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Abbreviated VITA

BUSINESS ADDRESS:

University of Maine
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EDUCATION:

1981 - Ph.D. University of Maine - Forest Resources (Forest Soils)
1978 - M.S. University of Maine - Plant & Soil Sciences (Soil Chemistry)
1975 - B.A. Hartwick College - Biology (Plant Science)

EMPLOYMENT HISTORY:

1993 - present Professor of Soil Science and Cooperating Professor of Forest Resources
University of Maine, Orono, Maine
2008 - present Cooperating Professor - Climate Change Institute
2006 - present Cooperating Professor - Center for Research on Sustainable Forests
1997 – 2002 Chair - Department of Plant, Soil and Environmental Sciences
1990 - 1994 Chair - Department of Plant, Soil, and Environmental Sciences
1987 - 1993 Associate Professor of Soil Science and Cooperating Associate Professor of Forest
Resources - University of Maine, Orono, Maine
1983 - 1987 Assistant Professor of Soil Science and Cooperating Assistant Professor of Forest
Resources - University of Maine, Orono, Maine
1981 - 1983 Research Forester - National Council of the Paper Industry for Air and Stream
Improvement, 260 Madison Avenue, New York

PROFESSIONAL AFFILIATIONS:

American Society of Agronomy (1979 – present)
Certified Soil Scientist - State of Maine (1984 – present)
Council for Agricultural Science and Technology (1986 – 1994)
Maine Audubon (1985 – present)
Maine Association of Profession Soil Scientists (1984 – present)
Member - State of Maine Board of Certification for Geologists and Soil Scientists (1993 – present)
Member - Council of Soil Science Examiners (CSSE) of the Soil Science Society of America (1997- present)
Member - Editorial Advisory Board for Environmental Monitoring and Assessment (2000 – present)
Member - US Environmental Protection Agency Scientific Advisory Board - Ecological Processes and Effects
Committee, Washington DC (2000-2006); Periodic consultant to the SAB.
Member - US Environmental Protection Agency Advisory Council on Clean Air Compliance Analysis
(COUNCIL): Chair of the Ecological Effects Subcommittee (2010-2013)
National Atmospheric Deposition Technical Committee and Site Supervisor (1985-2007)
National Wildlife Association (1984 – present)
Natural Resources Council of Maine (1985 – present)
Phi Kappa Phi (1979 – present)

Sigma Xi (1979 – present)
 Society of American Foresters (1982 – present)
 Society of Soil Scientists of Northern New England (1984 – present)
 Soil Conservation Society of America (1979 – present)
 Soil Science Society of America (Chair-elect/Chair Div. S-7, Forest, Range and Wildland Soils, 2003-2005)

AWARDS AND RECOGNITION:

Named Fellow in the Soil Science Society of America (2010)
 Sergei A. Wilde Distinguished Lectureship in Forest Soils – Soil Science Society of America (2010)
 CASE/Carnegie Professor of the Year (Maine-2008) – Washington DC
 Distinguished Maine Professor – University of Maine (2007)
 College of Natural Sciences, Forestry, and Agriculture Outstanding Research Award (2004)
 G. Peirce and Florence Pitts Webber Award for Outstanding Research in Forest Resources (1997)

PUBLICATIONS (Last 12 years):

Peer Reviewed Journal Articles

Goodale, C.L., R. Q. Thomas, F. Dentener, M.B. Adams, J.S. Baron, B.A. Emmett, C. D. Evans, I. J. Fernandez, P. Gundersen, F. Hagedorn, G. M. Lovett, A. Kulmatiski, S. G. McNulty, A.M. Melvin, F. Moldan, S. V. Ollinger, P. Schleppei, and M. S. Weiss. Nitrogen deposition and forest carbon sequestration: a quantitative synthesis from plot to global scales. *Global Change Biology* (submitted).

SanClements, Michael D., Ivan J. Fernandez, and Stephen A. Norton. 2010. Controls on phosphorus fractions in acidic soils of humid temperate forests. *Soil Sci. Soc. Am. J.* (in press).

Fernandez, Ivan J., Mary Beth Adams, Michael D. SanClements, and Stephen A. Norton. 2010. Comparing decadal responses of whole-watershed manipulations at the Bear Brook and Fernow experiments. *Environ. Monitor. Assess.* (in press).

SanClements, Michael D., Ivan J. Fernandez, and Stephen A. Norton. 2010. Soil chemical and physical properties at the Bear Brook Watershed in Maine, USA. *Environ. Monitor. Assess.* (in press).

Norton, Stephen A., Ivan J. Fernandez, J. Stephen Kahl, Lindsey E. Rustad, Tomás Navrátil, and Heather Almquist. 2010. The evolution of the science of the Bear Brook Watershed in Maine, USA. *Environ. Monitor. Assess.* (in press).

Amirbahman, Aria, Brett C. Holmes, Ivan J. Fernandez, Stephen A. Norton. 2010. Mobilization of metals and phosphorus from intact forest soil cores by dissolved inorganic carbon. *Environ. Monitor. Assess.* (in press).

Navrátil, Tomás, Stephen A. Norton, Ivan J. Fernandez, and Sarah J. Nelson. 2010. Twenty-year inter-annual trends and seasonal variations in precipitation and stream water chemistry at the Bear Brook Watershed in Maine, USA. *Environ. Monitor. Assess.* (in press).

Mitchell, Myron J., Gary Lovett, Scott Bailey, Fred Beall, Doug Burns, Don Buso, Thomas A. Clair, Francois Courchesne, Louis Duchesne, Cathy Eimers, Ivan Fernandez, Daniel Houle, Dean S. Jeffries, Gene E. Likens, Micheal D. Moran, Christopher Rogers, Donna Schwede, Jamie Shanley, Kathleen C. Weathers, and Robert Vet. 2010. Comparisons of watershed sulfur budgets in southeast Canada and northeast US: new approaches and implications. *Biogeochemistry* DOI 10.1007/s10533-010-9455-0.

Sarah E. Godsey, Wenche Aas, Thomas A. Clair, Heleen A. de Wit, Ivan J. Fernandez, J. Steve Kahl, Iain A. Malcolm, Colin Neal, Margaret Neal, Sarah J. Nelson, Stephen A. Norton, Marisa C. Palucis, Brit Lisa Skjelkvåle, Chris Soulsby, Doerthe Tetzlaff, and James W. Kirchner. 2010. Generality of fractal 1/f scaling in catchment tracer time series and its implications for catchment travel time distributions. *Hydrological Processes* 24: (in press).

- Nelson, S.J., I.J. Fernandez, and J.S. Kahl. 2010. A review of mercury concentration and deposition in snow in eastern temperate North America. *Hydrolog. Proc.* 24:1971-1980.
- Dail, David Bryan, David Y. Hollinger, Eric A. Davidson, Ivan J. Fernandez, Herman C. Sievering, Neal A. Scott, and Elizabeth Gaige. 2009. Distribution of nitrogen-15 tracers applied to the canopy of a mature spruce-hemlock stand, Howland, Maine, USA. *Oecologia* 160:589-599.
- Bethers, Suzanne, Michael E. Day, G. Bruce Wiersma, Ivan J. Fernandez and J. Alexander Elvir. 2009. Effects of chronically elevated nitrogen and sulfur deposition on sugar maple saplings: nutrition, growth and physiology. *For. Ecol. Manag.* 258:895-902.
- SanClements, Michael D., Ivan J. Fernandez, and Stephen A. Norton. 2009. Mechanisms defining spatial patterns in P fractions in a forest lake watershed at Acadia National Park, Maine, USA. *For. Ecol. Manag.* 258:2318-2325.
- Banaitis, Michael R., Ivan J. Fernandez, Cullen Wilson, Stephen A. Norton, and D. Bryan Dail. 2009. Biogeochemical response of a northern forest ecosystem to biosolids amendments. *J. Environ. Qual.* 38:792-803.
- Evans, Chris D., Christine L. Goodale, Simon J.M. Caporn, Nancy B. Dise, Bridget A. Emmett, Ivan J. Fernandez, Chris D. Field, Stuart E.G. Findlay, Gary M. Lovett, Henning Meeseburg, Filip Moldan, and Lucy J. Sheppard. 2009. Does elevated nitrogen deposition or ecosystem recovery from acidification drive increased dissolved organic carbon loss from upland soil? A review of evidence from field nitrogen addition experiments. *Biogeochem.* 91:13–35.
- Navratil, Tom, Jan Rohovec, Aria Amirbahman, Stephen A. Norton, and Ivan J. Fernandez. 2009. Amorphous aluminum hydroxide control on sulfate and phosphate in sediment-solution systems. *Water Air Soil Pollut* 210:87-98.
- Campbell, John L., Lindsey E. Rustad, Elizabeth W. Boyer, Sheila F. Christopher, Charles T. Driscoll, Ivan J. Fernandez, Peter M. Groffman, Daniel Houle, Jana Kieckbusch, Alison H. Magill, Myron H. Mitchell, and Scott V. Ollinger. 2008. Consequences of climate change for biogeochemical cycling in forests of northeastern North America. *Can J For Res* 39:264-284.
- Dale, Virginia H., Gregory R. Biddinger, Michael C. Newman, James T. Oris, Glenn W. Suter, Timothy Thompson, Thomas M. Armitage, Judith L. Meyer, Richelle M. Allen-King, G. Allen Burton, Peter M. Chapman, Loveday L. Conquest, Ivan J. Fernandez, Wayne G. Landis, Lawrence L. Master, William J. Mitsch, Thomas C. Mueller, Charles F. Rabeni, Amanda D. Rodewald, James G. Sanders, and Ivor L. van Heerden. 2008. Enhancing the ecological risk assessment process. *Integrated Environmental Assessment and Management* 4:306-313.
- Hunt, James F., Tsutomu Ohno, and Ivan J. Fernandez. 2008. Influence of foliar phosphorus and nitrogen content on chemical properties of water extractable organic matter derived from fresh and decomposed sugar maple leaves. *Soil Biol. Biochem.* 40:1931–1939.
- Nelson, Sarah J., Kenneth B. Johnson, Kathleen C. Weathers, Cynthia S. Loftin, Ivan J. Fernandez, Jeffrey S. Kahl, and David P. Krabbenhoft. 2008. A comparison of winter mercury accumulation at forested and no-canopy sites measured with different snow sampling techniques. *Applied Geochemistry* 23:384-398.
- McNeil, Brenden, Jane Read, Tim Sullivan, Ivan Fernandez, and Charles Driscoll. 2008. The spatial pattern of nitrogen cycling in the Adirondack Park, New York. *Ecol. Applic.* 18:438-452.
- Catherine H. Rosfjord, Katherine E. Webster, Jeffrey S. Kahl, Stephen A. Norton, Ivan J. Fernandez, and Alan T. Herlihy. 2007. Anthropogenically driven changes in chloride complicate interpretation of base cation trends in lakes recovering from acidic deposition. *Environ. Sci. Technol.* 41 (22), 7688 -7693.
- Ohno, Tsutomu, Ivan J. Fernandez, Syuntaro Hiradate, and Jessica F. Sherman. 2007. Effects of soil acidification and forest type on water soluble soil organic matter properties. *Geoderma* 140:176-187.

- Gaige, E., D. B. Dail, D.Y. Hollinger, E.A. Davidson, I.J. Fernandez, H. Sievering, A. White, and W. Halteman. 2007. Changes in canopy processes following whole-forest canopy nitrogen fertilization of a mature spruce-hemlock forest. *Ecosystems* 10:1133-11247.
- McGee, Chandra J., Ivan J. Fernandez, Stephen A. Norton, and Constance S. Stubbs. 2007. Cd, Ni, Pb, and Zn concentrations in forest vegetation and soils in Maine. *Water Air Soil Pollut.* 180:141-153.
- Kahl J. S., S. J. Nelson, I. Fernandez, T. Haines, S. Norton, G. B. Wiersma, G. Jacobson Jr., A. Amirbahman, K. Johnson, M. Schaufler, L. Rustad, K. Tonnessen, R. Lent, M. Bank, J. Elvir, J. Eckhoff, H. Caron, P. Ruck, J. Parker, J. Campbell, D. Manski, R. Breen, K. Sheehan and A. Grygo. 2007. Watershed nitrogen and mercury geochemical fluxes integrate landscape factors in long-term research watersheds at Acadia National Park, Maine, *Environ. Monitor. Assess.* 126:9-25.
- Nelson, S. J., K. B. Johnson, J. S. Kahl, T. A. Haines, and I. J. Fernandez. 2007. Mass balances of mercury and nitrogen in burned and unburned forested watersheds at Acadia National Park, Maine, USA. *Environ. Monitor. Assess.* 126:69-80.
- Sherman, Jessica, Ivan J. Fernandez, Stephen A. Norton, Tsutomu Ohno, and Lindsey E. Rustad. 2006. Soil aluminum, iron, and phosphorus dynamics in response to long-term experimental nitrogen and sulfur additions at the Bear Brook Watershed in Maine, USA. *Environ. Monitor. Assess.* 121: 421-429.
- Norton, S. A., Fernandez, I., Amirbahman, A., Coolidge, K., and Navratil, T., 2006, Aluminum, phosphorus, and oligotrophy - Assembling the pieces of the puzzle: *Proc. Soc. Intern. Limnol.* 29, 1877-1886.
- Elvir, J.A., G.B. Wiersma, M.E. Day, M.S. Greenwood, and I.J. Fernandez. 2006. Effects of enhanced nitrogen deposition on foliar chemistry and physiological processes of forest trees at the Bear Brook Watershed in Maine. *For. Ecol. Manag.* 221:207-214.
- Wallenstein, Matthew D., Steven McNulty, Ivan J. Fernandez, Johnny Boggs, and William H. Schlesinger. 2005. Nitrogen fertilization decreases forest soil fungal and bacterial biomass in three long-term experiments. *For. Ecol. Manag.* 222:459-468.
- Sullivan, T.J., I.J. Fernandez, T.C. McDonnell, N.A. Nowicki, A.T. Herlihy, K.U. Snyder, and J.W. Sutherland. 2006. Acid-base characteristics of soils in the Adirondack Mountains, New York. *Soil Sci. Soc. Am. J.* 70: 141-152.
- Szillery, Johanna E., Ivan J. Fernandez, Stephen A. Norton, Lindsey E. Rustad, and Alan S. White. 2006. Using ion-exchange resins to study soil response to experimental watershed acidification. *Environ. Monitor. Assess.* 116: 383-398.
- Sheehan, Katherine D., Ivan J. Fernandez, J. Stephen Kahl, and Aria Amirbahman. 2006. Litterfall mercury in two forested watersheds at Acadia National Park, Maine, USA. *Water Air Soil Pollut.* 170:249-265.
- Elvir, J.A., L. Rustad, I. Fernandez, and G.B. Wiersma. 2005. Eleven year response of foliar chemistry to chronic nitrogen and sulfur additions at the Bear Brook Watershed in Maine. *Canadian J. For. Res.* 35:1402-1410.
- Evans, Gordon C., Stephen A. Norton, Ivan J. Fernandez, Jeffrey s. Kahl, and Dennis Hanson. 2005. Changes in concentrations of major and trace metals in northeastern U.S.-Canadian sub-alpine forest floors. *Water Air Soil Pollut.* 163: 245-267.

- Watmough, S.A. Aherne, J., Alewell, C., Arp, P., Bailey, S., Clair, T., Dillon, P., Duchesne, L., Eimers, C., Fernandez, I., Foster, N., Larssen, T., Miller, E., Mitchell, M. and S. Page. 2004. Sulphate, nitrogen and base cation budgets at 21 forested catchments in Canada, the United States and Europe. *Environ. Monitor. Assess.* 109:1-36.
- Lawler, Joshua J., Jonathan Rubin, Bernard J. Cosby, Ivan J. Fernandez, Jeffrey S. Kahl, and Stephen A. Norton. 2005. Predicting recovery from acidic deposition: Applying a modified TAF (Tracking Analysis Framework) model to Maine (USA) High Elevation Lakes. *Water Air Soil Pollut.* 164: 383-399.
- Montgomery, M.B., T. Ohno, T.S. Griffin, C.W. Honeycutt and I.J. Fernandez. 2004. Phosphorus mineralization and availability in soil amended with biosolids and animal manures. *Biological Agriculture & Horticulture* 22:321-324.
- Venterea, Rodney T., Peter M. Groffman, Mark S. Castro, Louis V. Verchot, Ivan J. Fernandez, and Mary Beth Adams. 2004. Soil emissions of nitric oxide in two forest watersheds subjected to elevated N inputs. *For. Ecol. Manag.* 196:335-349.
- Jefts, Sultana, Ivan J. Fernandez, Lindsey E. Rustad, and D. Bryan Dail. 2004. Decadal responses in soil N dynamics at the Bear Brook Watershed in Maine, USA. *For. Ecol. Manag.* 189:189-205.
- Jefts, Sultana, Ivan J. Fernandez, Lindsey E. Rustad, and D. Bryan Dail. 2004. Comparing methods for assessing forest soil net N mineralization and nitrification. *Commun. Soil Sci. Plant Anal.* 35:2875 - 2890.
- Amirbahman, Aria, Philip L. Ruck, Ivan J. Fernandez, Terry A. Haines, and Jeffery S. Kahl. 2004. The effect of fire on mercury cycling in the soils of forested watersheds: Acadia National Park, Maine, USA. *Water Air Soil Pollut.* 152:313-331.
- Norton, S. A., Fernandez, I. J., Kahl, J. S and R. L. Reinhardt. 2004. Acidification trends and the evolution of neutralization mechanisms through time at the Bear Brook Watershed in Maine (BBWM), U.S.A. *Water Air Soil Pollut.* 4:289-310.
- Fernandez, Ivan J., Lindsey E. Rustad, Stephen A. Norton, J. Stephen Kahl and Bernard J. Cosby. 2003. Experimental acidification causes soil base cation depletion in a New England forested watershed. *Soil Sci. Soc. Am. J.* 67:1909-1919.
- Elvir, J.A., G.B. Wiersma, A.S. White and I.J. Fernandez. 2003. Effects of chronic ammonium sulfate treatment on basal area increment in red spruce and sugar maple at the Bear Brook Watershed in Maine. *Can J. For. Res.* 33:862-869.
- Parker, J. L. I.J. Fernandez, L. E. Rustad, and S. A. Norton. 2002. Soil C fractions in experimental forested watersheds. *Water Air Soil Pollut.* 138:101-121.
- Pellerin, B.A., I.J. Fenandez, S.A. Norton and J.S. Kahl. 2002. Soil aluminum distribution in the near-stream zone at the Bear Brook Watershed in Maine. *Water Air Soil Pollut.* 134:189-204.
- Parker, J.L., I.J. Fernandez, L.E. Rustad, and S.A. Norton. 2001. Effects of wildfire, harvesting, and N enrichment on forest soil C and N. *Soil Sci. Soc. Am. J.* 65:1248-1255.
- Norton, S. A., Cosby, B. J., Fernandez, I. J., Kahl, J. S., and Church, M. R. 2001. Long-term and seasonal variations in CO₂: linkages to catchment alkalinity generation. *Hydrology and Earth System Sciences* 5:83-91.
- Fernandez, I.J, J.A. Simmons, and R.D. Briggs. 2000. Indices of forest floor nitrogen status along a regional climate gradient in Maine, USA. *For. Ecol. Manag.* 134:177-187.
- Carpenter, A.F. and I.J. Fernandez. 2000. Pulp sludge as a component in manufactured topsoil. *J. Environ. Qual.* 29:387-397.
- Aber, John, Norman Christensen, Ivan Fernandez, Jerry Franklin, Lori Hidingier, Malcolm Hunter, James

- MacMahon, David Mladenoff, John Pastor, David Perry, Ron Slangen, and Helga van Miegroet. 2000. Applying ecological principles to management of the U.S. National Forests. *Issues in Ecology* Vol. 6. 20 pp.
- Sievering, J., I. Fernandez, J. Lee, J. Hom, and L. Rustad. 2000. Forest canopy uptake of atmospheric nitrogen deposition at eastern US conifer sites: carbon storage implications? *Global Biogeochem. Cycl.* 14: 1153-1160.
- Fernandez, I., L. Rustad, M. David, K. Nadelhoffer and M. Mitchell. 1999. Mineral soil and solution responses to experimental N and S enrichment at the Bear Brook Watershed in Maine (BBWM). *Environ. Monitor. Assess.* 55:165-185.
- Arnold, S.S., I.J. Fernandez, L.E. Rustad, L.M. Zibiliske. 1999. Microbial response of an acid forest soil to experimental soil warming. *Biol. Fertil. Soils* 30:239-244.
- Kahl, J., S. Norton, I. Fernandez, L. Rustad, and M. Handley. 1999. Nitrogen and sulfur input-output budgets in the experimental and reference watersheds, Bear Brook Watershed in Maine (BBWM). *Environ. Monitor. Assess.* 55:113-131.
- Norton, S., J. Kahl, and I. Fernandez. 1999. Altered soil-soil water interactions inferred from stream water chemistry at an artificially acidified watershed at Bear Brook Watershed, Maine USA. *Environ. Monitor. Assess.* 55:97-111.
- 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, Maine (BBWM), USA. *Environ. Monitor. Assess.* 55:7-51.
- Roy, S., S. Norton, I. Fernandez, and J. Kahl. 1999. Linkages of P and Al export at high discharge at the Bear Brook Watershed in Maine. *Environ. Monitor. Assess.* 55:133-147.
- Wang, Z. and I.J. Fernandez. 1999. Soil type and forest vegetation influences on forest floor nitrogen dynamics at the Bear Brook Watershed in Maine (BBWM). *Environ. Monitor. Assess.* 55:221-234.
- White, G., I. Fernandez, and G. Wiersma. 1999. Impacts of ammonium sulfate treatment on the foliar chemistry of forest trees at the Bear Brook Watershed in Maine. *Environ. Monitor. Assess.* 55:235-250.
- Mason, C.F., S.A. Norton, I.J. Fernandez, and L.E. Katz. 1998. Deconstruction of the chemical effects of road salt on stream water chemistry. *J. Environ. Qual.* 28:82-91.
- Aber, J.D., W.H. McDowell, K.J. Nadelhoffer, A. Magill, G. Bernston, M. Kamakea, S.G. McNulty, W. Currie, L. Rustad, I. Fernandez. 1998. Nitrogen saturation in temperate forest ecosystems: Hypotheses revisited. *BioScience* 48:921-934.
- Rustad, L.E., and I.J. Fernandez. 1998. Soil warming: consequences for litter decay in a spruce-fir forest in Maine, USA. *Soil Sci. Soc. Am. J.* 62:1072-1080.
- Rustad, L.E., and I.J. Fernandez. 1998. Experimental soil warming effects on CO₂ and CH₄ flux from a low elevation spruce-fir forest soil in Maine, USA. *Global Change Biol.* 4:597-606.
- Christ, M.J., M.B. David, P.J. McHale, J.W. McLaughlin, M.J. Mitchell, L.E. Rustad, and I.J. Fernandez. 1997. Microclimatic control of microbial C, N, and P pools in Spodosol Oa-horizons. *Canadian J. For. Res.* 27:1914-1921.

Books/Collections

- Fernandez, Ivan J. and Stephen A. Norton (Guest Editors). 2010. Bear Brook Watershed in Maine – The Second Decade. *Environmental Monitoring and Assessment* (in press).
- Norton, Stephen A. and Ivan J. Fernandez. 1999 (eds.). *The Bear Brook Watershed in Maine - A Paired Watershed Experiment - The First Decade (1987-1997)*. Kluwer Academic Publishers. Boston. 250 pp.

Book Chapters

Amirbahman, Aria and Ivan J. Fernandez. 2010. Mercury in Soils. In: Mercury in the Environment: Pattern and Process. Michael S. Bank (ed.). University of California Press, Berkeley, CA. (in press).

Fernandez, I.J. and M.B. Adams. 2000. Nitrogen saturation: An experimental approach at the watershed scale. In: Mickler, R., R. Birdsey, and J. Hom (eds.). Responses of Northern U.S. Forests to Environmental Change. Springer-Verlag New York Inc. pp.333-355.

Rustad, Lindsey E., Jerry M. Melillo, Myron J. Mitchell, Ivan J. Fernandez, Paul A. Steudler, and Patrick J. McHale. 2000. Effects of soil warming on carbon and nitrogen cycling. In: Mickler, R., R. Birdsey, and J. Hom (eds.). Responses of Northern U.S. Forests to Environmental Change. Springer-Verlag New York Inc. pp.357-381.

Peer Reviewed Technical Reports

Jacobson, G.L., I.J. Fernandez, P.A. Mayewski, and C.V. Schmitt (editors). 2009. Maine's Climate Future: An Initial Assessment. Orono, ME: University of Maine. 72 pp.

Jacobson, G.L., I.J. Fernandez, P.A. Mayewski, and C.V. Schmitt. 2009. Maine's Climate Yesterday, Today, and Tomorrow. Maine Policy Review Vol. 17, No. 2. pp. 16-23

Fernandez, Ivan J. 2008. Carbon and nutrients in Maine forest soils. Maine Agricultural and Forest Experiment Station Technical Bulletin 200. University of Maine, Orono, Maine. 24 pp.

Fernandez, Ivan J., Joseph E. Karem, Stephen A. Norton, and Lindsey E. Rustad. 2007. Temperature, soil moisture, and streamflow at the Bear Brook Watershed in Maine (BBWM). Maine Agricultural and Forest Experiment Station Technical Bulletin 196. University of Maine, Orono, Maine. 26 pp.

McGee, Chandra J., Ivan J. Fernandez, Stephen A. Norton and Constance S. Stubbs. 2006. Element Concentrations in Maine Forest Vegetation and Soils. Maine Agricultural and Forest Experiment Station Technical Bulletin 159. University of Maine, Orono, Maine. 25 pp.

Meyer, S.R.; R. Wagner; J. Witham; S. Norton; I. Fernandez; G.B. Wiersma; E. Small; J. Wilson; and A. Kimball. 2006. Long-term forest ecosystem studies of the Cooperative Forestry Research Unit and the University of Maine. Long-term silvicultural and ecological studies: results for science and management. Irland, Camp, Brissette, and Donohew, eds. Yale GISF, Res. Paper 005. 245 pp.

Evans, Jennifer L., Ivan J. Fernandez, Lindsey E. Rustad, and Stephen A. Norton. 2001. Methods for evaluating carbon fractions in forest soils: A review. Maine Agricultural and Forest Experiment Station Technical Bulletin 178. University of Maine, Orono, Maine. 56 pp.

Fernandez, Ivan J. and Llew Wortman. 1997. Precipitation Chemistry at the Greenville, Maine NADP/NTN Station 1980 - 1995. Maine Agricultural and Forest Experiment Station Tech. Bull. No. 164. Orono, Maine. 18 pp.

Selected Published Abstracts/Presentations (Last 12 years)

Simon, K.S., Anderson, D.S., Fernandez, I.J., Norton, S.A., Valett, H.M., and Ely, D.T. 2010. Chronic watershed nitrogen enrichment enhances phosphorus limitation of stream microbes and changes the stoichiometry of microbial enzymes. Joint meeting of the American Society for Limnology and Oceanography and the North American Benthological Society. Santa Fe, New Mexico, 10 June.

Fatemi, Farrah R., Ivan J. Fernandez, Kevin S. Simon, D. Bryan Dail, and Lindsey E. Rustad. 2009. The Effect of Nutrient Availability On Soil Extracellular Enzyme Activity and CNP Dynamics.. (Paper 113-2). Presented at the ASA-CSSA-SSSA International Meetings. Pittsburgh, PA. November 1-4.. [CD-ROM]. ASA, CSSA, SSSA, Madison, WI.

- Burke, Andrea M., Ivan J. Fernandez, Aaron Weiskittel, and Robert Wagner. 2009. Predicting differences in forest stand nutrient uptake and removal: Potential effects of increased biomass removals for energy on long-term site sustainability. (Paper 346-10). Presented at the ASA-CSSA-SSSA International Meetings. Pittsburgh, PA. November 1-4. [CD-ROM]. ASA, CSSA, SSSA, Madison, WI.
- Fatemi, Farrah R., Ivan J. Fernandez, Kevin S. Simon, and D. Bryan Dail. 2009. Soil extracellular enzyme activities as indices of microbial nutrient limitation and soil CNP dynamics. Soil Ecology Society Conference. Burlington, Vermont. July 12-15.
- SanClements, Michael D., Ivan J. Fernandez, Stephen A. Norton and Lindsey E. Rustad. 2009. Decadal responses in stream and soil Ca and Mg in an experimentally acidified watershed in the eastern United States. BIOGEOMON 2009. June 29-July 3. Helsinki, Finland.
- Norton, Stephen A., Jiří Kopáček, Tomáš Navrátil, Ivan J. Fernandez, and Aria Amirbahman. 2009. Evolution of controls on phosphorus availability in aquatic ecosystems: peri-glacial to recent times. BIOGEOMON 2009. June 29-July 3. Helsinki, Finland.
- Fatemi, Farrah R., Ivan J. Fernandez, Kevin S. Simon, D. Bryan Dail, and Lindsey E. Rustad. 2008. Response of forest soil CNP dynamics to N enrichment at the Bear Brook Watershed in Maine: Clues from extracellular enzyme activities. (Paper 596-4). Presented at the ASA-CSSA-SSSA International Meetings. Houston, Texas. October 5-9. [CD-ROM]. ASA, CSSA, SSSA, Madison, WI.
- SanClements, Michael D., Ivan J. Fernandez, Stephen A. Norton, Aria Amirbahman and Lindsey E. Rustad. 2008. Metal controls on forest floor and B horizon extractable phosphorus in forested watersheds. (Paper 596-2). Presented at the ASA-CSSA-SSSA International Meetings. Houston, Texas. October 5-9. [CD-ROM]. ASA, CSSA, SSSA, Madison, WI.
- Fernandez, Ivan J., Stephen A. Norton, Lindsey E. Rustad, G. Bruce Wiersma, and Kevin S. Simon. 2008. New challenges for the third decade of whole-ecosystem experimental manipulations at the Bear Brook Watershed in Maine (BBWM). (Paper 699-20). Presented at the ASA-CSSA-SSSA International Meetings. Houston, Texas. October 5-9. [CD-ROM]. ASA, CSSA, SSSA, Madison, WI.
- Fernandez, I.J. 2008. Carbon and nutrients in Maine forest soils. Abstract and presentation at the 11th North American Forest Soil Conference. Blacksburg, VA. p. 106.
- Fatemi, F.R., I.J. Fernandez, L.E. Rustad, K.S. Simon and S.A. Norton. 2008. The effects of N enrichment on forest CNP stoichiometry at the Bear Brook Watershed in Maine. Abstract and presentation at the 11th North American Forest Soil Conference. Blacksburg, VA. p. 66.
- SanClements, M.D., I.J. Fernandez, and S.A. Norton. 2008. Evolution of phosphorus fractions from an upland watershed to lake sediments. Abstract and presentation at the 11th North American Forest Soil Conference. Blacksburg, VA. p. 100.
- Nelson, S.J., I.J. Fernandez, J.S. Kahl. 2008. Mercury concentration and deposition in snow in eastern temperate North America. Eastern Snow Conference, Fairlee, VT, May 28-30, 2008.
- Fatemi, Farrah, Ivan J. Fernandez, Johanna Szillery, Stephen Norton and Lindsey E. Rustad. 2007. Insights from soil solutions on long-term acidification at the Bear Brook Watershed in Maine. (Paper 313-1). Presented at the ASA-CSSA-SSSA International Meetings. New Orleans, Louisiana. November 4-8. [CD-ROM]. ASA, CSSA, SSSA, Madison, WI.
- SanClements, Michael, Ivan Fernandez, Mary Beth Adams, Stephen Norton and Lindsey Rustad. 2007. Effects of long term experimental acidification on forest soil phosphorus. (Paper 347-1). Presented at the ASA-CSSA-SSSA International Meetings. New Orleans, Louisiana. November 4-8. [CD-ROM]. ASA, CSSA, SSSA, Madison, WI.
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SanClements, M.D., I.J. Fernandez, S.A. Norton, M.B. Adams, and L.E. Rustad. 2007. Soil phosphorus fractions from six acidic forested watersheds in the U.S. and Europe. Gordon Conference on Catchment Science: Interactions of Hydrology, Biology and Chemistry. Colby-Sawyer College, New London, New Hampshire. July 8-13.

Norton, S. A., J. Kopáček, I. J. Fernandez, P. Porcal, A. Amirbahman, T. Wilson, B. Lake, M. SanClements, D. Huntress. 2007. Al-Fe-DOC-P Coupling in Forested Ecosystems. Gordon Conference on Catchment Science: Interactions of Hydrology, Biology and Chemistry. Colby-Sawyer College, New London, New Hampshire. July 8-13.

Sullivan, T., C. Driscoll, B. Cosby, J. Zhai, I. Fernandez, A. Herlihy, K. Snyder, R. Stemberger, T. McDonnell, D. Moore, J. Sutherland, N. Nowicki, C. Boylen, and S. Nierzwicki-Bauer. 2007. Representativeness of Adirondack Long Term Monitoring Lakes and Recovery from Acidification. Environmental Monitoring, Evaluation and Protection in New York: Linking Science and Policy. New York State Energy Research and Development Authority. Albany, New York. November 15-16, 2007.

Kenefic, Laura, Andy Reinmann, Ivan Fernandez, and Walter Shortle. 2006. Effect of Harvest Intensity on Soil Productivity and Red Spruce Growth Response. Invited presentation at the National Workshop on Forest Productivity and Technology: Cooperative Research to Support a Sustainable and Competitive Future. Sponsored by USDA Forest Service in partnership with Agenda 2020 Technology Alliance, AF&PA, National Council for Air and Stream Improvement, US Dept. of Energy Nov. 8-9 2006, Washington, DC.

Banaitis, Michael, Cullen Wilson, and Ivan Fernandez. 2006. Temporal and Spatial Patterns in Forest Soil Response to Biosolid Amendments. (Paper 297-6) Presented at the ASA-CSSA-SSSA International Meetings. Indianapolis, Indiana. November 12-16, 2006. [CD-ROM]. ASA, CSSA, SSSA, Madison, WI.

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Fernandez, Ivan J., Stephen A. Norton and Lindsey E. Rustad. 2006. Invited keynote, The difficulty in defining long-term ecosystem response mechanisms with short-term experimental manipulations. BIOGEOMON 2006. Santa Cruz, California. June 25-30.

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Diehl, Melinda, J. Stephen Kahl, Stephen A. Norton, Ivan J. Fernandez, and Katherine E. Webster. 2006. Catchment resiliency to long-term experimental acidification at the Bear Brook Watershed in Maine, USA. BIOGEOMON 2006. Santa Cruz, California. June 25-30.

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Weaver, Jamie, John Peckenham, Laura Kenefic, Andy Reeve, and Ivan Fernandez. 2005. Mixedwood riparian forests and groundwater response to harvest intensity. Northeastern Society of American Foresters. Portland, Maine. March 17, 2005.

Diehl, Melinda, Katherine Webster, Ivan Fernandez, Steve Norton, and Steve Kahl. 2005. Controls on Surface Water Sulfate Concentrations at the Bear Brook Watersheds in Maine. Maine Water Conference. Augusta, Maine. March 2005.

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L.E. Rustad, I.J. Fernandez, S. McNulty, A. Magill. 2004. The Effects of Experimentally Elevated N on Fine Root Biomass, Chemistry, and Total Soil Respiration. The Harvard Forest LTER/NIGEC Symposium, March 29, 2004, Petersham, MA.

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Rustad, L., J.Gurevitch, M. Adams, A. Burton, M. Corre, B. Emmett, I. Fernandez, N. Lamersdorf, G. Lovett, A. Magill, H. Majdi, and W. Wessel. 2004. A Meta-Analysis of the Response of Fine Root Biomass, Fine Root Chemistry and Soil Respiration to Experimentally Elevated N Deposition in North Temperate Forest Ecosystems. Presented at the ASA-CSSA-SSSA Annual Meetings. Seattle, Washington. November 1-5, 2004. In Annual meetings abstracts [CD-ROM]. ASA, CSSA, SSSA, Madison, WI.

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Fernandez, Ivan J., Lindsey E. Rustad and Cheryl J. Spencer. 2003. Soil Sulfate dynamics reflect whole-watershed manipulations at the Bear Brook Watershed in Maine. (Abstract S07-fernandez679303-poster). Presented at the ASA-CSSA-SSSA Annual Meetings. Denver, Colorado. November 2-7, 2003. In Annual meetings abstracts [CD-ROM]. ASA, CSSA, SSSA, Madison, WI.

Rustad, Fernandez, McNulty, MaGill, and Aber. 2003. Does Elevated N Deposition Alter Fine Root Growth, Metabolism, and Turnover in North Temperate Forest Ecosystems? presented at a 'Workshop on Fine Root Turnover in Forested Ecosystems', Uppsala, Sweden, September 8-10, 2003.

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Szillery, J.E., I.J. Fernandez, S.A. Norton, A.S. White, and L.E. Rustad. 2002. Forest Type and Treatment Effects on Soil Solution Ca at the Bear Brook Watershed in Maine (BBWM). (Abstract S07-szillery100414-Oral). Presented at the ASA-CSSA-SSSA Annual Meetings. Indianapolis, Indiana. November 13, 2002. In Annual meetings abstracts [CD-ROM]. ASA, CSSA, SSSA, Madison, WI.

Shah, S.S., I.J. Fernandez, L.E. Rustad, and D.B. Dail. 2002. Forest Soil N Dynamics at a Paired Watershed Experiment in Maine. Eastern CANUSA Forest Science Conference Proceedings, Orono, Maine. p 67.

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- Norton, S. A., Fernandez, I. J., and Kahl, J. S., 2002, Acidification trends and the evolution of neutralization mechanisms through time at the Bear Brook Watershed in Maine (BBWM), USA: 4th International Symposium on Ecosystem Behavior (BIOGEOMON), Reading, England.
- Fernandez, I.J., R.A. Rustad, S.A. Norton and J.S. Kahl. 2001. Can Soil Properties Predict Lake Chemistry in Northeastern High Elevation Lakes? Agron. Abstr. Title Summary S07-Fernandez110257-P.
- Rustad, R.A. and I.J. Fernandez. 2001. Long-Term Experimental N and S Additions at BBWM Alter Linkages Among Foliar, Litterfall and Soil C. Agron. Abstr. Title Summary S07-Rustad135449-O.
- Fernandez, I.J., R.A. Rustad, J.L. Evans, S.A. Norton and J.S. Kahl. 2000. Distribution of soil N at the Bear Brook Watershed in Maine as influenced by experimental N enrichment. Agron. Abstr. p. 336.
- Fernandez, I.J., R.A. Rustad, S.A. Norton and J.S. Kahl. 2000. Does Elevated Atmospheric Deposition Cause Ca Depletion in New England Forest Soils?: Evidence from a Whole Watershed Manipulation Experiment. Agron. Abstr. p. 336-337.
- Pellerin, B., Fernandez, I., Norton, S. and Kahl, J. 2000. "Soil Aluminum Distribution in the Near-Stream Zone at the Bear Brook Watershed in Maine". Geological Society of America (GSA) Annual Meeting Abstracts, p. A-123. Nov. 13-17, Reno, NV and presented at the conference "Forestry and the Riparian Zone", University of Maine, Orono, Maine. Oct. 26.
- Evans, J.L., I.J. Fernandez, and L.E. Rustad. 1999. The response of soil C and N to forest ecosystem change. Agron. Abstr. p. 296.
- Pellerin, B.A., J.M. Kaste, I.J. Fernandez, S.A. Norton, and J.S. Kahl. 1999. Soil cation distribution in the near-stream zone of New England forested watersheds. Agron. Abstr. p. 295.
- Kahl, J. S., Norton, S. A., Handley, M., Cangelosi, J., and Fernandez, I. J., 1999, Relative changes in base cations in Maine surface waters (1982-1998): Amer. Geophy. Union Annual Mtg., Boston.
- Kaste, J., Norton, S. A., Fernandez, I. J., and Hess, C. T., 1999, Delivery of cosmogenic beryllium-7 to forested ecosystems in Maine: Geol. Soc. America Ann Mtg., Denver, CO.
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- Rustad, L.E., J.M. Melillo, P.J. McHale, P.A. Steudler, I.J. Fernandez, K.M. Newkirk, C.E. Catricala, M.J. Mithcell, and F. Bowles. 1998. Experimental soil warming effects on C and N dynamics in northeastern U.S. forest soils. Agron. Abstr. p. 295.
- Kaste, J.M., S.A. Norton, and I.J. Fernandez. 1998. Dynamics of Beryllium-7 in Forested Ecosystems. Abstract #50757. Geological Society of America Annual Meeting, Toronto. Canada.
- Fernandez, I.J., J.A. Simmons, and R.D. Briggs. 1998. Indices of forest floor nitrogen status along a regional climate gradient in Maine, USA. Abstract
- Fernandez I.J., M.B. Adams and Rustad, L.E.. 1997. Soil nitrogen fractions in eastern U.S. forested watersheds. Agron. Abstr. p. 279.
- Norton, S.A., J.S. Kahl, and I.J. Fernandez. 1997. Aquatic effects of acidic precipitation - The recent Maine story. 3rd EMAP Res. Symp. Developing the Tools to Meet the Nation's Monitoring Needs: The Evolution of EMAP. Albany, NY.

Grant History (Last 12 years)

Andrew S. Nelson, Robert G. Wagner, Michael E. Day, Ivan J. Fernandez
Silvicultural effects on environmental conditions and resulting aboveground productivity and carbon sequestration of northeastern mixedwood forests
 Northeastern States Research Cooperative - Theme 3 (Forest Productivity and Forest Products) - \$38,350

Kevin S. Simon, H. Maurice Vallett, Ivan J. Fernandez, Stephen A. Norton, Mary Beth Adams
COLLABORATIVE RESEARCH: Interactive effects of chronic N deposition, acidification and phosphorus limitation on coupled element cycling in streams.
 National Science Foundation - \$522,857

Ivan J. Fernandez, Stephen A. Norton, Lindsey E. Rustad
LTREB: Biogeochemical Mechanisms of Response in the Third Decade of Whole-Ecosystem Experimental Manipulations at the Bear Brook Watershed in Maine (BBWM)
 National Science Foundation - \$442,027

Ivan J. Fernandez and Laura S. Kenefic
*Soil-Site Influences on Northern White-Cedar (*Thuja occidentalis*) Stem Quality and Growth*
 USDA Forest Service – Northern Stations Research Cooperative - \$60,000

Ivan J. Fernandez, Stephen A. Norton, Aria Amirbahman, Lindsey E. Rustad, and Bernard J. Cosby, Jr.
Mechanisms Controlling Metal and Phosphorus Dynamics in an Experimentally Acidified Watershed in Maine
 National Science Foundation - \$535,500

Stephen A. Norton, Aria Amirbahman, and Ivan J. Fernandez
Abiotic Controls on the Trophic Status of Oligotrophic Surface Waters
 National Science Foundation - \$850,135

Ivan J. Fernandez
Biogeochemical Effects of N-Viro Soil Amendments in a Northeastern Forested Ecosystem: Phase II
 Soil Preparation, Inc., Plymouth, Maine - \$148,739

Ivan J. Fernandez, Lindsey E. Rustad, Stephen A. Norton
LTREB: Forest Ecosystem Response to Changes in Atmospheric Chemistry and Climate at the Bear Brook Watershed in Maine (BBWM)
 National Science Foundation - \$294,980

Ivan J. Fernandez
Does Elevated Nitrogen Deposition Induce Phosphorus Deficiency in North Temperate Forest Ecosystems?
 USDA Forest Service – Northern Stations Research Cooperative - \$101,419

Ivan J. Fernandez and Lindsey E. Rustad
Forest Ecosystem Response to Single and Multiple Drivers of Global Environmental Change
 USDA Forest Service - \$63,280

Ivan J. Fernandez, Laura Kenefic and Wallace Shortle
Effect of Harvest Intensity on Soil Productivity and Red Spruce Growth Response
 USDA Forest Service - \$93,692

Ivan J. Fernandez and Lindsey E. Rustad
Does Elevated N Deposition Alter Fine Root Growth, Metabolism and Turnover
 USDA Forest Service - \$359,000

Ivan J. Fernandez
Assessment of extent to which intensively-studied lakes are representative of the Adirondack Mountain region

E&S Environmental Chemistry, Inc., Corvallis, Oregon - \$57,861

Ivan J. Fernandez

Biogeochemical Effects of N-Viro Soil Amendments on Soils in a Northeastern Forested Ecosystem

Soil Preparation, Inc., Plymouth, Maine - \$124,514

David Hollinger, John D. Aver, Bryan Dail, Ivan J. Fernandez, Stewart M. Goltz, Eric A. Davidson, Monique LeClerc, and Herman C. Sievering

Impact of Canopy Nitrogen Deposition on Forest Carbon Storage: A Manipulative Experiment at the Howland AmeriFlux Site

U.S. Department of Energy - \$62,932

Peter M. Groffman, Louis V. Verchot, Christopher Potter, Mary Beth Adams, Ivan Fernandez, and Lindsey Rustad

Effects of N Deposition on Gaseous N Loss from Temperate Forest Ecosystems

U.S. Environmental Protection Agency - \$894,361

J.S. Kahl, I.J. Fernandez, S.A. Norton, B. Wiersma, G. Jacobson, D. Manski, T. Haines, L.E. Rustad, C. Roman, and R. Lent

Effects of Sulfur and Nitrogen on Forest and Aquatic Ecosystems in Maine

EPA/NPS DISPro - \$515,106

Ivan J. Fernandez

Effects of Sulfur and Nitrogen on Forest and Aquatic Ecosystems in Maine

USDA Forest Service - \$43,000

Stephen A. Norton, Ivan J. Fernandez, and Charles T. Hess

Beryllium Biogeochemistry in a Forested Ecosystem

National Science Foundation - \$59,958

Ivan Fernandez, Lindsey Rustad, Steven A. Norton, and J. Stephen Kahl

Does Elevated Nitrogen and Sulfur Deposition Lead to Net Base Cation Losses in Northern New England Forest Soils?

National Science Foundation - \$179,997

J.S. Kahl, I.J. Fernandez, D. Mageean, S. Ballard, J. Cosby, S.A. Norton, P. Ludwig, and L.E. Rustad

Linking Watershed-Scale Indicators of Changes in Atmospheric Deposition to Regional Response Patterns

U.S. Environmental Protection Agency - \$623,395

Ivan Fernandez, Mary Beth Adams, Lindsey Rustad

Nitrogen Cycling in Northeastern Forested Watersheds

U.S. Forest Service - \$104,357

Ivan J. Fernandez

Clean Air Status and Trends Network in Maine

Environmental Science and Engineering, Inc. - \$60,412

Andrew Carpenter, Ivan Fernandez, Cheryl Spencer

Factors Influencing the Effectiveness of Manufactured Topsoil Containing Pulp Sludge as a Growing Medium

International Paper - \$123,143

Stephen A. Norton, Ivan J. Fernandez, Jeffrey S. Kahl

A Catchment Scale Response to Increased Deposition of N and S at the Bear Brook Watershed in Maine

U.S. Environmental Protection Agency - \$549,958