April M. Melvin, PhD

Board on Atmospheric Sciences & Climate and Polar Research Board
The National Academies of Sciences, Engineering, and Medicine
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SUMMARY STATEMENT

- Biogeochemist and ecosystem ecologist with over 10 years of experience researching climate change and pollution effects on terrestrial ecosystems, including boreal forest in Alaska.
- Policy professional with expertise coordinating studies of climate change impacts in Alaska and the broader Arctic, including potential damages to public infrastructure; contributor to climate change consensus studies at the National Academy of Sciences.

EDUCATION

Ph.D. 2012 Cornell University, Program in Biogeochemistry
Dept. of Ecology & Evolutionary Biology, Ithaca NY

B.S. 2003 University of Rochester, Ecology & Evolutionary Biology, *cum laude*, Rochester NY

PROFESSIONAL EXPERIENCE

2018 – present **Program Officer**
Polar Research Board & Board on Atmospheric Sciences & Climate
National Academies of Sciences, Engineering, and Medicine, Washington DC

2016 – 2017 **Associate Program Officer**
Polar Research Board & Board on Atmospheric Sciences & Climate
National Academies of Sciences, Engineering, and Medicine, Washington DC

2014 – 2016 **Science & Technology Policy Fellow**
sponsored by American Association for the Advancement of Science (AAAS)
hosted by Climate Change Division, U.S. Environmental Protection Agency, Washington DC

2012 – 2014 **Postdoctoral Research Associate**
Circumpolar Ecosystem Ecology, Dept. of Biology, University of Florida, Gainesville FL

2011 **Mirzayan Science Policy Fellow**
Board on Atmospheric Sciences & Climate, National Academy of Sciences, Washington DC

2005 – 2012 **Cornell Graduate Fellow, Teaching Assistant, and NYSERDA-EMEP Fellow**
Dept. of Ecology & Evolutionary Biology, Cornell University, Ithaca NY

2004 – 2005 **Research Assistant**
Boyce Thompson Institute for Plant Research, Cornell University, Ithaca NY

2003 – 2004 **Associate in Research**
Nicholas School of the Environment, Duke University, Durham, NC

PEER-REVIEWED PUBLICATIONS

Melvin A.M., Celis, G., Johnstone, J.F., McGuire, A.D., Genet, H., Schuur, E.A.G., Rupp, T.S., Mack, M.C. 2018. Fuel-reduction management alters plant composition, carbon and nitrogen pools, and soil thaw in Alaskan boreal forest. *Ecological Applications*, **28**(1): 149-161.

Melvin A.M., Murray, J., Boehlert, B., Martinich, J.A., Rennels, L., and Rupp., T.S. 2017. Estimating wildfire response costs in Alaska's changing climate. Climatic Change Letters, **141**(4): 783–795.

Melvin A.M., Larsen, P., Boehlert, B., Neumann, J.E., Chinowsky, P., Espinet, X., Martinich, J., Baumann, M., Rennels, L., Bothner, A., Nicolsky, D. J., and Marchenko, S.S. 2016. Climate change damages to Alaska public infrastructure and the economics of proactive adaptation. *Proceedings of the National Academy of Sciences* **114**(2): E122-E131.

Melvin, A. M., Sarofim, M.C., Crimmins, A.R. 2016. Climate benefits of U.S. EPA programs and policies that reduced methane emissions 1993-2013. *Environmental Science & Technology* 50: 6873-6881.

Melvin, A.M., Mack, M.C., Johnstone, J.F., McGuire, A.D., Genet, H., Schuur, E.A.G. 2015. Differences in ecosystem carbon distribution and nutrient cycling linked to forest tree species composition in a mid-successional boreal forest. *Ecosystems* 18: 1472-1488.

Melvin, A.M., Lichstein, J.W., and Goodale, C.L. 2013. Forest liming increases forest floor carbon and nitrogen stocks in a mixed hardwood forest. *Ecological Applications* **23**(8): 1962-1975.

Genet, H., McGuire, A.D., Barrett, K., Breen, A., Euskirchen, E.S., Johnstone, J.F., Kasischke, E.S., **Melvin, A.M.**, Bennett, A., Mack, M.C., Rupp, T.S., Schuur, E.A.G., and Turetsky, M.R., Yuan, F. 2013. Modeling the effects of fire severity and climate warming on active layer thickness and soil carbon storage of black spruce forests across the landscape in interior Alaska. *Environmental Research Letters* 8: 045016.

Melvin, A.M., and Goodale, C.L. 2013. Tree species and earthworm effects on soil nutrient distribution and turnover in a Northeastern U.S. common garden. *Canadian Journal of Forest Research* **43**(2): 180-187.

Levine, C.R., Yanai, R.D., Vadeboncoeur, M.A., Hamburg, S.P., **Melvin, A.M.**, Goodale, C.L., Rau, B.M., Johnson, D.W. 2012. Assessing the suitability of using rotary corers for sampling cations in rocky soils. *Soil Science Society of America Journal* **76**(5): 1707-1718.

Rau, B.M., **Melvin, A.M.**, Johnson, D.W., Goodale, C.L., Blank, R.R., Fredriksen, G., Todd, D.E. Jr., Miller, W.W., Murphy, J.D., Walker, R.F. 2011. Revisiting soil C and N sampling: quantitative pits vs. rotary cores. *Soil Science* **176**(6): 273-279.

Moslemi, J.M., Capps, K.A., Johnson, M.S., Maul, J., McIntyre, P.B., **Melvin, A.M.**, Vadas, T.M., Vallano, D.M., Watkins, J.M., and Weiss, M. 2009. Training tomorrow's environmental problem solvers: an integrative approach to graduate education. *BioScience* **59**(6): 514-521.

Vadas, T.M., Fahey, T.J., Sherman, R.E., Demers, J.D., Grossman, J.M., Maul, J.E., **Melvin, A.M.**, O'Neill, B., Raciti, S.M., Rochon, E.T., Sugar, D.J., Tonitto, C., Turner, C.B., Walsch, M.J., and Xue, K. 2007. Approaches for analyzing local carbon mitigation strategies: Tompkins County, New York, USA. *International Journal of Greenhouse Gas Control* **1**(3): 360-373.

COMMUNICATION and POLICY DOCUMENTS

2016: Methane and Black Carbon Impacts on the Arctic: Communicating the Science (coordinating author)

2016: U.S. Interagency Arctic Research Policy Committee (IARPC) Arctic Research Plan: FY2017-2021 (contributing author to permafrost chapter)

2015: EPA regional climate change websites (lead author)

2015: U.S. National Black Carbon and Methane Emissions report to the Arctic Council (contributing author)

2011: Climate Modeling 101 website (contributing author), http://nas-sites.org/climate-change/climatemodeling/

MEDIA INTERVIEWS for Alaska climate change and infrastructure research

Arctic Deeply, February 21, 2017, https://www.newsdeeply.com/arctic/articles/2017/02/21/what-will-it-cost-for-the-north-to-adapt-to-a-changing-climate

Alaska Dispatch News, February 9, 2017, https://www.adn.com/alaska-news/environment/2017/02/09/climate-change-to-be-costly-to-alaskas-public-infrastructure-study-says/

Climatewire, January 4, 2017, reprinted in Scientific American, https://www.scientificamerican.com/article/alaska-faces-up-to-5-5-billion-in-climate-damage-by-2100/

SELECT PRESENTATIONS

Climate Change impacts in Vermont. 2017. Vermont Humanities Council, Belmont VT (invited)

Estimating the costs of climate change: infrastructure damage and proactive adaptation in Alaska. 2017. NOAA/NOS Science Seminar, Silver Spring MD (invited)

Estimating the costs of climate change: infrastructure damage and adaptation in Alaska. 2017. Week of the Arctic, Fairbanks AK (invited)

Climate change damages to Alaska public infrastructure and the economics of proactive adaptation. IARPC Staff Group Meeting, Washington DC (invited)

Climate change risks to Alaska public infrastructure: improved estimates of damages and the economics of proactive adaptation. 2016. U.S. Dept. of State, Arctic Policy Group, Washington DC (invited)

Quantification of physical and economic impacts of climate change on public infrastructure in Alaska and benefits of global greenhouse gas mitigation. 2015. American Geophysical Union annual meeting, San Francisco CA

Nutrient cycling in mid-successional Alaskan boreal forest. 2013. American Geophysical Union annual meeting, San Francisco CA

Forest management effects on carbon, permafrost, and plant successional trajectories in interior Alaska. 2013. International Boreal Forest Research Association, Edmonton, Alberta, Canada

Effects of fire management on vegetation, carbon storage, and permafrost thaw. 2013. Alaska Fire Science Consortium webinar.

Calcium fertilization alters forest carbon stocks in unexpected ways. 2011. INTERFACE/CLIMMANI Workshop, Reykjavik, Iceland (invited)

OUTREACH and TEACHING

OUTREACH ACTIVITIES

2017: Public lecture, Climate Change in Your Backyard. Mt. Holly Library, VT
2013: Congressional Climate Science Day: spoke with staffers about climate change in the U.S.
2013: Wildfires in Alaska: worked with 2 students on a semester-long class project. Talbert Middle School, CA
2006: Pollution and Ecosystem Health presentation. Black River High School, VT
2006: Cycles in the Biosphere presentation. Newfield High School, NY

TEACHING ASSISTANT

2010, 2007: Ecology and the Environment, Cornell University
2008: Evolutionary Biology, Cornell University
2007: Ecosystem Biology, Cornell University

LEADERSHIP EXPERIENCE

2015-present: Co-leader, AAAS Arctic Change Affinity Group
2015: Co-organizer, AAAS Energy/Climate Affinity Group Symposium
2013: Undergraduate Mentor, Dept. of Biology, University of Florida
2007 – 2010: Seminar Selection Committee Member, Biogeochemistry & Environmental Biocomplexity Program, Cornell University
2007 – 2008: President, Biogeochemistry & Environmental Biocomplexity Graduate Student Association, Cornell University

FELLOWSHIPS and GRANTS

RESEARCH FELLOWSHIPS

2008 – 2010: New York State Energy Research and Development Authority – Environmental Monitoring, Evaluation and Protection (NYSERDA-EMEP) Fellowship
2005: Cornell Graduate Fellowship
1999 – 2003: Bausch and Lomb Science Scholarship, University of Rochester

RESEARCH GRANTS

2008: Upper Susquehanna Agricultural Ecology Program Grant
2007 – 2010: Kieckhefer Adirondack Grant (3 awards)
2006 – 2010: NSF-IGERT Biogeochemisty & Evironmental Biocomplexity Grant (3 awards)
2006: Andrew W. Mellon Foundation Grant

TRAVEL GRANTS

2010: American Geophysical Union Student Travel Grant
2010: Cornell University Research Travel Grant
2009 – 2010: Northeast Ecosystem Research Cooperative Student Travel Grant (2 awards)
2008 – 2010: Cornell University Graduate Student Conference Grant (4 awards)