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Research Fields

- Atmospheric chemistry
- Biogeochemistry
- Carbon Footprint Analysis
- Climatology
- Community & Disaster Planning
- Data Analysis & Statistical Modeling
- Ecology & Ecosystem Management
- Economics
- Energy policy & technology
- Ethics
- Fire
- Forestry & Forest Management
- Geographic Information Systems
- Horticulture
- Human Impacts - economics
- Human Impacts - health
- Human Impacts - policy
- Hydrology
- Impacts - agriculture & horticulture
- Impacts - ecosystems, populations
- Impacts - physical
- Instrumentation
- Mitigation Policy
- Modeling Climate
- Modeling Ecosystems
- Modeling Socioeconomic Processes
- Natural Resource Policy & Planning
- Outreach & Engagement
- Paleoclimatology
- Paleoecology
- Physical Ecology
- Physiological Ecology
- Urban Ecology
- Water Policy & Planning
- Other...

Specific Research Interests

Human activity has caused extensive changes in the rates of inputs of various nutrient and toxic elements to many natural ecosystems, often with dramatic effects on the functioning of those ecosystems. My lab studies the changes in biogeochemical cycling, and the effects on the vegetative community, that has arisen from human activities. Most of my current research is focused in the H.J. Andrews Experimental Forest, which is OSU's LTER site. We have established DIRT (Detrital Input and Removal Treatment) plots to examine the effects of changing detrital quality and quantity on soil organic matter stabilization, C balance, and nutrient cycling and availability, and we are working with other emerging DIRT sites in the U.S. and in Europe on cross-site comparisons.

Projects

Selected Recent Publications

Yano, Y., P. Sollins, K. Lajtha, M. Kleber, J. Baham, and B.A. Caldwell. Decoupling of dissolved organic C and N sorption in relation to soil mineral surface properties and pH. *Biogeochemistry*, in review.

Crow, S. E., C. Swanston, K. Lajtha, J. R. Brooks, and H. Kierstead. 2007. Interpreting density fractions: searching for meaningful soil organic matter pools. *Biogeochemistry*, in press.

Marshall, J.D., J.R. Brooks, and K. Lajtha. 2007. Sources of variation in the stable isotopic composition of plants. In *Stable Isotopes in Ecology and Environmental Science 2nd Edition* Eds. R. Mitchener and K. Lajtha. Blackwell Scientific, Oxford. In press.

Vanderbilt, K.L., K. Lajtha and F. Swanson. 2003. Biogeochemistry of unpolluted forested watersheds in the Oregon Cascades: temporal patterns of precipitation and stream nitrogen fluxes. *Biogeochemistry* 62:87-117.

Beldin, S. I., E. W. Sulzman, B. A. Caldwell, P. Sollins, K. Lajtha, and S. E. Crow. 2007. Cation exchange capacity of density fractions from paired conifer/grassland soils. *Biology and Fertility of Soils*, in press.

Crow, S. E., E. W. Sulzman, W.D. Rugh, R.D. Bowden, and K. Lajtha. 2006. Isotopic analysis of respired CO₂ during decomposition of separated soil organic matter pools. *Soil Biology and Biochemistry* 38: 3279-3291.

Sollins, P., C. Swanston, M. Kleber, T. Filley, M. Kramer, S. Crow, B. Caldwell, K. Lajtha, and R. Bowden. 2006. Organic C and N stabilization in a forest soil: evidence from sequential density fractionation. *Soil Biology and Biochemistry* 38:3313-3324.

Brenner, R. E., R. D. Boone, J. B. Jones, K. Lajtha, and R. W. Ruess. 2006. Successional and physical controls on the retention of nitrogen in an undisturbed boreal forest ecosystem. *Oecologia* 148:602-611.

Carreira, J.A., B. Viñeola, and K. Lajtha. 2006. Secondary CaCO₃ and precipitation of P-Ca compounds control the retention of soil P in arid ecosystems. *Journal of Arid Environments* 64:460-473.

Sulzman, E.W., J.B. Brant, R.D. Bowden, and K. Lajtha. 2005. Contribution of aboveground litter, belowground litter, and rhizosphere respiration to total soil CO₂ efflux in an old growth coniferous forest. *Biogeochemistry* 73:231 - 256

Lajtha, K., S. Crow, Y. Yano, S.S. Kaushal, E.W. Sulzman, P. Sollins, and J.D.H. Spears. 2005. Detrital controls on soil solution N and dissolved organic matter in soils: a field experiment. *Biogeochemistry*, 76:261-281.

Cairns, M. A., and K. Lajtha. 2005. Effects of succession on nitrogen export in the west-central Cascades, Oregon. *Ecosystems* 8:583-601.

Yano, Y., K. Lajtha, P. Sollins, and B.A. Caldwell. 2005. Chemistry and dynamics of dissolved organic matter in a temperate coniferous forest on Andic soils: Effects of litter quality. *Ecosystems* 8: 286 - 300

Yano, Y., K. Lajtha, P. Sollins, and B.A. Caldwell. 2004. Chemical and seasonal controls on the dynamics of dissolved organic matter in a coniferous old-growth stand in the Pacific Northwest, USA. *Biogeochemistry* 71:197-223.

Holub, S.M., J.D.H. Spears, K. Lajtha. 2001. A reanalysis of nutrient dynamics in coniferous coarse woody debris. *Canadian Journal of Forest*

Research 31: 1894-1902.

Professional Activities

American Geophysical Union (AGU) Session co-convener, Soil Carbon: Mechanisms of Stabilization.

US member, Environmental Sciences Panel, Deutsche Forschungsgemeinschaft (German Research Foundation) for Germany's "Excellence Initiative"

National Ecological Observation Network (NEON) Biogeochemistry committee member

Member of organizing committee, 2nd International Conference on Mechanisms of Soil Organic Matter Stabilization, Monterey, CA, October 9-13, 2005.

Panel Member, NSF DEB Ecosystems (2004 – 2008)

Editor-in-Chief, Biogeochemistry (to present)

Member, US-ILTER (International Long-Term Ecosystem Research) National Committee (to present)