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EDITORIAL

Help Broaden the Nominations for AGU Awards

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It is time to submit nominations for Fellows, medals, and awards of AGU. The deadlines for arrival of nominations at AGU headquarters are October 1 for Fellows and October 15 for medals and awards. The Honors and Recognitions Committee would like to increase the diversity and quality of nominations for 2002 Fellows, medals, and awards. Here are some facts that have been assembled by the Committee.

Of Fellows, medalists and awardees, 18% live outside the United States, whereas they constitute 32% of the membership. Nominations of non-U.S. members are just as likely to be successful as U.S. members. There is potential in this portion of the membership, but more nominations of non-U.S. members are needed to balance the scales.

During some years (i.e., 1998, 2000), the percentage of women elected Fellows is much lower than the percentage nominated. We surmise that this was due to inconsistent efforts from year to year by members and the Sections to nominate women. In addition, there are still extremely few women among the medal winners.

The key to obtaining a higher representation of women and other minorities in the honors and awards programs of AGU is to increase the number of worthy nominations.

Anyone can nominate a colleague for Fellow, medals, and awards. Successful nominations have been made by young scientists. Making nominations is not an activity reserved for the "senior scientists' club."

Instructions and pointers for preparing an excellent package are available at AGU's Web site at http://www.agu.org/inside/fellnom.html and http://www.agu.org/inside/awardnom.html.

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Breakthroughs in Field-scale Bacterial Transport

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Microbial transport in the subsurface environment has been of interest for decades due to concerns about contamination of water supplies by pathogenic bacteria or viruses. More recently, research has demonstrated that many bacteria can beneficially serve to degrade or immobilize other environmental contaminants. A research program sponsored by the U.S. Department of Energy (DOE) is currently investigating the potential for enhancing and targeting bacterial transport to improve bioremediation efforts. Of particular interest to DOE is the potential for bioremediation of metals and radionuclides that are common to many of their former nuclear materials processing facility sites.

This article summarizes a bioaugmentation research project undertaken by a DOE-sponsored, multidisciplinary research team at a field site near Oyster, Virginia. The overall purpose of the ongoing project is to evaluate the relative importance of hydrogeological and geochemical heterogeneities in controlling bacterial transport, and to develop an approach for quantitative prediction of bacterial transport needed to design optimal bioremediation strategies.

Bioaugmentation is a process in which naturally occurring microbes are added to the subsurface to augment the existing biomass for the purpose of improving the remediation efficiency of the system. Bioremediation in general, and bioaugmentation in particular, are considered viable techniques. However, microbial transport in the presence of natural hydrogeological and geochemical heterogeneities is not well understood.

Although the hydrogeological heterogeneity of subsurface sediments has been recognized as a key control on microbial transport at the field scale, no prior study acquired a dense enough characterization data set in tandem with a field-scale bacterial transport experiment to enable investigation of the extent of the control.

Although bacteria cannot degrade metals and radionuclides, bacteria can either mobilize or immobilize these contaminants, facilitating remediation. The iron-rich Atlantic coastal plain sediments at the uncontaminated study site in Virginia provide a unique opportunity to study enhanced and targeted bacterial transport under both oxic and sub-oxic conditions. Because iron is precipitated and immobilized under the same conditions as uranium, this study site serves as an excellent surrogate for uranium-contaminated sites.

Research Objectives

The DOE-sponsored experiments were designed to investigate the influences of physical and chemical heterogeneities on bacterial transport under varying degrees of complexity at two study sites (Focus Areas) within the Oyster Site, which is located on Virginia's Eastern Shore Peninsula (Figure 1). Field-scale bacterial transport experiments have been performed at the oxic, relatively homogenous Narrow Channel (NC) Focus Area, and the anoxic, heterogeneous South Oyster Focus Area (SOFA).

Research at the NC Focus Area included multi-scale hydrogeological characterization, numerical modeling of bacterial transport, developing protocols for bacterial strain selection, designing and performing a field-scale tracer test, and developing novel methods for tracking bacterial transport.

This article discusses only the results from the NC Focus Area research. The experiment there permitted the investigation of the relative effects of hydrogeological and geochemical heterogeneity on the transport of a low-adhesion bacterial strain through a simple but stratified aquifer.