Yale Student Receives NWRI Fellowship for Groundwater Clean-up Research

Summer 2000 - For over three decades, bioremediation – or, the use of microorganisms, such as bacteria, to breakdown or immobilize contaminants – has been used as a method to cleanup contaminated groundwater. it is a demanding field, requiring expertise in no tone but three disciplines: environmental engineering, hydrogeology, and microbiology.

The study of bioremediation technologies can be a considerable challenge. For instance, researchers are still struggling with the complexities of the physical, chemical, and biological parameters that accompany the introduction of different species of microorganisms into a contaminated water system.

However, for environmental engineering student Sharon L. Walker, 24, environmental bioremediation is a passion that stemmed from her "life-long love affair with nature and the environment."

"I love the outdoors," said Sharon from Yale University in New Haven, Connecticut. "Whenever I can, I try to go hiking or fishing." This love has led her to numerous outdoor programs, including spending a semester on Catalina Island through the University of Southern California's Wrigley Institute for Environmental Studies and volunteering her summers as a ranger at the Gallatin National Forest in West Yellowstone, Montana.

This love also led her to the study of environmental engineering, where she has become a promising young researcher in the field of bioremediation "The future of water treatment processes lies in bacteria," she said. "In the past, we have used chemicals to clean-up contaminants; however, we don’t' understand the long-term effects of these chemicals. using bacteria – a natural process – to treat water is an environmentally sound method. We should work with what we already have naturally.

This May, Sharon was awarded an NWRI Fellowship for both her outstanding academic record and her impressive efforts in studying bioremediation. She received $25,000 to support research on her proposal, "*In Situ* Bioremediation of Groundwater Contaminated with Chlorinated Solvents: The Role of Bacterial Adhesion and Mobility." Specifically, Sharon is interested in looking at how the surface characteristics of bacteria, the chemical solution of groundwater, and the geology of the subsurface affect the transport of bacteria in groundwater during bioremediation.

"My research," said Sharon, "on the fundamental understanding of bacterial transport and on the development of high and low-adhesion bacteria species may provide the necessary scientific base for the development of effective bioremediation technologies for contaminated groundwater aquifers.

Sharon plans to use the fellowship award to support her graduate research on bioremediation. A vital part of this research would be interacting with key researchers who, among other things, will teach her new experimental techniques and introduce her to new ideas.

Sharon recently completed her first year as a doctoral student in the interdisciplinary Environmental Engineering Program at Yale University. She went directly into the doctoral program – bypassing a Masters degree – after receiving Bachelor of Science degrees in both Environmental Engineering and Environmental Studies (emphasis in Biology) from the University of Southern California, where she was among the top 10 students (for academics and leadership) of her 1998 graduating class.

Diligent, dedicated, and motivated, Sharon is the quintessential graduate researcher. With her passion for nature and glowing accomplishments, she is, by far, a rising star in the field of environmental engineering.

Every year, NWRI awards fellowships to outstanding graduate students in the field of water-science. These fellowships are meant to encourage the advancement of science and research by training young minds to solve problems in water and wastewater applications.

Nominations for NWRI Fellowships for the 2000-2001 school year are now being accepted.

This article, written by Gina Melin, first appeared in the Summer 2000 edition of the NWRI newsletter, *Briefings*.