

CURRICULUM VITAE

JOANNA C. CAREY, Ph.D.

Professor of Earth & Environmental Science

Andrew J. & Debi Butler Term Chair

Babson College. Division of Math, Analytics, Science & Technology. Wellesley, Massachusetts USA

NARRATIVE OF RESEARCH INTERESTS & EXPERIENCE

I am a biogeochemist investigating how anthropogenic change alters rates and controls on elemental cycling across the terrestrial–aquatic continuum. I specialize in silicon cycling and nutrient stoichiometry, specifically examining rivers and tidal marshes as integrators of watershed processes. A major emphasis of my work is Arctic biogeochemistry, where rapid warming is altering the rates and timing of material fluxes from land to sea. As a professor at a small college, much of my current research centers on team-based ecological synthesis – harmonizing disparate datasets to look at large-scale patterns of biogeochemical changes on Earth.

EDUCATION

- Ph.D. Earth Sciences, Boston University (2013)
Certificate in Terrestrial Biogeosciences. *Advisor:* Dr. Robinson W. Fulweiler
- Master of Environmental Science (MESc), Yale University (2007)
School of Forestry & Environmental Studies. *Advisor:* Dr. Shimon Anisfeld
- B.S. Environmental Policy and Planning. Minors: English and French (2005)
Virginia Polytechnic Institute & State University (Virginia Tech). *Summa Cum Laude*

PRIOR FACULTY APPOINTMENTS

- Associate Professor of Earth & Environmental Science. Babson College. Wellesley, MA. (2021 – 2026).
- Assistant Professor of Earth & Environmental Science. Babson College. Wellesley, MA. (2017 – 2021).
- Adjunct Assistant Professor of Earth & Environment. Boston University. Boston, MA. (2017 - 2025).
- Adjunct Lecturer, Division of Math and Science. Babson College. Wellesley, MA. (2014 - 2015).
- Adjunct Lecturer, Environmental Science. Roger Williams University. Bristol, RI. (2014).

POSTDOCTORAL APPOINTMENTS

- National Science Foundation Earth Science Postdoctoral Fellow (2016 - 2017)
Marine Biological Laboratory and Florida State University
- U.S. Geological Survey Powell Center Postdoctoral Fellow (2014 - 2015)
Marine Biological Laboratory, The Ecosystems Center
- Oak Ridge Institute for Science & Engineering (ORISE) Postdoctoral Fellow (2013-2014)
U.S. Environmental Protection Agency. Atlantic Ecology Division

OTHER RELEVANT WORK EXPERIENCE: *In-stream Flow and River Restoration Specialist*. Massachusetts Department of Fish & Game, Division of Ecological Restoration (2007-2009).

SHORT LIST OF KEY PUBLICATIONS

- Bush, S. A., *et al.* 2026. Thinking outside the rocks: Subsurface water storage, topography, and land cover are key modulators of large-scale riverine dissolved silicon dynamics. *Geophysical Research Letters*, 53(2).
- Johnson, K., *et al.* 2024. Establishing fluvial silicon regimes and their stability across the Northern Hemisphere. *Limnology & Oceanography Letters*.
- **Carey, J.C.** 2023. Saving Humanity: The Courage to Act on Climate Change. In “Entrepreneurial Humanities: *The Crucial Role of the Humanities in Enterprise and the Economy*”. Routledge.

- **Carey, J.C., et al.** 2022. Higher temperature sensitivity of ecosystem respiration in low marsh compared to high elevation marsh ecosystems. *J Geophysical Research–Biogeosciences*. 127 (11).
- Abbott, B.W., et al. 2022. We must stop fossil fuel emissions to protect permafrost ecosystems. *Frontiers in Environmental Science*, p.832.
- Johnston, S.E., et al. 2021. Spatial and temporal controls on Arctic riverine dissolved organic matter composition across a latitudinal gradient. *Journal of Geophysical Research - Biogeosciences*. 126 (9).
- **Carey, J.** 2020. Soil age alters the global silicon cycle. *Science*. 369 (6508): 1161-1162.
- **Carey, J.C., et al.** 2020. Arctic river dissolved and biogenic silicon exports - current conditions and future changes with warming. *Global Biogeochemical Cycles*. 34 (3).
- Huntzinger, D., et al. 2020. Evaluation of simulated soil carbon dynamics in Arctic-Boreal ecosystems. *Environmental Research Letters*. 15 (2) 025005.
- **Carey, J.C., et al.** 2019. Plant uptake offsets silica release from a large Arctic tundra wildfire. *Earth's Future*. 7, 1044–1057.
- Crowther, T.W., et al. 2018. More data but no new answers. *Nature*. 554 (7693)
- **Carey, J.C., et al.** 2017. Tundra biogenic silica storage across a latitudinal gradient. *Functional Ecology*. 31(11), 2177-2187.
- **Carey, J.C., et al.** 2016. Temperature response of soil respiration largely unaltered with experimental warming. *Proceedings of the National Academy of Sciences*. 113 (48), pp. 13797-13802.
- Crowther, T.W., et al. 2016. Quantifying global soil C losses in response to warming. *Nature*. 540 (7631), 104-108.
- Conley, D.J. and **J.C. Carey**. 2015. Biogeochemistry: Silica cycling over geologic time. *Nature Geoscience* 8 (6), 431-432.
- **Carey, J.C.** and R.W. Fulweiler. 2012. The Terrestrial Si Pump. *PLoS ONE*. 7(12): e52932.

SELECT HONORS & AWARDS

Babson College: 1) Service Award (2025), 2) Andrew J. Butler '84 and Debi Butler Term Chair (2022 – 2027), 3) Research Award (2020), 4) Presidential Innovation Fund Award (2017, 2019).

Lead or Co-PI: 1) NSF ULTRA-Data (2025 - 2028). *Developing global riverine solute regime and synchrony frameworks for understanding watershed-scale controls on river biogeochemical signals*. (\$795,851). 2) USGS Powell Center Synthesis Grant (2024 - 2026). *Are we experiencing a riverine silicon surge? Implications for the global carbon cycle*. (\$100,000). 3) MIT SeaGrant Award (2020-2021). *Pervasive Monitoring of Offshore Aquaculture Installations using Moored Profilers* (\$190,000). 4) Long-Term Ecological Research (LTER) Synthesis Working Group Award (2020 – 2024). *From poles to tropics: A multi-biome synthesis investigating the controls on river Si exports* (\$79,683). 5) AGU 100 Celebrate Grant (2019 – 2020). *The future of snow in a warmer climate: A public awareness and action campaign at ski resorts across the US*. (\$6999).

Graduate Fellowships: 1) EPA Science to Achieve Results (STAR) Fellowship (2010), 2) NOAA National Estuarine Research Reserve (NERR) Graduate Research Fellowship (2010), 3) Acadia National Park Research Fellowship (2010)

Other: 1) Peer Prize for Climate (2017), 2) Ketchum Award for Best Graduate Student Oral Presentation (2012), 3) Heinz Environmental Scholar (2006), Outstanding Undergraduate Academic Achievement Award (2005).

PROFESSIONAL SOCIETY MEMBERSHIPS

American Geophysical Union (AGU), Association for the Sciences of Limnology and Oceanography (ASLO), System Dynamics Society (SDS), National Center for Faculty Development & Diversity (NCFDD), National Center for Science & Civic Engagement (NCSCE), Coastal and Estuarine Research Federation (CERF).