

## **Dr. Sarah J. Nelson**

Director of Research, Appalachian Mountain Club; (603) 466-8149; snelson@outdoors.org

### **Relevant Experience**

Dr. Nelson's research focuses on understanding the effects of atmospheric pollution and climate change on forests, foodwebs, and freshwaters in remote and protected ecosystems. She studied snow deposition hydrology and geochemistry at Acadia National Park and currently works on several projects focused on changing winters and shifting seasonality in forested ecosystems and remote lakes.

### **Education**

University of Maine, Ecology and Environmental Sciences, Ph.D. 2007

University of Maine, Ecology and Environmental Sciences–Water Resources, M.S. 2002

Columbia University, Art History, B.A. 1994

### **Professional Appointments**

Director of Research, Appalachian Mountain Club, 2019–

Director, Program in Ecology and Environmental Sciences, University of Maine, 2015–2019

Associate Research Professor, School of Forest Resources, University of Maine, 2014– 2019

Assistant Research Professor, multiple departments (Senator George J. Mitchell Center for Environmental and Watershed Research, School of Forest Resources, Department of Plant, Soil, and Environmental Sciences), University of Maine, 2008 – 2014

### **Selected Recent Publications** (\* indicates student or intern author)

Willacker, J.J., C.A. Eagles-Smith, S.J. Nelson, C.M.F. Pritz, D. Krabbenhoft, 2023. The influence of short-term temporal variability on the efficacy of dragonfly larvae as mercury biosentinels. *Science of the Total Environment*, p.161469.

Gavin, A.L.\*, S.J. Nelson, J. Saros, M. SanClements, I.J. Fernandez, 2023. Depth Moderates DOC Impact on Cold-Water Refugia in Small, Northern Temperate Lakes. *Water Resources Research*, 59(6), p.e2022WR033430.

Dykema, S.\*, S.J. Nelson, R. Hovel, J.E. Saros, I.J. Fernandez, K.E. Webster, 2022. Biogeochemical shifts and zooplankton responses in post-CAAA northeastern lakes: The success of acid recovery, complexity of biological recovery, and value of long-term monitoring. *Atmospheric Environment*, p.119514. <https://doi.org/10.1016/j.atmosenv.2022.119514>

Burakowski, E.A., A.R. Contosta, D. Grogan, S.J. Nelson, S. Garlick, N. Casson, 2022. The future of winter in northeastern North America: climate indicators portray continued or accelerated warming and loss of snow that will impact ecosystems and communities, *Northeastern Naturalist* 28(SI11), 180-207.

S.J. Nelson, R. Hovel, J. Daly, A. Gavin\*, S. Dykema\*, W. McDowell, 2021. Northeastern mountain ponds as sentinels of change: current and emerging research and monitoring in the context of shifting chemistry and climate interactions. *Atmospheric Environment*, 264, p.118694.

Murray, G.L.D., A.M. Colgan\*, S.J. Nelson, E. Kelsey, K.D. Kimball, 2021. Climate trends on the highest peak of the Northeast: Mount Washington, NH, *Northeastern Naturalist* 28(SI11): 64-82.

Eagles-Smith, C.A., J.J. Willacker, S.J. Nelson, C.M. Flanagan Pritz, D.P. Krabbenhoft, C.Y. Chen, J.T. Ackerman, E.H. Campbell Grant, D.S. Pilliod, 2020. A national-scale assessment of mercury bioaccumulation in us national parks using dragonfly larvae as biosentinels through a citizen science framework. *Environmental Science and Technology*; 54, 14, 8779–8790.

Nelson, S.J., C.Y. Chen, J.S. Kahl, 2020. Dragonfly larvae as biosentinels of Hg bioaccumulation in Northeastern and Adirondack lakes: relationships to abiotic factors. *Ecotoxicology*, 29: 1659–1672.

Patel K.F.\*, C. Tatariw, J.D. MacRae, T. Ohno, S.J. Nelson, I.J. Fernandez, 2020. Snowmelt periods as hot moments for soil N dynamics: A case study in Maine, USA. *Environ. Monit. Assess.*, 192, 777.

Contosta, A.R., N.J. Casson, S.J. Nelson, S. Garlick, 2020. Defining frigid winter illuminates its loss across seasonally snow-covered areas of eastern North America. *Environ. Res. Lett.*, 15(3), p.034020.

Contosta, A.R., N.J. Casson, S. Garlick, S.J. Nelson, M.P. Ayres, E.A. Burakowski, J. Campbell, I. Creed, C. Eimers, C. Evans, I. Fernandez, C. Fuss, T. Huntington, K. Patel, R. Sanders-DeMott, K. Son, P. Templer, C. Thornbrugh, 2019. Northern forest winters have lost cold, snowy conditions that are important for ecosystems and human communities. *Ecological Applications*, 29(7), p.e01974.

Patel K.F.\*, C. Tatariw, J.D. MacRae, T. Ohno, S.J. Nelson, I.J. Fernandez, 2018. Soil C and N responses to snow removal and concrete frost in a coniferous Maine forest. *Canadian Journal of Soil Science*.

Gavin, A.L.\*, S.J. Nelson, A.J. Klemmer, I.J. Fernandez, K.E. Strock, W.H. McDowell, 2018. Acidification and Climate Linkages to Increased Dissolved Organic Carbon in High-Elevation Lakes. *Water Resources Research* 54(8): 5376-5393. DOI: 10.1029/2017WR020963

### **Related Synergistic Activities**

Stakeholder engagement lead, Northeast Snow Survey, September 2023-present

Panelist, US EPA CASTNet Review Panel, March 2023-present

Co-lead Mountain Ponds team, Natural Areas & Mountain Environmental Science (NAMES) Research Initiative, 2022-present

Guest Editor, Special Issue, *Northeastern Naturalist*, Climate Change in Maine and Northeast Mountain Ecosystems (10 papers), 2021–2022.

Member, Forest Climate Change Initiative, 2018–present. Included co-organizing session at Maine Sustainability and Water Conference, 2019 and planning webinar series (2020).

Team member, SESYNC Pursuit: Winter Weather Whiplash: Developing Indices of Extreme Winter Weather Variability and Socio-Ecological Responses. 2017–2019.

### **Experience in citizen (community) science and STEM education:**

- Founder of the Dragonfly Mercury Project (DMP), which engages citizen scientists (>5,000 to date) in collection of dragonfly larvae for mercury analysis in national parks
  - Watkins, T., A.J. Miller-Rushing, S.J. Nelson, 2018. Science in Places of Grandeur: Communication and Engagement in National Parks. *Integrative and comparative biology* 58(1): 67–76.
- Teacher professional development re: mercury, snowpack and climate, data literacy, 2007-present.

### **Communications:**

- Secured funding and co-mentor Climate Communications Fellow, AMC, 2023-2024
- Serve on White Mountain Climate Communications working group, 2021-present
- Online storymap: Nelson, S.J., and Poppenwimer, C. 2022. The Merrimack Dragonfly Mercury Project. Connecting people to place and tracking mercury in the Merrimack River Watershed. ArcGIS Online, <https://bit.ly/Merrimack-DMP>. ResearchGate, DOI: [10.13140/RG.2.2.10663.83360](https://doi.org/10.13140/RG.2.2.10663.83360)