

# ESEP-21 and Environmental and Water Resource Engineering Program Seminar

## *“Bacterial Transport and Sanitation in Coastal Areas”*



**Philip J. Roberts**

Civil & Environmental Engineering  
Georgia Tech

Thursday, October 12, 2006

1500 EECS, North Campus

The University of Michigan

Noon - 1:00 PM

Everyone is Invited

Refreshments Served

A large fraction of the world's population lives near coastal waters. These waters are the recipients of their wastewater via outfalls and bacteria and pathogens from other sources, especially creeks and rivers. Beaches and shorelines are also major recreation sites, but exposure of bathers to bacteria and pathogens can constitute a health hazard, and high bacterial levels at beaches result in beach closures with large economic impacts. How can we predict bacterial transport in coastal waters and how can we design outfalls and coastal sanitation schemes that are economical and protect public health and the environment? In this seminar we will discuss recent research governing the hydrodynamic aspects of wastewater mixing in coastal waters, particularly related to ocean outfalls discharging buoyant effluent into stratified environments. New laboratory techniques using three-dimensional laser-induced fluorescence, field experiments on outfall mixing, and mathematical modeling of coastal water dispersion will be discussed. An application of these methods to the design of a sanitation system in Cartagena, Colombia will be presented. Finally, recent research conducted on Lake Michigan on the mixing and transport of river plumes will be discussed.

This is the fifth in the winter Fall 2006 series of lectures addressing Environmental Science, Engineering and Policy in the 21st Century. This Seminar Series is organized by GREENPEAS and sponsored by the Environmental and Water Resources Engineering Program. Financial support is generously provided by the UofM Department of Civil and Environmental Engineering; Camp Dresser & McKee, Inc.; Limno-Tech, Inc.; Montgomery Watson Harza; The Kevin Olmstead Foundation; College of Engineering Council on the Environment; Barr Engineering; and TetraTech, Inc.