

## CURRICULUM VITAE

Sarah J. Nelson

Senator George J. Mitchell Center for  
Environmental and Watershed Research  
5710 Norman Smith Hall  
University of Maine  
Orono, ME 04469-5710

E-mail: sarah.nelson@umit.maine.edu  
Office phone: (207) 581-3454  
Fax: (207) 581-3320

### Education

Ph.D. in Ecology and Environmental Sciences, University of Maine, Orono, August 2007  
Advisors: Cynthia S. Loftin and Jeffrey S. Kahl  
Committee: Kathleen C. Weathers, Ivan J. Fernandez, Katherine E. Webster  
Dissertation: Winter contribution to annual throughfall inputs of mercury and tracers at Acadia National Park, Maine

M.S. in Ecology and Environmental Sciences – Water Resources, University of Maine, Orono, May 2002  
Advisor: Jeffrey S. Kahl  
Thesis: Determining atmospheric deposition inputs to two small watersheds at Acadia National Park

B.A. in Art History, Columbia University, New York, NY, October 1994 (cum laude)

### Professional Appointments

Assistant Research Professor, Senator George J. Mitchell Center for Environmental and Watershed Research, University of Maine, Orono, August 2008 - present

Acadian Internship Coordinator, Quebec Labrador Foundation/Atlantic Center for the Environment, July 2010-August 2010; ongoing as part of SERC Institute funding

Assistant Scientist, Senator George J. Mitchell Center for Environmental and Watershed Research, University of Maine, Orono, July 2003-August 2008

Fitz Eugene Dixon Fellow, Acadia Partners for Science and Learning, 2007-2008

Interim PEARL Coordinator, Senator George J. Mitchell Center for Environmental and Watershed Research, University of Maine, Orono, January 2003-July 2003

Intern, Field Office, Congressman John Baldacci, Bangor, Maine, June 2002-August 2002

Research Associate and Assistant Scientific Coordinator, Senator George J. Mitchell Center for Environmental and Watershed Research, University of Maine, Orono, April 2001-July 2003

Research Assistant, Water Research Institute, University of Maine, Orono, September 2000-April 2001

Graduate Research Assistant, Water Research Institute, University of Maine, Orono, February 1999-September 2000

Laboratory Aide, Water Research Institute, University of Maine, Orono, November 1998-February 1999

### **Honors and Awards**

Emerge Maine class of 2010, leadership training for women

Schoodic Research Fellow, 2008-2009: Are we under-estimating mercury burdens in winter soils? A case study at Schoodic Peninsula, Acadia National Park, Maine

Fitz Eugene Dixon Fellow, Acadia Partners for Science and Learning, 2007-2008

L.L. Bean Acadia Research Fellow, 2006: How much is enough? Developing a citizen-based monitoring plan for mercury in paired gauged watershed streams at Acadia National Park

Canon National Park Science Scholar, 2003: Closing the loop on hydrologic and mass balances for a temperate forested park

Poster Awards: Association of Graduate Students Research Expo 2002, Maine Water Conference 2000

### **Synergistic Activities**

Convener, Mercury in Acadia and northeast protected areas: A working group charged with developing research priorities that address natural resource managers' questions about mercury in the environment, April 2011. In collaboration with NPS-ARD, NPS-Acadia, SERC Institute

Lead Scientist, Acadia Learning project, 2007-present

Consultant (including convening a UMaine team), National Park Service. 2011. Scientific Assessment of Yellowstone National Park Winter Use.187p.

Consultant to Science Advisor for National Park Service, Fall 2010

Consultant, National Park Service-Air Resources Division, Mercury science at Acadia outreach and coordination initiative ([Fact Sheet](#), [Video podcast](#), [Webpage content](#)), summer 2010

Steering committee member, Acadian Internship in Regional Conservation and Stewardship, 2010-present

Steering committee member, Downeast and Acadian Initiative, 2010-present

Maine Water Conference, Science Program Chair, 2010-2011

Co-convener, AGU fall meeting (2 sessions regarding mercury biogeochemistry), December 2009

Public access to Acadia National Park Data initiatives: Acadia Science Web site team leader, 2010-present; Acadia Web Portals working group, coordinator, 2009-2010; Acadia Learning web site supervisor, 2010

Board member, Maine Lakes Conservancy Institute, 2007-2010

January Intersession for High School Students at Schoodic Education and Research Center - Winter watershed geochemistry field class: factors affecting mercury in winter soils, January 2008

Co-Chair, Landscape Change session, Maine Water Conference, 2007

January Intersession for High School Students at Schoodic Education and Research Center - Winter watershed geochemistry field class: Geochemical signatures across the landscape, January 2007

Appalachian Trail Environmental Monitoring Program, Water Quality Working Group, 2006-present

Guest editor (with co-editor J.S. Kahl), Environmental Monitoring and Assessment special issue, 2007: Mercury and nitrogen biogeochemistry in paired watershed studies at Acadia National Park, Maine, USA. Volume 126, Numbers 1-3

Coordinator, University of Maine Mercury Research Group, 2006-2008

Northeast Temperate Network Water Quality Monitoring Workgroup, 2006

Acadia Research Opportunities Catalog Physical Sciences Panel, 2006

Maine Water Conference Organizing Committee, 2004-present

Co-chair, Maine Water Conference, 2004

Coordinator, Watershed Research Group, University of Maine, 2001-2005

Co-editor (with K.B. Johnson), Maine Water Conference: Abstract Guide and Conference Program, 2002

Data coordinator, New England Governors and Eastern Canadian Premiers' Acid Rain Steering Committee, 2001-2002

Co-editor (with J. M. Peckenham and J.S. Kahl) Proceedings: Planning for water use and water availability in Maine in a changing climate, July 26, 2000.

### Refereed Journal Publications

Godsey, S.E., J.W. Kirchner, M. Palucis, H. de Wit, B.L. Skjelkvåle, W. Aas, C. Neal, M. Neal, **S.J. Nelson**, S. Kahl, S. Norton, I. Fernandez, I. Malcolm, D. Tetzlaff, C. Soulsby, I. Dennis, T. Clair. 2010. Generality of Fractal  $1/f$  Scaling in Catchment Tracer Time Series, and its Implications for Catchment Travel Time Distribution. *Hydrological Processes* 24(12):1660-1671.

Navrátil, T., S.A. Norton, I.J. Fernandez, **S.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. Monit. Assess.* 171:3-21.

**Nelson, S.J.**, I.J. Fernandez, J.S. Kahl, 2010. Mercury concentration and deposition in snow in eastern temperate North America. *Hydrological Processes* 24: 1971-1980.

**Nelson, S.J.**, 2009. Mercury in snow at Acadia National Park reveals watershed dynamics. *Park Science*, 26(1): 35-38.

**Nelson, S.J.**, K.B. Johnson, K.C. Weathers, C.S. Loftin, I.J. Fernandez, J.S. Kahl, D.P. Krabbenhoft, 2008. A comparison of winter mercury accumulation at forested and no-canopy sites measured with different snow sampling techniques. *Appl. Geochem.*, 23(3), 384-398.

Kahl, J.S., **S.J. Nelson**, et al., 2007. A conceptual framework for control of stream water geochemistry by landscape factors, Acadia National Park, USA. *Environ. Monit. Assess.*, 126 (1-3): 9-25.

Schauffler, M., **S.J. Nelson**, J.S. Kahl, G.L. Jacobson Jr., T.A. Haines, W.A. Patterson III, K.B. Johnson, 2007. Paleoecological assessment of watershed history in PRIMENet watersheds at Acadia National Park, USA. *Environ. Monit. Assess.*, 126 (1-3): 39-53.

**Nelson, S.J.**, K.B. Johnson, J.S. Kahl, T.A. Haines, I.J. Fernandez, 2007. Mass balances of mercury and nitrogen in burned and unburned forested watersheds at Acadia National Park, Maine, USA. *Environ. Monit. Assess.*, 126 (1-3): 69-80.

Peckenham, J.M., J.S. Kahl, **S.J. Nelson**, K.B. Johnson, T.A. Haines, 2007. Landscape Controls on Mercury in Streamwater at Acadia National Park, USA. *Environ. Monit. Assess.*, 126 (1-3): 97-104.

Dupont, J., T.A. Clair, C. Gagnon, D.D. Jeffries, J.S. Kahl, **S.J. Nelson**, J.M. Peckenham, 2005. Estimation of critical loads of acidity for lakes in northeastern United States and eastern Canada. *Environ. Monit. Assess.*, 109(1-3): 275-292.

Kahl, J.S., **S.J. Nelson**, J.L. Stoddard, S.A. Norton, T.A. Haines, 2004. Lakewater Chemistry at Acadia National Park, Maine, in Response to Declining Acidic Deposition, in *Protecting our Diverse Heritage: The Role of Parks, Protected Areas, and Cultural Sites. Proceedings of the George Wright Society/National Park Service Joint Conference, April 14-18, 2003, San Diego, CA.* David Harmon, Bruce M. Kilgore, Gay E. Vietzke, eds. The George Wright Society, Hancock, MI. pp. 314-321.

Campbell, J.L., J.W. Hornbeck, M.J. Mitchell, M.B. Adams, M.S. Castro, C.T. Driscoll, J.S. Kahl, J.N. Kochenderfer, G.E. Likens, J.A. Lynch, P.S. Murdoch, **S.J. Nelson**, and J.B. Shanley, 2004. Input-output budgets of inorganic nitrogen for 24 forest watersheds in the northeastern United States: A review. *Water Air Soil Pollut.* 151: 373-396.

### **Invited Scholarly Papers and Talks**

**Nelson, S.J.**, 2010. Finding mercury in Maine: Local, regional, and global influences. Husson University Environmental Club lecture series, March 30, 2010.

**Nelson, S.J.**, 2009. Finding mercury in Maine: Local, regional, and global influences. Maine Maritime Academy lecture series, Dec. 7, 2009.

Kahl, J.S., **S. Nelson**, A. Baumann, and B. McDowell, 2009 (invited). Long-term trends in lake chemistry in the northeastern U.S. and indicators of recovery from acidic deposition. EPA LTM/TIME workshop, Penn State, June, 2009.

**Nelson, S.J.**, I.J. Fernandez, J.S. Kahl, 2008. Mercury concentration and deposition in snow in eastern temperate North America. *Proceedings of the 65<sup>th</sup> Annual Eastern Snow Conference, Fairlee, VT, May 28-30, 2008*, pp. 73-86.

**Nelson, S.J.**, P.D. Vaux, Mary-Jane James-Pirri, C. Schmitt, 2008. Benchmarks for assessing the condition of natural resources in National Park Units: the challenges of heterogeneous data. Boston Harbor Islands Science Symposium, October 3, 2008.

**Nelson, S.J.**, I. Fernandez, S. Norton, B. Wiersma, L. Rustad, J.S. Kahl, 2008. The Bear Brook Watershed in Maine: Long-term research supporting climate change inquiry. Hydroclimatic effects on ecosystem response: participant workshop, Syracuse, NY, September 19, 2008.

**Nelson, S.J.**, K.B. Johnson, J.S. Kahl, I.J. Fernandez, 2006. Watershed mercury geochemical fluxes integrate landscape factors in long-term research watersheds. *New*

England Interstate Water Pollution Control Commission 2006 Northeast Regional Mercury Science & Policy Conference, Newport, RI, April 26-27, 2006.

Kahl, J.S., **S. Nelson**, A. Grygo, 2004. Surface water chemistry data for the northeastern US for interpreting climate and acid rain trends. Northeast Ecosystems Research Consortium meeting, Durham, NH, October, 2004.

**Nelson, S.J.**, J.S. Kahl, I.J. Fernandez, K.B. Johnson, 2002. Patterns in N and Hg processing in Lakes and streams across Maine. NERAQC (Northeast Regional Air Quality Committee) Annual Meeting, June 4-5, 2002, Hubbard Brook Experimental Forest Station, NH.

Vidito (**Nelson**), **S.J.**, J.S. Kahl, I.J. Fernandez, S.A. Norton, B. Wiersma, G. Jacobson, 2001. Inferring regional patterns and responses in N and Hg biogeochemistry using gauged paired watersheds at Acadia National Park. PRIMENet Annual Meeting, November 5-8, 2001, Hawaii-Volcanoes National Park, HI.

Vidito (**Nelson**), **S.J.**, J.S. Kahl, S.A. Norton, I.J. Fernandez, C. Cronan, A. White, D. Manski, T.A. Haines, L. Rustad, K. Weathers, 2001. Watershed Inputs: Wet-only, Bulk, and Throughfall Chemistry at Acadia. ARIA (Aquatic Research at Acadia) March 27, 2001, Bar Harbor, ME.

Vidito (**Nelson**), **S.J.**, J.S. Kahl, I.J. Fernandez, C. Cronan, A. White, 2000. The Evolution of Streamwater Chemistry as a Function of Landscape Controls on Deposition Inputs. ARIA (Aquatic Research at Acadia), Orono, ME.

### **Contributed Scholarly Papers and Talks**

Loftin, C.S., A.J.K. Calhoun, **S.J. Nelson**, A. Elskus, K. Simon. Influences on mercury bioaccumulation in wood frogs developing in seasonal woodland pools in Maine, USA. Submitted for consideration as an oral presentation at The 10th International Conference on Mercury as a Global Pollutant (ICMGP), July 24-29, 2011.

Zoellick, B., **S. Nelson**, B. Bisson, M. Schaffler. Watershed Studies in Schools: Supporting Student Understanding of Systems Concepts. Presented at the Maine Water Conference, Augusta, Maine, March 16, 2011.

Webber, H., B. Bisson, **S. Nelson**, B. Zoellick. Engaging teachers and students in landscape-scale research while supporting improved science education: Investigating eels – an expansion of the Acadia Learning project. Penobscot Science Exchange Spring Meeting, March 4, 2011.

Zoellick, B., **S. Nelson**, T. Johnston, Y. Davis. Making sense of observations and data: Integrating explicit instruction in working with data into science education. Maine Center for Research in STEM Education, 2010 National Summer Conference, June 21, 2010.

**Nelson, S.,** B. Zoellick, E. Lindsey, E. Sherman. Dragonfly larvae as indicators for mercury in the Northeast: interdisciplinary citizen science research. Dragonfly Society of the Americas 2010 Annual Meeting, June 24-27, 2010.

Zoellick, B., T. Johnson, **S. Nelson.** Making Sense of Observation and Data (Graphs are Not Just for Math Class): Integrating explicit instruction in working with data into science education. Integrating Science and Mathematics Education Research into Teaching National Conference University of Maine, Orono, Maine, June 21, 2010.

**Nelson, S.,** P. Vaux, B. Zoellick. No such thing as pristine: mercury in Maine waters and northeast National Parks. Maine Water Conference, Augusta, ME, March 17, 2010.

Loftin, C., A. Calhoun. **S. Nelson (presenter),** A. Elskus, K. Simon. Does mercury bioaccumulate in amphibians developing in vernal pools? Northeastern/Southeastern Geological Society of America meeting, Baltimore, MD, March 13-16, 2010.

Johnston, T., **S.J. Nelson.** Dealing with data. Workshop for high school teachers. Bangor, ME, Jan. 30, 2010

**Nelson, S.J.,** B. Zoellick, Y. Davis. Acadia Learning Program. Workshop for high school teachers, Winter Harbor, ME, 2009

**Nelson, S.J.** Tracking mercury through Maine ecosystems -- and people. Career and Technical Education Teachers workshop, Schoodic Education and Research Center, June 29, 2009; Madison High School, March 9, 2010.

Zoellick, B., **Nelson, S.J.** The Acadia Learning Project. Presented at No Question Left Behind: Bringing Guided-Inquiry Curricula into Science and Mathematics Classrooms. June 22 – 23, 2009, Schoodic Education and Research Center, Winter Harbor, Maine

**Nelson, S.J.,** N. Kamman, D. Krabbenhoft, J.S. Kahl, K. Webster, 2008. Evaluating spatial patterns in mercury and methyl mercury in northeastern lakes: Landscape setting, chemical climate, and human influences. Northeastern Ecosystem Research Cooperative Conference, Durham, NH, November 12-13, 2008.

**Nelson, S.J.,** C.S. Loftin, A. Calhoun, A. Elskus, K. Simon, P. Vaux. Growing up in the wrong neighborhood? Mercury in vernal pool amphibians at Acadia National Park. Northeast Regional Air Quality Committee Meeting (NERAQC), Winter Harbor, ME, Sept. 24, 2008.

**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.

**Nelson, S.J.** 2008. Evaluating spatial patterns in mercury and methyl mercury in northeastern lakes: landscape setting, chemical climate, and human influences. Maine Water Conference, Augusta, ME, March 19, 2008.

Kahl, S., K. Webster, D. Sassan, C. Rosfjord, **S. Nelson**, M. Greenawalt-Yelle, 2007. Increasing Cl in northeastern surface waters: an indicator of increasing development pressure. Maine Water Conference, Augusta, ME, March 21, 2007.

**Nelson, S.J.**, K.B. Johnson, D.P. Krabbenhoft, C.S. Loftin, K.C. Weathers. 2006. Deposition, re-emission, and evasion: snow sampling provides estimates of mass fluxes in winter at Acadia National Park, Maine, USA. Eighth International Conference on Mercury as a Global Pollutant, Madison, WI, August 6-11, 2006.

**Nelson, S.J.**, K.C. Weathers, K.B. Johnson, J.S. Kahl. 2005. Does Vegetation Matter? Mercury Deposition at Acadia National Park, Maine. Maine Water Conference, Augusta, ME, March 22, 2005.

Grygo, A., P. Vaux, **S. Nelson**, K. Tonnessen, D. Manski. 2005. Sharing the Wealth: Information exchange among research watersheds, George Wright Society Meeting Abstract, March 14-18, 2005, Philadelphia, PA, p. 134.

Peckenham, J.M., B. Mower, J.S. Kahl, **S.J. Nelson**. 2004. Geochemical associations of background mercury concentrations in Maine rivers. National Atmospheric Deposition Program 2004 Scientific Symposium and Annual Technical Committee Meeting, Halifax, Nova Scotia, September 21-24, 2004.

**Nelson, S.J.**, J.S. Kahl, I.J. Fernandez, B. Gawley, K.B. Johnson, S.A. Norton, K.E. Webster. 2003. Maine's Lakes and Research Watersheds: Indicators of Response to the Clean Air Act. Maine Water Conference, April 16, 2003, Augusta, ME.

Vidito (**Nelson**), **S.J.**, J.S. Kahl, S.A. Norton, I. J. Fernandez, C. Cronan, A. White, D. Manski, T.A. Haines, L. Rustad, K. Weathers. 2001. Coupling throughfall chemistry with landscape assessment: determining relative rates of atmospheric deposition at Acadia National Park. Maine Water Conference, May 3, 2001, Augusta, ME.

### **Invited Field Lectures and Public Presentations**

**Nelson, S.J.**, 2011. Finding mercury across the Northeast: local, regional, and global influences. Stevens High School, Claremont NH, January 28, 2011.

**Nelson, S.J.**, Soukup, M., Lindsey, E. 2010. WERU Radio – Talk of the Towns. Community Science: Schoodic Education and Research Center links researchers, school teachers and students. November 12, 2010. Available: <http://archives.weru.org/talk-of-the-towns/talk-of-the-towns-111210>

**Nelson, S.J.**, 2009. Tracking mercury through Maine ecosystems and people; Macroinvertebrate identification and life history. Hancock County Tech Center. October 29, 2010.

**Nelson, S.J.**, 2009. Tracking mercury through Maine ecosystems -- and people. Lewiston High School. February 23, 2009.

**Nelson, S.J.**, J.S. Kahl, 2008. Tracking mercury through snow, rain, heat, and gloom of night: What do Acadia's forests have to do with it? Schoodic Education and Research Center "Second Saturdays" lecture series, January 12, 2008.

**Nelson, S.J.**, 2007. Studying mercury in snow at Acadia National Park, Maine, USA. Keynote lecture, Canon National Envirothon, Geneva, NY, August 3, 2007.

**Nelson, S.J.**, K.B. Johnson. 2006. Acadia National Park paired research catchments. For Bates College class, "Valuation of Human-Altered Ecosystems", Northeast Harbor, ME, May 3, 2006.

Kahl, J.S., **S. Nelson**, K. Johnson, 2005. Perception experiment: paired watershed research at Acadia National Park. Gordon Research Conference field trip, July 20, 2005.

**Nelson, S.J.**, 2005. Modeling atmospheric deposition using GIS techniques, INT527. University of Maine, Orono, Maine, November 14, 2005.

**Nelson, S.J.**, J.S. Kahl, I.J. Fernandez, B. Gawley, K.B. Johnson, S.A. Norton, K.E. Webster, 2003. Patterns in N and Hg processing in lakes and streams across Maine. College of the Atlantic, Bar Harbor, ME, May 30, 2003.

**Nelson, S.J.**, J.S. Kahl, S.A. Norton, I. J. Fernandez, T.A. Haines, D. Manski, 2002. PRIMENet Research – Paired Watersheds at Acadia. Resource Acadia Seminar (Presentation for residents of the Acadia area), June 22, 2002, Acadia National Park Resource Management, Bar Harbor, ME.

Vidito (**Nelson**), **S.J.**, Johnson, K.J., 2000. Watershed controls on nitrogen and mercury – field methods and data analysis. Eagle Hill Field Seminar, How Watersheds Work; The Interactions of Hydrology, Geology, and Biology, July 23-29, 2000, Humbolt Center, ME.

## Poster Presentations

**Nelson, S.J.**, C. Chen, H. Roebuck, B. Zoellick. Sensible sentinels: Preliminary mercury data for dragonfly nymphs (*Odonata: anisoptera*) across northern New England corroborate expected spatial pattern. Submitted for consideration as a poster presentation at The 10th International Conference on Mercury as a Global Pollutant (ICMGP), Halifax, NS, July 24-29, 2011.

**Nelson, S.J.**, Zoellick, B., Davis, Y., Lindsey, E., 2009. The Acadia Learning Project: Lessons Learned from Engaging High School Teachers and Students in Citizen Science Supporting National Parks. American Geophysical Union Fall Meeting, Dec. 14-18, 2009, San Francisco, CA.

**Nelson, S.J.**, K.B. Johnson, 2009. Are We Under-Estimating Mercury in Soils? Experimental Acidification and Sample Collection Timing Demonstrate Variability in Estimates of Mercury in O-Horizon Soils at a Maine Site. American Geophysical Union Fall Meeting, Dec. 14-18, 2009, San Francisco, CA.

**S.J. Nelson**, J.S. Kahl, N.C. Kamman, D.P. Krabbenhoft, W.H. Halteman, 2009. Predicting mercury concentrations in northeast lakes using hydrogeomorphic features, landscape setting and chemical co-variates. Gordon Research Conference, Forested Catchments, July 12-17, 2009, Proctor Academy, NH.

**Nelson, S.**, K. Johnson, B. Zoellick, R. Ahearn, A. Chenevert, J. Dolan, A. Jarrett, N. Jimenez, N. Jimenez, C. Keen, I. Macomber, K. Stenberg, S. Buraceski, 2007. Does melting snow contribute mercury to vernal pools? Student-led research in the Schoodic Watershed. Student research poster, Dixon awards ceremony, August 5, 2007.

**Nelson, S.J.**, K.C. Weathers, C.S. Loftin, K.B. Johnson, J.S. Kahl, 2005. Pick your season: under-estimation (summer) and over-estimation (winter) of total mercury deposition by MDN collection methods at Acadia National Park, Maine. National Atmospheric Deposition Program 2005 Scientific Symposium and Annual Technical Committee Meeting, Jackson, Wyoming, September 27-30, 2005.

**Nelson, S.J.**, K.C. Weathers, K.B. Johnson, J.S. Kahl, 2004. Seasonal patterns and total deposition of mercury at Acadia National Park, Maine: relationships to MDN monitoring data. National Atmospheric Deposition Program 2004 Scientific Symposium and Annual Technical Committee Meeting, Halifax, Nova Scotia, September 21-24, 2004.

Grygo, A., J.S. Kahl, K.E. Webster, C. Loftin, K. Tonnessen, **S.J. Nelson**, 2004. Development of the SPARC Database for National Park Watershed Research: Searchable Park Access to Research Catchments. Maine Water Conference, 2004.

**Nelson, S.J.**, J.S. Kahl, J.L. Campbell, C. Goodale, J. Stoddard, L.E. Rustad, S.W. Bailey, J. Kellogg, 2003. Can forest fires affect nitrogen retention for centuries? Patterns of nitrogen flux in a chronosequence of burned watersheds. Gordon Research Conference – Catchment Science, July 20-25, 2003, New London, NH.

**Nelson, S.J.**, K.E. Webster, J.S. Kahl, K.B. Johnson, 2003. The Effects of Increasingly Variable Climate and Disturbance History on Episodic Acidification at a Coastal Maine Site, USA. American Geophysical Union Chapman Conference on Ecosystem Interaction with Land Use Change, June 14-18, 2003, Santa Fe, NM.

**Nelson, S.J.**, K.B. Johnson, J.S. Kahl, J. Hepinstall, 2002. Sulfate and mercury deposition at Acadia National Park: integrating enhancement ratios, wet deposition, and landcover data. Association of Graduate Students Research Expo, April 22, 2002, Orono, ME.

Vidito (**Nelson**), **S.J.**, J.S. Kahl, I. J. Fernandez, S.A. Norton, C. Cronan, A. White, D. Manski, 2001. Modification of atmospheric inputs at Acadia National Park, Maine: the relative influence of landscape factors. Gordon Research Conference – Forested Catchments, July 2001, Concord, NH.

Vidito (**Nelson**), **S.J.**, J.S. Kahl, I.J. Fernandez, S.A. Norton, C.S. Cronan, A.S. White, D. Manski, 2000. Landscape factors and riparian zones: Modification of atmospheric inputs in a paired watershed study at Acadia National Park, Maine. Graduate Research Exposition April 10-12, 2001, Orono, ME.

Vidito (**Nelson**), **S.J.**, J.S. Kahl, I. J. Fernandez, C. Cronan, A. White, 2000. The Relative Importance of Landscape Factors: Linkages between Atmospheric Deposition and Stream Export in Contrasting Watersheds at Acadia National Park, Maine. Gordon Research Conference - Environmental Sciences: Water, Holderness, NH.

Vidito (**Nelson**), **S.J.**, J.S. Kahl, I.J. Fernandez, S.A. Norton, T.A. Haines, 1999. N and Hg Biogeochemistry in Paired Watersheds at Acadia National Park, ME. Gordon Research Conference – Forested Catchments, Concord, NH.

### **Research Reports from Grant or Contract Work**

Zoellick, B., M. Schaufler, **S. Nelson**. 2011. Acadia Learning: Data Literacy. Interim Progress Report to Maine Department of Education – Year One, March 14, 2011.

Zoellick, B., **S. Nelson**, Y. Davis. 2011. Professional Partnership and Praxis: A program to connect teachers and working scientists in support of citizen science and student inquiry. Report to Maine Department of Education - Year Three, January 26, 2011.

Kahl, J.S., W. McDowell, **S. Nelson**, K. Webster. 2010. Determining the effectiveness of the Clean Air Act and Amendments on the recovery of surface waters in the northeastern US (IAG 06HQGR0143). Annual Report to USGS WRD WRRI, Reston, VA; US EPA, CAMD, Washington DC; and US EPA, ORD, Corvallis OR, March, 2010.

Zoellick, B., B. Bisson, **S. Nelson**, 2010. Acadia B-WET: a partnership to help teachers engage students in sustained, project-oriented investigations of the American eel (*Anguilla rostrata*) in Gulf of Maine watersheds. NOAA Office of Education Semi-Annual Project Progress Report, December 2010.

Vaux, P., **S.J. Nelson**. 2010. KnowledgeBase On-Line Bibliographic and Dataset Catalogue: Maintenance and Update of AcadiaScience.org Web site. Report to National Park Service, December 2010.

**Nelson, S.J.** 2010. The Acadian Internship in Regional Conservation and Stewardship: Large landscape conservation training and service for the next generation of public, private and non-profit conservation leaders. Report to Quebec-Labrador Foundation/Atlantic Center for the Environment, August 2010. 61 pp.

Vaux, P., **S.J. Nelson**, M.J. James-Pirri, and G. Giese. 2010. Assessment of natural resource conditions in and adjacent to Cape Cod National Seashore, Massachusetts. Natural Resource [Technical] Report NPS/XXXX/ NRXX—20XX/XXX. National Park Service, Fort Collins, Colorado. in final prep.

James-Pirri, M.J., **S.J. Nelson**, and P.D. Vaux. July 2010. Natural Resource Assessment for Saugus Iron Works National Historic Site. Natural Resources Report NPS/NER/NRR—2010/XXX. National Park Service. Boston, MA, in press.

Zoellick, B., **S.J. Nelson**, Y. Davis, 2009. Report on year 2: Professional Partnership and Praxis - A program to connect teachers and working scientists in support of citizen science and student inquiry. Report to Maine Department of Education, October, 2009.

**Nelson, S.J.**, K.B. Johnson, 2009. Are we under-estimating mercury in soils? Experimental acidification and sample collection timing demonstrate variability in estimates of mercury in O-horizon soils at a Maine site. Final report to Acadia Partners for Science and Learning and Acadia National Park.

**Nelson, S.J.**, S. Kahl, D.P. Krabbenhoft, N.C. Kamman, 2009. Evaluating spatial patterns in mercury and methyl mercury in northeastern lakes: landscape setting, chemical climate, and human influences. Final technical report to NSRC.

**Nelson, S.J.**, 2009. Mercury concentrations in northeast lakes predicted using landscape features, landscape setting, and water chemistry. Final "Project Impacts" report to NSRC.

Kahl, J.S., W. McDowell, **S. Nelson**, K. Webster. 2009. Determining the effectiveness of the Clean Air Act and Amendments on the recovery of surface waters in the northeastern US (IAG 06HQGR0143). Annual Report to USGS WRD WRRI, Reston, VA and US EPA, ORD, Corvallis OR, January, 2009.

Vaux, P.D., **S.J. Nelson**, N. Rajakaruna, G. Mittelhauser, K. Bell, B. Kopp, J. Peckenham, G. Longworth, 2008. Assessment of natural resource conditions in and adjacent to Acadia National Park, Maine. Natural Resource Report NPS/NRPC/WRD/NRR—2008/069. National Park Service, Fort Collins, Colorado.

Kahl, J.S., K. Webster, W. McDowell, **S. Nelson**. 2008. Determining the effectiveness of the Clean Air Act and Amendments on the recovery of surface waters in the northeastern US (IAG 06HQGR0143). Annual Report to USGS WRD WRRI, Reston, VA and US EPA, ORD, Corvallis OR, May, 2008.

**Nelson, S.J.**, K.B. Johnson, E.A. Dziezyk, J.S. Kahl, 2007. Determining trends in water chemistry for two salmon rivers and their small tributaries, 1985-2006. Final Report to the Maine Atlantic Salmon Commission.

**Nelson, S.J.**, K. Johnson, C. Schmitt, May, 2007. How much is enough? Developing a citizen-based monitoring plan for mercury in gauged watershed streams at Acadia National Park. Report to the L.L. Bean Acadia Research Fellows Program.

**Nelson, S.J.**, J. S. Kahl, I. J. Fernandez, K. D. Sheehan, A. Grygo Diamond, K. B. Johnson, K. C. Weathers, February, 2007. Final Report: Understanding atmospheric deposition to complex landscapes at Acadia National Park, Maine, 2002-2005. National Park Service, Northeast Region, Technical Report NPS/NER/NRTR-2007/080.

**Nelson, S.J.**, August 2006. Quicksilver from the skies: mercury in snow at Acadia National Park. Acadia Partners Report 2006-01. Published online:  
[http://www.acadiapartners.org/pubs/Nelson\\_Report.pdf](http://www.acadiapartners.org/pubs/Nelson_Report.pdf)

Rosfjord, C.H., J.S. Kahl, K. Webster, **S. Nelson**, I. Fernandez, L. Rustad, R. Stemberger, 2006. Final Report: Acidic deposition-relevant changes in lake chemistry in the EPA Eastern Lake Survey, 1984-2004. Submitted to USDA NSRC.

**Nelson, S.J.**, P. Vaux, A. Grygo, R. Hallsworth, D. Kramar , January 31, 2006. Final Project Report: Searchable Park Access to Research Catchments (SPARC). National Park Service report.

**Nelson, S.J.**, J.S. Kahl, K.B. Johnson, J. Boothroyd, August, 2005. Final Report: Are road de-icing salts a factor in the chemistry of salmon rivers? 2004 Maine Atlantic Salmon Conservation Fund.

**Nelson, S.J.**, J.S. Kahl, (editors) 2003. Final Integrated Report: Establishing paired gauged watersheds at Acadia National Park for long-term research on acidic deposition, nitrogen saturation, forest health, and mercury biogeochemistry (1998-2002). Submitted to US EPA and National Park Service.

Peckenham, J., J.S. Kahl, **S.J. Nelson**, 2002. Lake Water Chemistry Trends in New England. Report to the New England Governors-Eastern Canadian Premiers Water Quality Workgroup.

Dupont, J., Clair, T.A., Couture, S., Estabrook, R., Gagnon, C., Godfrey, P.J., Jeffries, D.S., Kahl, S., **Nelson, S.**, Peckenham, J., Pilgrim, W., Stacey, P., Taylor, D., Van Arsdale, A., 2002. WARNING NETWORK: Changes in Water Quality in New England and Eastern Canada. Produced on behalf of the New England Governors and Eastern Canadian Premiers' Acid Rain Steering Committee.

Dupont, J., S. Kahl, **S. Nelson**, J. Peckenham, C. Gagnon, J. Choate, T.A. Clair, D.S. Jeffries, D. Taylor, 2002. Critical loads of acidity and water sensitivity in New England states

and Eastern Canadian provinces. Produced on behalf of the New England Governors and Eastern Canadian Premiers' Acid Rain Steering Committee.

### **Current Research Funding**

National Science Foundation (\$1,485,330) *Biogeochemical Controls on Altered Nitrogen Cycling in the Third Decade of Whole-Watershed Simulated N Deposition* (I. Fernandez, J. MacRae, S. Norton, L. Rustad, K. Simon)

US EPA (\$202,227) *Determining the effectiveness of the Clean Air Act and Amendments on the recovery of surface waters in the northeastern US* (IAG 06HQGR0143) (W. McDowell, J.S. Kahl, **S.J. Nelson**)

Acadian Internship Coordinator (~\$14,000). Supplemental funding to **S. Nelson** from SERC Institute (2010) and Quebec-Labrador Foundation (Summer 2011).

Maine Department of Education, Title IIB Mathematics and Science Partnership (\$100,000) *Acadia Learning - Phase II: Data Literacy* (B. Zoellick, M. Schaufler, **S. Nelson**)

NOAA B-WET (\$261,000) *Acadia B-WET: a partnership to help teachers engage students in sustained, project-oriented investigations of eel population and distribution in coastal watershed systems* (B. Zoellick, B. Bisson, **S. Nelson**)

National Oceanic and Atmospheric Administration, 2009-2011 (\$500,000), Acadia Partners Program Expansion in Learning, Research, and Understanding Natural Science (B. Zoellick, S.J. Nelson, B. Bisson)

University of Maine Mitchell Center, 2010 and 2011 (\$5500/year), Maine Water Conference Science Program Chair funding (**S. Nelson**)

National Park Service, 2008-2011 (\$60,000). Development of a Natural Resource Stewardship Strategy for Boston Harbor Islands National Park Area. (P. Vaux, J. Craddock, **S. Nelson**)

National Park Service, 2007-2011 (\$150,000), Assessment of natural resources and watershed conditions in three National Parks: Cape Cod National Seashore, Boston Harbor Islands, and Saugus Ironworks (P. Vaux, M.J. James-Pierre, **S. Nelson**, C. Schmitt, P. Godfrey)

### **Prior Funding**

U.S. Geological Survey, 2003-2011 (\$1,019,125), Determining the effectiveness of the Clean Air Act and Amendments for the recovery of surface waters in the northeastern US (J.S. Kahl, W. McDowell, **S. Nelson**, K. Webster)

NOAA-Sea Grant development (seed) funds 2010 (\$200 + match), *Preliminary comparison of mercury concentrations in wild and farm-raised shrimp* (**S.J. Nelson, C. Schmitt**)

National Park Service (\$4,700) *KnowledgeBase On-Line Bibliographic and Dataset Catalogue* (**S. Nelson, P. Vaux**)

U.S. Geological Survey, 2009-2010 (\$6,000), *Supplemental funding for mainframe migration Determining the effectiveness of the Clean Air Act and Amendments for the recovery of surface waters in the northeastern US* (**S. Nelson**)

Northeastern States Research Cooperative, 2007-2008 (\$30,000), *Evaluating spatial patterns in mercury and methyl mercury in northeastern lakes: landscape setting, chemical climate, and human influences* (**S. Nelson, J.S. Kahl, D. Krabbenhoft, N. Kamman**)

Maine Department of Education, 2009-2010 (\$25,000), *Professional Partnership and Praxis: Connecting Teachers, Working Scientists, and College Education Faculty to Attain New Learning Results* (B. Zoellick, **S. Nelson, Y. Davis**)

Schoodic Research Fellowship Program, 2008-2009 (\$5,000) *Are we under-estimating mercury burdens in winter soils? A case study at Schoodic Peninsula, Acadia National Park, Maine* (**S. Nelson**)

Maine Department of Education, 2008-2009 (\$75,000), *Professional Partnership and Praxis: Connecting Teachers, Working Scientists, and College Education Faculty to Attain New Learning Results* (B. Zoellick, **S. Nelson, Y. Davis**)

Fitz Eugene Dixon Fellowship, Acadia Partners for Science and Learning, 2007-2008 (\$10,000), *Pilot studies of mercury in vernal pools at Acadia National Park* (**S. Nelson**)

US DOI, National Park Service, 2008 (\$8,000), *Assessment of Natural Resources and Watershed Conditions in and Adjacent to Acadia National Park (continuation of funding (\$50,000) for additional work products)*(P. Vaux, **S. Nelson**)

National Park Service, 2006-2007 (\$50,000), *Assessment of natural resources and watershed conditions in and adjacent to Acadia National Park* (P. Vaux, **S. Nelson, J. Peckenham, K. Bell, N. Rajakaruna, G. Mittelhauser, B. Kopp**)

Maine Department of Education, 2007-2008 (\$106,000), *Professional Partnership and Praxis: Connecting Teachers, Working Scientists, and College Education Faculty to Attain New Learning Results* (B. Zoellick, G. Saunders, **S. Nelson, et al.**)

Maine Atlantic Salmon Commission, 2004-2007 (\$40,000), *Determining trends in water chemistry for two salmon rivers and their small tributaries, 1985-2006* (**S. Nelson, K. Johnson**)

Maine Atlantic Salmon Commission, 2006 (\$15,000), *Do water sampling techniques affect aluminum speciation?* (K. Johnson, **S. Nelson**)

L.L. Bean Acadia Research Fellowship, 2006 (\$5,000), *How much is enough? Developing a citizen-based monitoring plan for mercury in paired gauged watershed streams at Acadia National Park* (**S.J. Nelson**)

Davis Conservation Foundation, subcontract via Acadia Partners for Science and Learning, 2006 (\$1,500), *Funds awarded to support a study of data quality produced by citizen monitoring as a complement to L.L. Bean-funded project, below* (**S.J. Nelson**)

USGS Mercury Research Lab, 2004-06, *In-kind award for analysis of 50 samples for isotopic and total mercury analyses to support the project: Does mercury migrate from soils to snowpack?* (**S.J. Nelson**, D. P. Krabbenhoft, K.B. Johnson, J.S. Kahl)

Canon National Parks Science Scholarship, 2003 (\$78,000), *Closing the loop on hydrologic and mass balances for a temperate forested park* (**S.J. Nelson**)

National Park Service, 2003 (\$20,000), *Servicewide Park Research Collaborative (SPaRC) for gauged watersheds* (J.S. Kahl, P. Vaux, **S. Nelson**)

U.S. Department of Agriculture/Northeastern States Research Cooperative, 2003 (\$99,000), *Evaluating scope and trends for the base cation decline in surface waters of the northeastern US* (J.S. Kahl, J. Stoddard, R. Church, **S. Nelson**, L. Rustad, K. Webster, I. Fernandez, R. Stemberger)

Margaret E. Burnham Charitable Trust, 2003 (\$1,500), *Funds awarded to purchase GIS software and present water research maps on the Web* (**S.J. Nelson**)

National Park Service, 2002. *Natural Resources Challenge-NRPP (\$340,000), Correlating predictive contaminant deposition maps with streamwater chemistry at Acadia National Park. Project PMIS Number 75017.* (J.S. Kahl, **S.J. Nelson**, I.J. Fernandez)

Association of Graduate Students, University Alumni Association, and Professional Employees Advisory Council Travel and Research Grants, 1999-2006 (12 grants)

### **Miscellaneous Publications**

**Nelson, S.J.**, C.V. Schmitt. 2011. Safe, Sustainable Seafood: A Study of Mercury in Shrimp. Maine Sea Grant Research in Focus series. In press.

**Nelson, S.J.**, B. Zoellick, T. Johnston, M. Schauffler. 2009-2011. Assessment instrument for data literacy (Dragonfly Survey). Administered to 300+ high school students. In validation as part of ongoing data literacy research.

Web site development for Acadian Internship, [acadianinternship.wordpress.com](http://acadianinternship.wordpress.com)

Web site development for Acadia Learning Project, [acadialearning.org](http://acadialearning.org)

Image-based key to identification of dragonfly larvae, web site developed and supervision of undergraduate web designer. See <http://parkcitizenscience.org/dragonfly/>

Zoellick, B, **Nelson, S.**, Davis, Y. 2010 (version 2). Teachers' Guides to Mercury in Maine's People and Ecosystems. A series of six curriculum units, published online, [www.acadialearning.org](http://www.acadialearning.org).

Zoellick, B, **Nelson, S.**, Davis, Y. 2009. Teachers' Guides to Mercury in Maine's People and Ecosystems. A series of six curriculum units, published online, [www.acadialearning.org](http://www.acadialearning.org).

**Nelson, S.J.**, B. Zoellick. 2009. Mercury in the Foodweb: Guiding Students Through Inquiry. Maine Stream Team Newsletter, Spring 2009.

*Mapping/GIS contributions:*

- Senator George J. Mitchell Center for Environmental & Watershed Research. 2008. Lower Penobscot River Map & Field Guide. Orono, ME: University of Maine.
- Maine Sea Grant Kiosk poster. 2007. Water Quality in Kenduskeag Stream.
- Maine Sea Grant Kiosk poster. 2007. The Penobscot River Watershed.

## Workshops

B. Bisson, **S. Nelson**, H. Webber, M. Schaffler, B. Zoellick. Teacher summer institute: Watershed Studies and Data Literacy, in prep. For June 27-July 1, 2011.

B. Zoellick, M. Schaffler, **S.J. Nelson**. Series of data literacy workshops for science teachers. Statewide (Maine), 2010-2011.

B. Bisson, B. Zoellick, **S. Nelson**, H. Webber. Series of science education workshops for teachers participating in Acadia B-WET (Acadia Learning), 2010-2011.

T. Johnston, **S.J. Nelson**. Dealing with data. Workshop for high school teachers. Bangor, ME, Jan. 30, 2010.

**S.J. Nelson**, B. Zoellick, Y. Davis. Acadia Learning Program. Workshop for high school teachers, Winter Harbor, ME, 2009.

**S.J. Nelson**, B. Zoellick, Y. Davis. Career and Technical Education Teachers workshop, Schoodic Education and Research Center, June 29, 2009.

**S.J. Nelson**, B. Zoellick, Y. Davis. Mercury and Human Health. Workshop for high school teachers, Brunswick, ME, November 14, 2008.

**S.J. Nelson**, B. Zoellick, K. Johnson, Y. Davis. Schoodic Summer Academy: Mercury. Workshop and field course for high school teachers, Unity College, Unity, ME, August 19-20, 2008.

Schoodic Summer Academy, Intertidal Ecology. Amy Philippi, Unity College. Assisted and made presentations. June 17-20, 2008.

### **Professional Affiliations**

American Geophysical Union, Member Biogeosciences Section, 2002-present  
American Association for the Advancement of Science, 2006-2008  
Ecological Society of America, 2003

### **Institutional Service**

Special seminar (C. Eagles-Smith, USGS) organizer, UMaine SSI and School of Biology and Ecology, 2011; Professional Employees Advisory Council (Subcommittees: Nominations, Professional Development Survey), 2002-2005; Association of Graduate Students, Grant Review Committee, 2002-2003; Associate of Graduate Students, Vice President, 2001-2002; Search Committees: Outreach and Development Coordinator, Environmental Chemistry Lab Director, Associate Dean for Students and Community Life, 2001-2002; Graduate Student Representative to the University of Maine Faculty Senate (Subcommittee: University Environment), 2001-2002; Health Insurance Subcommittee of the Association for Graduate Students, 2001-2002; Student Employment Advisory Council, 2000-2002; University of Maine Fitness Center Feasibility Committee, 2001-2002

### **Outreach Activities and Community Service not listed above**

Emerge Maine class of 2010

Canon National Envirothon final presentation judge, August, 2007

MDI Water Quality Coalition student mentor, 2006-2007

Skowhegan High School Environmental Chemistry Water Project mentor, 2006

Chair and Comprehensive Plan Committee Liaison, Planning Board, Town of Clifton, Maine, 2003-2005

ESRI Grant recipient and GIS coordinator, Town of Clifton, 2004

Member, Planning Board, Town of Clifton, Maine, 2001-2005

Northern Maine Children's Water Festival Volunteer, October 2002, 2004

**Research training, certification, and permits:**

UMaine IACUC for Acadia B-WET (S. Nelson, lead), approved 2010

UMaine IRB and Human Subjects Research training (S. Nelson, lead), approved 2011

National Park Service permits for research at Acadia National Park (several permits issued 1999-2010), Marsh Billings Rockefeller National Historic Park (2010)

New Hampshire Fish and Game permit for collection of macroinvertebrate specimens (2010)

**Reviewer for the following journals/agencies:** National Park Service, Air Resources Division; Acadia National Park Resource Management; Environmental Pollution; Environmental Monitoring and Assessment; Environmental Science and Technology; Geochimica et Cosmochimica Acta, National Fish and Wildlife Foundation; USGS Maine Water Research Institute grants program; Atmospheric Chemistry and Physics

**Graduate Committees:** Lauren Brown (M.S., spring 2010, Civil & Environmental Engineering, University of Maine); Melinda Diehl (Ph.D., expected 2011, Ecology & Environmental Sciences, University of Maine); M.J. Jones (M.S.T., expected 2011, University of Maine)