

HEATHER E. ERICKSON, PHD
ECOSYSTEMS ECOLOGIST
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PROFESSIONAL INTERESTS

Global change and terrestrial ecosystems, carbon and nitrogen dynamics, plant species and soil interactions, fire and ecosystems, science communication, mentoring

EDUCATION

Ph.D. 1994, College of Forest Resources (CFR), University of Washington, Seattle, Ecosystem analysis. *Dissertation:* Nitrogen and phosphorus availability, ecosystem processes and plant community dynamics in boreal wetland meadows

M.S. 1984, CFR, University of Washington, Soil microbiology and forest ecosystems.

Thesis: Logging residue decomposition: decay rates of woody debris in four PNW ecosystems after harvesting

B.A. 1977, Southern Illinois University, Carbondale, IL, Biology

PROFESSIONAL EXPERIENCE

Jan. 2010 – May 2010, *Adjunct Faculty*, Ecosystem Ecology, Washington State University, Vancouver, WA

2005 – Sept. 2009, *GS-13 Research Ecologist (currently a volunteer)*, USDA Forest Service, Pacific Northwest Research Station, Portland Forestry Sciences Lab, Portland OR 97205

2004 - 2006, *Adjunct Faculty*, Lewis and Clark College, Portland OR 97219

2003 - 2005, 2010, *Private consulting ecologist*, Portland, OR 97213

2003 - , *Courtesy Faculty*, Forest Science, Oregon State University (OSU), Corvallis, OR 97331

1997 - 2003, *Assistant Professor/Associate Professor (2003)*, Environmental Sciences, Universidad Metropolitana (UMET), San Juan, PR 00928

1994 - 1997, *Postdoctoral Research Associate*, Duke University's Organization for Tropical Studies and USFS International Institute of Tropical Forestry, Rio Piedras, PR 00928

1989 – 1994, *Predoctoral Research Associate*, CFR, University of Washington

1986 – 1989, *Environmental Scientist/Quality Assurance Coordinator*, Acid Deposition Program, NSI Technology Services, US EPA Environmental Research Lab, Corvallis, OR

1980 - 1984, *Research Assistant*, CFR, University of Washington.

1983, 1984, and 1985 field seasons, *Field Ecologist*, Old Growth Wildlife Habitat Project, OSU and University of Washington

1984, *Research Assistant*, Forest Science, OSU

PUBLICATIONS

Erickson, H.E. and J. E. Smith. *In preparation*. Taking the heat: microbial communities and soil respiration after fire in western coniferous forests.

Erickson, H.E., and S. Perakis. *In revision*. Methane, nitrous oxide and nitric oxide fluxes from Douglas-fir forests in the Oregon Coast Range.

Erickson, H.E., C. A. Harrington and D. Marshall. 2009. Tree growth at stand and individual scales in two dual species mixture experiments in southern Washington State, USA. **Canadian Journal of Forest Research** 39:1119-1132.

Erickson, H. E. and Rachel White. 2008. Soils under fire: soils research and the Joint Fire Science Program. **Gen. Tech. Rep. PNW-GTR-759**. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 17 p.

Erickson, H. E. and White, R. 2007. Invasive plant species and the Joint Fire Science Program. **Gen. Tech. Rep. PNW-GTR-707**. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 18 p.

Erickson, H.E. and C. A. Harrington. 2006. Conifer crown position relative to *Ceanothus* affects tree growth before and after shrub removal. **Forest Ecology and Management** 229: 183-194.

Erickson, H.E., P. Soto, D.W. Johnson, B. Roath, and C. Hunsaker. 2005. Effects of vegetation patches on soil nutrient pools and fluxes within a mixed-conifer forest. **Forest Science** 51:211-220.

Erickson, H.E. and G. Ayala. 2004. Hurricane-induced nitrous oxide fluxes from a wet tropical forest. **Global Change Biology** 10:1155-1162.

Ma, S., J. Chen, M. North, H. Erickson, and M. Bresee. 2003. Effects of experimental burning and thinning on soil respiration in an old-growth, mixed-conifer forest. Published on-line **Environmental Management** 10.1007/s00267-003-9125-2.

Erickson, H.E., E. Davidson, and M. Keller. 2002. Former land-use and tree species affect nitrogen oxide emissions from a tropical dry forest. **Oecologia** 130:297-308.

North, M., B. Oakley, J. Chen, H. Erickson, A. Gray, A. Izzo, D. Johnson, S. Ma, J. Marra, M. Meyer, K. Purcell, B. Roath, T. Rambo, D. Rizzo, and T. Schowalter. 2002. Vegetation and ecological characteristics of mixed-conifer and red-fir forests at the Teakettle Experimental Forest. **USFS Gen. Tech. Rep. PSW-GTR-186**.

Erickson, H.E., M. Keller and E. Davidson. 2001. Nitrogen oxide fluxes and nitrogen cycling

during secondary succession and forest fertilization in the humid tropics. **Ecosystems** 4:67-84.

Davidson, E.A., M. Keller, H. Erickson, L.V. Verchot and E. Veldkamp. 2000. A cross-site test of a conceptual model of nitrous oxide and nitric oxide emissions from soils. **BioScience** 50:667-680.

Verchot, L.V., E. A. Davidson, J.H. Cattanio, I.L. Ackerman, H.E. Erickson and M. Keller. 1999. Land-use change and biogeochemical controls of nitrogen oxide emissions from soils in Eastern Amazonia. **Global Biogeochemical Cycles** 13:31-46.

Veldkamp, E., E.A. Davidson, H. Erickson, M. Keller, and A. Weitz. 1999. Soil nitrogen cycling and nitrogen oxide emission along a pasture chronosequence in the humid sub-tropics. **Soil Biology and Biochemistry** 31:387-394.

Norton, S., J. Kahl, I. Fernandez, T. Haines, L. Rustad, S. Nodvin, J. Scofield, T. Strickland, H. Erickson, P. Wigington Jr., and J. Lee. 1999. The Bear Brook Watershed in Maine, USA. **Environmental Monitoring and Assessment** 55:7-51.

Erickson, H. and M. Keller. 1997. Tropical land use change and soil emissions of nitrogen oxides. **Soil Use and Management** 13:278-287.

Pastor, J., A. Downing and H. Erickson. 1996. Species-area curves and diversity-productivity relationships in beaver meadows of Voyageurs National Park, Minnesota, U.S.A. **Oikos** 77: 399-406.

Pollock, M.M., R.J. Naiman, H.E. Erickson, C.A. Johnston, J. Pastor and G. Pinnay. 1995. Beavers as engineers: influences on biotic and abiotic characteristics of drainage basins. Chapter 12 in Jones, C.G. and J.H. Lawton, ed. **Linking Species and Ecosystems**. Papers from the 5th Cary Conference, Institute of Ecosystem Studies, Milbrook, NY, May 1993.

Erickson, H.E. and R.L. Edmonds. 1994. Influence of Mount St. Helens' ash on litter decomposition II: Experimental studies with Douglas-fir needles. **Canadian Journal of Forest Research** 24: 832-838.

Edmonds, R.L. and H.E. Erickson. 1994. Influence of Mount St. Helens' ash on litter decomposition I: Pacific Silver fir needle decomposition in the ash fall zone. **Canadian Journal of Forest Research** 24: 826-831.

Erickson, H.E. and D. Coffey. 1991. The Watershed Manipulation project: case study of an interlaboratory comparison program. **Accountability in Research** 1:195-206.

Erickson, H.E., R.L. Edmonds and C.E. Peterson. 1985. Decomposition of logging residues in Douglas- fir, western hemlock, Pacific silver fir, and ponderosa pine ecosystems. **Canadian Journal of Forest Research** 15: 914-921.

TECHNICAL REPORTS

Erickson, H. 2001. A rapid environmental assessment of an urban watershed – the Río Piedras,

PR. Report to the USFS International Institute of Tropical Forestry, Program in Urban and Community Forestry, San Juan, PR

Hinckley, T.M., D. G. Sprugel, J. L. F. Batista, J. R. Brooks, L. B. Brubaker, J. Compton, H. E. Erickson, R. L. Little, D. A. Maguire, J. B. McCarter, S. J. McKay, D. Pass, D. W. Peterson, J. P. Reed, W. Tacey, L. E. Wilkinson, and A. Whytemare. 1996. Use of the JABOWA family of individual-tree based models for exploration of forest responses to global climate change. NCASI Technical Bulletin No. 717. pp II1-II54.

GRANTS, CONTRACTS, AND AGREEMENTS

Submitted, 2009, USDA Soil Processes, Erickson lead P.I. through USFS. "Nitrogen and soil water regulation of greenhouse gas emissions and global warming potential of Pacific Northwest forest soils" (*Not funded*)

2007 - 2009, Erickson lead PI, Interagency agreement with the USGS, "Nutrient and Rainfall Control of Nitrogen Trace Gas Emissions from Pacific Northwest Forests", \$40,000

Submitted, 2006, Joint Fire Sciences Program, Erickson lead P.I. through USFS. "Soil Nitrogen and Forest Plant Community Interactions after Fuel Reduction Treatments in a Mixed-Conifer Forest" (*Not funded*)

Submitted, 2006, USDA Soil Processes, Erickson lead P.I. through OSU. "Nitrogen and soil water regulation of greenhouse gas emissions and global warming potential of Pacific Northwest forest soils" (*Ranked High Priority, not funded*)

Submitted, 2005, USDA Soil Processes, Erickson lead P.I. through OSU. "Do Increases in Nitrogen Availability and Soil Moisture Lessen Greenhouse Gas Fluxes from PNW Conifer Forests?" (*Ranked High Priority, not funded*)

Submitted, 2004, WESTGEC (NIGEC-DOE), Erickson lead P.I. through OSU. "Soil fluxes of carbon dioxide, nitrous oxide, and methane in response to water and nitrogen additions in a young and an old-growth Douglas-fir forest" (*Not funded*)

2004 - 2005, USFS, Pacific Northwest and Pacific Southwest Research Stations. Continuing and new research initiatives (personal contracts), \$12,500

2004, Contract through the Pacific Watershed Institute, Olympia, WA, \$4,000

1998 - 2003, Research Joint Venture Agreement with the USFS (PSW) and Universidad Metropolitana "Restoration effects on carbon and nitrogen cycling at the Teakettle Experimental Forest, Sierra Nevada Mountains, CA", \$100,476

2002, NASA-EPSCOR "Nitrous oxide fluxes from a wet tropical forest after Hurricane *Georges*", \$5,000

2000 – 2002, USDA - NRI Ecosystems equipment grant “Exploring links between land-use change and nutrient cycling with a LECO carbon and nitrogen analyzer”, \$64,000

2000 – 2001, Cooperative Agreement between USFS International Institute of Tropical Research and Universidad Metropolitana “A rapid environmental assessment of a subcatchment to the Rio Piedras”, \$15,051

1999, “Laboratory Supplies for a Community-based Research and Teaching Facility in Ciales, PR.” Internal Institutional Grant, Universidad Metropolitana, \$10,000

1990, Research Experience for Undergraduates to NSF Grant BSR-8817665, "Animal influences on the aquatic landscape: vegetative patterns, successional transitions and nutrient dynamics"

TEACHING AND CURRICULA DEVELOPMENT

2010, Washington State University, Vancouver, WA. Developed and taught a new course for WASU-V, ESRP 404, Ecosystem Ecology.

2005, 2006, Lewis and Clark College, Portland, OR. Bio100 - Perspectives in Biology “Environmental Science for non-majors”, summer session.

2004, Lewis and Clark College, Portland, OR. Bio141 - Investigations in Ecology and Environmental Science (2 laboratory sections).

1997 - 2003, UMET, San Juan, PR. Designed and implemented the new environmental sciences curriculum, developed a completely new curriculum for natural resources management in the tropics, designed and coordinated the installation of a new lab for undergraduate research and education in environmental sciences.

Coordinated, designed and implemented a an intensive, field-based, summer research program (for five summers) in the Sierra Nevada Mountains of California for 2 - 5 Puerto Rican undergraduates to learn research skills.

Taught: ENSC443 Integrated Environmental Laboratory - A hands-on, experiential, research course for seniors, topics ranged from environmental assessments of an urban watershed to terrestrial litter decomposition; ENSC101 Introduction to Environmental Science, lecture, laboratory and field; BIOL203 Biology for majors: ecology, evolution and diversity, with laboratory.

1992 - 1994, University of Washington, Seattle, WA. Teaching Assistant, Forest Ecosystem Analysis, Forest Soils.

PROFESSIONAL AFFILIATIONS

American Geophysical Union, Ecological Society of America, Soil Science Society of America, Association for Tropical Biology, Society of Wetland Scientists, American Institute of Biological Sciences, Organization for Tropical Studies

SERVICES AS REVIEWER (SINCE 1995)

Applied Soil Ecology (2009 – 2x), Biogeochemistry (2009), Canadian Journal of Forest Research (1995, 1999), Caribbean Journal of Science (2006), Chemosphere (1997), Ecology (1995), Ecosystems (2007), Ecohydrology (2008), Forest Ecology and Management (2005, 2006, 2008), Forest Science (2008, 2009), Global Biogeochemical Cycles (2002), Global Change Biology (2002, 2004, 2005), Journal of Integrative Plant Biology (2007), International Journal of Plant Sciences (2007), Journal of Geophysical Research, Biogeosciences (2006), Landscape Ecology (2001), Northwest Science (2008), Plant and Soil (2005, 2006, 2007), Soil Biology and Biochemistry (2008, 2009), Soil Science Society of America Journal (1995, 2000, 2002, 2003)

ADDITIONAL PROFESSIONAL SERVICE

EPA Star Program for Global Change (2010), Terrestrial Ecosystems (2005), and Graduate Research in Forestry (1998)
USFS Scientist review panels (4 since 2005)
Poster Judge, Ecological Society of America (1999)
Science Fair Judge, Universidad Metropolitana (UMET, 1999-2003)
Poster and Presentation Judge, Annual UMET Undergraduate Research Symposia (1998-2002)
Member, IACUC Committee, University of Puerto Rico (2000-2002)

PROFESSIONAL PRESENTATIONS (SINCE 1995)

Erickson, H.E., and S. Perakis. 2010. Soil fluxes of methane, nitrous oxide and nitric oxide from coastal forests in Oregon. PNW Climate Science Conference. Portland State University, June 15-16, 2010, Portland, OR

Erickson, H.E. 2009. Soils under Fire: A Brief Review of Fire and Soils in Western Forests. USFS Region 6 Vegetation Conference, Feb. 24-25, 2009, Vancouver, WA

Erickson, H.E., E. Helmer, T. Brandeis, and A. Lugo. 2008. Local versus landscape control of leaf litter chemistry on a diverse Tropical island. 2008 American Geophysical Union Fall Meeting, Dec. 15-19, 2008, San Francisco, CA

Erickson, H.E., and S. Perakis. 2008. Autumn fluxes of nitrogen oxides from Oregon coastal forest soils. 93rd Annual Ecological Society of America, Aug. 2008, Milwaukee, WI

Erickson, H.E. 2008. Biology, Ecology, and Management of Huckleberries. Workshop on “Enhancing and Restoring Huckleberry Areas in a Healthy Watershed Approach to Management”, June 10-11, 2008, Warm Springs OR

Erickson, H.E., and C. Harrington. 2007. Effects of neighborhood composition on tree growth in conifer plantations in southern Washington State, USA. North American Forest Ecology Workshop, Vancouver, B.C.

Barbour, J., S. Barro, M. Hemstrom, H. Erickson, and T. Swedberg. 2005. Effective communication of fire research results to managers on the ground: case studies of lessons learned. 4th USGS Wildland Fire Science Workshop, Westward Look Resort, Dec. 6-9, 2005, Tucson, AZ,

Erickson, H.E. 2004. Near term response of surface soil nitrogen cycles and pools to forest clearing and burning. Ecological Society of America Meetings, Aug. 1-6, 2004, Portland, OR

Erickson, H.E., P. Soto and J.E. Compton. 2003. Differential effects of soil and substrate nitrogen on leaf litter decomposition in two Puerto Rican Forests. LTER All Scientists Meeting 2003, Sept. 18-20, 2003, Seattle, WA

Erickson, H.E. and J.E. Compton. 2002. Leaf litter nitrogen (N), soil N availability and decomposition dynamics in two Puerto Rican forests. Soil Science Society of America Meetings, Nov. 10-14, 2002, Indianapolis, IN

Erickson, H., D. Johnson, P. Soto and C. Hunsaker. 2002. Soil nutrient pools and fluxes within a mixed-conifer forest: implications for ecological restoration. Sierra Nevada Science Symposium, Oct. 7-10, 2002, Lake Tahoe, CA

Erickson, H., G. Ayala, P. Soto and W. Rivera. 2001. Leaf litter C:N ratio and soil N availability do not effect short-term mass loss of mixed-species litters in two Puerto Rican forests. International Conference on Tropical Ecosystems: Structure, Diversity and Human Welfare, Association for Tropical Biology. July 15 -18, 2001, Bangalore, India

Erickson, H., and G. Ayala. 2001. Detecting change in N oxide emissions after a hurricane: the value of long-term measurements. Annual LUQ LTER meeting, UPR campus, Jan. 13, 2001, San Juan, PR

Erickson, H. 2000. Soil N turnover, N fixation and *Ceanothus cordulatus* patches in a mixed-conifer forest. Annual Ecological Society of America Meetings, August 2000, Snowbird, UT

Erickson, H. and Ayala, G. 2000. Soil fluxes of nitrous oxide and nitrogen availability in a wet tropical forest after hurricane *Georges*. LTER All Scientists meeting, Aug. 2000, Snowbird, UT

Ayala,G. and H. E. Erickson. 2000. Effects of Hurricane *Georges* on soil emissions of nitrous oxide in a wet tropical forest. Joint Meetings, Ecological Society of America/British Ecological Society, March 2000, Orlando, FL

Erickson, H., M. Keller and E.A. Davidson. 1999. "Plant species and N-oxide gases after pasture in Puerto Rico." Invited speaker - Symposium on succession in tropical pastures. International Botanical Congress, Aug. 1999, St. Louis, MO

Davidson, E.A., M. Keller, H. Erickson, L. Verchot, and E. Veldkamp. 1998. Testing the Hole-in-the-Pipe Model of Nitrogen Trace Gas Emissions in Tropical Forests and Pastures. American Geophysical Union Annual Meetings, Dec. 1998, San Francisco, CA

Erickson, H.E., M. Keller, and E. Davidson. 1997. Nitrogen oxide emissions and nitrogen cycling in wet and dry tropical forests in Puerto Rico. Supplement to the Bulletin of the Ecological Society of America, ESA Annual Meeting, Aug. 1997, Albuquerque, NM

Erickson, H.E., E.A. Davidson and M. Keller. 1996. Relationships between N Trace Gas Emissions and Indices of Soil N Availability in Eastern Puerto Rico. Soil Science Society of America Meetings, Nov. 3-8, 1996, Indianapolis, IN

Erickson, H.E., M. Keller and E. Davidson. 1996. Nitric oxide (NO) production is higher in secondary versus "primary" tropical dry forests of Puerto Rico. Bulletin of the Ecological Society of America, ESA Annual Meeting, July 1996, Providence, RI

MENTORED UNDERGRADUATE RESEARCH PRESENTATIONS

Roldan, L., M. Torres and H. Erickson. 2003. Effect of fire on foliar nitrogen in *Ceanothus cordulatus* and *Arctostaphylos patula*. **Best student poster**. XIIIth Undergraduate Research Symposium, October 23 - 25, 2003, Universidad Metropolitana, San Juan, PR

Torres, M., L. Roldan and H. Erickson. 2003. A potential link between fire suppression, tree species, and soil processes. SACNAS Nat'l Symposium, Oct. 2-5, 2003, Albuquerque, NM

Marrero, H., D. Pérez, and H. Erickson. 2003. Microbial biomass carbon in two tropical successional forests. Spring Undergraduate Research Symposium. May, 2003, Universidad Metropolitana, San Juan, PR

Berberena, A.N., T. Crowl and H. E. Erickson. 2003. Shrimp migration in montane, tropical streams of Puerto Rico. Third annual symposium on Long-Term Research in Puerto Rico. University of Puerto Rico, San Juan, PR

Ruiz, B. and H.E. Erickson. 2002. Effect of burning on soil carbon and nitrogen in a mixed-conifer forest at Teakettle Experimental Forest in California. XIIth Undergraduate Research Symposium, October 18 - 20, 2002, Universidad Metropolitana, San Juan, PR

Torres, M., B. Ruiz, A. Quijano and H. Erickson. 2002. Effect of tree species on soil properties in the Sierra Nevada Mountains. XIIth Undergraduate Research Symposium, October 18- 20, 2002, Universidad Metropolitana, San Juan, PR

Quijano, A., B. Ruiz, M. Torres, and H. Erickson. 2002. Effect of experimental burning and forest cutting on microbial biomass in a Californian mixed-conifer forest. SACNAS Nat'l Symposium, Sept. 27-29, 2002, Anaheim, CA

Torres, M., B. Ruiz, A. Quijano and H. Erickson. 2002. Effect of tree species on soil pH in the Sierra Nevada Mountains. SACNAS Nat'l Symposium, Sept. 27-29, 2002, Anaheim, CA

Pérez, D., and H.E. Erickson. 2002. Evidence for a decrease in soil carbon and nitrogen pools after a hurricane. Spring Undergraduate Research Symposium, May, 2002, Universidad Metropolitana, San Juan, PR

Berberena, A., T. Crowl, and H. Erickson. 2002. Assessing shrimp migration in a tropical stream. Spring Undergraduate Research Symposium, May, 2002, Universidad Metropolitana, San Juan, PR

Tirado-López, A. and H.E. Erickson. 2000. Seedling regeneration and survival in open, shrub and closed canopy patches in a mixed-conifer forest. XIth Undergraduate Research Symposium, October 20-22, 2000, Universidad Metropolitana, San Juan, PR

Vega, C. and H.E. Erickson. 2000. Do soil nitrogen pools increase under *Ceanothus*? XIth Undergraduate Research Symposium, October 20-22, 2000, Universidad Metropolitana, San Juan, PR

Rodríguez, K., H. Erickson and S. Ma. 2000. Canopy openings affect microclimate in the Teakettle Experimental Forest, California. XIth Undergraduate Research Symposium, October 20-22, 2000, Universidad Metropolitana, San Juan, PR

Ayala, G. and H.E. Erickson. 1999. Nitrous oxide fluxes after Hurricane *Georges* at El Verde, Puerto Rico. Xth Undergraduate Research Symposium, October 14th, 1999, Universidad Metropolitana, San Juan, PR

Carro, S., P. Soto, C. Vega and H.E. Erickson. 1999. The effect of three tree species on the pH of the organic layer in a mixed-conifer forest. Xth Undergraduate Research Symposium, October 14th, 1999, Universidad Metropolitana, San Juan, PR

Soto Oliver, P. and H.E. Erickson. 1999. A comparison of two soil moisture measuring techniques. Xth Undergraduate Research Symposium, October 14th, 1999, Universidad Metropolitana, San Juan, PR

Vega Rios, C. and H.E. Erickson. 1999. A summer experience on a large-scale restoration forest project in the Sierra Nevada Mountains. Xth Undergraduate Research Symposium, October 14th, 1999, Universidad Metropolitana, San Juan, PR

Ayala, G. and H.E. Erickson. 1998. Effect of elevation on organic matter accumulation in mixed-conifer forest. IXth Undergraduate Research Symposium, October 17th, 1998, Universidad Metropolitana, San Juan, PR

GRADUATE STUDENT COMMITTEES

Johanna Santamaria. MS student. UPR Biology. Thesis topic: Nitrification in abandoned sugar cane fields.

Matthew Warren. PhD student. UPR Biology. Thesis topic: Effect of rainfall seasonality on microbial and plant competition for nutrients in the tropics.

Maria Juncos. MS student. UMET Environmental Affairs. Thesis topic: A community based management plan for the Tres Picachos forest in Puerto Rico.