

Christine Sierra O'Connell

CONTACT INFORMATION

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EDUCATION

University of Minnesota-Twin Cities, Minneapolis, Minnesota

Ph.D., Ecology, Evolution & Behavior

November 2015

- Dissertation Topic: "Ecological Tradeoffs of an Agricultural Amazonia"
- Advisors: Sarah Hobbie (2014-), Stephen Polasky, Jonathan Foley (2010-4; moved institutions)

Stanford University, Stanford, California

B.S. with Distinction in Earth Systems, concentration in Biology

2008

- Honors in Environmental Science, Technology and Policy
- Including study at:
 - Stanford University in Australia, Brisbane, Australia
 - Stanford University Hopkins Marine Station, Monterey, California

RESEARCH INTERESTS

Ecosystem ecology; tropical forest ecology; global change; ecosystem services

PUBLICATIONS

Powers, J., Becklund, K., Gei, M., Iyengar, S., Meyer, R., **O'Connell, C. S.**, Schilling, E., Smith, C., Waring, B., Werden, L. "Nutrient addition effects on tropical dry forests: a mini-review from microbial to ecosystem scales." *Frontiers in Earth Science* 3 (2015): 34, 1-8.

Laurance, W. F., Clements, G. R., Sloan, S., **O'Connell, C. S.**, Mueller, N. D., Goosem, M., Venter, O., Edwards, D. P., Phalan, B., Balmford, A., Van Der Ree, R., Arrea. I. B. "A global strategy for road building." *Nature* 513 (2014): 229-232.

Foley, J. A., Ramankutty, N., Brauman, K., Cassidy, E., Gerber, J., Johnston, M., Mueller, N., **O'Connell, C. S.**, Ray, D., West, P., Balzer, C., Bennett, E., Carpenter, S., Hill, J., Monfreda, C., Polasky, S., Rockstrom, J., Sheehan, J., Siebert, S., Tilman, D., Zaks, D. "Solutions for a cultivated planet." *Nature* 478 (2011): 337-342.

McGlue, M. M., Soreghan, M. J., Michel, E., Todd, J. A., Cohen, A. S., Mischler, J., **O'Connell, C. S.**, Castaneda, O. S., Hartwell, R. J., Lezzar, K. E., Nkotagu, H. H. "Environmental controls on shell-rich facies in tropical lacustrine rifts: A view from Lake Tanganyikas littoral." *Palaeos* 25 (2010): 426-438.

SUBMITTED / IN PREP

Gerber, J. S., Carlson, K. M., de Cortazar-Atauri, I. G., Launay, M., Makowski, D., Mueller, N. D., **O'Connell, C. S.**, West, P. C. "Refined global N₂O emissions estimates support climate mitigation opportunities from fertilizer management." *Submitted*.

O'Connell, C. S., Carlson, K. M., Cuadra, S., Feeley, K., West, P., Polasky, S., Foley, J. A. "Conserving Amazonia's ecosystem services in the face of expanding agriculture." *In preparation*.

O'Connell, C. S., Galford, G., Neill, C., Cerri, C. C., Cerri, C. E., Macedo, M., Davidson, E., Venterea, R. "Nitrous oxide emissions respond to management and precipitation on intensified croplands in Southeastern Amazonia." *In preparation*.

O’Connell, C. S., Macedo, M., Galford, G., Coe, M., Neill, C., Cerri, C. C., Cerri, C. E., Davidson, E., Venterea, R., Foley, J. A. “Landscape-level greenhouse gas emissions from double-cropped agriculture in comparison to Amazonian forest.” *In preparation*.

O’Connell, C. S., Foley, J. A. and Coe, M. “Saving forests for climate: How biophysical and biogeochemical forcing after deforestation alter climate and influence agricultural productivity.” *In preparation*.

Reid, J. and Hawthorne, P. (equal contribution), Binder, S., Burgess, M., Cassidy, E., Clark, A., Isbell, F., Mueller, N. D., **O’Connell, C. S.**, Polasky, S. “Make it fit: How can global society achieve sustainable development?” *In preparation*.

HONORS AND
AWARDS

Fellowships

University of Minnesota Doctoral Dissertation Fellowship, 2014-2015
National Science Foundation Graduate Research Fellowship, 2011-2014
University of Minnesota Graduate School Fellowship, 2010-2011
Mellon Mays Undergraduate Fellowship, 2006-2008

Research Grants

Council of Graduate Students Conference Travel Grant, 2015
Dept. of Ecology, Evolution & Behavior Professional Development Grant, 2015
Council of Graduate Students Career Development Grant, 2015
Bell Museum of Natural History James W. Wilkie Fund for Natural History Fellowship, 2012
Mellon Mays Research and Travel Grant, 2012
Mellon Mays Graduate Studies Enhancement Grant, 2011
Stanford University Quarterly Research Grant, 2007
National Science Foundation Research Experience for Undergraduates (REU) Grant, 2006
Stanford University Learning Expedition Grant, 2008

Awards for Academic Achievement

Degree conferred with Distinction, Stanford University, 2008
Elected Phi Beta Kappa, Stanford University, 2008
Deans Award for Undergraduate Academic Achievement, Stanford University, 2008
Award for Outstanding Undergraduate Research, Stanford University, 2008
Chicano & Latino Community Awards, Stanford University, 2005/6/7/8
Presidents Award For Academic Excellence in the Freshman Year, Stanford University, 2005

RESEARCH
EXPERIENCE

University of California, Berkeley, Berkeley, California

Researcher, Siver Lab, Dept. of Environmental Science, Policy, & Management (ESPM) ongoing
Conducting research into the drivers of greenhouse gas emissions from wet tropical forest soils. Organizing and overseeing an ongoing field campaign of soil variable data collection in Puerto Rico, conducting additional laboratory analyses and collaborating with global change modelers.

University of Minnesota-Twin Cities, Minneapolis, Minnesota

Graduate Research Fellow, Global Landscapes Initiative **2010-2015**
Designed and implemented PhD project as NSF Graduate Research Fellow. Emphases in tropical forest ecology, ecosystem services and land-use/land-cover change. Member of the Global Landscapes Initiative at the University of Minnesota’s Institute on the Environment.

- *Committee*: Jonathan Foley, Sarah Hobbie, Stephen Polasky, Jennifer Powers, Rodney Venterea
- *Field work*: Led a field campaign in Mato Grosso, Brazil investigating agricultural intensification in the Amazon and effects on nitrogen cycling and greenhouse gas emissions. *Collaborating*

institutions included Instituto de Pesquisa Ambiental da Amazonia, Woods Hole Research Center, Marine Biological Laboratory, and Centro de Energia Nuclear na Agricultura at the University of Sao Paulo.

- *Data work:* Research with the Global Landscapes Initiative in land-use/land-cover change effects on carbon, nitrogen, biophysical climate and biodiversity, using primarily spatially-explicit global datasets, with an emphasis on tropical systems. *Collaborating institutions* included McGill University, Brazilian Enterprise for Agricultural Research (Embrapa), and Florida International University.
- *Quantitative Skills & Professional Development:* Extensive work in R and Matlab, including suites of scripts that combine workflows for data import and cleaning, initial processing, and automated analytics as new data is collected. In both R and Matlab, experience with Bayesian and Monte Carlo techniques, mixed effect models, writing functions and using version control (particularly git and Github, see <https://github.com/coconn>). *Professional development* includes four R “data science” online courses via Coursera and day-long courses in Python and bash.

Stanford University, Stanford, California

Research Assistant, Palumbi Lab, Dept. Biological Sciences, Stanford University **2007**
Monterey Bay, California

Defined the molecular and ecological distinctions between two species of commercially-harvested sea cucumber in the Monterey Bay, CA region. Contributed to sample collection via field work. Used PCR and sequencing techniques.

Targeted Research Project (TRP) Student, Stanford in Australia **2007**
Brisbane, Australia

Studied the effects of global warming on Eastern Australia's mangrove. Evaluated trends and assessed potential impacts on infrastructure.

Research Assistant, Research Experience for Undergraduates (REU) **2006**
Lake Tanganyika, Tanzania

As a part of the Nyanza Project, conducted independent field research concerning the impacts of deforestation on benthic community ecology in Lake Tanganyika, Tanzania. Basis of undergraduate honors thesis exploring the intersection of ecology and conservation policy.

TEACHING EXPERIENCE (HIGHER ED)

University of Minnesota-Twin Cities, Minneapolis, Minnesota

Graduate Assistant, Ecosystem Ecology, Prof. Sarah Hobbie **2014**
Department of Ecology, Evolution & Behavior, University of Minnesota

Led discussion sections for upper-level undergraduate students and graduate students. Assisted with grading and assignment creation.

Graduate Assistant, Undergraduate Course Trip, UN Climate Change Conference **2010**
Sustainability Studies Program, University of Minnesota

Acted as resource to undergraduate students participating in an environmental policy course on a week-long trip to the United Nations climate change negotiations conference in Cancun, Mexico.

Stanford University, Stanford, California

Teaching Assistant, Introduction to Earth Systems, Prof. Gary Ernst **2007, 2008**
Earth Systems Program, Stanford University

Communicated the science basis for contemporary environmental issues to majors and non-majors as a section leader. Created components of curriculum, wrote assignments with emphasis on student internalization and engagement with subject matter.

Student Leader, Harry Potter and the Arc of Storytelling, Prof. Judith Richardson **2008**
Department of English, Stanford University

Designed, proposed and implemented an English seminar on the topic of the Harry Potter novels through a student-initiated course program.

Course Assistant, Environmental Problems and Solutions, Prof. Paul Ehrlich **2007**

Department of Biological Sciences, Stanford University

Mediated discussion in a seminar concerning the politics and economics of environmentalism. Assisted with course design and grading.

TEACHING
EXPERIENCE
(K-12)

Teach For America Corps Member, New York City, New York

Biology Teacher and Teacher Leader, Williamsburg Charter High School **2008-2010**

Member of a national teacher corps of recent college graduates who commit to teaching in under-served public school districts across the nation. Designed curriculum and tracked student progress as a high school biology teacher at Williamsburg Charter High School, Brooklyn. In second year, serving as curriculum and logistical coordinator for biology team of eight teachers.

TEACHING
INTERESTS

Courses in: ecosystem ecology; forest ecology; introductory biology/ecology

Pedagogical interests: scientific literacy; inclusive teaching; active learning via field and lab classroom experience; underrepresented group participation in STEM

SERVICE AND
OUTREACH

University of Minnesota-Twin Cities, Minneapolis, Minnesota

Peer Reviewer

ongoing

Frontiers in Ecology and the Environment, Nature Communications, Ecology and Society, Agronomy and Sustainable Development

Volunteer teacher, Teaching SMART (Science, Math and Research Technology)

ongoing

Facilitated and designed research-driven lessons via Teaching SMART, a university group that brings graduate researchers into diverse classrooms around the Twin Cities.

Student Representative to the External Review Response Committee

2011-2012

Department of Ecology, Evolution & Behavior, University of Minnesota

Presenter, 11th and 12th Grade Environmental Science

2011

Great River School, St. Paul, Minnesota

NON-ACADEMIC
PUBLICATIONS

O'Connell, Christine S. "Don't let uncertainty drive climate policy." *The Minnesota Daily* 8 Dec 2010: letters page.

O'Connell, Christine S. "Support our domestic opportunities to regulate greenhouse gases." *The Star Tribune* 13 Dec 2010: letters page.

O'Connell, Christine S. "Molluscan Shell Accumulations and Associated Ecological Dynamics: A case study in environmental change in Lake Tanganyika, East Africa." Undergraduate Thesis. Stanford University, 2008. Advised by Vitousek, Peter.

O'Connell, Christine S., Alison J. Haupt and Stephen R. Palumbi. "Molecular and Morphological Characterization of Two Species of Sea Cucumber, *Parastichopus parvimensis* and *Parastichopus californicus*, in Monterey, CA." *Stanford Undergraduate Research Journal* 7 (2008): 36-40.

INVITED TALKS /
CONFERENCE
PRESENTATIONS

Association of American Geographers. Chicago, IL. 21-24 April 2015. "GHG Emissions in South-eastern Amazonia: The Effect of Agricultural Intensification" (invited talk).

Graduate Climate Conference. Seattle, WA. 31 October-2 November 2014. "Saving forests for climate: How biophysical and biogeochemical forcing after deforestation alter climate and influence

agricultural productivity” (poster).

Ecological Society of America. Sacramento, CA. 10-15 August 2014. “Balancing tradeoffs: Reconciling multiple environmental goals in an agricultural Amazonia” (talk).

Universidade Federal de Viçosa, SAGE Conference. Viçosa, Brazil. 13 March 2014. “Conserving Amazonia’s ecosystem services in the face of expanding agriculture” (invited talk).

James Cook University, Roads Symposium. Cairns, Australia. 31 October 2013. “You can’t always get what you want: Tradeoffs in Amazonia between agricultural production and key environmental variables” (invited talk).

Preliminary Oral Exam, public pre-thesis seminar, Dept. of Ecology, Evolution & Behavior. St. Paul, MN. 2 October 2013. “The ecological cost of doing agricultural business” (talk).

American Geophysical Union. San Francisco, CA. 5-9 December 2011. “Making Tropical Forests Count: Balancing ecosystem service delivery in Amazonia” (poster).

Ecological Society of America. Austin, TX. 7-12 August 2011. “Making things fit: modeling a sustainable, well-fed world in 2050” (poster).

American Association for the Advancement of Science. Washington, DC. 18-21 February. 2011 “Scaling up soil carbon change estimates in the wake of agricultural conversion” (poster).

SKILLS

Languages: Spanish (proficient), Brazilian Portuguese (proficient)

Computer programs and skills: R; Matlab (fluent); ArcGIS, L^AT_EX, Git, GitHub (proficient); python, bash (novice)

PROFESSIONAL AFFILIATIONS

American Geophysical Union
Earth Science Women’s Network
Ecological Society of America

REFERENCES

Sarah Hobbie, Ph.D. co-advisor (2014-)
(612) 624-6777, shobbie@umn.edu
Department of Ecology, Evolution & Behavior
University of Minnesota-Twin Cities

Steve Polasky, Ph.D. co-advisor
(612) 625-9213, polasky@umn.edu
Departments of Ecology, Evolution & Behavior & Applied Economics
University of Minnesota-Twin Cities

Jonathan Foley, Ph.D. co-advisor (2010-4; moved institutions)
(415) 379-5398, jfoley@calacademy.org
California Academy of Sciences
San Francisco, California

Michael Coe
(508) 444-1536, mtcoe@whrc.org
Woods Hole Research Center
Falmouth, Massachusetts

Jennifer Powers
(612) 625-5721, powers@umn.edu
Departments of Ecology, Evolution & Behavior & Plant Biology
University of Minnesota-Twin Cities

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