N E G S NEWS

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ACS Chemistry for Life®

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SPEAKER'S BIOGRAPHICAL SKETCH

Dr. Samantha Joye is the Athletic Association Professor in Arts and Sciences in the Department of Marine Sciences in the University of Georgia's Franklin College of Arts and Sciences. She earned her Ph.D. in Marine Sciences from the University of North Carolina-Chapel Hill in 1993 and joined the faculty of the University of Georgia in 1997, having served briefly as a research associate at San Francisco State University and an assistant professor of oceanography at Texas A&M. She is an expert in biogeochemistry and microbial ecology and works in open ocean and coastal ecosystems. Her work is interdisciplinary, bridging the fields of chemistry, microbiology, and geology. She was also awarded a fellowship at the Hanse Institute for Advanced Study in Delmenhorst, Germany, where she served as a visiting professor at the Max Planck Institute for Marine Microbiology in Bremen, in 2002-03. In 1997 and 1999, she served as a research fellow at the Marine Biological Laboratory in Woods Hole, Mass.

In 2008, she was awarded the university's Creative Research Medal for her work assessing the impacts of climate change on biological and geological processes, particularly those involving carbon, in coastal ecosystems. Her work along the Georgia coast showed for the first time that even small changes in temperature affect the efficiency of super-sensitive microorganisms that degrade organic carbon in coastal sediments. She is also acutely interested in understanding how the rising sea levels caused by climate change may affect coastal wetlands, particularly salt, brackish, and freshwater tidal marshes.

Dr. Joye has been studying natural seepage of oil and gas in the Gulf of Mexico for fifteen years. Her current research related to the Gulf oil spill zone examines the distribution of deepwater plumes of oil and gas, measuring the activities of the microorganisms that break down oil and gas, and assessing other variables such as dissolved oxygen concentration and other environmental impacts of the spill. She was among the first to document the presence of weathered oil on the seafloor and is continuing to study its impact on the Gulf system.

Her research has been widely published in leading scientific journals, and she is regularly called upon by national and international scientific and policy agencies for expert commentary. Her work has been funded by substantial, multi-year grants from the National Science Foundation, the Environmental Protection Agency (US EPA), the Gulf Research Institute, and the National Oceanic and Atmospheric Administration (NOAA), among others.

MONTHLY MEETING

Dr. Samantha (Mandy) Joye

University of Georgia, Athens, GA

Talk Title:
Undersea plumes of oil and dissolved gas and sedimented oil along the seafloor alter the ocean system following the BP oil well blowout

Tuesday, September 18, 2012
6:00 PM

Loco's Grill & Pub
1985 Barnett Shoals
Athens, GA 30605

Each NEGS ACS member and chemistry major college student will receive a

$5.00 credit for his/her meal.

TALK SYNOPSIS

Undersea plumes of oil and dissolved gas and sedimented oil along the seafloor alter the ocean system following the BP oil well blowout

The explosion and subsequent sinking of the Deepwater Horizon drilling rig resulted in a deepwater blowout that injected vast quantities of crude oil and low molecular weight hydrocarbon gases into Gulf of Mexico for almost three months. The depth of the blowout (1500m), the rate of oil and gas injection, and the duration of the event underscore the unprecedented nature of this environmental disaster. While most of the released crude oil reached the ocean surface, generating massive surface slicks, some of the oil was trapped in extensive undersea plumes. These oil plumes occupied discrete layers of varying thickness between 1000 and 1300m water depth to the southwest of the wellhead. Unlike the crude oil, the vast majority of methane released from the wellhead appears to have dissolved into the deep cold seawater: concentrations of thermogenic gases (methane, ethane, propane, butane and pentane) were 10,000 to 1,000,000 times higher than previous concentrations measured at similar depths in the Gulf of Mexico. Very little gas appears to have fluxed to the atmosphere; most of the released gas was trapped in the undersea plumes. The injection of hydrocarbons into undersea plumes generated a swift phylogenetic and metabolic response in the microbial community -- hydrocarbon degrading microorganisms flourished and rates of methane oxidation and oxygen consumption were elevated by several orders of magnitude relative to background rates. Oil on the surface ocean was weathered and dispersed, resulting in an “oil aggregate snow storm” on the seafloor. Oil deposition to the seafloor generated substantial changes in microbial community and patterns of microbial activity.

Available Now: New Guidelines and Recommendations for Teaching High School Chemistry

Featuring strategies and considerations for teaching high school chemistry in the 21st century to all students, the new ACS Guidelines and Recommendations for Teaching High School Chemistry are a useful resource for strengthening high school chemistry programs. This timely and comprehensive document provides guidance on the classroom and laboratory environments, safety, the big ideas in chemistry, strategies and technologies for teaching diverse learners, the professional responsibilities of chemistry teachers, and more.

Visit www.acs.org/hsguidelines for more information.

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AMERICAN CHEMICAL SOCIETY NATIONAL OFFICES

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Headquarters
1155 Sixteenth Street, NW
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