

JAYNE F. KNOTT, PH.D.

Personal Information

Position: Principal/Senior Scientist
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a. Education

Ph.D. Civil & Environmental Engineering, University of New Hampshire, Durham, NH; 2019
M.S. Civil & Environmental Engineering, Massachusetts Institute of Technology, Cambridge, MA; 1981
B.A. Mount Holyoke College, South Hadley, MA; B.A. in Geology and Physics, Magna cum laude; 1978

b. Professional History

JFK Environmental Services LLC – Principal/Senior Scientist (2008-present)
University of Massachusetts Boston – Research Associate (2019-present)
University of New Hampshire – Research Scientist (2019)
University of New Hampshire - Research Assistant in the Department of Civil and Environmental Engineering (2015-2017)
Independent Environmental Consultant (1986-2008)
Environmental Research and Technology, Inc. (now AECOM) (1983-1985)
U.S. Geological Survey (1981-1983)
Massachusetts Institute of Technology/Woods Hole Oceanographic Institute – Research Assistant (1978-1981)

c. Publications Relevant to Climate Change and Hydrology

Knott, J.F.; Kirshen, P.; Douglas, E. 2022. Climate-Change Impacts on Groundwater in MAPC Communities. *GBRAG Special Report*. Boston, MA. In Press.

Pimental, K.; Rand, J.; Knott, J.; Jacobs, J. 2022. Sea Level Rise Impacts on Groundwater Levels and Water Quality: A Vulnerability and Planning Study in Durham, New Hampshire. Developed for the Town of Durham, NH. Strafford Regional Planning Commission, JFK Environmental Services LLC, University of New Hampshire, and the NH Department of Environmental Services.

Haslett, K.E.; Knott, J. F.; Stoner, A.M.K.; Sias, J.E.; Dave, E.V.; Jacobs, J. M.; Mo, W.; and Hayhoe, K. 2021. Climate change impacts on flexible pavement design and rehabilitation practices. *Road Materials and Pavement Design*.
<https://www.tandfonline.com/doi/abs/10.1080/14680629.2021.1880468>

Wake, C., Knott, J., Lippmann, T., Stampone, M., Ballestero, T., Bjerklie, D., Burakowski, E., Glidden, S., Hosseini-Shakib, I., Jacobs, J. 2019. New Hampshire Coastal Flood Risk Summary – Part I: Science. Prepared for the New Hampshire Coastal Flood Risk Science and Technical Advisory Panel. Report published by the University of New Hampshire, Durham, NH.

Knott, J.F.; Jacobs, J.M.; Sias, J.E.; Kirshen P.; Dave, E.V. 2019. A Framework for Introducing Climate-Change Adaptation in Pavement Management. *Sustainability* 2019, 11, 4382.
<https://doi.org/10.3390/su11164382>.

- Knott, J.F.; Sias, J.E.; Dave, E.V. 2019. Seasonal and Long-Term Changes to Pavement Life Caused by Rising Temperatures from Climate Change. *Transportation Research Record: Journal of the Transportation Research Board*, 2673(6), pp. 267-278.
<https://journals.sagepub.com/doi/10.1177/0361198119844249>
- Knott, J. F.; Daniel, J.S.; Jacobs, J.; Kirshen, P. 2018. Modeling Groundwater Rise Caused by Sea-Level Rise in Coastal New Hampshire. *Journal of Coastal Research*, 35(1), pp.143-157.
<https://www.jcronline.org/doi/abs/10.2112/JCOASTRES-D-17-00153.1>
- Knott, J. F., Daniel, J.S., Jacobs, J., Kirshen, P. 2018. Adaptation Planning to Mitigate Coastal Road Pavement Damage from Groundwater Rise Caused by Seal-Level Rise. *Transportation Research Record: Journal of the Transportation Research Board*, 2672 (2).
<https://doi.org/10.1177/0361198118757441>
- Jacobs, J.; Knott, J.; Durfee, E.; Mack, R.; and Pimental, K. 2017. Sea-Level Rise Impacts on Drinking Water – A Groundwater Modeling Study in Newmarket, NH. Strafford Regional Planning Commission, Rochester, NH.
http://www.strafford.org/cmsAdmin/uploads/final_groundwater-modeling-report_001.pdf
- Knott, J. F., Elshaer, M., Daniel, J.S., Jacobs, J., Kirshen, P. 2017. Assessing the effect of rising groundwater from sea-level rise on the service life of pavements in coastal road infrastructure. *Transportation Research Record: Journal of the Transportation Research Board*, No. 2639, pp. 1-10. <https://trrjournalonline.trb.org/doi/abs/10.3141/2639-01>.
- Knott, J. F., Nuttle, W.K., and Hemond, H.F. 1987. Hydrologic parameters of salt marsh peat. *Hydrological Processes*, vol.1, no. 2.
- Knott, J. F., and Olimpio, J.C. 1986. Estimation of recharge rates to the sand and gravel aquifer using environmental tritium, Nantucket, Massachusetts, *U.S. Geological Survey – Water Supply Paper 2297*.
- Hemond, H.F. and Fifield, J.L., 1982. Subsurface flow in salt marsh peat: A model and field study. *Limnology and Oceanography*, vol. 27, no.1, pp. 126-136.

e. Recent Presentations

- Groundwater Rising and Implications for Maine’s Coastal Communities. Presented at the Southern Maine Planning and Development Commission Meeting. June 16, 2021.
- A Framework for Introducing Climate Resilience into Pavement Management. Presented at the Federal Highway Administration (FHWA) Pavement Resiliency Peer Exchange Meeting, USDOT Sustainable Pavements Program. November 13, 2020, and December 17, 2020.
- A Framework for Introducing Climate-Change Adaptation in Pavement Management. Presented at Transportation Resilience 2019-An International Conference on Natural Hazards and Extreme Weather Events, Washington, D.C., November 13, 2019.
- Seasonal and Long-Term Changes to Pavement Life Caused by Rising Temperatures from Climate Change. Presented at the Transportation Research Board 98th Annual Meeting, Washington, D.C., January 13-17, 2019.
- Sea-Level Rise Impacts on Drinking Water: A Groundwater Modeling Study in Newmarket, New Hampshire. Presented at the NH Coastal Adaptation Working Group (NHCAW) Climate Summit, Greenland, NH, June 20, 2018.
- The Effects of Sea-Level Rise on Groundwater Levels in Coastal New Hampshire. Presented at the Groundwater Protection Council Annual Forum, Boston, MA, September 27-29, 2017.

f. Relevant project Experience

- Sea-level rise impacts on groundwater levels and water quality: a vulnerability and planning study in Durham, New Hampshire – Created a groundwater flow model using MODFLOW and

SEAWAT to identify waste disposal areas (including septic systems), domestic water-supply wells, and infrastructure that are vulnerable to premature failure from groundwater rise caused by sea-level-rise.

Climate-change effects on groundwater in the Greater Boston Area – Investigated the effects of climate change on aquifer recharge, groundwater levels, and stream baseflows in eastern Massachusetts.

Groundwater-flow and saltwater intrusion modeling - Used MODFLOW and SEAWAT to investigate sea-level rise impacts on groundwater levels, flow, and saltwater intrusion with implications for infrastructure, ecosystems, and water quality in NH coastal communities.

Groundwater modeling for climate-change adaptation – Modified a USGS MODFLOW model to investigate the effects of sea-level rise on groundwater levels in coastal NH and to develop and adaptation framework for coastal road infrastructure.

Groundwater fate and transport modeling - Used groundwater fate and transport modeling to evaluate remediation options at contaminated sites including Superfund sites.

Groundwater research – Designed and managed a USGS investigation to measure groundwater recharge using atmospheric tritium including well installation; the design and use of multilevel groundwater samplers, geophysical techniques, water-quality sampling, data analysis, and report writing.

Wetlands - Designed and conducted a field and laboratory study of subsurface water flow in two New England salt marshes and adapted an analytical model for the simulation of groundwater flow in the salt marsh ecosystem.

g. Affiliations

4th National Climate Assessment – Northeast Chapter Review Editor

American Society of Civil Engineers

American Society of Adaptation Professionals

Transportation Research Board

American Geophysical Union

NSF Research - Infrastructure and Climate Network Global (ICNet Global)

Environmental Business Council of New England

Cape Ann Climate Coalition

TownGreen

NH Coastal Adaptation Workgroup (NHCAW)