

Matthew A. Vadeboncoeur

Research Scientist

Earth Systems Research Center
University of New Hampshire
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EDUCATION

- 2013 **University of New Hampshire**, Durham, NH
Ph.D. in Earth and Environmental Sciences
Dissertation: [Mechanisms of nutrient limitation and nutrient acquisition in temperate forest ecosystems](#)
Major Advisor: [Erik A. Hobbie](#)
- 2003 **Brown University**, Providence, RI
Sc.B. with honors in Environmental Science
Thesis: [Using GIS to prioritize land for management in the conservation of a rare species](#)
Advisors: [Johanna Schmitt](#), [Steven P. Hamburg](#)

PEER-REVIEWED PUBLICATIONS (REPRINTS AVAILABLE UPON REQUEST)

36. Coble AP, Vadeboncoeur MA, Berry ZC, Jennings KA, McIntire CD, Campbell JL, Rustad LE, Templer PH, Asbjornsen H. [Are northeastern U.S. forests vulnerable to extreme drought?](#) *Ecological Processes*, accepted.
35. Liu X, Lin TC, Yang Z, Vadeboncoeur MA, Lin C, Xiong D, Lin W, Chen GS, Xie J, Li Y, Yang Y. 2017. [Increased litter in subtropical forests boosts soil respiration in natural forests but not plantations of *Castanopsis carlesii*](#). *Plant and Soil*, in press. doi:[10.1007/s11104-017-3281-2](#)
34. Remiszewski KA, Bryce JG, Fahnestock MF, Pettitt EA, Blichert-Toft J, Vadeboncoeur MA, Bailey SW. 2016. [Elemental and isotopic perspectives on the impact of arbuscular mycorrhizal and ectomycorrhizal fungi on mineral weathering across imposed geologic gradients](#). *Chemical Geology*, 445:164-171. doi:[10.1016/j.chemgeo.2016.05.005](#)
33. Jennings K, Guerrieri R, Vadeboncoeur MA, Asbjornsen H. 2016. [Response of *Quercus velutina* growth and water use efficiency to climate variability and nitrogen fertilization in a temperate deciduous forest in the northeastern U.S.](#) *Tree Physiology*, 36: 428-443. doi:[10.1093/treephys/tpw003](#)
32. Durán J, Morse JL, Groffman PM, Campbell JL, Christenson LM, Driscoll CT, Fahey TJ, Fisk MC, Likens GE, Melillo JM, Mitchell MJ, Templer PH, Vadeboncoeur MA. 2016. [Climate change decreases nitrogen supply in northern hardwood forests](#). *Ecosphere*, 7: e01251. doi:[10.1002/ecs2.1251](#)
31. Vadeboncoeur MA, Ouimette AP, Hobbie EA. [Mycorrhizal roots in a temperate forest take up organic nitrogen from ¹³C- and ¹⁵N-labeled organic matter](#). 2015. *Plant and Soil*, 397: 303-315. doi:[10.1007/s11104-015-2623-1](#)
30. Hernández-Santana V, Hernández-Hernández A, Vadeboncoeur MA, Asbjornsen H. 2015. [Scaling from single-point sap velocity measurements to stand transpiration in a multi-species deciduous forest: uncertainty sources, stand structure effect, and future scenarios impacts](#). *Canadian Journal of Forest Research*, 45: 1489-1497. doi:[10.1139/cjfr-2015-0009](#)
29. Liu TY, Lin KC, Vadeboncoeur MA, Chen MZ, Huang MY, Lin TC. 2015. [Understory plant community and light availability in adjacent abandoned conifer plantations and adjacent natural hardwood forests in northern Taiwan](#). *Applied Vegetation Science*, 18: 591-602. doi:[10.1111/avsc.12178](#)
28. See CR, Yanai RD, Fisk MC, Vadeboncoeur MA, Fahey TJ, Quintero B. 2015. [Soil nitrogen affects phosphorus recycling: foliar resorption and plant-soil feedbacks in a northern hardwood forest](#). *Ecology*, 96: 2488-2498. doi:[10.1890/15-0188.1](#)
27. Falster DS, et al. (with 85 co-authors). 2015. [BAAD: a biomass and allometry database for woody plants](#): *Ecological Archives E096-128*. *Ecology*, 96: 1445. doi:[10.1890/14-1889.1](#)

26. Fahey TJ, Templer PH, Anderson BT, Battles JJ, Campbell JL, Driscoll CT, Fusco AR, Green MB, Kassam KS, Rodenhouse NL, Rustad L, Schaberg PG, Vadeboncoeur MA. 2015. The promise and peril of intensive-site-based ecological research: Insights from the Hubbard Brook Ecosystem Study. *Ecology*, 96: 885-901. doi:[10.1890/14-1043.1](https://doi.org/10.1890/14-1043.1)
25. Vadeboncoeur, MA, Hamburg SP, Yanai RD, Blum JD. 2014. Rates of sustainable forest harvest depend on rotation length and weathering of soil minerals. *Forest Ecology and Management*, 318: 194-205. doi:[10.1016/j.foreco.2014.01.012](https://doi.org/10.1016/j.foreco.2014.01.012)
24. Chang CT, Wang SF, Vadeboncoeur MA, Lin TC. 2014. Relating vegetation dynamics to temperature and precipitation at monthly and annual time scales in Taiwan using MODIS vegetation indices. *International Journal of Remote Sensing*, 35: 598-620. doi:[10.1080/01431161.2013.871593](https://doi.org/10.1080/01431161.2013.871593)
23. Yanai RD, Vadeboncoeur MA, Hamburg SP, Arthur MA, Fuss CB, Groffman PM, Siccama TG, Driscoll CT. 2013. From missing source to missing sink: Long-term changes in the nitrogen budget of a northern hardwood forest. *Environmental Science & Technology*, 47: 11440-11448. doi:[10.1021/es4025723](https://doi.org/10.1021/es4025723)
22. Rastetter EB, Yanai RD, Thomas RQ, Vadeboncoeur MA, Fahey TJ, Fisk MC, Kwiatkowski BL, Hamburg SP. 2013. Recovery from disturbance requires resynchronization of ecosystem nutrient cycles. *Ecological Applications*, 23:621-642. doi:[10.1890/12-0751.1](https://doi.org/10.1890/12-0751.1)
21. Robinson TMP, La Pierre KJ, Vadeboncoeur MA, Byrne KM, Colby SE, Thomey ML. 2013. Seasonal, not annual precipitation drives community productivity across ecosystems. *Oikos*, 122:727-738. doi:[10.1111/j.1600-0706.2012.20655.x](https://doi.org/10.1111/j.1600-0706.2012.20655.x)
20. Hamburg SP, Vadeboncoeur MA, Richardson AD, Bailey AS. 2013. Climate change at the ecosystem scale: A 50-year record in New Hampshire. *Climatic Change*, 116:457-477. doi:[10.1007/s10584-012-0517-2](https://doi.org/10.1007/s10584-012-0517-2)
19. Vadeboncoeur MA, Hamburg SP, Blum JD, Pennino MJ, Yanai RD, Johnson CE. 2012. The quantitative soil pit method for measuring belowground carbon and nitrogen stocks. *Soil Science Society of America Journal* 76: 2241-2255. doi:[10.2136/sssaj2012.0111](https://doi.org/10.2136/sssaj2012.0111)
18. Groffman, PM, Rustad LE, Templer PH, Campbell JL, Christenson LM, Lany NK, Soggi AM, Vadeboncoeur MA, Schaberg PG, Wilson GW. 2012. Long-term integrated studies show complex and surprising effects of climate change in the northern hardwood forest. *Bioscience*, 62:1056-1066. doi:[10.1525/bio.2012.62.12.7](https://doi.org/10.1525/bio.2012.62.12.7)
17. Levine CR, Yanai RD, Vadeboncoeur MA, Hamburg SP, Melvin A, Goodale CL, Rau BM, Johnson DW. 2012. Assessing the suitability of using rotary coring for sampling in rocky soils. *Soil Science Society of America Journal*, 76:1707-1718. doi:[10.2136/sssaj2011.0425](https://doi.org/10.2136/sssaj2011.0425)
16. Vadeboncoeur MA, Hamburg SP, Cogbill CV, Sugimura WY. 2012. A comparison of presettlement and modern forest composition along an elevation gradient in central New Hampshire. *Canadian Journal of Forest Research* 42:190-202. doi: [10.1139/x11-169](https://doi.org/10.1139/x11-169)
15. Raciti S, Fahey TJ, Hall B, Driscoll CT, Carranti FJ, Foster DR, Gwyther PS, Jenkins JC, Jenkins JP, Hamburg SP, Neill C, Ollinger SV, Peery BW, Quigley EE, Sherman R, Thomas RQ, Vadeboncoeur MA, Weinstein D, Wilson G, Woodbury P, Yandik W. 2012. Local-scale carbon budgets and mitigation opportunities for the northeastern United States. *Bioscience* 62:23-38. doi:[10.1525/bio.2012.62.1.7](https://doi.org/10.1525/bio.2012.62.1.7)
14. Fatemi FR, Yanai RD, Hamburg SP, Vadeboncoeur MA, Arthur MA, Briggs RD, Levine CR. 2011. Allometric equations for young northern hardwoods: the importance of age-specific equations for estimating aboveground biomass. *Canadian Journal of Forest Research* 41:881-891. doi:[10.1139/x10-248](https://doi.org/10.1139/x10-248)
13. Lin TC, Hamburg SP, Lin KC, Wang LJ, Chang CT, Hsia YJ, Vadeboncoeur MA. 2011. Typhoon disturbance and forest dynamics: Lessons from a northwest Pacific subtropical forest. *Ecosystems* 14:127-143. doi:[10.1007/s10021-010-9399-1](https://doi.org/10.1007/s10021-010-9399-1)
12. Chang CT, Lin TC, Wang SF, Vadeboncoeur MA. 2011. Assessing growing season beginning and end dates and their relation to climate in Taiwan using satellite data. *International Journal of Remote Sensing* 32:5035-5058. doi:[10.1080/01431161.2010.494635](https://doi.org/10.1080/01431161.2010.494635)
11. Vadeboncoeur MA. 2010. Meta-analysis of fertilization experiments indicates multiple limiting nutrients in northeastern deciduous forests. *Canadian Journal of Forest Research* 40:1766-1780. doi:[10.1139/X10-127](https://doi.org/10.1139/X10-127)

10. Wielopolski L, Yanai RD, Levine CR, Mitra S, Vadeboncoeur MA. 2010. Rapid, non-destructive carbon analysis of forest soils using neutron-induced gamma-ray spectroscopy. *Forest Ecology and Management* 260:1132-1137. doi:[10.1016/j.foreco.2010.06.039](https://doi.org/10.1016/j.foreco.2010.06.039)
9. Vadeboncoeur MA, Hamburg SP, Pryor D. 2010. Modeled nitrogen loading to Narragansett Bay: 1850 to 2015. *Estuaries and Coasts* 33:1113-1127. doi:[10.1007/s12237-010-9320-3](https://doi.org/10.1007/s12237-010-9320-3)
8. Schaller M, Blum JD, Hamburg SP, Vadeboncoeur MA. 2010. Spatial variability of long-term chemical weathering rates in the White Mountains, New Hampshire, USA. *Geoderma* 154:294-301. doi:[10.1016/j.geoderma.2009.10.017](https://doi.org/10.1016/j.geoderma.2009.10.017)
7. Weeks BC, Hamburg SP, Vadeboncoeur MA. 2009. Ice storm effects on the canopy structure of a northern hardwood forest after eight years. *Canadian Journal of Forest Research* 39:1475-1483. doi:[10.1139/X09-076](https://doi.org/10.1139/X09-076)
6. Lee MF, Lin TC, Vadeboncoeur MA, Hwang JL. 2008. Remote sensing assessment of forest damage in relation to the 1996 strong typhoon Herb at Lienhuachi Experimental Forest, Taiwan. *Forest Ecology and Management* 255:3297-3306. doi:[10.1016/j.foreco.2008.02.010](https://doi.org/10.1016/j.foreco.2008.02.010)
5. Hamburg SP, Pryor D, Vadeboncoeur MA. 2008. Nitrogen inputs to Narragansett Bay: an historical perspective. Chapter in Desbonnet A. and Costa-Pierce B. (eds.) *Ecosystem-based Management of a Southern New England Estuary: A Case Study of Narragansett Bay*. New York: Springer. doi:[10.1007/978-0-387-35299-2_6](https://doi.org/10.1007/978-0-387-35299-2_6)
4. Vadeboncoeur MA, Hamburg SP, Yanai RD. 2007. Validation and refinement of allometric equations for roots of northern hardwoods. *Canadian Journal of Forest Research* 37:1777-1783. doi:[10.1139/X07-032](https://doi.org/10.1139/X07-032)
3. Skeldon MA, Vadeboncoeur MA, Hamburg SP, Blum JD. 2007. Terrestrial gastropod responses to an ecosystem-level calcium manipulation in a northern hardwood forest. *Canadian Journal of Zoology* 85:994-1007. doi:[10.1139/Z07-084](https://doi.org/10.1139/Z07-084)
2. Park BB, Yanai RD, Vadeboncoeur MA, Hamburg SP. 2007. Estimating root biomass in rocky soils using pits, cores, and allometric equations. *Soil Science Society of America Journal* 71:206-213. doi:[10.2136/sssaj2005.0329](https://doi.org/10.2136/sssaj2005.0329)
1. Fisher JL, Mustard JF, Vadeboncoeur MA. 2006. Green leaf phenology at Landsat resolution: scaling from the field to the satellite. *Remote Sensing of Environment* 100:265-279. doi:[10.1016/j.rse.2005.10.022](https://doi.org/10.1016/j.rse.2005.10.022)

OTHER PUBLICATIONS

- Campbell, J.L., Vadeboncoeur, M.A., Asbjornsen, H., Green, M.B., Adams, M.B. Boyer, E.W. 2016. Evaluating biological and physical drivers of evapotranspiration trends at northeastern U.S. watersheds. pp. 229-231 in Stringer, C.E.; Krauss, K.W.; Latimer, J.S., eds. *Headwaters to estuaries: advances in watershed science and management—Proceedings of the Fifth Interagency Conference on Research in the Watersheds*. March 2-5, 2015, North Charleston, South Carolina. e-Gen. Tech. Rep. SRS-211. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. <http://www.srs.fs.usda.gov/pubs/50141>
- Fahey TJ, Carranti FJ, Driscoll CT, Foster DR, Gwyther PS, Hall B, Hamburg SP, Jenkins JC, Jenkins JP, Neill C, Ollinger SV, Peery BW, Quigley EE, Raciti S, Sherman R, Thomas RQ, Vadeboncoeur MA, Weinstein D, Wilson G, Woodbury P, Yandik W. 2011. Carbon and communities: Linking carbon science with public policy and resource management in the northeastern United States. Hanover, NH: Hubbard Brook Research Foundation. *Science Links* 1(4). <http://hubbardbrookfoundation.org/carbon/>
- Vadeboncoeur MA. 2012. Assessing Total Belowground Carbon and Nitrogen Stocks with Quantitative Pits. *CSA News* 57(11):13-15.

PRESENTATIONS

- Vadeboncoeur MA, Hamburg SP, Johnson CE, Koppers MM. A 36-year record of changing soil carbon at Bald Mountain. Talk at the 2017 Hubbard Brook Cooperators' Meeting.
- Asbjornsen H, Vadeboncoeur MA. Responses of Northern Forest Tree Species to Climate Change and Drought. Webinar hosted by Northeastern States Research Cooperative, February 2017.
- Vadeboncoeur MA, Asbjornsen H. Responses of sugar maple growth and physiology to global change drivers across the northeast. Talk at 2017 NH Maple Producers Association annual meeting, Plymouth, NH.

- Vadeboncoeur MA, Brum M Oliveira RS, Moutinho VHP, Flores CF, Llerena CA, Palace MW, Asbjornsen H. Effects of natural and experimental drought on growth in Amazon trees. Poster at 2016 AGU Fall Meeting, San Francisco, CA.
- Vadeboncoeur MA, Green MB, Campbell JL, Asbjornsen H, Adams MB, Boyer EW, Burns DA, Fernandez JJ, Mitchell MJ, Shanley JB. Evapotranspiration trends at Hubbard Brook: Climatic drivers and regional context. Talk at the 2016 Hubbard Brook Cooperators' Meeting.
- Vadeboncoeur MA, Asbjornsen H, Campbell JL, Green MB. Strength of climatic signals in growth and water use efficiency varies across a temperate climate gradient. Poster at Ameridendro 2016, Mendoza, Argentina.
- Vadeboncoeur MA, Asbjornsen H, Green MB, Campbell JL. Drivers of trends and variation in tree-ring C and O isotopes at Watershed 3. Talk at 2015 Hubbard Brook Cooperators' Meeting.
- Vadeboncoeur MA, Asbjornsen H, Green MB, Campbell JL. Examining long-term trends in evapotranspiration and water use efficiency in northeastern forested catchments. Talk at 2015 NERC Conference, Saratoga Springs, NY.
- Vadeboncoeur MA, Yanai RD, Hamburg SP, Blum JD. Sustainable forest harvest requires nutrient supply from soil pools: Ecosystem budgets for second-growth northern hardwoods in New Hampshire, USA. Poster at IUFRO 2014, Salt Lake City, UT and talk at Spring 2015 Hubbard Brook Committee of Scientists Meeting.
- Vadeboncoeur MA, Buzinski L, Asbjornsen H, Green MB. Dendrochronological insights into growth and ecophysiology effects of the Watershed I calcium fertilization. Talk at the 2014 Hubbard Brook Cooperators' Meeting.
- Vadeboncoeur MA, Asbjornsen H, Green MB, Campbell JL. Examining drivers of long-term trends in evapotranspiration in forested small catchments in the northeastern USA. Talk at the 2014 ASABE International Symposium on Evapotranspiration, Raleigh, NC. Poster at IUFRO 2014, Salt Lake City, UT.
- Vadeboncoeur MA, Bryce JG, Hobbie EA, Meana-Prado MF, Blichert-Toft J. Developing biogeochemical tracers of apatite weathering by ectomycorrhizal fungi. Talk at the 2012 American Geophysical Union Fall Meeting, San Francisco, CA, and at the 2013 Geological Society of America Northeastern Section Meeting, Bretton Woods, NH.
- Vadeboncoeur MA, Ouimette AP, Hobbie EA. A robust method confirming organic nitrogen uptake by mycorrhizal roots in a temperate forest. Talk at the 2012 Ecological Society of America Meeting, Portland, OR.
- Vadeboncoeur MA. Mining the soil for bioenergy? Biogeochemical constraints on the long-term sustainability of forest biomass harvesting. Invited talk at Harvard Forest, Petersham, MA, 2011, and at Fujian Normal University, Fuzhou, China, 2011.
- Vadeboncoeur MA, Hamburg SP, Cogbill CV, Sugimura WY. A comparison of presettlement and modern forest composition in central New Hampshire. Poster at 2011 Ecological Society of America Meeting, Austin, TX, and at 2012 UNH Graduate Research Conference.
- Vadeboncoeur MA, Hamburg SP, Johnson CE, Siccama TG. Changes in Soil Carbon and Nitrogen in Watershed 5 from 1983 to 1998. Talk at the 2011 Hubbard Brook Cooperators' Meeting.
- Vadeboncoeur MA. Mechanisms of nutrient limitation and nutrient acquisition in managed and unmanaged forest ecosystems. Ph.D. proposal talk, University of New Hampshire, 2011.
- Vadeboncoeur MA, Yanai RD, Hamburg SP, Blum JD. Large variation in stand-scale sustainability of forest biomass harvesting in central New Hampshire. Talk at the 2010 Ecological Society of America Meeting, Pittsburgh, PA; the 2010 Hubbard Brook Cooperators' Meeting; the 2010 NERC Conference, Saratoga Springs, NY, the 2011 UNH Graduate Research Conference; the 2011 Woody Biomass Energy Research Symposium, Burlington, VT; poster at 2011 European Science Foundation High-Level Research Conference on The Future Role of Bio-energy from Tree Biomass in Europe, Vienna, Austria.
- Vadeboncoeur MA, Yanai RD, Hamburg SP, Arthur MA, Fuss CB, Siccama TG, Goodale CL, Groffman PM. Long-term forest floor data and the changing N budget at Hubbard Brooks Watershed 6. Poster at 2009 LTER All Scientists Meeting, Estes Park, CO.
- Vadeboncoeur MA. Nutrient limitation in northern hardwood forests: A meta-analysis. Poster presented at the 2009 Ecological Society of America Meeting, Albuquerque, NM.
- Vadeboncoeur MA, Yanai RD, Arthur MA, Siccama TG, Fahey TJ, Hamburg SP, Fuss CB. Changes in foliar and forest floor N:P ratios suggest a shift towards P limitation at Hubbard Brook. Talk at the 2008 Hubbard Brook Cooperators' Meeting; Poster at the 2008 Ecological Society of America Meeting, Milwaukee, WI; Poster at the 2008 NERC Conference, Durham, NH; Poster at the 2009 UNH Graduate Research Conference, Durham, NH.
- Vadeboncoeur MA, Pennino M, Hamburg SP. Soil monitoring using the quantitative pit method: Lessons from 25 years of digging. Talk at the 2008 Northeast Soil Monitoring Cooperative, Troy, NY.
- Vadeboncoeur MA, Hamburg SP, Pryor D. Modeling 150 years of anthropogenic N loading to Narragansett Bay. Talk at the 2007 Ecological Society of America Meeting, San Jose, CA.
- Vadeboncoeur MA, Hamburg SP, Fox D, Schneider LC. Historic and modern anthropogenic C flux from Grafton County, NH. Talk at the 2007 Hubbard Brook Experimental Forest Cooperators' Meeting.
- Vadeboncoeur MA, Hamburg SP, Richardson AD. Looking for climate change at the ecosystem level: Examination of a 50-year record from Hubbard Brook. Talk at the 2006 Hubbard Brook Experimental Forest Cooperators' Meeting; Talk at the 2006 Ecological Society of America Meeting, Memphis, TN; Poster at the 2006 LTER All Scientists Meeting, Estes Park, CO.
- Vadeboncoeur MA, Hamburg SP, Pryor D. A brief history of anthropogenic nitrogen inputs to Narragansett Bay. Poster at the 2006 RI Natural History Society Meeting, Narragansett, RI.

Vadeboncoeur MA, Hamburg SP. [Land-use legacies and soil carbon dynamics: A regional assessment of the White Mountains, NH.](#) Talk at the 2005 Ecological Society of America Meeting, Montréal.

Vadeboncoeur MA, Hamburg SP. [Mapping land use history at the regional scale: An update for the upper Pemigewasset Valley, NH.](#) Talk at the 2005 Hubbard Brook Experimental Forest Cooperators' Meeting.

Vadeboncoeur MA, Hamburg SP. [Landscape-scale patterns of land-use history in Grafton County, NH.](#) Talk at the 2004 Hubbard Brook Experimental Forest Cooperators' Meeting.

Vadeboncoeur MA. [Using GIS to prioritize parcels for the conservation of a rare wildflower: A colonization probability model for northern blazing star on Block Island, RI.](#) Poster at the 2003 Rhode Island Natural History Society Annual Meeting, Cranston, RI; Poster at the 2004 Ecological Society of America Meeting, Portland, OR.

RESEARCH EXPERIENCE (SUPERSCRIPTS REFER TO PUBLICATIONS LIST)

- 2014- Research Scientist, Earth Systems Research Center, University of New Hampshire
- Continued research into long-term trends and short-term controls on evapotranspiration, water stress, and water use efficiency, and interactions of these effects with other global change drivers.
 - Conducted field-based research in Brazilian and Peruvian Amazon examining physiological effects of recent severe droughts.
 - Planned future research and developed collaborative grant proposals.
 - Mentored graduate and undergraduate students conducting research in the lab.
- 2013-14 Postdoctoral Research Associate, [Asbjomsen Ecohydrology Lab](#), University of New Hampshire
- Examined secular trends in catchment- and ecosystem-scale evapotranspiration records across the northeast.
 - Conducted dendrochronological ¹³C and ¹⁸O analyses as a proxy for multi-decade trends in water-use efficiency at a range of spatial scales.³³
 - Mentored graduate and undergraduate students conducting research in the lab.^{30,33}
- 2011-13 Ph.D. Candidate (Switzer Fellow, Dissertation Year Fellow), University of New Hampshire
- Modeled forest nutrient budgets and soil stock depletion under varying harvest intensities.²⁵
 - Measured uptake of organic nitrogen forms in the field using isotopically labeled cyanobacteria.³¹
 - Conducted greenhouse experiment showing uptake of lanthanide element and Pb isotopic tracers from weathering granite by ectomycorrhizal tree seedlings.
 - Collected and analyzed soils and sporocarps from fertilized forest stands for analysis of weathering tracers.³⁴
- 2011-12 Research Analyst ([MELNHE project](#)), [Yanai Lab](#), SUNY College of Environmental Science and Forestry.
- Managed geospatial and long-term forest biometric datasets, ensured inter-year consistency in research methods, oversaw field logistics. Previously collaborated on experimental design and sampling protocols, and on updating the MEL ecosystem model.^{22,25,28}
- 2007-10 Graduate Research Assistant, [Hobbie Lab](#), University of New Hampshire.
- Conducted meta-analysis of fertilization experiments in northeastern forests.¹¹
 - Measured root and fungal biomass in soil cores and fertilized/control root-ingrowth cores across a species and N-cycling gradient; complete floristic survey of study plots.³¹
 - Stable isotope analysis of fungal sporocarps, foliage, soil, and roots.
 - Examined relationships between inter-annual variation in seasonal precipitation and primary production across the LTER network.²¹
- 2003-07 Research Assistant, Hamburg Lab, Brown University.
- Managed field crews of up to 12 undergraduate and graduate students, establishing long-term study plots, quantitatively sampling soils, and forest mensuration.^{2,4,8,10,19,22,25,28}
 - Conducted C and N analyses on elemental analyzer, supervised undergraduate lab assistants.¹⁹
 - Assembled historic land-use history data for Grafton County, NH and the Narragansett Bay watershed.^{5,9,16}
 - Modeled long-term trends in anthropogenic nitrogen flux to Narragansett Bay.^{5,9}
 - Analyzed elevation trends in pre-settlement forest species composition from witness trees in central NH.¹⁶
 - Mentored undergraduate and Master's thesis students.^{3,7,14}
 - Coordinated data and sample sharing in large collaborative research group.
 - Collaborated on projects relating remote sensing data and direct forest monitoring to describe patterns of phenology and storm damage.^{1,6,12,13}
- 2002-03 Research Assistant, Schmitt Lab, Brown University.
- Constructed a GIS model of dispersal probability and habitat suitability for a metapopulation of northern blazing star (*Liatrix scariosa* var. *novae-angliae*) populations on Block Island.
 - Collected demographic data and constructed Leslie Matrix models for northern blazing star populations.

- Established a common garden experiment of northern blazing star.
 - Conducted GIS analysis relating *Arabidopsis* fitness and life-history parameters from a common garden to climatic data for accession locations across Europe and Japan.
- 2001 Field Research Assistant (NSF-REU), Hamburg Lab, Brown University
- Took increment cores and inventory of trees in forests growing on abandoned pastures.¹⁶
 - Collected snails in calcium-fertilized and control watersheds at Hubbard Brook Experimental Forest.³
 - Monitored canopy leaf area in forest stands damaged by the 1998 ice storm.⁷

TEACHING EXPERIENCE

University of New Hampshire

- 2014 (Spring) Instructor, *Biogeography*
- Developed syllabus, lectured, designed and graded exams and written assignments.
- 2011 (Spring) Teaching Assistant, *Natural Resources and Environmental Policy*. D. Kaiser, instructor.
- Led discussion section, graded papers and exams.
- 2009 (Spring) Teaching Assistant, *Our Solar System*. J. Bryce, instructor.
- Taught two lab sections, graded lab reports and exams, held well-attended weekly office hours.

Guest Lectures and Labs:

Tropical Ecology, H. Asbjornsen, 2016-17.

Silviculture, H. Asbjornsen, 2016.

Monitoring Forest Health, B. Rock, 2008-11.

Brown University

- 2004 (Fall) Teaching Assistant, *Conservation Biology*. J. Hughes, instructor.
- Led discussion section focused on current research papers. Graded problem sets.
- 2003 (Spring) Teaching Assistant, *Environmental Science*. S. Hamburg, instructor.
- Led lab section, managed course website, collaborated on developing lab projects (this was the first year this course was offered).
- 2001 (Fall) Teaching Assistant, *Diversity and Adaptation in Seed Plants*. J. Schmitt, instructor.
- Assisted with leading labs and field trips. Graded quizzes and term projects.
- 1999-2002 Team Leader and Curriculum Committee Member. [Providence Science Outreach](#).
- Developed and taught weekly interactive science lessons to 4th-5th grade classes in Providence public schools.

MENTORING SERVICE

- 2017 Mentor, Weeks Fellowship Project, Emily Dutton, U. New Hampshire.
- 2016- M.Sc. Committee Member, Korik Vargas Moreno, U. New Hampshire.
- 2016- Ph.D. Committee Member, Kiley Remiszewski, U. New Hampshire.
- 2015- Ph.D. Committee Member, Cameron McIntire, U. New Hampshire.
- 2015 Mentor, Senior Capstone Project, Cameron Twombly, U. New Hampshire.
- 2015 Mentor, Undergraduate Research Assistantship, Stacie Powers, U. New Hampshire.
- 2014 M.Sc. Committee Member, Adán Hernández-Hernández, U. New Hampshire.
- 2013 M.Sc. Committee Member, Craig See, SUNY College of Environmental Science and Forestry.
- 2011 M.Sc. Committee Member, Carrie Rose Levine, SUNY College of Environmental Science and Forestry.

GRANTS AND HONORS

- 2017 Iola Hubbard Climate Endowment Funding (lead PI): [Remotely sensing drought stress at leaf to stand scales in temperate mixed forests](#)
- 2016 NSF Hydrological Sciences (co-PI): [Collaborative research: Forest water use and the influence of acid deposition \(EAR1562019\)](#)
- 2014 Iola Hubbard Climate Endowment Funding (lead PI): [Building capacity to understand ecosystem responses to climate-induced increases in plant water stress and implications for hydrologic services](#)

- 2013 NSRC Supplemental Funding (co-investigator): [Using stable oxygen isotopes to disentangle the role of photosynthesis and stomatal conductance in explaining long-term evapotranspiration trends](#)
- 2012 NSF Dissertation Improvement Grant: [Developing biogeochemical tracers of apatite weathering by ectomycorrhizal fungi \(DEB1210560\)](#)
- 2012 UNH Graduate School Dissertation Year Fellowship
- 2011 [Switzer Environmental Fellowship](#)
- 2011 UNH Summer Teaching Assistant Fellowship
- 2010 NERC Conference Travel Funding
- 2010 NSF funding to attend the Workshop on Dynamic Plot Database Application, Kuala Lumpur, Malaysia
- 2010 NSF LTER Workshop Travel Grant
- 2009 LTER Travel Funding for All Scientist's Meeting
- 2008-12 UNH Graduate School Travel Grants (6)
- 2008-12 UNH NRESS Student Research Support Grants (5)
- 2007 UNH NRESS Graduate Fellowship
- 2007 Undergraduate thesis featured in [The Nature and Properties of Soils](#) by Brady and Weil, 14-15th eds.
- 2004 Undergraduate thesis featured in [ESRI Map Book vol. 19](#)
- 2003 [Sigma Xi Honor Society](#)
- 2003 Albert Arnold Bennett Departmental Award in Environmental Science
- 2002 Mellon Fund Grant for Undergraduate Thesis Research
- 2002 Hughes Undergraduate Research Fellowship
- 1999 [National Merit Scholarship](#)
- 1999 [Louis E. Feinsein Memorial Scholarship](#)
- 1999 Senator Jack Reed Scholarship
- 1999 Rhode Island Scholarship

LEADERSHIP AND INSTITUTIONAL SERVICE

- 2015-21 Steering Committee, [Northeastern Ecosystem Research Cooperative](#)
- 2010 Organizing Committee, Environmental Science Speaker Series (UNH NRESS Program)
- 2004 Faculty Search Committee, Alumni representative, Brown Environmental Change Initiative

PUBLIC OUTREACH ACTIVITIES

- 2017 Environmental Science Module organizer, [Project SMART](#), University of New Hampshire
- 2017 Invited Speaker, NH Maple Producers Association annual meeting, Plymouth, NH
- 2013- Naturalist/Hike Leader, Appalachian Mountain Club Cold River Camp, Chatham, NH
- 2013 Invited Speaker, Campton Historical Society, Campton, NH

PROFESSIONAL MEMBERSHIPS

American Institute of Biological Sciences
 American Geophysical Union
 Ecological Society of America
 Soil Science Society of America
 Tree-Ring Society

JOURNALS REFEREED

Acta Oecologica
Agricultural and Forest Meteorology
Annals of the New York Academy of Sciences
Biogeochemistry
Biogeosciences
Biological Conservation
Canadian Journal of Forest Research
Climatic Change
Current Forestry Reports
Ecology
Ecosphere
Environmental Pollution
European Journal of Forest Research
Forest Ecology and Management

Forests

iForest - Biogeosciences and Forestry

Journal of Earth System Science

Journal of Environmental Management

Journal of Geophysical Research - Biogeosciences

Journal of Mountain Science

Northeastern Naturalist

Oecologia

Plant and Soil

Science of the Total Environment

Soil Science Society of America Journal

Tree Physiology