

Cheryl A. Kelley
Department of Geological Sciences
101 Geological Sciences Building
University of Missouri-Columbia
Columbia, MO 65211
(573) 882-8813
FAX (573) 882-5458
email: kelleyc@missouri.edu

EDUCATION

1993: Ph.D. Marine Sciences, University of North Carolina at Chapel Hill

1988: M.S. Marine Sciences, University of North Carolina at Chapel Hill

1983: B.S. Chemistry, University of Minnesota-Duluth, graduated summa cum laude

POSITIONS

2003 to present: Associate Professor, Department of Geological Sciences, University of Missouri-Columbia

1997 - 2003: Assistant Professor, Department of Geological Sciences, University of Missouri-Columbia

1996-97: American Society of Engineering Education (ASEE) Post-Doctoral Fellow, Naval Research Laboratory, Washington, DC.

1993-96: National Research Council (NRC) Post-Doctoral Fellow, U.S. Environmental Protection Agency, Gulf Breeze, FL.

PROFESSIONAL SOCIETY MEMBERSHIPS

American Society of Limnology and Oceanography (ASLO)

American Geophysical Union (AGU)

American Society of Microbiology (ASM)

PUBLICATIONS

Peterson, E. W., C. M. Wicks, and C. A. Kelley,. 2004. Persistence of 17 β -estradiol in waters and sediments from karst streams. *Environmental & Engineering Geoscience*. (submitted).

Formolo, M. J., T. W. Lyons, C. Zhang, C. Kelley, R. Sassen, J. Horita and D. R. Cole. 2004. Quantifying carbon sources in the formation of authigenic carbonates at gas hydrates sites in the Gulf of Mexico. *Chem. Geol.*, 205, 253-264.

- Wicks, C., C. Kelley, and E. Peterson. 2004. Estrogen in a karstic aquifer. *Ground Water*, 42, 384-389.
- Bugna, G. C., J. P. Chanton, C. A. Kelley, T. B. Stauffer, W. G. MacIntyre, and E. L. Libelo. 2004. A field test of $\delta^{13}\text{C}$ as a tracer of aerobic hydrocarbon degradation. *Org. Geochem.*, 35, 123-135.
- Kelley, C. A. 2003. Methane oxidation potential in the water column of two diverse coastal marine sites. *Biogeochemistry*, 65, 105-120.
- Kelley, C. A., and W. H. Jeffrey, 2002. Dissolved methane concentrations profiles and air-sea fluxes from 41 °S to 27 °N. *Global Biogeochem. Cycles*, 16(3), 1040, doi:10.1029/2001GB001809.
- Booth, M.G., L. Hutchinson, M. Brumsted, P. Aas, R. B. Coffin, R. C. Downer, Jr, C. A. Kelley, M. M. Lyons, J. D. Pakulski, S. L. Holder Sandvik, W. H. Jeffrey, and R. V. Miller. 2001. Quantification of RecA gene expression as an indicator of repair potential in marine bacterioplankton communities of Antarctica. *Aquatic Microbial Ecology*, 24, 51-59.
- Boyd, T. J., M. T. Montgomery, B. J. Spargo, D. C. Smith, R. B. Coffin, C. A. Kelley, and J. G. Mueller. 2001. Effects of oxygenation on hydrocarbon biodegradation in a hypoxic environment. *Bioremediation Journal* 5, 145-157.
- Coffin, R. B., P. H. Miyares, C. A. Kelley, L. A. Cifuentes, and C. M. Reynolds. 2001. Stable carbon and nitrogen isotope analysis of TNT: Two dimensional source identification. *Environ. Toxicology and Chemistry*, 20, 2676-2680.
- Kelley, C. A., J. D. Pakulski, S. L. H. Sandvik, R. B. Coffin, R. C. Downer, Jr., P. Aas, M. M. Lyons, and W. H. Jeffrey. 1999. Phytoplanktonic and bacterial carbon pools and productivities in the Gerlache Strait, Antarctica during early austral spring. *Microb. Ecol.*, 38, 296-305.
- Kelley, C. A., R. B. Coffin, and L. A. Cifuentes. 1998. Stable isotope evidence for alternative bacterial carbon sources in the Gulf of Mexico. *Limnol. Oceanogr.*, 43, 1962-1969.
- Kelley, C. A., R. B. Coffin, and J. G. Mueller. 1998. Stable isotope analyses: An innovative technique to monitor biodegradation of petroleum hydrocarbons. *Geotechnical News*, 16, 20-24.
- Hammer, B. T., C. A. Kelley, R. B. Coffin, L. A. Cifuentes, and J. G. Mueller. 1998. $\delta^{13}\text{C}$ values of polycyclic aromatic hydrocarbons collected from two creosote-contaminated sites. *Chem. Geol.* 152, 43-58.
- Pelz, O., L. A. Cifuentes, B. T. Hammer, C. A. Kelley, and R. B. Coffin. 1998. Tracing the assimilation of organic compounds using $\delta^{13}\text{C}$ analysis of unique amino acids in the bacterial peptidoglycan cell wall. *FEMS Microbiol. Ecol.*, 25, 229-240.

- Kelley, C. A., B. T. Hammer, and R. B. Coffin. 1997. Concentrations and stable isotope values of BTEX in gasoline-contaminated groundwater. *Environ. Sci. Tech.*, 31, 2469-2472.
- Pakulski, J. D., R. B. Coffin, C. A. Kelley, S. L. Holder, R. Downer, P. Aas, M. M. Lyons, and W. H. Jeffrey. 1996. Iron stimulation of Antarctic marine bacteria. *Nature*, 383, 133-134.
- Kelley, C. A., C. S. Martens, and W. Ussler III. 1995. Methane dynamics across a tidally flooded river bank margin. *Limnol. Oceanogr.*, 40, 1112-1129.
- Chanton, J., J. Bauer, P. Glaser, D. Siegel, C. Kelley, S. C. Tyler, E. Romanowicz, and A. Lazrus. 1995. Radiocarbon evidence for the substrates supporting methane formation within northern Minnesota peatlands. *Geochim. Cosmochim. Acta*, 59, 3663-3668.
- Ussler, W., III, J. P. Chanton, C. A. Kelley, and C. S. Martens. 1994. Radon-222 tracing of soil and forest canopy trace gas exchange in an open canopy boreal forest. *J. Geophys. Res.*, 99, 1953-1963.
- Kelley, C. A., N. B. Dise, and C. S. Martens. 1992. Temporal variations in the stable carbon isotopic composition of methane emitted from Minnesota peatlands. *Global Biogeochem. Cycles*, 6, 263-269.
- Chanton, J. P., C. S. Martens, C. A. Kelley, P. M. Crill, and W. J. Showers. 1992. Mechanisms of methane transport and isotope fractionation in macrophytes of Alaskan tundra lakes. *J. Geophys. Res.*, 97, 16,681-16,688.
- Martens, C. S., C. A. Kelley, J. P. Chanton, and W. Showers. 1992. Carbon and hydrogen isotopic characterization of methane from wetlands and lakes of the Yukon-Kuskokwim Delta, western Alaska. *J. Geophys. Res.*, 97, 16,689-16,701.
- Kelley, C. A., C. S. Martens, and J. P. Chanton. 1990. Variations in sedimentary carbon remineralization rates in the White Oak River Estuary, North Carolina. *Limnol. Oceanogr.*, 35, 372-383.
- Chanton, J. P., C. S. Martens, and C. A. Kelley. 1989. Gas transport from methane-saturated tidal freshwater and wetland sediments. *Limnol. Oceanogr.*, 34, 807-819.
- Cook, R. B., C. A. Kelley, J. C. Kingston, and R. G. Kreis. 1987. Chemical limnology of soft water lakes in the Upper Midwest. *Biogeochemistry*, 4, 97-117.

PUBLISHED ABSTRACTS (papers presented at national and international meetings)

- Kelley, C. A., C. M. Wicks, and E. W. Peterson. 2004. Estrogen in karst spring basins of Missouri. ASLO abstracts. 2004 ASLO summer meeting.

- Carlson, C., C. Wicks, C. Kelley, and K. MacLeod. 2003. Variation in the isotopic composition of spring water. GSA abstracts. 2003 annual GSA meeting.
- Formolo, M. J., T. W. Lyons, C. Zhang, C. Kelley, and D. Sullivan. 2003. The biogeochemical cycling of sulfur, carbon, and oxygen at Gulf of Mexico cold seep environments. GSA abstracts. 2003 annual GSA meeting.
- Hurtgen, M. T., M. A. Arthur, T. W. Lyons, G. P. Halverson, and C. A. Kelley. 2003. The oxygen isotope of trace sulfate associated with a Neoproterozoic cap carbonate from Namibia. 2003 Astrobiology conference. Arizona State University.
- Ndubuka, C., C. M. Wicks, C. A. Kelley, and E. W. Peterson. 2002. The significance of 17-beta estradiol in the Rock Bridge stream/spring system. GSA abstracts. 2002 annual GSA meeting.
- Kelley, C.A., C. M. Wicks, E. W. Peterson, C. I. Ndubuka, and R. Lerch. 2002. Mass flux of natural estrogen through a karst spring system. ASLO abstracts. 2002 summer ASLO meeting.
- Kelley, C. A. 2001. Dissolved methane concentrations profiles and surface saturation ratios along the transect from 41 oS to 27 oN. ASLO abstracts. 2001 ASLO aquatic sciences meeting.
- Pakulski, J. D., A. Baldwin, A. Dean, S. Durkin, D. Karentz, C. Kelley, S. Wilhelm, W. Jeffrey. 2001. Translatitudinal Assessment of Biological Acclimation to Solar Conditions in the Oceans (TABASCO). ASLO abstracts. 2001 ASLO aquatic sciences meeting.
- Hoke, K. D., and C. A. Kelley. 2000. Iron and sulfate profiles for two acid mine lakes in central Missouri. GSA abstracts. 2000 annual GSA meeting.
- Kelley, C. A., and C. S. Martens. 2000. Aerobic methane oxidation along the salinity gradient of the White Oak River Estuary, NC. *Eos*, 81, S72.
- Kelley, C. A., C. S. Martens, R. B. Coffin, and L. A. Cifuentes. 1999. Allochthonous v. autochthonous bacterial carbon sources: A comparison between the northern Gulf of Mexico and a coastal marine basin (Cape Lookout Bight, NC). ASLO abstracts. 1999 ASLO aquatic sciences meeting.
- Kelley, C. A., P. Aas, R. B. Coffin, R. C. Downer Jr., W. H. Jeffrey, M. M. Lyons, J. D. Pakulski, and S. H. Sandvik. 1998. Carbon dynamics in Antarctic waters during late austral winter/early spring - Gerlache Strait. ASLO abstracts. summer ASLO meeting.
- Boyd, T. J., M. T. Montgomery, B. J. Spargo, J. G. Mueller, L. A. Cifuentes, C. A. Kelley, and R. B. Coffin. 1997. Effect of a groundwater circulation well on PAH degradation in a creosote contaminated aquifer. ASM abstracts. ASM annual meeting.
- Montgomery, M., T. J. Boyd, B. J. Spargo, J. G. Mueller, L. A. Cifuentes, C. A. Kelley, and R. B. Coffin. 1997. Effect of a groundwater circulation well on BTEX degradation in a gasoline contaminated aquifer. ASM abstracts. ASM annual meeting.

- Kelley, C. A., R. B. Coffin, J. D. Pakulski, and L. A. Cifuentes. 1997. Bacterial utilization of methane in the Gulf of Mexico. ASLO abstracts, 1997 ASLO aquatic sciences meeting.
- Cifuentes, L. A., R. B. Coffin, R. Downer, Jr., C. A. Kelley, L. A. Roelke, G. G. Salata, and B. A. Trust, 1997. Comparing stable carbon isotope tracers at two bioremediation sites. Abstracts for Battelle's 1997 In Situ and On-Site Bioremediation Symposium, New Orleans, LA.
- Coffin, R. B., M. T. Montgomery, and C. A. Kelley. 1997. Assessment of nutrient-contaminant carbon ratios for enhancing in situ bioremediation. Abstracts for Battelle's 1997 In Situ and On-Site Bioremediation Symposium, New Orleans, LA.
- Morin, J. P., L. A. Cifuentes, R. B. Coffin, and C. A. Kelley. 1996. Applications of a zero head space large-volume incubator for studying gases and VOC. *Eos*, 77, 20.
- Trust, B. A., C. A. Kelley, R. B. Coffin, L. A. Cifuentes, and J. G. Mueller. 1995. Delta- ^{13}C values of polycyclic aromatic hydrocarbons (PAHs) collected from two creosote-contaminated waste sites. Abstracts for Geological Society of America annual meeting, New Orleans, LA.
- Kelley, C. A., R. B. Coffin, L. A. Cifuentes, S. E. Lantz, and J. G. Mueller. 1995. The use of GC/C/IRMS coupled with GC/MS to monitor biodegradation of petroleum hydrocarbons. Abstracts for Battelle's 1995 In Situ and On-Site Bioreclamation Symposium, San Diego, CA.
- Pelz, O., C. A. Kelley, L. A. Cifuentes, and R. B. Coffin. 1995. Tracing the assimilation of organic compounds using ^{13}C analyses of unique amino acids in the bacterial cell wall. Abstracts for Battelle's 1995 In Situ and On-Site Bioreclamation Symposium, San Diego, CA.
- Chanton, J., B. Gaza, L. Graham, R. Coffin, M. Hoch, C. Kelley, and K. Dillon. 1994. Multiple stable isotope tracing of the food web in a river dominated estuary, Apalachicola Bay, Florida. Abstracts for the Second Coastal Wetland Ecology and Management Symposium, Key Largo, Florida.
- Coffin, R. B., C. A. Kelley, and L. A. Cifuentes. 1994. Seasonal variations in bacterial carbon sources in the coastal Gulf of Mexico. GBF Workshop on Molecular Microbial Ecology, GBF Braunschweig, Germany, invited paper.
- Ussler, W., III, C. A. Kelley, C. S. Martens, and H. P. Mendlovitz. 1994. Tide cycle variations in methane δD and $\delta^{13}\text{C}$ composition and ebullitive flux from a tidal-freshwater estuary, White Oak River, NC. *Eos*, 75, 69.
- Kelley, C. A., C. S. Martens, and W. Ussler III. 1993. Methane production and flux from a tidal freshwater wetland. ASLO abstracts, 1993 ASLO aquatic sciences meeting.

- Kelley, C. A. and C. S. Martens. 1993. Effects of water level on methane cycling in wetlands. Abstracts for the Second Biennial Symposium on Biogeochemistry of Wetlands sponsored by the Wetland Biogeochemistry Institute, Louisiana State University.
- Chanton, J. P., J. Bauer, P. Glaser, D. Siegel, S. Tyler, C. A. Kelley, A. Lazrus, and J. Southon. 1993. ^{14}C and ^{13}C isotopic composition of methane dissolved in porewaters and groundwaters and emitted from Red Lake Minnesota peatlands. *Eos*, 74, 151.
- Kelley, C. A. and C. S. Martens. 1992. Seasonal and spatial variations in pore water methane concentrations in the White Oak River Estuary, NC. ASLO abstracts, 1992 ASLO aquatic sciences meeting.
- Blair, N. E., C. A. Kelley, and C. S. Martens. 1992. The carbon isotope biogeochemistry of freshwater methanogenic sediments. ACS abstracts, 1992 spring meeting.
- Kelley, C. A., P. M. Crill, J. P. Chanton, and C. S. Martens. 1991. An investigation of two inert gases, ^{222}Rn and SF_6 , as tracers of enhanced gas transport associated with aquatic macrophytes. *Eos*, 72, 68.
- Kelley, C. A., C. S. Martens, and J. P. Chanton. 1991. Seasonal variations in the $\delta^{13}\text{C}$ signature of methane emitted from northern wetlands. Abstracts for the Wetlands Biogeochemistry Symposium sponsored by the Laboratory for Wetland Soils and Sediments, Louisiana State University.
- Chanton, J., W. Showers, C. Kelley, C. Martens, J. Happell and G. Gerard. 1991. Stable isotope tracing of methane emissions by aquatic plants. Abstracts for the Wetlands Biogeochemistry Symposium sponsored by the Laboratory for Wetland Soils and Sediments, Louisiana State University.
- Chanton, J., G. Whiting, W. Showers, C. Kelley, C. Martens, J. Happell and G. Gerard. 1991. Methane flux from aquatic plants -- isotopic, ventilation, biomass and diurnal effects. Abstracts for the 10th International Symposium on Environmental Biogeochemistry, San Francisco.
- Happell, J. D., J. P. Chanton, W. J. Showers, B. Genna, and C. A. Kelley. 1991. The effects of plants on the transport of methane to the atmosphere from the Everglades. ACS abstracts, 1991 spring meeting.
- Martens, C. S., C. A. Kelley, W. Ussler III, R. J. McCaffrey, J. P. Chanton, and J. Happell. 1991. Stable carbon isotopic characterization of methane emissions from Canadian subarctic fens, Schefferville, Quebec, summer 1990. *Eos*, 72, 76.
- Martens, C. S., C. A. Kelley, W. Ussler III, R. J. McCaffrey, J. P. Chanton, J. Happell, and S. Trumbore. 1991. Isotopic characterization of methane from Yukon-Kuskokwim Delta tundra and minerotrophic fens in northern Quebec. Abstracts for the 10th International Symposium on Environmental Biogeochemistry, San Francisco.

- Chanton, J. P., C. S. Martens, C. A. Kelley, P. M. Crill, and W. J. Showers. 1989. Isotopic fractionation of methane emitted by Alaskan tundra macrophytes. *Eos*, 70, 285.
- Martens, C. S., J. P. Chanton, C. A. Kelley, J. K. Cox, and P. M. Crill. 1989. Carbon isotopic signature of methane emitted from Alaska's Yukon-Kuskokwim Delta. *Eos*, 70, 284.
- Martens, C. S., J. P. Chanton, J. V. Klump, L. K. Benninger, P. M. Crill, R. I. Haddad, D. B. Albert, C. A. Kelley, M. J. Alperin, J. D. Willey, and N. E. Blair. 1989. Biogeochemical processes dominating upper slope sediments along a 36° 20' N transect off North Carolina, USA. *Eos*, 70, 368.
- Sass, R. L., K. B. Bartlett, P. M. Crill, N. Dice, C. S. Martens, J. P. Chanton, C. A. Kelley, M. Hardisky, and M. Gross. 1989. Dissolved methane reservoir in tundra soil. *Eos*, 70, 286.
- Kelley, C. A., C. S. Martens, and J. P. Chanton. 1988. Variations in sedimentary organic carbon remineralization rates along the estuarine gradient of the White Oak River, N.C. ASLO abstracts, 1988 summer meeting, invited paper.

RESEARCH GRANTS

External funding:

Stable isotopic study of microbial mats. C. Kelley. 7/04-6/05. \$5000. American Philosophical Society (Franklin Research Grant)

Natural Estrogens in Spring Water in the Ozark Plateau Region. C. M. Wicks and C. A. Kelley, 7/99 – 6/03 \$199,959 from the National Science Foundation. EAR-9975380

Acquisition of a Multi-use Isotope Ratio Mass Spectrometer System. C. A. Kelley, K. MacLeod, T. Lyons, K. Shelton and C. Zhang, 1/00 – 12/01, \$129,515 for 50 % match from the National Science Foundation. EAR-9910489

Investigation of Methane Assimilation by Bacterioplankton using Stable Isotope Analysis. 9/98 - 8/00, \$20,000 from the American Chemical Society's Petroleum Research Fund.

Internal funding:

An isotopic study of hypersaline microbial mats. C. Kelley. 7/04-6/05. \$7500. MU Research Council.

An isotopic study of hypersaline microbial mats. C. Kelley. 7/04-6/05. MU Research Leave.

Request to obtain carbonate device for new IRMS system. C. A. Kelley, K. MacLeod, T. Lyons, K. Shelton and C. Zhang. 1/00 – 12/01, \$52, 750, MU Research Board

Study of Bacterial Carbon Cycling Using Stable Isotopes, 6/98 - 5/99 \$27,520, MU Research Board.

SERVICE

Professional Service:

Session chair (1999) American Society of Limnology and Oceanography (ASLO) Aquatic Sciences meeting

Reviewer for Professional Journals:

Global Biogeochemical Cycles, Journal of Geophysical Research, Environmental Science and Technology, Biogeochemistry, Limnology and Oceanography, Organic Geochemistry, Geochimica et Cosmochimica Acta, Geophysical Research Letters, Archiv fur Hydrobiologie, Marine Chemistry, Bioremediation Journal, and the Journal of Geotechnical Engineering

Reviewer for Funding Agencies:

National Science Foundation (NSF), National Aeronautics and Space Agency (NASA), Yellowstone National Park, American Chemical Society-Petroleum Research Fund (ACS-PRF), Delaware Sea Grant, Connecticut Department of Environmental Protection

Invited Seminar Speaker:

University of Missouri - Department of Chemistry (1997)
University of Missouri - Department of Civil Engineering (1998)
Iowa State University - Department of Geological and Atmospheric Sciences (1999)
University of Arkansas - Department of Geosciences (1999)
University of Minnesota, Duluth - Department of Chemistry (1999)

University Service:

Department of Geological Sciences

Faculty Search Committees (Biogeochemical History, 1997-98; Sedimentology, 2000-01; Geomicrobiology/Organic Geochemistry, 2003-04)
Speakers Committee (1997-2000)
Salary Advisory Committee (1998-2001)
Graduate Admissions Committee (1998-2003)
Advisor to the Geology Graduate Student Organization (2000-2003)
Director of Undergraduate Studies (2003 – present)
Curriculum Committee (2003 – present)
Undergraduate Scholarship Committee (2003 – present)

College of Arts and Sciences

Status of Women Committee (1998-2001)
Curriculum, Instruction and Advising (CIA) Committee (2003 – present)

University

University of Missouri Doctoral Faculty (1997 -present)
MU Environmental Literacy Committee (1999-2001)
MU Research Council (2001-2004)
Reviewer of Internal Grants (Research Board and Research Council)

GRADUATE STUDENT COMMITTEES

MU Department of Geological Sciences:

Masters

Brian Bohm (1997)
John Hoke (1998)
Matt Hurtgen (1998)
Qi We (2002)
Chinwe Ndubuka (2002)
Tom Ratterman (2002)
Joyce McBeth (2003)
Kelly Titkemeir (2004)
Jessica Kern (2004)
Carolina Isaza (2004)
Christine Carlson (2004)
Daniel Basnett (present)
Moojoon Shim (present)

PhD

Toby Dogwiler (2002)
Eric Peterson (2002)
Mike Formolo (present)
Carolina Isaza (present)
Damon Bassett (present)

MU Department of Fisheries and Wildlife Sciences:

Leigh Ann Flenniken (2001) Jeanie Roper Hayward (2002)

COURSES TAUGHT AT MU

Geol 1200 Environmental Geology. An introductory lab science course, focused on the interactions between geologic processes and human society. Topics include volcanic hazards, earthquakes, floods, mineral resources, groundwater, energy, pollution problems and environmental management.

Geol 2450 Global Water Cycle. This course focuses on the study of environmental factors controlling the composition of natural waters in its various reservoirs (atmosphere, lakes and streams, estuaries and oceans), and sources of water's constituents (both natural and anthropogenic). This is a Math Reasoning Proficiency (MRP) course.

Geol 4991 Investigation of Earth Materials. This is a field and laboratory-based course designed to

provide students who are majoring in geology, soil science, and civil engineering with hands-on training in analyzing and interpreting near-surface processes. The course integrates the students understanding of sedimentological, hydrogeological, and geochemical processes. This is the capstone course for the BA in Environmental Geology.

Geol 4500/7500 Organic Geochemistry. This course focuses on the study of the transformations undergone by all organic matter in the geosphere, including those mediated by biological agents and those controlled by temperature and pressure at depth in the crust.

Geol 8270 Bioremediation Techniques. Discussion of contaminant degradation pathways and current technology available. The interdisciplinary aspects of the field (i.e., hydrogeology, microbial ecology, geochemistry) is emphasized.