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Education

Ph.D. 1998. Duke University Nicholas School of the Environment, Durham, North Carolina.

M.S. 1996. Duke University Nicholas School of the Environment.

B.A., 1991. University of New Hampshire, Durham, New Hampshire, *Summa cum laude*.

Academic positions

Assistant professor/Assistant scientist, Department of Ecology and Evolutionary Biology, Kansas Biological Survey, University of Kansas (2003-present).

Research assistant professor, Department of Biological Sciences, University of Arkansas (2002-2003).

Post-doctoral research associate, University of Arkansas Stable Isotope Facility, Department of Biological Sciences, University of Arkansas. 1999-2002.

Publications

Billings, S. 2006. Soil organic matter dynamics and land use change at a grassland/forest ecotone. Soil Biology and Biochemistry 38:2934-2943.

Billings, S., Richter, D.D. 2006. Changes in stable isotopic signatures of soil nitrogen and carbon during forty years of forest development. Oecologia. DOI 10.1007/s00442-006-0366-7.

Billings, S., Brewer, C.M., Foster, B. 2006. Incorporation of plant residues into soil organic matter fractions with grassland management practices in the North American Midwest. Ecosystems. Ecosystems 9: DOI: 10.1007/s10021-006-0080-7.

Billings, S., Ziegler S. 2005. Linking microbial activity and soil organic matter transformations in forest soils under elevated CO₂. Global Change Biology 11:203-212.

Billings, S., Schaeffer, S.M., Evans, R.D. 2004. Response of soil microbial activity and N mineralization to elevated CO₂ in Mojave Desert soils. Global Biogeochemical Cycles 18:GB1011, doi:10.1029/2003GB002137.

Billings, S., Zitzer, S., Weatherley, H., Schaeffer, S.M., Charlet, T., Arnone, J., Evans, R.D. 2003. Effects of elevated CO₂ on green tissue and litter quality in an intact Mojave Desert ecosystem. Global Change Biology 5:729-735.

Billings, S., Schaeffer, S.M., Evans, R.D. 2003. Nitrogen fixation by biological soil crusts and free-living bacteria in an intact Mojave Desert ecosystem with elevated CO₂ and added soil carbon. Soil Biology and Biochemistry 35:643-649.

Schaeffer, S.M., Billings, S.A., Evans, R.D. 2003. Responses of nitrogen dynamics in an intact Mojave Desert ecosystem to manipulations in soil carbon and nitrogen availability. Oecologia 134:547-553.

Billings, S., Schaeffer, S.M., Zitzer, S., Evans, R.D. 2003. Trace N gas losses and N mineralization in an intact Mojave Desert ecosystem with elevated CO₂. Soil Biology and Biochemistry 34:1777-1784.

Billings, S., Schaeffer, S.M., Zitzer, S., Charlet, T., Smith, S.D., Evans, R.D. 2002. Alterations of nitrogen dynamics under elevated CO₂ in an intact Mojave Desert ecosystem: evidence from $\delta^{15}\text{N}$. Oecologia 131:463-467.

Yarie, J., Billings, S. 2002. Carbon balance of the taiga forest within Alaska: present and future. Canadian Journal of Forest Research 32:757-767.

Billings, S., Richter, D., Yarie, J. 2000. Sensitivity of soil methane fluxes to an altered precipitation regime in boreal forest soils. Soil Biology and Biochemistry 32:1431-1441.

Billings, S., Richter, D., Yarie, J. 1998. Soil carbon dioxide fluxes and profile concentrations in two boreal forests. Canadian Journal of Forest Research 28:1773-1783.

Current funding

Assessing predisposition to red oak borer-induced oak mortality using dendrochronological techniques. PI. Department of Agriculture, US Forest Service. 2006-2007.

Linking microbial activity and soil organic matter transformations in forest soils under elevated CO₂. Lead PI with co-PI Dr. S. Ziegler. Department of Energy, National Institute for Global Environmental Change, 2005-2007.

Enhancement of research and education facilities at the University of Kansas Field Station. Co-PI. National Science Foundation. 2005-2008.

Soil organic matter mineralization kinetics with climate change. PI. University of Kansas General Research Fund with matching funds from the Department of Ecology and Evolutionary Biology and the Kansas Biological Survey. 2005-2007.

Past funding

Fragmented woody plant invasions in grass ecosystems and soil carbon and nitrogen cycling. PI. National Science Foundation EPSCoR Program. 2004-2005.

Soil C sequestration and N retention: An assessment of three soil fractionation techniques in grassland and forested soils. PI. University of Kansas General Research Fund. 2004-2005.

Additional ongoing research

Linking models of forest biomass accumulation with measures of vegetation water consumption (Alaska)

Assessing ecosystem-level shifts in soil organic matter pools and transformations with woody plant encroachment in former grasslands (California)

Courses taught

Principles of Ecology. Department of Ecology and Evolutionary Biology, University of Kansas. Taught alternate fall semesters.

Field and Laboratory Methods for Ecology. Department of Ecology and Evolutionary Biology, University of Kansas. Taught alternate fall semesters.

Forest Ecosystems. Department of Ecology and Evolutionary Biology, University of Kansas. Taught alternate fall semesters.

Presentations at conferences

Billings, S., Haavik, L., Stephen, F., Fierke, M., Salisbury, V., Leavitt, S. (2006) Dendrochronological parameters of northern red oak (*Quercus rubra* Fagaceae) subjected to a major forest disturbance (red oak borer, *Enaphalodes rufulus*). International Union of Forest Researchers' Organization. Canopy Processes traveling meeting in northeastern United States, October 2006.

York, H., Billings, S.A. (2006) Stable isotope analysis of diet in the short-tailed fruit bats (Chiroptera: Phyllostomidae: *Carollia*). Poster presentation at the North American Symposium on Bat Research, North Carolina, October 2006.

York, H., Billings, S.A. (2006) Stable isotope analysis of diet in the short-tailed fruit bats (Chiroptera: Phyllostomidae: *Carollia*). Poster presentation at the 86th Annual Meeting of the American Society of Mammalogists, Massachusetts, June 2006.

Billings, S., Brewer, C., Foster, B. (2005). Incorporation of plant residues into soil organic matter fractions with grassland management practices in the North American Midwest. Poster presentation at the Ecological Society of America Meeting, August, 2005.

Billings, S., Richter, D.D. (2005). Stable isotopic signatures of soil organic nitrogen and carbon during forty years of forest development. Poster presentation at American Geophysical Union Meeting, May 2005.

Billings, S. (2004) Assessing soil organic matter distribution and stable isotopic composition: The impact of land use change on carbon dynamics. Poster presentation at American Geophysical Union Meeting, December 2004. Eos. Trans. AGU, 2004 Fall Meeting Supplement, Abstract #8092.

Billings, S., Schaeffer, S., Evans, R.D. (2002) Net N and C mineralization and soil microbial biomass with elevated CO₂ in a Mojave Desert ecosystem. Poster presentation at American Geophysical Union Meeting, December 2002. Eos. Trans. AGU, 2002 Fall Meeting Supplement, Abstract #B11B-0736.

Billings, S., Schaeffer, S., Evans, R.D. (2001) Elevated CO₂ alters soil nitrogen dynamics in an intact Mojave Desert ecosystem. Poster presentation at American Geophysical Union Meeting, December 2001. Eos. Trans. AGU, 2001 Fall Meeting Supplement, Abstract #B51B-0209.

Billings, S., Schaeffer, S., Charlet, T.N., Zitzer, S.F., Smith, S.D., Evans, R.D. (2001) Perturbations to nitrogen cycling in response to elevated CO₂ in an intact Mojave desert ecosystem. Poster presentation at Ecological Society of America Annual Meeting, August 2001. Abstract in: 86th Annual ESA Abstracts.

Billings, S., Schaeffer, S., and Evans, R.D. (2000) Response of soil nitrogen and CO₂ dynamics to elevated CO₂ in a Mojave Desert ecosystem. Talk given at Ecological Society of America Annual Meeting, August 2000. Abstract in: 85th Annual ESA Abstracts.

Schaeffer, S.M., S.A. Billings, and R.D. Evans (2000). Nitrogen dynamics in arid ecosystems in response to carbon and nitrogen addition. Talk given at Ecological Society of America Annual Meeting, August 2000. Abstract in: 85th Annual ESA Abstracts.

Yarie, J., Billings, S. (2000) Carbon balance of the Alaskan taiga forest. Presentation at the International Science Conference "The Role of Boreal Forests and Forestry in the Global Carbon Budget," May 8-12, 2000, Edmonton, Alberta, Canada.

Billings, S., Richter, D., Yarie, J. (1997) Soil respiration in the boreal forest: linking soil CO₂ to moisture availability. Talk given at Soil Science Society of America Annual Meeting, October 1997.

Billings, S., Richter, D., Yarie, J. (1997) Soil carbon gases and water relations in the boreal forest. Talk given at Ecological Society of America Annual Meeting, August 1997. Abstract in: 82nd Annual ESA Abstracts.

Memberships

American Geophysical Union
Ecological Society of America
Soil Science Society of America

Professional service

Proposal reviewer for Kearney Foundation Carbon Program, USDA Soils and Soils Biology Program, and the Department of Energy

LTER site reviewer for the National Science Foundation

Manuscript reviewer for Journal of Geophysical Research – Biogeosciences, Soil Biology and Biochemistry, Global Change Biology, Oecologia, Ecology, Functional Ecology, and Arctic, Antarctic, and Alpine Research