

# GILLIAN GALFORD

Research Associate Professor  
Gillian.Galford@UVM.edu  
802.656.2920

Rubenstein School of Environment & Natural Resources  
Gund Institute for Environment  
University of Vermont

---

## AREAS OF EXPERTISE

I work at the emerging frontier of coupled human-natural systems, with foci on agricultural systems, carbon and nitrogen cycling, climate change and sustainability. I am uniquely positioned in this field as I work across scales ranging from plot-level field studies to regional or national scale modeling (Fig. 1) using systems frameworks. My research focuses on **three themes: 1) human activities on the land** (e.g., deforestation, agricultural management, **2) responses to global change** (e.g., agricultural activities responding to climate variability or economic globalization), and **3) ecosystem interactions of humans and the environment** (e.g., disrupted carbon and nitrogen cycling). I pursue “science for society’s sake” by conducting transdisciplinary research, building strong collaborative teams nationally and internationally, and communicating to non-technical audiences.

## EDUCATION

**Ph.D. 2010** | Department of Geological Sciences (Brown University) and The Ecosystems Center (MBL)  
**B.A., cum laude 2004** | Washington University in St. Louis

## APPOINTMENTS

### *University of Vermont*

<b>Research Associate Professor</b>   Rubenstein School of Environment & Natural Resources	2019-pres
<b>Research Assistant Professor</b>   Rubenstein School of Environment & Natural Resources	2012-pres.
<b>Coordinator</b>   Geospatial Technologies Minor	2017-pres.
<b>Fellow</b>   Gund Institute for Environment	2017-pres.
<b>Faculty</b>   Food Systems Graduate Program	2018-pres.
<b>Participating Faculty</b>   Quantitative and Evolutionary STEM Training (QuEST) Program	2018-pres.
<b>Sustainability Faculty Fellow</b>	2012-pres.
<b>Steering Committee</b>   Food Systems Initiative	2013-2017
<b>Fellow</b>   Gund Institute for Ecological Economics	2012-2017
<b>Woods Hole Research Center</b>   Postdoctoral Fellow	2011-2012
<b>Earth Institute, Columbia University</b>   Fellow, Adjunct	2010, 2011-pres.

## JOURNAL PUBLICATIONS

**NOTE:** Mentoring and teaching collaborations are indicated with (\*) for a graduate student and (^) for a postdoctoral researcher at the time of collaboration

M. Jain, R. Fishman, P. Mondal, G.L. Galford, N. Bhattarai, S. Naeem, U. Lall, and R.S. DeFries (In Review).  
Groundwater Depletion Will Reduce Cropping Intensity in India. **Nature Sustainability.**

- H. Michelson and G.L. Galford (In Review). Agricultural productivity and nutrition outcomes: Evidence from Malawi. **Journal of Development Economics**.
- E. Kinnebrew\*, G.L. Galford, L. Champlin\*, C. Neill (In Review). Woody plant encroachment into coastal grasslands: consequences for soil properties and plant diversity. **Landscape Ecology**.
- A.M. Huddell\*, G.L. Galford, D.N.L. Menge, K.L. Tully, C.A. Palm, C. Neill, M.N. Macedo, J.E. Hickman (In Review). Environmentally-important impacts of intensive nitrogen use in tropical agroecosystems. **Global Change Biology**.
- K. Watson\*, G.L. Galford, L. Sonter, I. Koh<sup>^</sup>, T. Ricketts (In Review). Conserving ecosystem services and biodiversity: Measuring the tradeoffs involved in splitting conservation budgets. **Ecosystem Services**.
- H. Tallis, K. Kreis, L. Olander, C. Ringler, D. Ameyaw, M.E. Borsuk, D. Fletschner, E. Game, D.O. Gilligan, M. Jeuland, G.Kennedy, N. Miller, Y.J. Masuda, S. Mehta, M. Parker, C. Pollino, J. Rajaratnam, D. Wilkie, W. Zhang, S. Ahmed, O.C. Ajayi, H. Alderman, G. Arhonditsis, I. Azevedo, R. Badola, R. Bailis, P. Balvanera, E. Barbour, M. Bardini, D.N. Barton, J. Baumgartner, T.G. Benton, M. Bergin, E. Birol, E. Bobrow, D. Bossio, A. Bostrom, A. Braimoh, E. Brondizio, J. Brown, B.P. Bryant, R.S.D. Calder, B. Chaplin-Kramer, A. Chapoto, T. Chupein, A. Cullen, N. DeMello, K.L. Dickinson, K.L. Ebi, H.E. Eves, J. Fanzo, P.J. Ferraro, B. Fisher, E.A. Frongillo, G.L. Galford, D. Garrity, L. Gatere, A.P. Grieshop, N.J. Grigg, C. Groves, M.K. Gugerty, M. Hamm, M. Hirpa, X. Hou, C. Huang, M. Imhoff, D. Jack, A.D. Jones, R. Kelsey, M. Kothari, R. Kumar, C. Lachat, A. Larsen, M. Lawrence, F. DeClerck, P.S. Levin, E. Mabaya, J.M. Gibson, R.I. McDonald, G. Mace, R. Maertens, D.I. Mangale, B. Marcot, R. Martino, S. Mason, L. Mehta, R. Meinzen-Dick, B. Merz, S. Msangi, G. Murray, K.A. Murray, C.E. Naude, L. Naughton, N.K. Newlands, E. Nkonya, A. Park, A. Peterman, T. Petruney, H. Possingham, J. Puri, R. Remans, L. Remlinger, T.H. Ricketts, B. Reta, D. Robinson, B.E. Robinson, D. Roe, J. Rosenthal, S. Ruffo, G. Shen, D. Shindell, M. Small, B. Stewart-Koster, T. Sunderland, W. Sunderlin, W.J. Sutherland, H. Swaminathan, J. Tewksbury, B. Toole, W. Twine, Kit Vaughan, H. Wasser, S. Wear, C. Webb, D. Whittington, M. Wilkerson, H. Wittmer, B.D.K. Wood, S. Wood, J. Wu, G. Yadama, S. Zobrist (In Revision). Aligning Evidence Generation and Use Across Health, Development and Environment. **Current Opinion in Environmental Sustainability**.
- C. Costa Jr.<sup>^</sup>, G.L. Galford, M.T. Coe, M. Macedo, K.J. Jankowski<sup>^</sup>, C. O'Connell\*, C. Neill (In Revision). Modeling Nitrous Oxide Emissions from Large-scale Intensification of Soybean-maize Cropping Systems in the Southern Amazon, **Biogeochemical Cycles** [Paper # 2018GB006089].
- G.L. Galford, O. Peña, A.K. Sullivan, J. Nash, N. Gurwick, G. Pirolli, M. Richards, J. White, E. Wollenberg (In Revision). Agricultural development addresses food loss and waste while reducing greenhouse gas emissions. **Science of the Total Environment**.
- A. Adams\*, J. Pontius, G.L. Galford, D. Gudex-Cross (In Revision). Simulating forest cover change in the northeastern U.S.: Decreasing forest area and increasing fragmentation. **Landscape Ecology**.
28. C. Kirchoff, G.L. Galford, A. Karmalkar, A. Seth, G. Wang, M. Barlow, K. Lombardo, S. Stephenson, J. Barsugli (In Press). Climate Assessments for local action. **BAMS Inbox**. DOI: 10.1175/BAMS-D-18-0138.1
27. D. Thom<sup>^</sup>, M. Golivets<sup>^</sup>, L. Edling\*, G. Meigs<sup>^</sup>, J. Gourevitch\*, L.J. Sonter, G.L. Galford, W.S. Keeton (2019). Climate sensitivity of carbon, timber, and species richness in the boreal-temperate ecotone co-varies with forest development. **Global Change Biology** 25: 2446-2458. DOI: 10.1111/gcb.14656

26. C. Ramirez-Reyes<sup>^</sup>, K. Brauman, G.L. Galford, B. Chapin-Kramer, S.B. Adamo, G.R.H. Allington, C. Anderson, K. Bagstad, M.T. Coe, A.F. Cord, L.E. Dee, M. Jain, V.G. Kowal, F. Muller-Karger, P. Potapov, J. Qiu, J. Rieb, L.H. Samberg, N. Singh, R. Sharp, S. Szeto (2019). Improving Integration of Earth Observations into Ecosystem Service Models. **Science of the Total Environment** 665:1053-1063. DOI: 10.1016/j.scitotenv.2019.02.150.
25. K. Watson\*, G.L. Galford, L. Sonter, I. Koh<sup>^</sup>, T. Ricketts (2019). The effect of accounting for beneficiary demand in prioritizing conservation actions to meet biodiversity and ecosystem service goals. **Conservation Biology** DOI: 10.1111/cobi.13276.
24. S. Ahamed\*, J. Sperling, G.L. Galford, J. Stephens, D. Arent (2019). Gas rich, water poor: Integrated assessment of the food-energy-water nexus in the Denver region, USA. **Case Studies in the Environment**, pp. 1-21 DOI: 10.1525/cse.2018.001735.
23. K.J. Jankowski<sup>^</sup>, C. Neill, E.A. Davidson, M.N. Macedo, C. Costa Jr<sup>^</sup>, G.L. Galford, L. Maracahipes\*, P. Lefebvre, D. Nunes, C.E.P. Cerri, R.M. McHorney, C. O'Connell\*, M.T. Coe (2018). Fate of nitrogen fertilizer in intensive soybean-maize tropical cropland in Mato Grosso, Brazil. **Scientific Reports** 8:13478 DOI: 10.1038/s41598-018-31175-1
22. U. Grewer, J. Nash<sup>^</sup>, N. Gurwick, L. Bockel, G.L. Galford, M. Richards, C. Costa Junior<sup>^</sup>, J. White, G. Pirolli, E. Wollenberg (2018). Analyzing the greenhouse gas impact of smallholder development actions across a global food security program. **Environmental Research Letters** DOI: 10.1088/1748-9326/aab0b0
21. A.B. Adams\*, J. Pontius, G.L. Galford, S.C. Merrill, D. Gudex-Cross\* (2018). Modeling carbon storage across a heterogeneous mixed temperate forest: the influence of forest type specificity on regional-scale carbon storage estimates. **Landscape Ecology** DOI: 10.1007/s10980-018-0625-0
20. G.L. Galford, M. Fernandez, J. Roman, I. Monasterolo, S. Ahamed\*, G. Fiske, P. González, L. Kaufman (2018). Cuban land use and conservation, from rainforests to coral reefs. **Bulletin of Marine Science** 94(2): DOI: 10.5343/bms.2017.1026.
19. L.J. Sonter<sup>^</sup>, D. Herrera<sup>^</sup>, D.J. Barrett, G.L. Galford, C.J. Moran, B.S. Soares-Filho (2017). Mining drives extensive deforestation in the Brazilian Amazon. **Nature Communications** 8:1013. DOI: 10.1038/s41467-017-00557-w
18. M. Jain\*, P. Mondal<sup>^</sup>, G.L. Galford, G Fiske, R.S. DeFries (2017). An Automated Approach to Map Winter Cropped Area of Smallholder Farms across Large Scales Using MODIS Imagery. **Remote Sensing** 9(6): 566.
17. G. Galford, J. Nash\*, A.K. Betts, S. Carlson\*, A. Hoogenboom\*, D. Markowitz, A. Nash, E. Palchak\*, S. Pears\*, K.L. Underwood\* (2016). Bridging the climate information gap: A framework for engaging knowledge brokers and decision makers in state climate assessments. **Climatic Change** 138(3-4), 383-395.
16. A. Zia, A. Bomblies, A.W. Schroth, C. Koliba, P.D.F. Isles, Y. Tsai<sup>^</sup>, I.N. Mohammed, G. Bucini<sup>^</sup>, P.J. Clemins, S. Turnbull, M. Rodgers, A. Hamed, B. Beckage, J. Winter, C. Adair, **G.L. Galford**, D. Rizzo, J. Van Houten (2016). Coupled impacts of climate and land use change across a river-lake continuum: insights from an integrated assessment model of Lake Champlain's Missisquoi Basin, 2000-2040. **Environmental Research Letters** 11(11).
15. K. Bryan\*, T.H. Ricketts, G. Galford, S. Polasky, J. O'Neil-Dunne (2016). Avoided flood damages on the Otter Creek, VT: Impacts of intact wetland complexes. **Ecological Economics** 130, 16-24.

14. S. Spera\*, G.L. Galford, M.T. Coe, M.N. Macedo, J.F. Mustard (2016). Land-use change affects water recycling in Brazil's Last Agricultural Frontier. **Global Change Biology** 22(10), 3405-3413.
13. P. Mondal^, M. Jain\*, M. Zukowski, G. Galford, R.S. DeFries (2016). Quantifying fluctuations in winter productive cropping area in the Central Indian Highlands. **Regional Environmental Change** 16(1), 69-82. DOI 10.1007/s10113-016-0946-y
12. G. Galford, B.S. Soares-Filho, N. Laporte, L. Sonter^ (2015). Will Passive Protection Save Congo Forests? **PLoS ONE** 10(6) DOI: 10.1371/journal.pone.0128473
11. E. Palchak\*, J. Nash\*, G. Galford (2015). The Vermont Climate Assessment: A Problem-Based Model to Bridge National Climate Research and Local Resilience. **Michigan Journal of Sustainability** (3) DOI 10.3998/mjs.12333712.0003.005.
10. P. Mondal^, M. Jain\*, R.S. DeFries, G. Galford, C. Small (2015). Sensitivity of crop cover to climate variability: Insights from two Indian agro-ecoregions. **Journal of Environmental Management** 148:21-30.
9. M.J. Lathuilliere\*, M.S. Johnson, G.L. Galford, E.G. Couto (2014). Environmental footprints show China and Europe's evolving resource appropriation for soybean production in Mato Grosso. **Environmental Research Letters** 9(7): 074001.
8. P. Mondal^, M. Jain\*, A.W. Robertson^, G.L. Galford, C. Small, R.S. DeFries (2014). Winter crop sensitivity to inter-annual climate variability in central India. **Climatic Change** 125(2).
7. G.L. Galford, B. Soares-Filho, C.E.P. Cerri (2013) Prospects for land-use sustainability on the agricultural frontier of the Brazilian Amazon. **Philosophical Transactions of the Royal Society B-Biological Sciences** 368 (1619)
6. M. Jain\*, P. Mondal, R.S. DeFries, C. Small, G.L. Galford (2013). Mapping cropping intensity of smallholder farms: A comparison of methods using multiple sensors. **Remote Sensing of Environment**, 134: 210-233.
5. M.N. Macedo\*, R.S. DeFries, D.C. Morton, C.M. Stickler\*, G.L. Galford, Y.E. Shimabukuro (2012). Decoupling deforestation and soy production in the southern Amazon during the late 2000s. **Proceedings of the National Academy of Sciences** 109(4):1341-1346.
4. G.L. Galford, J.M. Melillo, D.W. Kicklighter, J.F. Mustard, T.W. Cronin, C.E.P. Cerri, C.C. Cerri (2011). Carbon emissions and uptake from 105 years of land-cover and land-use change at the agricultural frontier of the Brazilian Amazon. **Ecological Applications** 21(3):750-763.
3. G.L. Galford, J.M. Melillo, D.W. Kicklighter, T.W. Cronin, C.E.P. Cerri, J.F. Mustard, C.C. Cerri (2010). Estimating greenhouse gas emissions from land-cover and land-use change: Future scenarios of deforestation and agricultural management. **Proceedings of the National Academy of Science** 107:19649-19654.
2. G.L. Galford, J.M. Melillo, J.F. Mustard, C.E.P. Cerri, C.C. Cerri (2010). The Amazon frontier of land-use change: croplands and consequences for greenhouse gas emissions. **Earth Interactions** 14:14.
1. G.L. Galford, J.F. Mustard, J. Melillo, A. Gendrin, C.C. Cerri, C.E.P. Cerri (2008). Wavelet analysis of MODIS time series to detect expansion and intensification of row-crop agriculture in Brazil. **Remote Sensing of Environment** 112: 576-587.

## **BOOK CHAPTERS**

- G. Galford, T.H. Ricketts (2016). Chapter 25: Ecosystems Services: Provisioning. In, Handbook of Ecosystems Services (Marion Potcham, Kerry Turner, Eds.). EarthScan: London, pp. 316-327.
- Neibur, C.S., R.E. Arvidson, E.A. Guinness, and G.L. Galford (2003). Lower Missouri River Flood Plain at Arrow Rock Before and After the Great Floods of 1993, in *At The Confluence: Rivers, Floods, and Water Quality in the St. Louis Region*, ed. R. E. Criss, D. A. Wilson, Missouri Botanical Gardens Press.

## **WHITE PAPERS**

- Galford, G.L. (2018). Deforestation and soybean in Brazil: Soybean supply chain. **Principles for Responsible Investment (PRI) and Ceres**, 12 p.
- Michelson, H., Galford, G.L. (2016). Agricultural production subsidies and child health: Evidence from Malawi. **Agriculture and Applied Economics Association**, Issue 236815, Boston, Massachusetts, 45 p.
- Nash J, Grewer U, Bockel L, Galford GL, Pirolli G, White J. 2016. Accelerating Agriculture Productivity Improvement in Bangladesh: Mitigation co-benefits of nutrient and water use efficiency. **CCAFS Info Note**. Copenhagen, Denmark: International Center for Tropical Agriculture (CIAT) and the Food and Agriculture Organization of the United Nations (FAO). Accessed online at <http://cgspace.cgiar.org/rest/bitstreams/85311/retrieve>
- Nash J, Grewer U, Bockel L, Galford GL, Pirolli G, White J. 2016. ACCESO in Honduras: Mitigation co-benefits of perennial crop expansion, soil management, and livestock improvements. **CCAFS Info Note**. Copenhagen, Denmark: International Center for Tropical Agriculture (CIAT) and the Food and Agriculture Organization of the United Nations (FAO), 11 pages. Accessed online at <https://cgspace.cgiar.org/rest/bitstreams/85616/retrieve>
- Grewer U, Bockel L, Nash J, Galford GL. 2016. Agricultural Development and Value Chain Enhancement Activity II (ADVANCE II) in Ghana: Climate change mitigation co-benefits from sustainable intensification of maize, soybean and rice. **CCAFS Info Note**. Copenhagen, Denmark: International Center for Tropical Agriculture (CIAT) and the Food and Agriculture Organization of the United Nations (FAO). Accessed online at <http://cgspace.cgiar.org/rest/bitstreams/85615/retrieve>
- Nash J, Grewer U, Bockel L, Galford GL, Pirolli G, White J. 2016. Better Life Alliance in Zambia: Climate change mitigation as a co-benefit of improved landscape, agroforestry, soil, and fertilizer management. **CCAFS Info Note**. Copenhagen, Denmark: International Center for Tropical Agriculture (CIAT) and the Food and Agriculture Organization of the United Nations (FAO). Accessed online at <http://cgspace.cgiar.org/rest/bitstreams/84795/retrieve>
- Nash J, Grewer U, Bockel L, Galford GL, Pirolli G, White J. 2016. Pastoralist Areas Resilience Improvement through Market Expansion (PRIME) in Ethiopia: Mitigation co-benefits of livestock productivity. **CCAFS Info Note**. Copenhagen, Denmark: International Center for Tropical Agriculture (CIAT) and the Food and Agriculture Organization of the United Nations (FAO). Accessed online at: <http://hdl.handle.net/10568/77619>
- Nash J, Grewer U, Bockel L, Galford GL, Pirolli G, White J. 2016. Peru Cacao Alliance: Carbon sequestration as a co-benefit of cacao expansion. **CCAFS Info Note**. Copenhagen, Denmark: International Center for Tropical Agriculture (CIAT) and the Food and Agriculture Organization of the United Nations (FAO). Accessed online at <http://hdl.handle.net/10568/77617>
- Nash J, Grewer U, Bockel L, Galford GL, Pirolli G, White J. 2016. Resilience and Economic Growth in Arid Lands – Accelerated Growth in Kenya: Mitigation co-benefits of herd size and feed quality management. **CCAFS Info Note**. Copenhagen, Denmark: International Center for Tropical Agriculture (CIAT) and the Food and Agriculture Organization of the United Nations (FAO). Accessed online at <http://hdl.handle.net/10568/77632>

- Grewer U, Nash J, Bockel L, Galford GL. 2016. Rwanda Dairy Competitiveness Program II: Efficiency gains of dairy production systems strongly decrease GHG emission intensity. **CCAFS Info Note**. Copenhagen, Denmark: International Center for Tropical Agriculture (CIAT) and the Food and Agriculture Organization of the United Nations (FAO). Accessed online at <http://hdl.handle.net/10568/77622>
- Grewer U, Nash J, Galford GL, Bockel L (2016). Chanje Lavi Planté in Haiti: Hillside soil conservation as a measure to increase yields and sequester carbon in Haiti. **CCAFS Info Note**. Copenhagen, Denmark: International Center for Tropical Agriculture (CIAT) and the Food and Agriculture Organization of the United Nations (FAO). Accessed online at <https://cgspace.cgiar.org/rest/bitstreams/84848/retrieve>
- Grewer U, Bockel L, Galford GL, Gurwick N, Nash J, Pirolli G, Wollenberg E. 2016. A methodology for greenhouse gas emission and carbon sequestration assessments in agriculture: Supplemental materials for info note series analysing low emissions agricultural practices in USAID development projects. **CCAFS Working Paper no. 187**. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS); International Center for Tropical Agriculture (CIAT); Food and Agriculture Organization of the United Nations (FAO).
- Nash J, Costa C, Galford GL, Gurwick N, Wollenberg E. 2015. Methods for Identifying Low Emissions Development Options in Agriculture. **CCAFS Working Paper no. 147**. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark.
- Galford GL, Hoogenboom A, Carlson S, Ford S, Nash J, Palchak E, Pears S, Underwood K, Baker DV (2014). Vermont Climate Assessment: Considering Vermont's Future in a Changing Climate. **Gund Institute for Ecological Economics**, 219 pp. Accessible online at [www.VTclimate.org](http://www.VTclimate.org).
- Nkonya E, Karsenty A, Msangi S, Souza Jr. C, Shah M, van Braun J, Galford GL, Park SJ. (2012). Rio+20: The state of the world's forests. **World Bank Report**.
- Farr, T. G., ed. (2003). Terrestrial Analogs to Mars, **Planetary Decadal Study Community White Paper**, Solar System Exploration Survey, 2003-2013.

## **RESEARCH GRANTS AND AWARDS**

### ***Currently Funded***

- PI K. Brauman, Co-I & Institutional PI G. Galford, "Workshops to connect ecosystem services model developers with earth observation producers," **NASA Earth Science Applications** NNH16ZDA001N-ECO4CAST, 02/21/2017-08/20/2018, Total Award Amount: \$10,000, 0.5 mo/year.
- PI W. Keeton et al., Co-I G. Galford. 9/2014-8/2019. "Managing the Matrix" **U.S. Department of Agriculture** McEntire-Stennis Program, 0.5 months/year.
- PI G. Galford, Sustainability research, **private donor**, 01/01/2018, Total Award Amount: \$15,000
- PIs H. Darby, G. Galford. Commercialization of milkweed. **Gund Catalyst Award**, 02/2018, Total Award Amount: \$44,000.

### ***Past Funded Projects***

- PI G. Galford, **private donor**, 01/01/2017, Total Award Amount: \$10,000
- PI Wollenberg, Co-I G. Galford. 01/01/15-06/30/2017. "Reducing and accounting for agriculture-driven greenhouse gas emissions in USAID's agriculture related work" **U.S. Agency for International Development**, \$1,624,178 (UVM direct funds \$752,991).

- PI G. Galford, Co-I H. Michelson, Environmental & socioeconomic outcomes of the new African Green Revolution, **NASA Land-Cover and Land-Use Change Program** (New Investigators), Total Award Amount: \$319,869. Total Award Period Covered: 01/1/13-12/31/17, Months Per Year Committed to the Project: 2 mo/yr
- PI E. Davidson et al., Co-I G. Galford. Disrupted Nitrogen Cycles in the Brazilian Amazon, **NSF Division of Environmental Biology (Ecosystems)**, Total Award Amount: \$889,083, Total Award Period Covered: 10/01/13-09/30/16, Months Per Year Committed to the Project: 2.0 mo/yr
- PI G. Galford, Co-I B Wemple. 9/2014-5/30/2016. Evaluating hydrological services in ecosystems. **Gund Collaborating Funds**, Total Award Amount: \$10,000
- PI G. Galford. 7/1/2014-06/30/2015. The sensitivity of agricultural output to climate variability across smallholder farms in South Asia. **Google Research**, Total Award Amount: \$67,690
- PI A. Zia et al., co-I G. Galford. Regional Adaptation to Climate Change. **Vermont EPSCOR program**. 7/1/2014- 6/30/2015. Months Per Year Committed to the Project: 1.0 mo/yr
- PI J. Pontius, Co-I G. Galford. 30 years of forest conversion in the northeast: Historical impacts and future projections. **Northeastern States Research Cooperative**.
- PIs T. Ricketts and G. Galford. April 1, 2014, "Ecosystems Services of Vermont's Conservation Lands" (Various small donors)
- PI G. Galford. 06/20/2012-7/20/2014. Intelligent Intensification of Agriculture. **Betsy & Jesse Fink Foundation**, \$15,000
- PI G. Galford. 9/25/2012-5/30/2013. Vermont Climate Assessment. **Gund Collaborating Funds**, Total Award Amount: \$10,000
- PI J. Mustard. 03/01/2010-02/28/2013. Rates and Drivers of Land Use Land Cover Change in the Agricultural Frontier of Mato Grosso, Brazil. **NASA LCLUC**, Total Award Amount: \$745,210, Months Per Year Committed to the Project: consultant
- PI: Ruth DeFries, Co-I G. Galford 05/01/2011-04/30/2014. Multi-sensor Fusion to Determine Climate Sensitivity of Agricultural Intensification in South Asia. **NASA LCLUC**, Total Award Amount: \$758,077, Months Per Year Committed to the Project: 5.25 mo/yr1, 3.0 mo/yr2
- PI: M. Coe. 01/01/11-12/31/13. Linking Historical and Future Land-Use Change to the Economic Drivers and Biophysical Limitations of Agricultural Expansion in the Brazilian Cerrado. **NASA LCLUC**, Total Award Amount: \$781,205, Months Per Year Committed to the Project: 3.0 mo/yr
- PI: G.L. Galford. 01/01/2010-12/31/2011. Earth Institute Post-doctoral Fellowship, **Columbia University**. \$100,000, effort: 12 mo/yr
- PI: G.L. Galford. 09/01/06-05/31/09. Biogeochemical Consequences of Land Use Transitions Along Brazil's Agricultural Frontier. **NASA Earth System Science Fellowship Program**, budget: \$144,000, effort: 12 mo/yr

## **INVITED TALKS**

### **2018**

Natural Catastrophes: Understanding local changes, Vermont Captive Insurance Association Annual meeting, Burlington, VT

Mining drives extensive deforestation in the Brazilian Amazon, Imaflora, Piracicaba, Brazil.  
Vermont Climate Assessment. Lamoille Valley Osher Program for Lifelong Learning, Stowe, VT.

## **2017**

State climate assessments: Building saliency, relevancy and credibility on a budget. U. Connecticut.  
The power of personal relationships—Using Bridge as a platform for cross-sectoral action. The Bridge Collaborative London, UK.  
Greenhouse gas emissions from land use change. Intensification of the world's largest agriculture frontier: reconciling agricultural production and environmental integrity in a changing climate. Brasilia, Brazil.  
Cuba: Rainforests to Reefs. Gund Research Slam.  
Deforestation in the 21<sup>st</sup> Century. Engage the Chain, Ceres webinar.

## **2016**

Vermont Climate Assessment. Lyndon State College Environmental Science Seminar.  
Vermont Climate Assessment. Sterling College, VT.  
Environmental and socioeconomic outcomes of the new African Green Revolution. NASA Land Cover and Land Use Change Webinar.  
Multiscalar fusion and the case of homogeneous heterogeneity. NASA Land Cover and Land Use Change Science Team Meeting, North Bethesda, MD.

## **2015**

Climate Training: Understanding global and local climate changes. Vermont Land Trust, Shelburne, VT.  
Vermont's changing climate. Vermont Senators' Climate Caucus, Burlington, VT.  
From plot to pixel: Tropical ecosystems in a fast-changing world. The Ecosystems Center, MBL, Woods Hole, MA.  
Environmental and socioeconomic outcomes of the new African Green Revolution. NASA Land-cover and land-use change Science Team Meeting. College Park, MD.  
Climate change challenges for Vermont. Expert testimony for VT Senate Committee on Natural Resources and Energy, Montpelier, VT.  
How will regional and global climate change affect Vermont's future? Panel discussion at Vermont Council on Rural Development Climate Economy Summit.

## **2014**

Vermont Climate Assessment. Vermont Youth Summit, Burlington, VT.  
Vermont Climate Assessment (Multiple talks). Vermont Legislative Summit on Climate Change, Burlington, VT.  
Modeling Greenhouse Gas Emissions from 100 Years of Land-Cover and Land-Use Change on the Amazon Agricultural Frontier. Laboratório de Processamento de Imagens e Geoprocessamento, Goiânia, Brazil.  
Vermont Climate Assessment. Rutland Regional Planning Commission, Rutland, VT.  
Vermont Climate Assessment: A regional look at climate change trends. Climate Science Center, U. Massachusetts, Amherst.



## **2013**

Environmental and Socioeconomic Outcomes of the New African Green Revolution. IFPRI. Washington, DC.

Environmental and Socioeconomic Outcomes of the New African Green Revolution. NASA Science Team Meeting, LCLUC Program. Rockland, MD.

Tropical Agriculture—food security, poverty and environmental sustainability. U. of Vermont, Plant and Soil Sciences.

## **MENTORSHIP**

### ***Postdoctoral fellows (5)***

Laura Edling, proposed 2019; Carlos Ramirez-Reyes, 2017-2018; Laura Sonter, 2016-2017; Julie Nash, 2015-2017; Ciniro Costa, Jr, 2014-2015

### ***Graduate advisor (5)***

Eva Kinnebrew, Ph.D. student, expected 2022

Sonya Ahamed, Ph.D. student, expected 2019

Benjamin Kaufman, M.S. Natural Resources, 2017

Keri Bryan Watson, Ph.D. Natural Resources, 2017 (co-advised)

Anna Cimini, Master of Liberal Arts Extension Studies, 2016 (Harvard Extension)

### ***Research assistant supervisor (4)***

2017 Alexandra Huddell, current PhD student, Columbia University

Gillian Pirolli, independent consultant for G.I.S.

2016 Samuel Grubinger, B.S. ENSC 2016, current M.S. student, University of British Columbia

2013 Bryne Hadnott, current PhD student, Cornell

### ***Graduate committee member (4)***

Lauren Bomeisl, Ph.D., Natural Resources, expected 2022

Luis Rodriguez-Cruz, Ph.D., Food Systems, expected 2022

Kirsten Tyler, Ph.D., Natural Resources, expected 2021

Lindsey Barbieri, Ph.D., Natural Resources, expected 2020

Eduardo Rodriguez, Ph.D., Natural Resources, expected 2019

Mae Kate Campbell, M.S. Geology, expected 2019

Lucia Orantes, Ph.D., Natural Resources, 2017

Alison Adams, M.S. Natural Resources, 2016

Sarah Ford, M.S. Natural Resources, 2016

Matt Burke, M.P.A. Community Development and Applied Economics, 2014

### ***Graduate research supervisor (4)***

Cynthia Crowley, M.S. Mathematics and Statistics, in progress; Kay Hopper, Ph.D., in progress

(CEMS); Olivia Peña, M.A. Food Systems, 2018; Lucia Orantes, Ph.D. Natural Resources, 2017; Ann

Hoogenboom, M.P.A. Community Development and Applied Economics, 2014

### ***Graduate teaching assistant supervisor (6)***

2018 Stephanie Drago, Alexandra Neidermeier; 2017: Laura Edling; 2016 Peter Clark; 2015 Sam Talbot; 2014 Clare Crosby

### ***Undergraduate research assistant and intern supervisor (11)***

Hannah Turner, B.S. ENSC, expected 2020; Carolyn Bittner, B.S. ENSC, in progress; Carly Kreiger, B.S. ENSC, expected 2019; Catherine Salarano, B.S. ENSC expected 2019; Kunal Palawat, B.S. ENSC, 2018; Jesse Gordon, B.S. ENSC, 2017; Samuel Grubinger, B.S. ENSC 2016; Hannah Boudreau, B.S. ENSC 2015; Taylor Smith, B.S. ENSC 2015; Alayna Thompson, B.S. ENVS 2015 (honors thesis); Joshua Petter, B.S. ENSC 2013

### ***Undergraduate teaching assistants (6)***

2018 Amanda Cole, Haley Gula, Nisha Nadkarni, Hannah Turner; 2017 Kendra Hodges, Sabrina Kyburg, Kunal Palawat, Morgan Schwartz; 2013 Daniel Baker

## **SERVICE**

***Media interviews*** | Associated Press, Reuters, Fast Company, Grist, Vermont Public Radio, Green Energy Times, Climate Central, New Calcedonia Record

***Journal reviewer*** | Climate, Climatic Change, Conservation Letters, Ecosystems, Environmental Entomology, Environmental Research Letters, Forest Ecology, Frontiers, Gaia, Global Environmental Change, Geophysical Research Letters, International Journal of Remote Sensing, Land Use Policy, Land Use Science, Nature Climate Change, Nature Sustainability, PeerJ, Proceedings of the National Academy of Sciences, Philosophical Transactions of the Royal Society, Remote Sensing of Environment, Science of the Total Environment, Scientific Reports

***Publication reviewer*** | State of Connecticut Physical Climate Change Assessment; CCAFS Working Papers; Pearson Publishing; Lake Champaign Basin Program

***Panel reviewer*** | EPA STAR, NSF, NASA LCLUC, NASA Carbon Cycle, Netherlands Organisation for Scientific Research (NWO)

***Community Advisor & Volunteer*** | Champlain Valley Union High School Sustainability Hub 2014-pres.

***Committee Member*** | UVM Food Systems Steering Committee 2013-pres.

***Committee Member*** | RSENR Community Sustainability Committee 2013-2016

***Committee Member*** | Gund Fellows Selection Committee 2013-2017

***Session chair*** | Ecological Society of America "Disrupted Nitrogen Cycling in the Tropics: Tracking the Effects of Global Change Impacts on N Biogeochemistry from Soil to Stream" 11 Aug 2015

***Trainer (invited)*** | Vermont Land Trust 05 Nov 2015

***Expert Witness*** | VT Senate Committee on Natural Resources & Energy 25 March 2015

## **TEACHING EXPERIENCE**

***Research Professor*** | Gund Institute for Ecological Economics & Rubenstein School of Environment & Natural Resources: Spatial Modeling for Ecological Economics\*, The Vermont Climate Assessment\*, Cuba: Ridges to Reefs\*, Ecological Economics Methods, Ecosystems Ecology, Global Environmental Assessment (\*graduate only) 2012-pres.

***Sustainability Facility Fellow*** | University of Vermont 2012-2013

***Teaching Staff*** | The Woods Hole Research Center, Pantropical Scholars Program 2011

***Intern Mentor*** | The Earth Institute at Columbia University, Sustainability & Development 2011

## **MEDIA COVERAGE**

### **2018**

Captive International  
Civil Eats

Captives must be wary of inconsistent Natural Catastrophe Models  
What does climate change mean for Vermont's Maple Sugarers?

### **2017**

ABC News (Australia) Amazon rainforest deforestation: 'Almost 10 per cent' due to development around mines

Brazzil Mining is responsible for 10 percent of deforestation in the Amazon

Climate News Network Brazilian Amazon lost 660,000 hectares of forest in last year

Cosmos Mining takes toll on Amazon

Earth Increased mining causing deforestation in the Amazon rainforest

Earther (Gizmodo) Amazon Mining Devastation Spreads far Beyond Leased Areas

El Mundo (Spain) La minería destruye un 10% más de selva amazónica de lo que se pensaba

Estado (Brazil) Mineração foi responsável por 9% do desmatamento da Amazônia entre 2005 e 2015

Global Land Program Mining drives extensive deforestation in Brazilian Amazon

Globo (Brazil): Mineração respondeu por 9% do desmatamento na Amazônia brasileira entre 2005 e 2015

Itatiaia (Brazil): Mineração foi responsável por 9% do desmatamento da Amazônia entre 2005 e 2015

La Prensa (Peru) Brasil: ¿La minería destruye más selva amazónica de lo que se pensaba?

Maringa: O Diario do Mineração foi responsável por 9 do desmatamento da amazonia entre-2005 e 2015

Norte Parana (Brazil):

Mining Technology Mining's big environmental footprint in the Amazon

Mongabay Mining activity causing nearly 10 percent of Amazon deforestation

Last frontiers of wilderness': Intact forest plummets globally

Successful forest protection in DRC hinges on community participation

New Scientist Robotic underwater miners can go where humans can't

Pacific Standard The last frontiers of wilderness: Intact forest plummets around the world

Publico (Portugal) Minas são responsáveis por 10% da desflorestação da Amazônia

Quo (Spain) LA NUEVA AMENAZA PARA EL AMAZONAS: LA MINERÍA

Scienze (Italy): Le attività minerarie distruggono l'Amazzonia

US News & World Report Mining is shrinking the Brazilian Amazon more than previously thought

Vermont Public Radio Draft report sheds light on impact of climate change on northeast

### **2016**

Ames Tribune Deforestation in Brazil's Cerrado rivals Amazon but gets less attention

Brietbart Massive deforestation discovered in Brazil's Cerrado region

Barre Montpelier Times Argus Conservation	Killington gambles to bring world class skiing East  THE INVISIBLE LOSS OF WATER OVER BRAZIL’S ADVANCING AGRICULTURAL FRONTIER
Grist Inside Climate News	A state-by-state guide to climate on the ballot Five years after Hurricane Irene, Vermont still striving for resilience
John Hopkins News Letter La Repubblica (Italy) Mongabay	Agricultural expansion depletes natural areas La deforestazione per l’agricoltura distruggerà gli agricoltori Global brands' beef is putting South America's tropical forests at risk Brazil’s Cerrado region: A new tropical deforestation hotspot New bird in Cerrado
Mother Jones New York Times	Here are the races to watch if you care about global warming The: In Vermont’s bid to lure pro skiers, a warm welcome is unwanted
ScienceDaily	Massive deforestation found in Brazil's Cerrado Snowmobiling could be hard hit by climate change, new study says
UPI VermontBiz Vermont Public Radio Washington Post	Massive deforestation discovered in Brazil's Cerrado region Study: Floodplains saved Middlebury \$1.8 million in damage Vermont's climate future This huge region of Brazil is even more deforested — and less protected — than the Amazon

## **2015**

Burlington Free Press The Conversation Journalist Resource	VT lawmakers consider climate change resolution Africa’s forest may be our last chance to slow climate change Trends in the frequency and intensity of floods across the central U.S
National Geographic Phys.org Valley News	It's not just coal and oil: Forests are key to climate Lax rules put Congo's forests, key carbon reserve, at risk VTC Hosts Climate Talk In Randolph

## **2014**

Associated Press (many placements, including this one in the Boston Globe)	Study shows ski areas could see more snow before dearth
Burlington Free Press Caledonian Record	Study details climate predictions for Vermont Vermont Climate Assessment: NEK climate changing, researcher says

CleanTechnica	Hawaii, Rhode Island, Vermont take serious climate adaptation action
Climate Central	Climate impact on Vermont may have benefits
Fast Company	Vermont is the first state to publish a 100-year climate assessment
Fox44 & ABC22	Ski industry threatened by long-term climate change, Vt. report warns
Huffington Post	Vermont climate change report warns of catastrophic flood risk
Grist	After Irene, Vermont shows us what climate resilience looks like
Inhabit	Highly toxic residue from winter road salt is killing aquatic life
Nation Swell	Vermont farmers and citizens provide climate change research
New Scientist	Vermont is first US state to create long term climate plan
North Country Public Radio	Report looks at effects of a warming Vermont
Orleans County Record	Study: Ski areas could see more snow before dearth
Phys.org	Projections for climate change in Vermont Researcher calls report on economic impacts of US climate change 'like a flashlight at night'
Rutland Herald/Vermont Press Bureau	New report on impacts of climate change in VT
Scientific American	Vermont climate change report warns of catastrophic flood risk
WAMC	Vermont Climate Assessment report released
WNYT-TV	Vermont Climate Assessment report released
WCAX-TV	New report on impacts of climate change in VT
Vermont Biz	Climate assessment: Vermont to get warmer, wetter
Vermont Public Radio	Donka At Odds With Welch, Climate Science Study: Climate change isn't all bad for Vermont Climate change and activism
VTDigger	UVM climate change study projects snow, followed by rain

## **2013**

ScienceDaily	Deep, permeable soils buffer impacts of crop fertilizer on Amazon streams
--------------	---

## **PROFESSIONAL ORGANIZATIONS**

US-International Association of Landscape Ecologists	<i>2015-pres.</i>
Ecological Society of America	<i>2004-pres.</i>
American Geophysical Union	<i>2002-pres.</i>
Soil Science Society of America	<i>2010-2013</i>
American Association of Geographers	<i>2007-2010</i>