

CRAIG C. BRANDT

PRESENT POSITION

2006-Present Research Staff Scientist, Microbial Ecology and Physiology Group, Biosciences Division, P.O. Box 2008 MS6038, Oak Ridge National Laboratory, Oak Ridge, TN 37831-6038.
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PREVIOUS POSITIONS

1996-2006 Research Staff Scientist, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN.
1988-1996 Research Staff Scientist, Computer Sciences and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge, TN.
1984-1988 Staff Scientist, Science Applications International Corporation, Oak Ridge, TN.

EDUCATION

Michigan State University	Biochemistry	B.S. 1975
University of Tennessee	Statistics	M.S. 1988

COMPUTER SKILLS

Software	SAS, MATLAB, C, FORTRAN
Hardware	Intel-based PCs and Unix workstations

RESEARCH INTERESTS

Application of statistics and advanced data analysis tools (e.g., artificial neural networks) to environmental and ecological problems; microbial ecology; environmental data management.

PROFESSIONAL RECOGNITION AND AFFILIATIONS

Member: American Statistical Association, Biometrics Society. Ad hoc reviewer for several agencies and journals.

GRANTS, AWARDS, PATENTS

Principal investigator or investigator on more than 10 grants from DOE and DOD for data analysis, microbial ecology, bioremediation, and environmental restoration including:

- Artificial Neural Networks: An Innovative Tool for the Assessment of Microbial Communities. Department of Energy, Natural and Accelerated Bioremediation Program. FY1998-2000. \$767,000 (Principal Investigator).
- Optimization of Nonlinear Data Analysis Tools for the Assessment of Microbial Communities. Department of Energy, Natural and Accelerated Bioremediation Program. FY2001-2003. \$750,000 (Principal Investigator).
- Spatial Estimates of Toxic Metal Bioaccessibility at Department of Defense Facilities. Strategic Environmental Research and Development Program. FY2002-2003. \$76,000 (Principal Investigator).
- An Integrated Assessment of Geochemical and Community Structure Determinants of Metal Reduction Rates in Subsurface Sediments. Department of Energy, Natural and Accelerated Bioremediation Program. FY2005-2007. \$1,336,000 (Co-Principal Investigator).
- An Integrated Experimental and Modeling Approach for the Study of Microbial Biofilm Communities. Oak Ridge National Laboratory LDRD. FY2004-2006. \$547,500 (Co-Principal Investigator).

- A Genomic Analysis of Microbial-Mediated Metal Transformation. Oak Ridge National Laboratory Seed. FY2006-2007. \$100,000 (Co-Principal Investigator).
- Geochemical, Genetic, and Community Controls on Mercury Methylation. Department of Energy, Environmental Remediation Sciences Program. FY2007-2009. \$1,783,000 (Co-Principal Investigator).
- Multiscale Investigations on the Rates and Mechanisms of Targeted Immobilization and Natural Attenuation of Metal, Radionuclide and Co-Contaminants in the Subsurface. Department of Energy, Environmental Remediation Sciences Program. FY2007-2011. \$15,000,000 (Co-Principal Investigator).

SELECTED PUBLICATIONS

- Jager, H., L. Baskaran, C. Brandt, E. Davis, C. Gunderson, and S. Wulschleger. Empirical geographic modeling of switchgrass yields in the United States. *Global Change Biology Bioenergy* (submitted).
- Vishnivetskaya, T.A., C.C. Brandt, A.S. Madden, M.M. Drake, J.E. Kostka, D.M. Akob, K. Küsel, and A.V. Palumbo. Microbial community changes in response to ethanol or methanol amendments for U(VI) reduction. *Applied and Environmental Microbiology* (submitted).
- Christensen, S.W., C.C. Brandt, and M.K. McCracken. Importance of data management in a long-term biological monitoring program. *Environmental Management* (accepted).
- West, T.O., C.C. Brandt, L.M. Baskaran, C.M. Hellwinckel, R. Mueller, C.J. Bernacchi, V.P. Bandaru, B. Yang, B.S. Wilson, G. Marland, R.G. Nelson, D.G. De La Torre Ugarte, and W.M. Post. Net carbon flux and net ecosystem exchange from croplands in the United States: increasing geospatial resolution of inventory-based carbon accounting. *Ecological Applications* (accepted).
- Smith, J.G., C.C. Brandt, and S.W. Christensen. Long-term benthic macroinvertebrate community monitoring to assess pollution abatement effectiveness. *Environmental Management* (accepted).
- Nelson, R.G., C.M. Hellwinckel, C.C. Brandt, T.O. West, D.G. De La Torre Ugarte, and G. Marland. 2009. Energy use and carbon dioxide emissions from cropland production in the United States, 1990-2004. *Journal of Environmental Quality* 38:418-425.
- Madden A.S., A.V. Palumbo, B. Ravel, T.A. Vishnivetskaya, T.J. Phelps, C.W. Schadt, and C.C. Brandt. 2009. Donor-dependent extent of uranium reduction for bioremediation of contaminated sediment microcosms. *Journal of Environmental Quality* 38:53-60.
- Palumbo, A.V., J.C. Schryver, S.M. Pfiffner, T. Marsh, and C.C. Brandt. 2008. Relating microbial community structure to a dominant environmental variable in a complex environment: an example from a chromium contaminated site. pp. 61-67. In: *Proceedings of the 2008 International Conference on Bioinformatics and Computational Biology (Biocomp 2008) Volume I*, Editors: H.R. Arabnia, M.Q. Yang, and J.Y. Yang. Las Vegas, NV, July 14-17, 2008. CSREA Press, USA.
- West, T.O., C.C. Brandt, B.S. Wilson, C.M. Hellwinckel, D.D. Tyler, G. Marland, D.G. De La Torre Ugarte, J.A. Larson, and R.G. Nelson. 2008. Estimating regional changes in soil carbon with high spatial resolution. *Soil Science Society of America Journal* 72:285-294.
- English, B.C., K. Jensen, J. Menard, M.E. Walsh, C.C. Brandt, J. Van Dyke, and S. Hadley. 2007. Economic impacts of carbon taxes and biomass feedstock usage in southeastern United States coal utilities. *Journal of Agricultural and Applied Economics* 39:103-119.
- Fields, M.W., J.C. Schryver, C.C. Brandt, T. Yan, J. Zhou, and A.V. Palumbo. 2006. Confidence intervals for similarity values achieved from direct sequence determination of cloned 16S rRNA genes from environmental samples. *Journal of Microbiological Methods* 65:144-152.
- Schryver, J.C., C.C. Brandt, S.M. Pfiffner, A.V. Palumbo, A.D. Peacock, D.C. White, J.P. McKinley, and P.E. Long. 2006. Application of nonlinear analysis methods for identifying relationships between microbial community structure and groundwater geochemistry. *Microbial Ecology* 51:177-188.
- Heuscher, S.A., C.C. Brandt, and P.M. Jardine. 2005. Using soil physical and chemical properties to estimate bulk density. *Soil Science Society of America Journal* 69:51-56.

- Palumbo, A.V., J.C. Schryver, M.W. Fields, C.E. Bagwell, J. Zhou, T. Yan, X. Liu, and C.C. Brandt. 2004. Coupling functional gene diversity and geochemical data from environmental samples. *Applied and Environmental Microbiology* 70:6525-6534.
- Zatsepin, O.Y., D. Riestenberg, S.D. McCallum, M. Gborigi, C. Brandt, B.A. Buffet, and T.J. Phelps. 2004. Influence of water thermal history and overpressure on CO₂-hydrate nucleation and morphology. *American Mineralogist* 89:1254-1259.
- Heuscher, S.A., C.C. Brandt, and P.M. Jardine. 2004. SBAT: A tool for estimating metal bioaccessibility in soils. ORNL/TM-2004/49. Oak Ridge National Laboratory, Oak Ridge, TN.
- Stewart M.A., P.M. Jardine, C.C. Brandt, M.O. Barnett, S.E. Fendorf, L.D. McKay, T.L. Mehlhorn, and K. Paul. 2003. Effects of contaminant concentration, aging, and soil properties on the bioaccessibility of Cr(III) and Cr(VI) in soil. *Soil & Sediment Contamination* 12:1-21.
- Thompson, D.K., A.S. Beliaev, C.S. Giometti, S.L. Tollaksen, T. Khare, D.P. Lies, K.H. Nealson, H. Lim, J. Yates III, C.C. Brandt, J.M. Tiedje, and J.-Z. Zhou. 2002. Transcriptional and proteomic analysis of a ferric uptake regulator (Fur) mutant of *Shewanella oneidensis*: possible involvement of Fur in energy metabolism, transcriptional regulation, and oxidative stress. *Applied and Environmental Microbiology* 68:881-892.
- Beliaev, A.S., D.K. Thompson, T. Khare, H. Lim, C.C. Brandt, G. Li, A.E. Murray, J.F. Heidelberg, C.S. Giometti, J. Yates III, K.H. Nealson, J.M. Tiedje, and J.-Z. Zhou. 2002. Gene and protein expression profiles of *Shewanella oneidensis* during anaerobic growth with different electron acceptors. *Omic: An Journal of Integrative Biology* 6:39-60.
- Jager, H.I., W.W. Hargrove, C.C. Brandt, A.W. King, R.J. Olson, J.M.O. Scurlock, and K.A. Rose. 2000. Contrasting climate responses of models with those of field data at a regional scale. *Ecosystems* 3:396-411.
- Brandt, C.C., J.C. Schryver, S.M. Pfiffner, A.V. Palumbo, and S. Macnaughton. 1999. Artificial neural networks: an innovative tool for the assessment of microbial communities. In: *Bioremediation of Metals and Inorganic Compounds* (Eds. Leeson, A. and B.C. Allerman), Proceedings from the Fifth International In Situ and On-Site Symposium. Battelle Press, Columbus, OH. pp. 1-6.
- Pfiffner, S.M., C.C. Brandt, J.C. Schryver, A.V. Palumbo, and J.S. Almeida. 1999. Using artificial neural networks to assess microbial community structure. In: *Proceedings of the 1998 National Conference on Environmental Remediation Science and Technology*, (Eds. Uzochukwu, G.A. and G.B. Reddy) Battelle Press, Columbus, OH. pp. 205-211.
- Schmoyer, R.L., J.J. Beauchamp, C.C. Brandt, and F.O. Hoffman. 1996. Difficulties with the lognormal model in mean estimating and testing. *Environmental and Ecological Statistics* 3:81-97.
- Weinstein, D.A., H.H. Shugart, and C.C. Brandt. 1983. Energy flow and the persistence of a human population: a simulation study. *Human Ecology* 11:201-225.