

CONFRONTING COASTAL CHALLENGES: *Lessons Learned from the Deepwater Horizon Oil Spill*

The air hangs hot and humid in the mesocosm as Dr. Michael Fulton tours stacked, rectangular bins of *Spartina* cordgrass, a patchwork of mini-marsh ecosystems in this greenhouse laboratory. Scientists here at the Center for Coastal Environmental Health & Biomolecular Research drop in oil pollutants. They wait, watch and measure to learn how the simulated coastal ecosystem will respond.

Nearby at the Marine Environmental Specimen Bank operated by the National Institute of Standards and Technology (NIST), the temperature drops sharply. Research biologist Rebecca Pugh, decked out in Tyvek coveralls, sinks her gloved hands into a cold abyss of mists spiraling atop barrel-shaped nitrogen freezers where temperatures at the base sink down to minus 150 degrees Celsius. She pulls out a long tray housing barcoded marine samples.

The scene takes a medical twist at the Marine Biomedicine & Environmental Sciences Center where Medical University of South Carolina (MUSC) researchers Dr. Louis J. Guillette, a reproductive endocrinologist and developmental geneticist known for his fieldwork in alligator studies, and Dr. Demetri Spyropoulos, a developmental biologist and an expert in the manipulation of embryonic stem cells, pair their talents to investigate marine environmental contaminants and their possible effects on human health.

The same is true of two other researchers nearby who want to know more about this environmental connection to human health.



This dolphin, coated in oil, was observed in Bay Jimmy, Barataria Bay, Louisiana, August 5, 2010.

Dr. Susan Lovelace, an environmental social scientist and Human Dimensions Program manager at Hollings Marine Laboratory (HML), is working out a scientific method to monitor how an area's environmental health affects the well-being of its coastal residents. Dr. Lori Schwacke, chief of the Oceans & Human Health Branch of NOAA/National Centers for Coastal Ocean Science (NCCOS) HML, is investigating the impact of environmental contaminants on dolphins in the Gulf.

What pulls these disparate fields and institutions together in a creative, scientific stew is HML, where they are all housed. The other unifying factor is the *Deepwater Horizon (DWH)* oil spill, aka BP oil spill, an event called one of the worst oil disasters in history. All of the groups, using their distinctive skill sets, are investigating the environmental effects of the spill that began

April 20, 2010, in the Gulf of Mexico and was capped 87 days later. It impacted about 500 miles of the Gulf's shoreline and caused approximately five million gallons of oil to gush into the Gulf.

Dr. Jeffrey King, HML's Acting Director, said it's amazing to have one event being looked at from so many different angles. "Who would have ever thought that there would have been so many unique individuals from all of our different partners working on the same project?" he said. "It speaks to what we have in the way of talented individuals with diverse skill sets and expertise. They were asked to be a part of something that was important to our nation at a time when things were getting out of hand and out of control."

King said NOAA looked to NCCOS to come up with solutions for a very difficult problem that was happening in the Gulf, knowing that it wasn't going to be a quick fix. HML is one of five centers within NCCOS, and the laboratory hosts five primary research partners that include: NOAA, NIST, the South Carolina Department of Natural Resources, MUSC, and the College of Charleston. "They understood this event was something we'd have to deal with for many years. We have to know what those long-term impacts are now. In fact, there are effects we probably won't see for another 10 to 15 years."

In what might seem to be a bureaucratic nightmare of partnering organizations, researchers find that's not the case at all. HML provides a laboratory of collaboration and cooperation. It's an environment Guillette, who has conducted research worldwide, has found

Dark clouds of smoke and fire emerge as oil burns during a controlled fire in the Gulf of Mexico May 6, 2010, as part of the Deepwater Horizon oil spill response in the Gulf of Mexico. The U.S. Coast Guard working in partnership with BP P.L.C., local residents, and other federal agencies conducted the "in situ burn" to aid in preventing the spread of oil following the April 20, 2010 explosion on the mobile offshore drilling unit.