

## Maegen B. Simmonds

Lawrence Berkeley National Laboratory  
One Cyclotron Rd, 84-118K, Berkeley, CA 94720  
707-694-6079, mbsimmonds@lbl.gov

### EDUCATION

**Ph.D.** Soils and Biogeochemistry, University of California, Davis, 2014

**B.A.** Letters, Arts and Sciences, The Pennsylvania State University, 2003

### RESEARCH EXPERIENCE

**Geological Project Scientist**, Earth & Environmental Sciences Area, 3/2018 - current  
Lawrence Berkeley National Lab

Research area: *Development of California natural and working lands greenhouse gas and carbon accounting model (CALAND) and climate change mitigation scenarios*, PI's: Peter Nico and Alan Di Vittorio

- Model and scenario development using R and Git/Github
- Simulating spatially explicit land carbon sink and net CO<sub>2e</sub> flux trajectories of various suites of land management interventions (relative to historical baseline) interacting with wildfire, land use and land cover change, mortality, forest (non)regeneration, and climate change.
- Informing California State Agencies in identifying greenhouse gas reduction targets and land management goals for the California Natural and Working Lands Climate Change Implementation Plan.

**Postdoctoral Scholar**, Stanford University, California 4/2016 - 3/2018

Research area: *Effects of climate change on the fate of soil carbon: a greenhouse incubation study*, PI: Scott Fendorf

**Consultant** 1/2015 - 5/2016

International Programs of CA&ES, University of California, Davis.

- Developed software (powered by R), open-source curriculum, and teaching materials on experimental design and analysis of agronomic field trials.

Terra Global Capitol, San Francisco, California.

- Developed scripts in R for batch post-processing of carbon and nitrogen outputs from the DeNitrification-DeComposition (DNDC) model.
- Interpreted model discrepancies and provided recommendations for improving parameterization.

Natural Resource Ecology Laboratory, University of Colorado.

- Supported validation of DayCent model for rice systems: compiled data from 16 field trials, and provided insight into model-data discrepancies.

**Graduate Student Researcher**, UC Davis, California 3/2008 - 12/2014

Advisors: Drs. Chris van Kessel and Bruce Linquist

Dissertation: *Understanding spatial heterogeneity of yield, and management-specific CH<sub>4</sub> and N<sub>2</sub>O emissions in rice systems: experimental field studies and modeling*

- Conducted field- and model-based research on carbon and nitrogen cycling, greenhouse gas emissions, and interactions with management practices in rice cropping systems; collaborated with farmers; installed instrumentation; developed protocols; and collected and analyzed geo-referenced gas, soil,

- water, and crop data for chemical and physical properties.
- Empirically evaluated the biogeochemical model, DNDC, for simulating plant growth and development, and carbon and nitrogen cycling in rice systems, including multi-site calibration and validation, and sensitivity analyses.
- Modified and adapted methods for numerous field, lab, and data analyses (e.g. soil solute concentrations and dissolved trace gases; data cleaning of spatial yield data; and *k*-means clustering and classification and regression tree analyses to determine underlying causes of spatial variability of soil chemical properties and crop yield).
- Awarded \$53,177 in research fellowships, four years of paid tuition and monthly stipend.

#### **PUBLICATIONS IN PEER-REVIEWED JOURNALS**

- 2015 Simmonds, M. B.**, C. Li, J. Lee, J. Six, C. van Kessel, and B. A. Linquist. Modeling methane and nitrous oxide emissions from direct-seeded rice systems. *J. Geophys. Res-Bioge.*, 120(10), 2011-2035.
- 2015 Simmonds, M. B.**, M. Anders, M. A. Adviento-Borbe, A. McClung, C. van Kessel, and B. A. Linquist. Seasonal methane and nitrous oxide emissions of several cultivars in direct seeded rice systems. *J. Environ. Qual.*, 44(1), 103-114.
- 2015** Adviento-Borbe, M. A., G. N. Padilla, C. Pittelkow, **M. B. Simmonds**, C. van Kessel, B. Linquist. Methane and nitrous oxide emissions from flooded rice systems following the end-of-season drain. *J. Environ. Qual.*, 44(4), 1071-1079.
- 2013 Simmonds, M. B.**, R. E. Plant, J. M. Peña-Barragán, C. van Kessel, J. Hill, and B. A. Linquist. Underlying causes of yield spatial variability and potential for precision management in rice systems. *Precis. Agric.*, 14(5), 512–540.

#### **PRESENTATIONS**

- 2019 Simmonds, M. B.**, A. Di Vittorio, P. Nico. California natural and working LANDS carbon and greenhouse gas model (CALAND), Modeling to Promote Climate Smart Conservation on Working Lands Meeting, TomKat Ranch, Pescadero, CA. (Oral)
- 2018 Simmonds, M. B.**, A. Di Vittorio, and P. Nico. Landscape carbon and greenhouse gas modeling for climate change mitigation planning in natural and working lands: California case study. AGU Fall Meeting, Washington, DC. (Oral)
- 2018 Simmonds, M. B.**, P. Nico, and A. Di Vittorio. The building blocks of a landscape carbon and greenhouse gas model to support climate change mitigation in California's natural and working lands. The Land-Energy Nexus in Climate Change Mitigation, Global Climate Action Summit, San Francisco, CA. (Poster)
- 2017 Simmonds, M. B.**, M. Muehe, and S. Fendorf. Effects of climate change and organic matter amendments on the fate of soil carbon and the global warming potential of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions in an upland soil. AGU Fall Meeting, New Orleans, LA. (Poster)
- 2017 Simmonds, M. B.**, Peter Nico, and Alan Di Vittorio. California Natural and Working LAND's Carbon and Greenhouse Gas Model (CALAND) Version 2, Natural and working lands researcher meeting, The Nature Conservancy, San Francisco, CA (Oral, Invited).

- 2015 Simmonds, M. B.** Understanding spatial heterogeneity of yield, and management-specific methane and nitrous oxide emissions in rice systems. Lawrence Berkeley National Lab, Earth Science Division (Oral, Invited).
- 2014 Simmonds, M. B.,** M. Anders, M. A. Adviento-Borbe, C. van Kessel, A. McClung, and B. Linquist. Seasonal CH<sub>4</sub> and N<sub>2</sub>O emissions and plant growth characteristics of several cultivars in direct seeded rice systems. American Geophysical Union (AGU) Fall Meeting, San Francisco, CA. (Poster)
- 2013 Simmonds, M. B.,** C. Li, J. Lee, J. Six, C. van Kessel, and B. Linquist. Modeling cultivar-specific crop growth and methane and nitrous oxide emissions using the DNDC model: Calibration and validation in California rice systems. AGU Fall Meeting, San Francisco, CA. (Poster)
- 2012 Simmonds, M. B.,** B. Linquist, R. Plant, and C. van Kessel. Evaluating the potential for precision management in irrigated rice fields. ASA, CSSA and SSSA Annual Meetings, Cincinnati, OH. (Oral)
- 2012 Simmonds, M. B.,** B. Linquist, C. van Kessel (2012) Cultivar-specific emissions of methane from wet seeded rice cropping systems in California. 35<sup>th</sup> Rice Technical Working Group Meeting. Hot Springs, AR. (Poster)
- 2011** Decock, C., Garland, G., Matiasek, M., Niles, M., **Simmonds, M. B.** Tackling Uncertainties Associated with N<sub>2</sub>O Emissions from Soil. Interdisciplinary Graduate and Professional Students Symposium. UC Davis. (Panel discussion)
- 2010 Simmonds, M. B.,** B. Linquist, R. Plant, and C. van Kessel. The influence of flood irrigation on the spatial distribution of soil nutrients, plant uptake and yield. ASA, CSSA and SSSA Annual Meetings. Long Beach, CA. (Oral)
- 2010 Simmonds, M. B.,** B. Linquist, J. Pena, R. Plant, C. van Kessel. Spatiotemporal variability of soil fertility and nutrient uptake in rice soils: the role of flood water movement. 33<sup>rd</sup> Rice Technical Working Group Meeting. Biloxi, MS. (Poster)
- 2009 Simmonds, M. B.,** B. Linquist, J. Pena, R. Plant, C. van Kessel. Spatial variability of soil nutrient availability and yield in rice soils: the role of flood water movement. Rice Field Days. Rice Experiment Station. Biggs, CA. (Poster)

#### **TEACHING**

- 2017** Climate change: carbon cycling and the role of soils, Guest Lecturer, San Francisco Art Institute
- 2014** Applied Statistics in Agricultural Science, Teaching Assistant, UC Davis
- 2012** Soil Fertility and Nutrient Management, Teaching Assistant, UC Davis
- 2010** Principles of Soil Science, Teaching Assistant, UC Davis

#### **MENTORING**

- 2016** Sarah Spaugh, currently an undergraduate student at Stanford University
- 2013** Jenny Zhao, currently a GIS Technician Apple via NetPolarity
- 2011** Toni Leong, currently a PV designer at Bright Harvest Solar
- 2011** Ian Marton, currently a manufacturing bioprocess technician at Genentech
- 2011** Evonne Soon, currently a Project Scientist at Montrose Environmental Group
- 2008-2009** Kristen Kammeier, currently a Registered Nurse at Emory Healthcare

## GRANTS, FELLOWSHIPS, & AWARDS

- 2019-2022** California Collaborative on Climate Change Solutions: Working Lands Innovation Center—Catalyzing Negative Carbon Emissions, California Strategic Growth Council (Co-Modeling Lead and Co-Author)
- 2015** Shapiro Family Award for Excellence in Science for quality of dissertation and outstanding academic and research record
- 2010-2014** UC Davis Department of Plant Sciences Graduate Researcher Fellowship
- 2013** Full scholarship to Rice Research to Production Course, International Rice Research Institute (IRRI), Philippines, funded by NSF
- 2008-2012** William G. and Kathleen Golden International Agriculture Fellowship
- 2009-2011** UC Davis & Humanities Graduate Research Award
- 2009-2010** Ben A. Madson Scholarship, UC Davis
- 2009** Dr. Marlin Brandon Rice Research Fellowship, UC Davis
- 2009** Henry A. Jastro Graduate Research Award, UC Davis
- 2008** Block Grant, Soils and Biogeochemistry Graduate Group, UC Davis

## SERVICE

- Ongoing** Referee for: EGU Biogeosciences; Pedosphere; Agriculture, Ecosystems and Environment; Field Crops Research
- 2013** Organizer for *Symphony of the Soil* film screening and panel discussion, UC Davis
- 2004-2007** Environmental Health Technician, outreach and education in natural resource conservation and environmental stewardship, Napa County Department of Environmental Management

## REFERENCES

Dr. Peter Nico  
Energy Geosciences Division  
Lawrence Berkeley National Laboratory  
[psnico@lbl.gov](mailto:psnico@lbl.gov)  
(510) 486-7118

Dr. Bruce Linquist  
Plant Sciences  
UC Davis  
[balinquist@ucdavis.edu](mailto:balinquist@ucdavis.edu)  
(530) 752-3125

Dr. Scott Fendorf  
Earth Systems Sciences  
Stanford University  
[fendorf@stanford.edu](mailto:fendorf@stanford.edu)  
(650) 723-5238

Dr. Johan Six  
Env. Systems Science  
ETH Zurich  
[jsix@ethz.ch](mailto:jsix@ethz.ch)  
+41 44 632 84 83