atmospheric Exchange of Reduced Sulfur Compounds in Natural Ecosystems

B.A., honors, Chemistry/Political Science, New College of Florida 2004 Spring
 the honors college of the Florida state university system

Appointments

Assistant Professor Fall 2019
 Department of Environmental Sciences, Rutgers University

Postdoctoral Researcher 2017-present
 Department of Atmospheric and Ocean Sciences, UC Los Angeles

Postdoctoral Research Fellow 2015-2017
 NSF Atmospheric and Geospace Sciences, UC Merced

Postdoctoral Scholar 2014-2017
 Sierra Nevada Research Institute,
 joint appointment with Lawrence Livermore National Laboratory

Instructor/Researcher 2013-2015
 Future Scientists Improving the Public's Climate Literacy
 Lawrence Hall of Science, NSF Geoscience Education Grant

Graduate Student Researcher 2007-2013
 Atmospheric Biogeochemistry Laboratory, UC Berkeley

Staff Chemist 2005-2006
 Dept of Chemical Ecology, Mote Marine Laboratory and Aquarium
 Sarasota, FL

Honors and Awards

AGU Biogeosciences Caregiver Award 2018
 Postdoctoral Innovation Award, Carnegie Institution for Science 2017
 NSF Atmospheric and Geospace Sciences Postdoctoral Fellowship 2015-2017
 Janet Witter Award for Environmental Science Research 2013
 Outstanding Graduate Student Instructor Award 2012
 Martin Foundation Research Funding Award 2012
 UC Berkeley Graduate Division Summer Grant 2012
 Graduate Student Association Community Leader Award 2010

Publications

18. Meredith, LK, J Ogée, K Boye, E Singer, L Wingate, C von Sperber, A Sengupta, **ME Whelan**, E Pang, M Keiluweit, N Brüggemann, JA Berry, and PV Welander: Soil exchange rates of COS and CO-18O differ with the diversity of microbial communities and their carbonic anhydrase enzymes, *ISME Journal*, 2019.
17. Rastogi, B, M Berkelhammer, S Wharton, **ME Whelan**, FC Meinzer, D Noone, and CJ Still: Ecosystem fluxes of carbonyl sulfide in an old-growth forest: temporal dynamics and responses to diffuse radiation and heat waves, *Biogeosciences*, 2018.
16. Meredith, LK, K Boye, C Youngerman, **ME Whelan**, J Ogée, J Sauze, L Wingate, Coupled biological and abiotic mechanisms driving carbonyl sulfide production in soils, *Soil Systems*, 2018.
15. Zumkehr, A, TW Hilton, **ME Whelan**, S Smith, L Kuai, J Worden, JE Campbell, Global gridded anthropogenic emissions inventory of carbonyl sulfide, *Atmospheric Environment*, 2018.
14. **Whelan, ME**, ST Lennartz, TE Gimeno, R Wehr, G Wohlfahrt, Y Wang, L Kooijmans, TW Hilton, S Belviso, P Peylin, R Commane, W Sun, H Chen, L Kuai, I Mammarella, K Maseyk, M Berkelhammer, K-F Li, D Yakir, A Zumkehr, Y Katayama, J Ogée, FM Spielmann, F Kitz, B Rastogi, J Kesselmeier, J Marshall, K-M Erkkilä, L Wingate, LK Meredith, W He, R Bunk, T Launois, T Vesala, JA Schmidt, CG Fichot, U Seibt, S Saleska, ES Saltzman, SA Montzka, JA Berry, and JE Campbell: Reviews and Syntheses: Carbonyl Sulfide as a Multi-scale Tracer for Carbon and Water Cycles, *Biogeosciences*, 2018.
13. Campbell, JE, **ME Whelan**, JA Berry, TW Hilton, A Zumkehr, J Stinecipher, Y Lu, A Kornfeld, U Seibt, TE Dawsome, SA Montzka: Coastal redwood sink of atmospheric carbonyl sulfide provides a new biogeochemical tracer for coastal fog-mediated processes, *JGR-Biogeosciences*, 2017.
12. Hilton, TW, **ME Whelan**, A Zumkehr, S Kulkarni, JA Berry, I Baker, SA Montzka, C Sweeney, BR Miller, JE Campbell: Peak growing season gross uptake of carbon in North America is largest in the Midwest, USA, *Nature Climate Change*, 2017.
11. Campbell, JE, J Kesselmeier, D Yakir, JA Berry, P Peylin, S Belviso, T Vesala, K Maseyk, U Seibt, H Chen, **ME Whelan**, TW Hilton, SA Montzka, MB Berkelhammer, ST Lennartz, L Kuai, G Wohlfahrt, Y Wang, NJ Blake, DR Blake, J Stinecipher, I Baker, and S Sitch: Assessing a New Clue to How Much Carbon Plants Take Up, *EOS*, 2017.
10. Zumkehr, A, TW Hilton, **ME Whelan**, S Smith, JE Campbell: Gridded anthropogenic emissions inventory and atmospheric transport of carbonyl sulfide in the U.S., *JGR-Atmospheres*, 2017.
9. **Whelan, ME**, TW Hilton, JA Berry, M Berkelhammer, AR Desai, and JE Campbell: Carbonyl sulfide exchange in soils for better estimates of ecosystem carbon uptake, *Atmospheric Chemistry and Physics*, 2016.
8. **Whelan, ME** and RC Rhew: Reduced sulfur trace gas exchange between a seasonally dry grassland and the atmosphere, *Biogeochemistry*, 2016.

7. Campbell JE, **ME Whelan**, U Seibt, SJ Smith, JA Berry, and TW Hilton: Atmospheric carbonyl sulfide sources from anthropogenic activity: Implications for carbon cycle constraints, *Geophysical Research Letters*, 2015.
6. Hilton TW, A Zumkehr, S Kulkarni, JA Berry, **ME Whelan**, and JE Campbell: Large variability in ecosystem models explains uncertainty in a critical parameter for quantifying GPP with carbonyl sulphide, *Tellus B*, 2015.
5. **Whelan, ME** and RC Rhew: Carbonyl sulfide produced by abiotic thermal and photo-degradation of soil organic matter from wheat field substrate, *Journal of Geophysical Research Biogeosciences*, 2015.

Publications (continued)

4. Rhew, RC, **ME Whelan**, and D-H Min: Large methyl halide emissions from south Texas salt marshes, *Biogeosciences*, 11, 2014.
3. Khan, MAH, RC Rhew, K Zhou, and **ME Whelan**: Halogen biogeochemistry of invasive perennial pepperweed (*Lepidium latifolium*) in a peatland pasture, *Journal of Geophysical Research Biogeosciences*, 2013.
2. **Whelan, ME**, D-H Min, and RC Rhew: Salt marshes as a source of atmospheric carbonyl sulfide, *Atmospheric Environment*, 2013.
1. Khan, MAH, **ME Whelan**, and RC Rhew: Analysis of low concentration reduced sulfur compounds (RSCs) in air: storage issues and measurement by gas chromatography with sulfur chemiluminescence detection, *Talanta*, 2012.

Outreach and Community Activities

Science community.

Founded COSANOVA.org in 2014 to develop international collaborations on novel tracer studies. Arrange and facilitate workshop meetings annually at AGU and EGU.

Organized an international workshop of 30 scientists in Hyytiälä, Finland, lead author on the subsequent 40-author synthesis document to define the progress in the field and clarify future community goals.

Act as a reviewer for PNAS, JGR-Biogeosciences, Biogeosciences, Frontiers in Ecology, and Atmospheric Chemistry and Physics.

Public outreach.

Subject specialist for NSF-sponsored Promoting Climate Literacy Project with the Lawrence Hall of Science. Developed course curriculum to teach undergraduate and graduate students how to carry out climate change outreach to informal (museum) audiences.

Created FogSci.com for a new social/natural science investigation of coastal redwood conservation. Subject expert for California State Parks Service.

Mentoring.

Trained 12 undergraduate research assistants, 6 from underrepresented backgrounds, in laboratory-based and field-based gas analyses and advised 4 undergraduate students in the completion of their honors theses. 3 assistants have gone on to graduate school.

Advised 2 graduate students in laser spectroscopy and atmospheric modeling.

Invited Seminars

2 nd International OCS Workshop, Austria <i>What we don't know about OCS-specific uncertainties</i>	Nov 2019
ORNL Integrating Evidence for CO ₂ Fertilization, Biosphere, AZ <i>Carbon fertilization from the ice core record</i>	Sept 2018
USGS Research Seminar Series, Golden, CO <i>The carbon cycle via gas tracers and satellites</i>	Mar 2018
Keck Institute for Space Studies, Pasadena, CA <i>Soil Carbonyl Sulfide Exchange: A Primer for Modelers</i>	Sept 2017
Carbonyl Sulfide Research Group Workshop, Hyytiälä, Finland <i>Many paths to GPP estimates</i>	Sept 2016
Lawrence Livermore National Laboratory Biogeochemistry Seminar Series <i>New approaches to evaluate land carbon models</i>	Aug 2016
Wayne State University, Department of Geology <i>Intertwining the fast C and S cycles</i>	Apr 2016
Carnegie Institution for Science, Department of Plant Biology <i>Better estimates of ecosystem carbon uptake using measurements of COS exchange</i>	Feb 2015
Lawrence Livermore National Laboratory <i>Connecting C and S biogeochemical cycles: GPP, mineralization in soil and rainfall events</i>	Jun 2013