

PLENARY SESSION

Monday, 6:00–8:00 P.M.

FEATURED SPEAKER

Terry Hazen, Ph.D. (Energy Biosciences Institute at E.O. Lawrence Berkeley National Laboratory)
Intrinsic Bioremediation and Ecogenomics of the Deepwater Horizon Oil Spill



Dr. Hazen led the work of a research team studying the spill in the Gulf of Mexico as it progressed following the April 2010 explosion at the Deepwater Horizon drilling rig. For several months, Dr. Hazen and his team worked from on board NOAA's R/V Ferrel and other research vessels and provided the first data ever on microbial activity in a deepwater

dispersed oil plume. The plume extended more than 600 feet into the water column and more than 10 miles from the wellhead. Once the wellhead had been capped, the plume was degraded and diluted to undetectable levels within weeks, and this degradation took place without significant oxygen depletion. The results indicate that a variety of hydrocarbon-degrading microbes exist in the deep water of the Gulf, where natural oil seeps have occurred with some frequency over long periods of time. Dr. Hazen will discuss his investigations in the Gulf, his conclusions about the role of bioremediation compared with other cleanup efforts, and how this data can be used to determine the long-term effects of the Deepwater spill in the Gulf and plan how to address future marine spills.

Dr. Hazen's specialty is environmental microbiology, especially as related to bioremediation, water quality and bioenergy. After chairing the Biology Department and directing graduate studies at the University of Puerto Rico, he conducted research at Savannah River National Laboratory and Savannah River Ecology Laboratory. At the Berkeley Lab, Dr. Hazen heads the Ecology Department, the Center for Environmental Biotechnology, and the Microbial Communities Department of the Joint BioEnergy Institute; he co-directs the Virtual Institute for Microbial Stress and Survival and the Microbial Enhanced Hydrocarbon Recovery Program. He is a fellow of the American Academy of Microbiology, has authored more than 230 scientific publications, and has patents on five bioremediation processes in use in the U.S., Europe, and Asia. Dr. Hazen has supervised the work of graduate students and postdoctoral fellows and has obtained substantial competitive research funding and institutional grants. Among his awards are two R&D 100 awards and the Distinguished Scientist Award from the U.S. Department of Energy's Office of Biological and Environmental Research.

PANEL DISCUSSION

Biological and Chemical Fate of Petroleum in Deepwater and Marsh Environments

Moderator:

C.H. (Herb) Ward, Ph.D. (Rice University)

Panelists:

Terry C. Hazen, Ph.D. (E.O. Lawrence Berkeley National Laboratory)

Roger Prince, Ph.D. (ExxonMobil Biomedical Sciences, Inc.)

Albert D. Venosa, Ph.D. (U.S. Environmental Protection Agency)

Lily Y. Young, Ph.D. (Rutgers University)

Alexander Zehnder, Ph.D. (Alberta Water Research Institute)

For decades, petroleum releases in marine environments have been the subject of fate-and-transport studies by both private and academic sector scientists. Petroleum itself represents a complex and heterogeneous mixture, known to vary in composition according to geographic location. The fate of this mixture in saline and marsh environments depends on a variety of interrelated biogeochemical processes, including abiotic, biotic, and chemical microbially mediated pathways. Rates and mechanisms of transformation also depend on the physical/chemical properties of the petroleum, which may vary considerably across different geologic settings and with time as the petroleum ages. Recently, the relative importance of microbial degradation of petroleum releases in deepwater environments has come to the forefront, in part due to a sense of urgency concerning the April 2010 Gulf oil spill. The extent to which microbes in the pelagic and near-shore environments may govern the degradation of petroleum hydrocarbons is being researched as a mechanism for the removal of petroleum in the Gulf. This panel will review recent research on microbial utilization of petroleum hydrocarbons. Topics of discussion during the panel will include new findings on dominant mechanisms governing degradation; short- and long-term effects of petroleum constituents and dispersants on deepwater and marsh/coastal systems; trade-offs involved in using dispersants; and the effectiveness of methods to enhance degradation of petroleum constituents.