
Peter Jaffé

Professor of Civil and Environmental Engineering
Ph.D., Vanderbilt University, 1981



Research Interests

Jaffé's research interests relate to the physical, chemical, and biological processes that govern the transport and transformation of pollutants in the environment and their application toward the remediation of contaminated systems. Areas of current emphasis include laboratory and field experiments as well as mathematical simulations of biogeochemical processes in porous media, such as (1) numerical simulation of denitrification in soils as a function of rainfall and soil properties, and the scaling of these results to link them to climate change models; (2) dynamics of trace metals in sediments, wetland soils, and groundwater; (3) biological reduction of uranium in groundwater and the long-term stability of the reduced uranium phases; (4) nitrogen processing in urban settings coupled to urban hydrology; and (5) effects of carbon dioxide sequestration in deep aquifers on shallow soils due to potential leaks. He has served on numerous committees and panels, including the National Research Council, EPA, NIH, and DOE.

Courses

CEE 308: Environmental Engineering Laboratory
CEE 471: Introduction to Water Pollution Technology
CEE 576: Water Quality Modeling and Analysis

Selected Publications

- Komlos, J. and P.R. Jaffé. 2004. Effect of iron bioavailability on dissolved hydrogen concentrations during microbial iron reduction. *Biodegradation* 15:315-325.
- Xu, S., A.C. Leri, S.C.B. Myneni, and P.R. Jaffé. Uptake of bromide by two wetland plants (*Typha latifolia* L. and *Phragmites australis* (Cav.) Trin. ex Steud). *Environmental Science and Technology* 38(21):5642-5648.
- Kim, H.S., P.R. Jaffé and L.Y. Young. 2004. Simulating biodegradation of toluene in sand-column experiments at the macroscopic and pore-level scale for aerobic and denitrifying conditions. *Advances in Water Research* 27: 335-348.
- Wang, S., and P.R. Jaffé. 2004. Dissolution of trace metals in potable aquifers due to CO₂ releases from deep formations. *Energy Conversion and Management* 45(18-19): 2833-2848.

Wang, S., P.R. Jaffé, G. Li, S.W. Wang, and H.A. Rabitz. 2003. Simulating bioremediation of uranium-contaminated aquifers; Uncertainty assessments of model parameters. *J. of Contaminant Hydrology* 64(3-4):283-307.

Brown, D.G., J.R. Stencel, and P.R. Jaffé. 2002. Effects of porous media preparation on bacteria transport through porous media. *Water Research* 36: 105-114.

Li, G., S.W. Wang, H. Rabitz, S. Wang, and P. Jaffé. 2002. Global uncertainty assessments by high dimensional model representations (HDMR). *Chemical Engineering Science* 57: 4445-4460.

Jaffé, P.R., S. Wang, P.L. Kallin, and S.L. Smith. 2001. The dynamics of arsenic in saturated porous media: Fate and transport modeling for deep-water sediments, wetland sediments, and groundwater environments. Water rock interactions, ore deposits, and environmental geochemistry: A tribute to David Crerar, edited by R. Hellman and S.A. Wood. *The Geochemical Society*, Special Publication No. 7.

Brown, D.G., and P.R. Jaffé. 2001. Effects of nonionic surfactants on bacterial transport through porous media. *Environmental Science and Technology* 35(19): 3877-3883.

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