

JACLYN HATALA MATTHES

Assistant Professor, Dept. Biological Sciences, Wellesley College

Science Center, 106 Central Street, Wellesley, MA 02481

Email: jmatthes@wellesley.edu, Web: <http://matthesecolab.com>

HIGHLIGHTS AS ASSISTANT PROFESSOR, *July 2014 – present*

- Published 13 peer-reviewed papers.
- Awarded 3 NSF grants totaling \$1,588,957, with \$342,885 allocated to the Matthes Lab.
- Primary Advisor for 2 Ph.D. students (expected graduation Spring 2020) and 21 undergraduate women (13 from underrepresented racial and/or ethnic groups) in independent laboratory research, including 3 undergraduate Senior Thesis projects.
- Taught 6 courses, 2 of which were developed *de novo* and focus on quantitative methods for data science and modeling in ecology.
- Appointed Member of the National Ecological Observatory Network (NEON) Science, Technology, & Education Advisory Council.

EDUCATION

- **Ph.D. University of California – Berkeley**, Environmental Science, Policy, & Management, Ecosystem Sciences Division, 2013
- **A.B. Harvard University**, Environmental Science & Public Policy, 2007

PROFESSIONAL APPOINTMENTS

- **Assistant Professor**, Dept. Biological Sciences, Wellesley College, 2016 – *present*
- **Adjunct Assistant Professor**, Ecology, Evolution, Ecosystems, & Society (EEES) Ph.D. Program, Dartmouth College, 2016 – *present*
- **Assistant Professor**, Dept. Geography, Dartmouth College, 2014 – 2016
- **Adjunct Assistant Professor**, Dept. Biological Sciences, Dartmouth College, 2014 – 2016
- **Postdoctoral Researcher**, Dept. Earth & Environment, Boston University, 2013 – 2014
- **Graduate Student Researcher**, Baldocchi Biometeorology Lab, UC Berkeley, 2009 – 2013
- **Research Assistant**, Moorcroft Ecology Lab, Harvard University, 2007 – 2009
- **Research Scientist**, Yellowstone Ecological Research Center, Bozeman, MT, 2007

PEER-REVIEWED PUBLICATIONS (*published as Jaclyn A. Hatala before 2013*)

* mentored Ph.D. student; ^ mentored undergraduate student

- 2018 -

[20] **Matthes, J. H.**, A. K. Lang*, F. V. Jevon*, S. Russell^. 2018. Tree stress and mortality from emerald ash borer does not systematically alter short-term soil carbon flux in a mixed northeastern U.S. forest, *Forests* 9(1): 37, doi:10.3390/f9010037.

- 2017 -

- [19] Rollinson, C., Y. Liu, A. Raiho, D. Moore, J. McLachlan, D. Bishop, A. Dye, A. Hessel, T. Hickler, **J. H. Matthes**, N. Pederson, B. Poulter, T. L. Quaipe, K. Schaefer, J. Steinkamp, M. Dietze. 2017. Emergent climate and CO₂ sensitivities of net primary productivity in ecosystem models do not agree with empirical data in temperate forests in Eastern North America. *Global Change Biology* 23(7): 2755-2767, doi:10.1111/gcb.13626.
- [18] Knox, S. H., I. Dronova, C. Sturtevant, P. Oikawa, **J. H. Matthes**, J. Verfaillie, D. Baldocchi. 2017. Using digital camera and Landsat imagery with eddy covariance data to model gross primary production in restored wetlands. *Agricultural and Forest Meteorology* 237-238: 233-245, doi: 10.1016/j.agrformet.2017.02.020.
- 2016 -
- [17] Goring, S. J., D. J. Mladenoff, C. V. Cogbill, S. Record, C. J. Paciorek, S. T. Jackson, M. C. Dietze, A. Dawson, **J. H. Matthes**, J. S. McLachlan, J. W. Williams. 2016. Novel and lost forests in the Upper Midwestern United States, from new estimates of Settlement-Era composition, stem density, and biomass. *PLoS One* 11(12): e0151935. doi:10.1371/journal.pone.0151935.
- [16] Poindexter, C. M., D. D. Baldocchi, **J. H. Matthes**, S. H. Knox, E. A. Variano. 2016. Overlooked methane transport process controls significant portion of a wetland's methane emissions. *Geophysical Research Letters*, doi: 10.1002/2016GL068782.
- [15] Baldocchi, D. D., S. H. Knox, I. Dronova, J. Verfaillie, P. Oikawa, C. Sturtevant, **J. H. Matthes**, M. Detto. 2016. The impact of expanding flooded land area on the annual evaporation of rice. *Agricultural and Forest Meteorology* 223: 181-193, doi:10.1016/j.agrformet.2016.04.001.
- [14] Knox, S. H., **J. H. Matthes**, C. Sturtevant, P. Oikawa, J. Verfaillie, D. D. Baldocchi. 2016. Biophysical controls on interannual variability in ecosystem scale CO₂ and CH₄ exchange in a California rice paddy. *Journal of Geophysical Research – Biogeosciences* 121(3): 978-1001, doi: 10.1002/2015JG003247.
- [13] Anderson, F. E., B. Bergamaschi, C. Sturtevant, S. Knox, L. Hastings, L. Windham-Myers, M. Detto, E. L. Hestir, J. Drexler, R. L. Miller, **J. H. Matthes**, J. Verfaillie, D. Baldocchi, R. L. Snyder, R. Fujii. 2016. Variation of energy and carbon fluxes from a restored temperate freshwater wetland and implications for carbon market verification protocols. *Journal of Geophysical Research – Biogeosciences* 121(3): 777-795, doi: 10.1002/2015JG003083.
- [12] **Matthes, J. H.**, S. Goring, J. W. Williams, M. C. Dietze. 2016. Benchmarking historical CMIP5 land-climate feedbacks across the Upper Midwest and Northeastern United States. *Journal of Geophysical Research – Biogeosciences* 121(2): 523-535, doi: 10.1002/2015JG003175.
- [11] Sturtevant, C., B. Ruddell, S. H. Knox, J. Verfaillie, **J. H. Matthes**, P. Oikawa, D. D. Baldocchi. 2016. Identifying scale-emergent, non-linear, asynchronous processes of wetland methane exchange. *Journal of Geophysical Research – Biogeosciences*, 121(1): 188-204, doi:10.1002/2015JG003054.

- 2015 -

[10] **Matthes, J. H.**, S. H. Knox, C. Sturtevant, O. Sonnentag, J. Verfaillie, D. D. Baldocchi. 2015. Predicting landscape-scale CO₂ flux at a pasture and rice paddy with long-term canopy hyperspectral reflectance measurements. *Biogeosciences* 12: 4577-4594, doi:10.5194/bg-12-4577-2015.

[9] Petrescu, A. M. R., A. Lohila, J.-P. Tuovinen, D. D. Baldocchi, A. Desai, N. Roulet, T. Vesala, A. J. Dolman, W. Oechel, B. Marcolla, T. Friborg, J. Rinne, **J. H. Matthes**, L. Merbold, A. Meijide, G. Kiely, M. Sottocornola, T. Sachs, D. Zona, A. Varlagin, D. Lai, E. Veenendaal, F.-J. Parmentier, U. Skiba, M. Lund, A. Hensen, J. van Huissteden, L. Flanagan, N. Shurpali, T. Grünwald, E. Humphreys, M. Jackowicz-Korczyński, M. Aurela, T. Laurila, C. Grüning, C. Corradi, A. Schrier-Uijl, T. Christensen, M. Tamstorf, M. Mastepanov, P. Martikainen, S. Verma, C. Bernhofer, A. Cescatti. 2015. The uncertain climate footprint of wetlands under human pressure. *Proceedings of the National Academy of Sciences of the United States of America* 112(15): 4594-4599, doi: 10.1073/pnas.1416267112.

[8] Knox, S. H., C. Sturtevant, **J. H. Matthes**, L. Koteen, J. Verfaillie, D. D. Baldocchi. 2015. Greenhouse gas budgets (CO₂ and CH₄) of drained agricultural peatlands and restored wetlands in the Sacramento-San Joaquin Delta. *Global Change Biology* 21(2): 750-765, doi: 10.1111/gcb.12745.

- 2014 -

[7] Dietze, M. C. and **J. H. Matthes**. 2014. A general ecophysiological framework for modeling the impact of pests and pathogens on forest ecosystems. *Ecology Letters* 17(11): 1418-1426, doi: 10.1111/ele.12345.

[6] **Matthes, J. H.**, C. Sturtevant, J. Verfaillie, S. H. Knox, D. D. Baldocchi. 2014. Parsing variability in CH₄ fluxes at a spatially heterogeneous wetland: Integrating multiple eddy covariance towers with high-resolution flux footprint analysis. *Journal of Geophysical Research – Biogeosciences* 119(7): 1322-1339, doi: 10.1002/2014JG002642.

- 2012 -

[5] **Hatala, J. A.**, M. Detto, D. D. Baldocchi. 2012. Gross ecosystem productivity causes a diurnal pattern in methane flux from rice. *Geophysical Research Letters* 39(6): L06409, doi:10.1029/2012GL051303.

[4] **Hatala, J. A.**, M. Detto, O. Sonnentag, S. J. Deverel, J. Verfaillie, D. D. Baldocchi. 2012. Greenhouse gas (CO₂, CH₄, H₂O) fluxes from drained and flooded agricultural peatlands in the Sacramento-San Joaquin Delta. *Agriculture, Ecosystems & Environment* 150: 1-18, doi: 10.1016/j.agee.2012.01.009.

[3] Ma, S., D. D. Baldocchi, **J. A. Hatala**, M. Detto, J. Curiel-Yuste. 2012. Are rain-induced ecosystem respiration pulses enhanced by legacies of antecedent photodegradation in semi-arid environments? *Agricultural and Forest Meteorology* 144-145: 203-213, doi:10.1016/j.agrformet.2011.11.007.

- 2010 & 2011 -

- [2] **Hatala, J. A.**, M. C. Dietze, R. L. Crabtree, D. Six, K. Kendall, and P. M. Moorcroft. 2011. An ecosystem-scale model for the spread of a host-specific fungal pathogen in the Greater Yellowstone Ecosystem. *Ecological Applications* 21(4): 1138-1153, doi:10.1890/09-2118.1.
- [1] **Hatala, J. A.**, K. Q. Halligan, R. L. Crabtree, and P. M. Moorcroft. 2010. Landscape-scale patterns of forest pest and pathogen damage in the Greater Yellowstone Ecosystem. *Remote Sensing of Environment* 114(2): 375-384, doi:10.1016/j.rse.2009.09.008.

- **Submitted & In Prep** - (manuscripts available upon request)

* mentored Ph.D. student; ^ mentored undergraduate student

- [1] Jevon, F. V.*, I. Chen^, A. Conte^, A. Lang*, A. Sama^, M. Ayres, **J. H. Matthes**. Conspecific soils create negative density-dependent feedbacks for *Quercus rubra* seedlings. In Prep for *New Phytologist*.
- [2] Lang, A.*, F. Jevon*, M. Ayres, **J. H. Matthes**. Functional mycorrhizal associations mediate soil respiration in a northern hardwood forest. In Prep for *Ecosphere*.
- [3] **Matthes, J. H.**, S. Russell^, V. Pasquarella. Regional drought and autumn climate structure thresholds of forest resistance and resilience to repeated defoliation. In Prep for *Global Change Biology*.
- [4] Russell, S.^, C. Vines, D. Johnson, G. Bohrer, **J. H. Matthes**. ¹³CH₄ signatures reveal more frequent large CH₄ emission events during hydraulic fracturing in the Marcellus Shale region of West Virginia. In Prep for *Environmental Research Letters*.

Invited Book Chapters

- [1] **Matthes, J. H.** and E. H. Matthes. 2018. 'The Clean Plate Club? Food Waste and Individual Responsibility'. *The Oxford Handbook of Food Ethics*, Eds. A. Barnhill, M. Budolfson, and T. Doggett, Oxford University Press.

RESEARCH GRANTS & CONTRACTS

Funded (Total Award Value = \$1,588,957; To Matthes = \$342,885)

- [3] 'MSB-ECA: A generalized framework for modeling the impacts of forest insects and pathogens in the Earth System', National Science Foundation, MacroSystems Biology and Early NEON Science, NSF-1638406, 01/01/17-12/31/18, PI: J. H. Matthes, Total: **\$133,533**
- [2] 'LTER: Long-Term Ecological Research at the Hubbard Brook Experimental Forest', National Science Foundation, Long Term Ecological Research, Lead PI: Gary Lovett (Cary Institute of Ecosystem Studies), NSF-1637685, 02/01/17-01/31/23, co-PIs: J. H. Matthes and 21 others, Total Award: \$1,127,000, To Matthes: **\$55,740**
- [1] 'UNS: Collaborative Research: Measurement and modeling of the pathways of potential fugitive methane emissions during hydrofracking', National Science Foundation,

Chemical, Bioengineering, Environmental, and Transport Systems, NSF-1509297, 08/15/15 – 08/14/18 *no-cost extension to 08/15/19*, Lead PI: Gil Bohrer (Ohio State Univ.), co-PI: J.H. Matthes, Total Award: \$328,424, To Matthes: **\$153,612**

AWARDS AND FELLOWSHIPS

- National Ecological Observatory Network Data Education Fellow, 2018
- Early Career Participant Award, NSF Office of International Science and Engineering, 'Ecological Knowledge and Predictions: Integrating Across Networks and National Observatories', 2018
- Distinguished Student Lecture Award in Environmental Science, UC Berkeley, 2013
- National Science Foundation Graduate Research Fellowship, 2010-2013
- Environmental Protection Agency Science to Achieve Results Fellowship, 2010 (*declined*)

INVITED SEMINARS & PROFESSIONAL MEETING TALKS SINCE 2014

- "Interactions among defoliation, drought, and tree phenology determine ecosystem-atmosphere feedbacks in northeastern U.S. mesic forests," Co-authors: S. Russell & V. Pasquarella, Ecological Society of America Annual Meeting, New Orleans, LA, 2018
- "An app-based approach to developing simulation modeling skills in an introductory organismal biology course", Association of American Colleges & Universities Project Kaleidoscope Regional Meeting, Salem, MA, 2018
- "DisturbED: A generalized framework for modeling the impacts of insects and pathogens in the Earth System", Abstract B53A-0506, American Geophysical Union Fall Meeting, San Francisco, CA, 2017
- "The challenge of reconciling earth system models with ecological datasets across centuries", Invited Keynote, Gordon Research Conference: Unifying Ecology across Scales, Biddeford, ME, 2016.
- "The Clean Plate Club? Food Waste and Individual Responsibility", University of Vermont, Food Ethics Workshop, 2016
- "Putting bugs into models: A generalized framework for modeling Earth system feedbacks with forest insects and pathogens", Cary Institute of Ecosystem Studies, Seminar, 2016
- "Ecosystems in Flux: How climatic, ecological, and anthropogenic disturbances shape ecosystem processes"
 - Wellesley College, Biological Sciences Seminar, 2015
 - Chatham University, Women in Global Change Science Series, 2016
- "The Breathing of the Biosphere: Why Ecosystem Metabolism Matters in the Anthropocene", Massachusetts Institute of Technology, MIT Media Lab Seminar, 2015
- "Constraining Centennial-Scale Ecosystem-Climate Interactions with a Settlement-era Forest Reconstruction across the Upper Midwest and Northeastern United States",

Co-authors: D. J. Moore, A. Fox, S. Goring, B. Poulter, T. Quaife, K. Schaefer, J. Steinkamp, J. McLachlan, M. C. Dietze, American Geophysical Union Fall Meeting, San Francisco, CA, 2014

- “Plant and microbial carbon flux coherence in managed and agricultural wetlands”
 - Plymouth State University, Environmental Science Colloquium, 2014
 - University of Vermont, Plant and Soil Science Seminar, 2014
 - The Ohio State University, Environmental Sciences Seminar, 2014
- “Managing, measuring, and modeling ecosystem carbon flows: Lessons from the California Delta”
 - Marine Biological Laboratory, Ecosystems Center Seminar, 2014
 - Dartmouth College, Biology Department, Cramer Seminar Series, 2014
 - Purdue University, Dept. Forestry & Natural Resources, 2016

TEACHING EXPERIENCE

Teaching at Wellesley College in Dept. Biological Sciences (2016 – present)

- **BISC 111:** Organismal Biology with Laboratory, *Spring 2017, Spring 2018, Spring 2019*
- **BISC 113:** Exploration of Organismal Biology with Laboratory, *Spring 2019*
- **BISC 201:** Ecology with Laboratory, *Fall 2018*
- **BISC 204:** Biological Modeling with Laboratory, *Spring 2017, Spring 2018*
- **BISC 307:** Ecosystem Ecology with Laboratory, *Fall 2016, Fall 2017, Fall 2018*

Teaching at Dartmouth in Dept. Geography (2014 – 2016)

- **GEOG 8:** Life in the Anthropocene, *Winter 2015, Winter 2016*
- **GEOG 3:** The Natural Environment, *Spring 2015*

Published Pedagogical Resources (non-peer-reviewed)

- **Matthes, J. H.** (2018). Outstanding Oaks: Quercus Phenology at NEON Sites. NEON Faculty Mentoring Network, QUBES. doi:10.25334/Q4HQ54
- **Matthes, J. H.** (2018), "Modeling the Mechanisms of Evolution," <https://qubeshub.org/resources/evopopulations>
- **Matthes, J. H.** (2018), "Investigating Trade-offs among Mammal Traits," <https://qubeshub.org/resources/mammaltraits>

STUDENT ADVISING & MENTORING

Graduate Students

- **Dartmouth Ecology, Evolution, Ecosystems, & Society Ph.D. Program:**
 - Chelsea Vario Petrenko, Dissertation Committee, Ph.D. awarded *June 2015*
 - Fiona Jevon, Ph.D. Dissertation Advisor, expected graduation *June 2020*
 - Ashley Lang, Ph.D. Dissertation Advisor, expected graduation *June 2020*

Undergraduate Students

- **Senior Honors Thesis**
 - 2018-2019: Andrea Sama, *Biochemistry*; Sarah Smith-Tripp, *Biological Sciences*
 - 2017-2018: Emily Neel, *Environmental Studies*, 2017-2018
- **Wellesley Sophomore Early Research Program**, Undergraduate Research Mentor
 - 2017-2018: Sulaikha Buuh '20; Lyba Khan '20
 - 2016-2017: Prapti Koirala '19
- **Wellesley Science Center Summer Research Program**, Undergraduate Research Mentor
 - 2018: Emma Conrad-Rooney '20, Eva Paradiso '20
 - 2017: Amaya Allen '18, Sulaikha Buuh '20, Lyba Khan '20, Lauren Tso '20
 - 2016: Amanda Hernandez '18, Prapti Koirala '19
- **Wellesley BISC 250H/350H: Independent Study**, Undergraduate Research Mentor
 - 2018-2019: Lacey Berg '21; Jennifer Chien '19; Abigail Conte '20; Katherine D'Hennezel '21; Diana Hernandez '21; Erica Huang '20; Carolina Jimenez '21
 - 2017-2018: Irina Chen '18, Emma Conrad-Rooney '20, Abigail Conte '20; Erica Huang '20; Lara Jones '18; Andrea Sama
 - 2016-2017: Irina Chen '18, Emma Conrad-Rooney '20, Sarah Russell '17; Amandine Fromont '17
- **Dartmouth Women in Science Program**, Undergraduate Research Mentor
 - 2015-2016: Mariko Whitenack '17
 - 2014-2015: Kennedy Jensen '18; Emma Rieb '18
- **UC Berkeley Biology Scholars Program; New Experience for Research & Diversity in Science; Sponsored Program for Undergraduate Research, 2009-2013**
 - Developed and advised 7 semester and year-long independent undergraduate research projects

PROFESSIONAL SERVICE

Production of Science Scholarship

- **Editorial Board Member**, *Agricultural and Forest Meteorology*, "an international journal for the publication of original articles and reviews on the inter-relationship between meteorology, agriculture, forestry, and natural ecosystems", 2016-present
- **Editorial Board Member**, *Frontiers in Forests and Global Change*, "publishes rigorously peer-reviewed research across the field of forest science – spanning from molecules to ecosystems to the biosphere, to inform and promote the sustainable management of the worlds forests.", 2018-present
- **Peer Reviewer for Journal Articles**: *Agricultural and Forest Meteorology*, *Atmospheric Environment*, *Biogeosciences*, *Boreal Environmental Research*, *Ecological Applications*, *Ecology Letters*, *Environmental Informatics*, *Environmental Research Letters*, *Geographic Research*, *Global Change Biology*, *Journal of Forest Research*, *Journal of Geophysical Research*, *Journal of Plant Nutrition and Soil Science*, *PLoS One*, *Remote Sensing*, *Remote Sensing of Environment*, *Soil Science Society of America Journal*

- **Peer Reviewer for External Grant Proposals:**
 - Ad-Hoc Reviewer, National Science Foundation, BIO Population and Community Ecology Cluster, 2017; SBE Geography and Spatial Sciences Program, 2018
 - Reviewer, Estonian Research Council (ETAg) Basic Research Proposal, 2017
 - Ad-Hoc Reviewer, Helmholtz Association, Helmholtz Young Investigators Group Research Proposals (German Early Career Award), 2017
 - Ohio State Wetland Restoration Program, 2016
 - National Science Foundation, Graduate Research Fellowship Program, 2015
 - California State Dept. Fish & Wildlife, Wetlands Restoration for Greenhouse Gas Reduction Program, 2015

Professional Societies Service

- **Member**, American Geophysical Union (2008-present), Ecological Society of America (2008-present)
- **Primary Convener**, B13L/B14D/B23E: Observing and Predicting Impacts from Ecological and Climatological Disturbances, AGU Fall Meeting 2014
- **Outstanding Student Paper Award Liaison**, Session B29A: Observing and Predicting Impacts from Ecological and Climatological Disturbances, AGU Fall Meeting 2014
- **Co-Convener**, Sessions B11H/B12A/B13K/B21A: Biosphere-Atmosphere Greenhouse Gas Fluxes in Terrestrial Ecosystems I/II/III/IV, AGU Fall Meeting 2013

Synergistic Activities

- Member, National Ecological Observatory Network (NEON) Science, Technology, & Education Advisory Council, 2018-2021
- Committee of Scientists, Hubbard Brook Long-Term Ecological Research site, 2014 – present
- Participant, NSF Research Coordination Network, S3: Scenarios, Services, and Society, Workshop 1: Scenarios to Solutions, South Casco, ME, 2014
- Participant, Lake GHG Flux Workshop, Hyytiälä Forestry Field Station, Finland, 2014
- Participant, National Center for Atmospheric Research (NCAR) Advanced Study Program Researcher Workshop, Key Uncertainties in the Global Carbon Cycle: Perspectives across terrestrial and ocean ecosystems, 2013
- Participant, NSF Research Coordination Network, FORECAST: Promoting New Perspectives on Data Assimilation in Global Change Science, Woods Hole, MA, 2012

Wellesley College Service

- Member, Ad-hoc committee on the development of a Data Science minor, 2016 – present
- Member, Advisory Committee on Library and Technology Policy, 2017 – present
- Biological Sciences Equity & Inclusion Committee, 2018 – present
- Biological Sciences Assessment Committee, 2016 – 2018