Ruth K. Varner
Department of Earth Sciences and Institute for the Study of Earth, Oceans and Space
University of New Hampshire, Durham, NH 03824 USA

History of Employment

Professor, Earth Systems Research Center, Institute for the Study of Earth, Oceans and Space and Department of Earth Sciences, University of New Hampshire - Durham.	9/16 – present
Director, Joan and James Leitzel Center for Mathematics, Science and Engineering Education, University of New Hampshire, Durham (sabbatical leave AY 2019-2020).	9/16 – present
Visiting Researcher in Climate and the Environment, Dept. of Physical Geography and Bolin Center for Climate Research, Stockholm University	2/20-2/21
Associate Professor	9/13-8/16
Research Associate Professor	7/10 – 8/13
Research Assistant Professor	9/03 – 7/10
Research Scientist	3/95 – 9/03
Research Technician	2/94 - 3/95

Education

Hartwick College, Oneonta, NY	Geology	**B.A.**, 1991
University of New Hampshire, Durham, NH	Earth Sciences, Hydrology	**M.S.**, 1993
University of New Hampshire, Durham, NH	Earth Sciences, Geochemistry	**Ph.D.**, 2000

Narrative of Research Experience

I specialize in trace gas emissions from terrestrial, aquatic and human-managed ecosystems. My early career focused on developing novel methods to measure very low-concentration, reactive halogenated trace gases. Over the past several decades I have established and maintained long-term measurements of methane emissions from wetlands and permafrost peatlands. I currently collaborate with microbial ecologists, remote sensing specialists, and modelers to address questions of scaling processes from regions to the globe. I integrate graduate and undergraduate students in my research and outreach. As the Director of UNH's Leitzel Center, I develop and participate in professional development for K-12 STEM teachers. I served as the Director of the NSF REU Northern Ecosystems Research for Undergraduates program. I am currently the Director of the Collaborative Links to Ocean Science and Earth Science Graduate Academic Programs (CLOSES-GAP), an NSF GEOPATHS program collaborative with minority-serving institutions to broaden participation in the geosciences by engaging undergraduate students from traditionally underrepresented groups

Select Key Publications (58 total publications, 34 in AGU journals; h-index= 30 (06/24/20); * indicates undergraduate; ° indicates graduate student):

1.**°**Perryman, C. R., McCalley, C. K., Malhotra, A., Fahnestock, M. F., Kashi, N. N., Bryce, J. G., Geisler, R., and **R.K. Varner** (2020), Thaw transitions and redox conditions drive methane oxidation in a permafrost peatland. *J. Geophys. Res.: Biogeosci.*, *124*, e2019JG005526. https://doi.org/ 10.1029/2019JG005526.

2.Contosta, A., S. Lerman, J. Xiao and **R.K. Varner** (2020) Biogeochemical and socioeconomic drivers of above- and below-ground carbon stocks in urban residential yards of a small city*, Landscape and Urban Plann., 196,* doi: 10.1016/j.landurbplan.2019.103724.

3.°Fahnestock, M.F., J.G. Bryce, C. K. McCalley, M. Montesdeoca, S. Bai, Y. Li, C.T. Driscoll, P.M. Crill, V.I. Rich, and **R.K. Varner** (2019) Mercury reallocation in thawing subarctic peatlands. *Geochem. Persp. Let.* 11, 33–38*,* doi: 10.7185/geochemlet.1922.

4.°Burke, S., M. Wik, A. Contosta, M. Palace, °A. Lane, and P.M. Crill, and **R.K. Varner** (2019) Long-term measurements of methane ebullition from thaw ponds*, J. Geophys. Res. Biogeosci*., https://doi.org/10.1029/2018JG004786*.*

5. Palace, M., C. Herrick, *J. DelGreco, *D. Finnell, *A. J. Garnello, C. McCalley, *K. McArthur, F. Sullivan and **R. K. Varner** (2018) Determining Subarctic Peatland Vegetation Using an Unmanned Aerial System (UAS), *Remote Sens.*, *10*, 1498; doi:10.3390/rs10091498.
6. Deng, J., C.K. McCalley, S. Frolking, J. Chanton, P. Crill, **R.K. Varner**, G. Tyson, V. Rich, M. Hines, S. Saleska, C. Li (2017) Adding stable carbon isotopes improves model representation of the role of microbial communities in peatland methane cycling, *J. Adv. Model. Earth Syst.*, 9, 1412–1430, doi:10.1002/2016MS000817.
7. Contosta, A., E. Burakowski, **R.K. Varner** and S. Frey (2016) Winter soil respiration in a humid temperate forest: The roles of moisture, temperature, and snowpack, *J. Geophys. Res. Biogeosciences*, doi: 10.1002/2016JG003450**.**
8. **°**Treat, C., W. Wollheim, **R.K. Varner**, and W.B. Bowden (2016) Longer thaw seasons increase nitrogen availability for leaching during fall in tundra soils, *Environ. Res. Lett.*, 11, doi: 10.1088/1748-9326/11/6/064013.
9. **°**Wik, M., **R.K. Varner,** K. Walter-Anthony, S. MacIntyre and D. Bastviken, (2016) Climate-sensitive northern lakes and ponds are critical components of methane release, *Nature Geoscience Reviews,* doi: 10.1038/NGEO2578.
10. °Johnston, C.E., S.A. Ewing, J.W. Harden, **R.K. Varner**, K.P. Wickland, J.C. Koch, C.C. Fuller, K. Manies, M.T. Jorgenson, (2014) Effect of permafrost thaw on CO_2 and CH_4 exchange in a western Alaska peatland chronosequence, *Environ. Res. Letts.*, **9(**8): 085004, doi:10.1088/1748-9326/9/8/085004.
11. **°**Noyce, G., **R.K. Varner**, J. Bubier and S. Frolking, (2014) Effect of *Carex rostrata* on seasonal and interannual variability in peatland methane emissions, *J. Geophys Res. Biogeosciences, 119,* doi:10.1002/2013JG002474.
12. °Wik, M., P.M. Crill, **R.K. Varner**, and D. Bastviken, (2013), Multiyear Measurements of Ebullitive Methane Flux from three Subarctic Lakes, *J. Geophys. Res. Biogeosciences,* 118, doi:10.1002/jgrg.20103.
13. °Goodrich, J. P., **R.K. Varner**, S. Frolking, B.N. Duncan, and P.M. Crill (2011), High-frequency measurements of methane ebullition over a growing season at a temperate peatland site, *Geophys. Res. Lett.*, 38, L07404, doi:10.1029/2011GL046915
14. **Varner, R.K.**, °Y. Zhou, °R.S. Russo, O. W. Wingenter, E. Atlas, C. Stroud, H. Mao, R. Talbot, and B. C. Sive (2008), Controls on atmospheric chloroiodomethane (CH_2ClI) in marine environments, *J. Geophys. Res.*, *113*, D10303, doi:10.1029/2007JD008889.
15. *Treat, C.C., J.L. Bubier, **R.K. Varner**, J. Gifford and P.M. Crill (2007), Time scale dependence of environmental and plant-mediated controls on CH_4 flux in a temperate fen, *J. Geophys. Res.*, 112, G01014, doi:10.1029/2006JG000210.
16. **Varner, R.K.**, M. Keller, *J.R. Robertson, J.D. Dias, °H. Silva, P.M. Crill, °M. McGroddy and W.L. Silver (2003), Experimentally induced root mortality increased nitrous oxide emission from tropical forest soils, *Geophys. Res. Lett.*, 30, 10.1029/2002GL016164.
17. **Varner, R.K.**, P.M. Crill, and R.W. Talbot (1999), Wetlands: a potentially significant source of atmospheric methyl bromide and methyl chloride, *Geophys. Res. Lett.*, *26*, 2433-2436.

Honors:

Kellogg Scholar - Hartwick College, 1987-1991; Saxton Fellow- Departmental Distinction - 1991
Summer Teaching Assistant Fellowship,1992 - UNH
University of New Hampshire Women's Commission Award Nominee - 2005, 2007, 2009, 2010
AGU Biogeosciences Elizabeth Sulzman Award for Excellence in Education and Mentoring 2015
Outstanding Associate Professor for 2016, University of New Hampshire
Class of 1940 Professorship, 2016-2019, University of New Hampshire

Professional Society Memberships

American Geophysical Union 1998-present