

# REBECCA RYALS – CURRICULUM VITAE

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Assistant Professor  
University of California, Merced

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## EDUCATION

- 2012 **Ph.D.** Environmental Science, Policy, and Management, University of California, Berkeley  
2006 **M.E.M.** Ecosystem Science and Management, Duke University  
2004 **B.Sc. (summa cum laude)** Environmental Science, Marywood University

## PROFESSIONAL EXPERIENCE

- 2018 - present **Assistant Professor**, University of California, Merced  
2015 – 2017 **Assistant Professor**, University of Hawai‘i at Mānoa  
2012 – 2015 **Voss Postdoctoral Research Associate**, Brown University & Marine Biological Laboratory  
2006 – 2012 **Graduate Research Assistant**, University of California, Berkeley  
2007 – 2008 **Graduate Student Instructor**, University of California, Berkeley  
2005 – 2006 **Climate Change Policy Partnership Fellow**, Duke University  
2005 **Stanback Intern**, Union of Concerned Scientists

## GRANTS

- 2018 – 2019  
\$85,000 Exploring the beneficial role of biosolids in soil health and climate mitigation in California’s agricultural soils  
Bay Area Clean Water Association  
PI: R. Ryals
- 2018 – 2019  
\$10,000 Closing the poop loop: The role of ecological sanitation in achieving multiple sustainable development goals  
Blum Center, University of California, Merced  
PI: R. Ryals
- 2016 – 2021  
\$125,000 Evaluating production and nutrient-cycling of grazing management systems in Hawaiian forests and pastures  
USDA McIntire-Stennis  
PI: R. Ryals; co-PI: M. Thorne
- 2016 – 2018  
\$40,000 Exploring science-based solutions for climate-smart agriculture in Hawaii  
USDA Hatch  
PI: R. Ryals
- 2016 – 2017  
\$10,489 Development of a protocol to assess soil carbon at the ranch-scale  
Maui County Office of Economic Development  
PI: R. Ryals; co-PI: J. Leary
- 2016 – 2018  
\$121,371 Building climate literacy in the Cooperative Extension Service to increase capacity for climate change adaptation and mitigation among Pacific Island agricultural systems  
Office of Insular Affairs Technical Assistance Program  
PI: C. Trauernicht; co-PIs: S. Enomoto, R. Ryals, J. Deenik
- 2015  
\$2,000 Faculty Research Travel Award  
UH Mānoa Office of the Vice Chancellor for Research

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- 2014 – 2015 Sources and solutions of reactive nitrogen pollution from intensive animal agriculture  
\$110,000 Institute at Brown for Environment and Society Small Grant  
PI: R. Ryals; co-PIs: M. Hastings, J. Tang, and D. King.
- 2014 – 2015 Mitigating nitrogen pollution from poultry manure in the Chesapeake Bay watershed  
\$100,000 Rathmann Family Foundation grant  
PI: R. Ryals.
- 2013 – 2014 Monitoring atmospheric ammonia concentrations associated with chicken grazing at a  
\$9,225 permaculture farm  
Brown University Environmental Change Initiative Seed Grant  
PI: R. Ryals. co-PIs: M. Hastings, J. Tang, J. Galloway, A. Leach..
- 2013 – 2014 Sustainable poultry manure management and nitrogen cycling in the Chesapeake Bay  
\$45,922 Watershed  
Rathmann Family Foundation  
PI: R. Ryals; co-PIs: M. Hastings, J. Tang.

## AWARDS & SCHOLARSHIPS

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<i>Year(s)</i>	<i>Name</i>	<i>Institution</i>
2017	Travel award, Sequestering Carbon in Soil: Addressing the Climate Threat conference	Breakthrough Strategies & Solutions
2015	Young Scientist Award	Int'l Symposium on Organic Matter Management and Compost Use in Horticulture
2013	Symposium Scholar	Dissertation Initiative for the Advancement of Climate Change Research (DISSCRS)
2009	Outstanding Graduate Student Instructor Award	University of California, Berkeley
2007	Graduate Research Fellowship Program Honorable Mention	National Science Foundation
2006	Most Outstanding Second Year Student Award	Nicholas School of the Env. (Duke)
2005-2006	Climate Change Partnership Fellowship	Center on Global Change (Duke)
2005	Nicholas School Alumni Fellowship	Duke University
2005	Most Outstanding First Year Student Award	Nicholas School of the Env. (Duke)
2004	Nicholas School of the Environment Scholarship	Duke University
2004	Award for Environmental Excellence	Marywood University
2004	Phillip E. Mulry Medal for Excellence in Chemistry	Marywood University
2004	Kappa Gamma Pi Medal for General Excellence	Marywood University

## PUBLICATIONS

Harden, J., G. Hugelius, A. Anders, J. Blankinship, B. Bond-Lamberty, C. Lawrence, J. Loisel, A. Malhotra, R. Jackson, S. Ogle, C. Phillips, **R. Ryals**, K. Todd-Brown, R. Vargas, S. Vargas, F. Cotrufo, M. Keiluweit, K. Heckman, S. Crow, W. Silver, M. DeLonge, N. Lucas. 2018. Networking our science to characterize the state, vulnerabilities, and management opportunities of soil organic matter. *Global Change Biology* 24:e705-718.

Teller, A., **R. Ryals**, S. Porder. In review. Nutrient losses after application of biochar and composted poultry manure fertilizer on two farms in the Chesapeake Bay Watershed. *Agriculture and Natural Resources*.

Clark, S. **R. Ryals**, D. Miller, C. Mullen, D. Pan, M. Zondlo, A.A. Boateng, M.G. Hastings. 2017. Effluent gas flux characterization during pyrolysis of chicken manure. Submitted to *ACS Sustainable Chemistry and Engineering*. DOI: 10.1021/acssuschemeng.7b00815

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Tully, K., **R. Ryals**. 2017. Nutrient cycling in agroecosystems: Balancing food and environmental objectives. Submitted to *Agroecology and Sustainable Food Systems* 41:761-798.

Castner, E., A. Leach, N. Leary, J. Baron, J. Compton, J.N. Galloway, M. Hastings, J. Kimiecik, J. Lantz-Trissel, E. de la Reguera, and **R. Ryals**. 2017. The Nitrogen Footprint Network: A multi-institution program to limit nitrogen pollution. *Sustainability: the Journal of Record* 10:79-88

Hastings, M.G., R.T. Barnes, J. Berry, J. Kimiecik, **R. Ryals**, J. Lantz-Trissel. 2017. Calculating institutional nitrogen footprints creates connections across campus. *Sustainability: the Journal of Record* 10:74-78.

Cayuela, M.L., E. Aguilera, A. Sanz-Cobena, D.C. Adams, D. Abalos, **R. Ryals**, W. Silver, L. Barton, M.A. Alfaro, V. Pappa, P. Smith, J. Garnier, G. Billen, A. Bondeau, L. Bouwman, L. Lassaletta. 2017. Nitrous oxide emission factors in Mediterranean climate cropping systems: a revision of the available literature and assessment of difference with official national estimates. *Agriculture, Ecosystems and Ecology* 238:25-35.

Yang, W.H., **R. Ryals**, D. Cusack, W.L. Silver. 2017. Cross-biome assessment of gross soil nitrogen cycling in California ecosystems. *Soil Biology & Biochemistry* 107:144-155.

Rowntree, J.E., **R. Ryals**, M.S. DeLonge, W.R. Teague, M.B. Chiavegato, P. Byck, T. Wang, S. Xu. 2016. Potential mitigation of Midwest grass-finished beef production emissions with soil carbon sequestration. *Future of Food: Journal on Food, Agriculture and Society*. 4:31-38.

**Ryals, R.**, V. Eviner, C.E. Stein, W.L. Silver. 2016. Grassland compost amendments increase forage production without changing plant communities. *Ecosphere*. 7:e01270.

**Ryals, R.**, M. Hartmann, W.J. Parton, M.S. DeLonge, and W.L. Silver. 2015. Simulating soil carbon and greenhouse gas dynamics in grasslands amended with compost. *Ecological Applications*. 25:531-545.

**Ryals, R.**, M. Kaiser, M.S. Torn, A.A. Berhe, and W.L. Silver. 2014. Impacts of organic matter amendments on carbon and nitrogen dynamics in rangeland soils. *Soil Biology and Biochemistry*. 68: 52-61.

DeLonge, M.S., **R. Ryals**, and W.L. Silver. 2013. A lifecycle model to evaluate carbon sequestration potential and greenhouse gas dynamics of managed grasslands. *Ecosystems*. 16: 963-979.

**Ryals, R.** and W.L. Silver. 2013. Effects of organic matter amendments on net primary productivity and greenhouse gas emissions in annual grasslands. *Ecological Applications* 23:46-59.

Ackerely, D.D., **R. Ryals**, W.K. Cornwell, S.R. Loarie, W.L. Silver, and T.E. Dawson. 2012. Potential impacts of climate change on biodiversity and ecosystem services in the San Francisco Bay Area. Chapter in *Bay Area Climate Change Impacts Report*, California Energy Commission.

Silver, W.L., **R. Ryals**, and V.T. Eviner. 2010. Soil carbon storage in California rangelands. *Rangeland Ecology and Management*. DOI: 10.2111/REM-D-09-00106.1

Lichter, J., S.A. Billings, S.E. Zegler, D. Gaindh, **R. Ryals**, A.C. Finzi, R.B. Jackson, E.A. Stemmler, W.H. Schlesinger. 2008. Soil carbon sequestration in a pine forest after 9 years of atmospheric CO<sub>2</sub> enrichment. *Global Change Biology* 14:2910-2922.

Williams, E., N. Greenglass, and **R. Ryals**. 2007. Carbon capture, pipeline and storage: a viable option for North Carolina utilities? The Nicholas Institute for Environmental Policy Solutions and The Center on Global Change at Duke University. Working Paper. March 8, 2007.

### SELECTED PRESENTATIONS

**Ryals, R.** 2018. Ecological approaches to agriculture in California. On Panel: Growing a Just and Ecological Food System from the Ground Up. Rural Justice Summit, California Institute for Rural Studies, University of California, Merced.

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**Ryals, R.** 2017. Closing the Poop Loop: Transforming human waste to combat climate change and enhance resilience of agroecosystems. Departmental Seminar, Natural Resources and Environmental Management, University of Hawaii at Manoa.

**Ryals, R.** 2017. Carbon, Climate, and Agriculture. Hawaii Extension Climate Forum: Sharing Climate Knowledge, Supporting Our Community. University of Hawaii at Manoa.

**Ryals, R.**, G. Andersen, G. McNicol, S. Kramer. 2017. Biosolids recycling: Emerging opportunities in California and Haiti. W3170 Annual Meeting. Los Angeles, CA.

Clark, S.C., **R. Ryals**, D.J. Miller, C.A. Mullen, D. Pan, M.A. Zondlo, M.G. Hastings. 2017. Effluent gas flux characterization during pyrolysis of chicken manure. American Geophysical Union Fall Meeting. New Orleans, LA.

**Ryals, R.** 2016. How can we apply ecosystem science to find solutions to wicked problems? Hawaii Ecosystems Meeting. Hilo, HI.

**Ryals, R.**, S. Kramer, S. Porder, G. Andersen. 2015. Linking human health, climate change, and food security through ecological-based sanitation systems. American Geophysical Union Fall Meeting. San Francisco, CA.

### TEACHING & MENTORSHIP

2015 – 2017: **Instructor** at UH Mānoa in the Depts of Natural Resources & Environmental Management (NREM) and Tropical Plant & Soil Sciences (TPSS).

- TPSS 450/NREM 460: Nutrient Management of Agroecosystems (4 cr; Spring 2016, Spring 2017)
- NREM 631: Climate Change Mitigation and Adaption in Agricultural Systems (3 cr; hybrid synchronous online course; Fall 2016, Fall 2017)
- NREM 695: Masters Proposal (1 cr; Spring 2016; Fall 2017)
- NREM 696: Masters Capstone Experience (3 cr; Fall 2016; Spring 2017)

2015 – current: **Graduate faculty advisor** for UC Merced and UH Mānoa. Currently primary advisor of 1 MSc candidate, 2 PhD students; Graduate dissertation committee member for 2 PhD and 2 MSc students; Previously advised 1 Postdoctoral fellow

2010 – 2018: **Undergraduate research mentor** for two UH Nitrogen Footprint fellows and for undergraduate research theses (five students at Brown University and UC Berkeley); Trained and supervised 35 additional students in laboratory research experiences in ecology and biogeochemistry at UH Mānoa, Brown University, and UC Berkeley.

2008 – current: **Guest lecturer** at UC Berkeley (2018), UH Mānoa (2015-2016), Brown University (2013-2015), UC Berkeley (2008-2012), Cal Poly San Louis Obispo (2010), San Francisco State University (2009-2011) on topics of climate change, agriculture, nitrogen biogeochemistry, and rangeland management.

2007 – 2008: **Co-Instructor** at UC-Berkeley, ESPM 298.02 *Climate Change: Facts and Controversies* and ESPM 298.10 *Combating Climate Change: the Science Behind Solutions*

### SERVICE & OUTREACH

*Departmental and University Service*

- **SNS Living and Learning Communities Advisory Board Member**, UC Merced (2018 – present)
- **Soils Collaborative Member**, UH Mānoa interdepartmental effort to strengthen soils-based curriculum and research (2015 – 2017)
- **UH Mānoa Nitrogen Footprint Project**, advise 2 students on sustainability project (2016-present)

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- **Undergraduate Academic Advisor** for four students in UH Mānoa Dept of NREM (2016 – 2017)
- **Participant**, UH Mānoa Instructional Assessment Project: Quantitative Reasoning (2016 – 2017)
- **Judge** at College of Tropical Agriculture & Human Resources Student Research Symposium (2016)

### *Service Scientific Community*

- **Grazing Lands Action Group Co-Leader**, International Soil Carbon Network. 2016 - present
- **Co-convener** for oral and poster sessions on “The Bio-atmospheric N Cycle” and Outstanding Student Paper Award Liaison and Judge at American Geophysical Union Fall Meetings (2012 -2017)
- **Reviewer of grant proposals** for National Science Foundation DEB, Department of Energy SBIR, US Department of Agriculture SBIR
- **Peer-reviewer of journal articles** in *Frontiers in Ecology and the Environment*, *Global Change Biology*, *JGR-Biogeosciences*, *Biogeochemistry*, *Applied Soil Ecology*, *Soil Biology & Biogeochemistry*, *Restoration Ecology*, *Journal of Environmental Quality*, *Ecological Applications*, *Environmental Management*, *Sustainability*, *Acta Horticulturae*, *Journal of Soil & Water Conservation*, *Agricultural & Forest Meteorology*, and *Agriculture, Ecosystems & Environment*
- **Lead organizer**, *Intensifying Agriculture: Environmental Impacts and Potential Solutions*, an interdisciplinary Brown-MBL sponsored workshop, January 2013
- **Presenter at scientific conferences**, including American Geophysical Union Fall Meeting, Ecological Society of America Annual Meeting, International Symposium on Organic Matter Management and Compost Use in Horticulture, Global Land Project Meeting.

### *Public Service and Outreach*

- **Expert reviewer**, Environmental Impact Statement for proposed dairy, 2016
- **Public seminars**, including webinar on “The Agriculture-Climate Connection” for Hawaii Center for Food Safety and “Soils as a Solution” for Maui Seminar Series.
- **Member**, Marin Carbon Project, 2008 – present
- **Research featured in Sustainable Organic Integrated Livelihoods Blogs**, “Monitoring Meteorology in one of the World’s Most Climate-Vulnerable Nations” (1/29/2018), “Capturing the Conditions of a Microbial Revolution” (6/25/2017), “Compost and Climate Research Interns” (1/25/2017), “Sunscreen or Rubber Boots? Soil has a Weather Station!” (12/13/2016), “EcoSan Combats Climate Change” (7/7/2014)

**PROFESSIONAL MEMBERSHIPS:** American Geophysical Union (AGU), Ecological Society of America (ESA), American Association for the Advancement of Science (AAAS)