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Gulf oil spill
SeaKeepers and USF track lasting effects

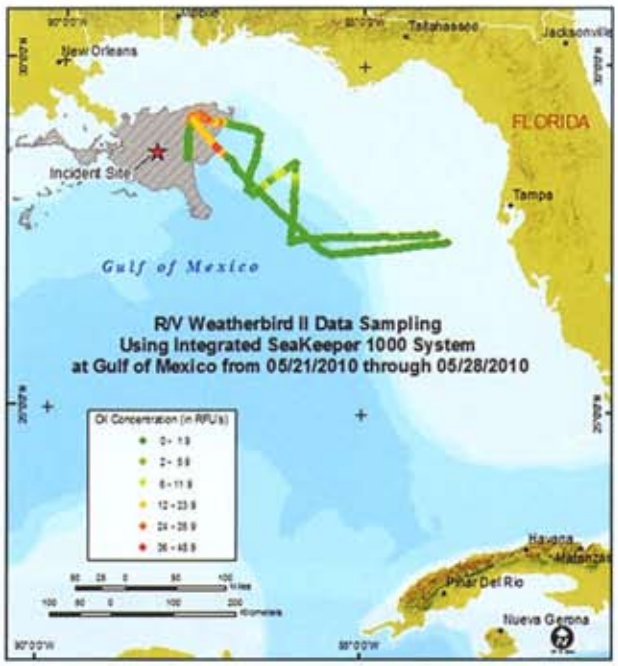
Recently, the National Oceanic and Atmospheric Association (NOAA) reported that most of the oil from the BP spill had either been disbursed or evaporated. It begs the questions: How much oil is left in the Gulf of Mexico, and where has it gone? Leaders in the nonprofit, corporate and academic environments are working on providing answers.

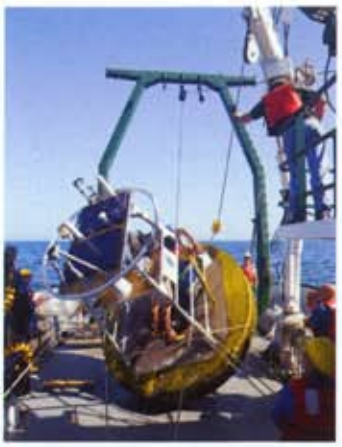
"Just because [the oil] has dispersed doesn't mean it's gone. Large clouds of tiny droplets still exist and can cause damage for many years—or decades," says Mark E. Luther, associate professor and director of the University of South Florida (USF) Ocean Monitoring and Prediction Lab. "These oil droplets can bubble up miles from the site of the spill in unpredictable ways. Oil doesn't degrade as quickly beneath the surface where it is dark and colder and can persist for longer periods—unlike on the surface where sun and warm water help break it down," he explains. He adds that oil from the Valdez spill, which happened in March 1989, is still surfacing—and the Gulf spill is estimated to have released about 20 times the amount of oil that spilled out of the Exxon Valdez.

The International SeaKeepers Society, a nonprofit international organization created by yachtsmen to help preserve the world's oceans, works closely with the scientific community. Among scientists that have used the oceanographic data the organization's equipment has collected is Dr. Luther, who currently heads a USF research team gathering information on oil in the Gulf. In fact, SeaKeepers has had a long-standing relationship with USF. Its state-of-the-art laboratories process scientific data that the Society's widely endorsed SeaKeeper 1000 ocean-monitoring units have collected during the past six years, and USF's own research vessel, the R/V *WeatherBird II*, is equipped with a SeaKeeper 1000 monitor.

Recently, SeaKeepers partnered with YSI Inc to install Hydrocarbon sensors that can help map diluted oil plumes. The research vessel *WeatherBird II* was equipped with the sensor. It has been cruising the Gulf of Mexico with a crew of 14 scientists, taking water samplings at various depths and has found evidence of petroleum hydrocarbons in marine organisms like phytoplankton and bacteria. Evidence came from the nutrient-rich DeSoto Canyon, a critical area that supports the spawning grounds of commercially important fish species on the West Florida Shelf. More research is needed to define the extent of the toxicity.

"Oil can affect fish spawning and larvae for decades," says Dr.





FROM LEFT: The research vessel *WeatherBird II*, seen during earlier expeditions, is equipped with a Hydrocarbon sensor; the map tracks the data sampling *Weatherbird II* took in the Gulf of Mexico in May 2010 revealing higher concentration levels in yellow and red

Luther. He cited as example a fishing collapse that occurred four years after the Valdez crisis, a period that happens to coincide with the lifecycle of fish. "We won't know the full impact [of the BP oil spill] for four to five years, minimum."

These hydrocarbon sensors are not exclusive to USF. In fact, the sensors can be easily installed in a matter of hours in a smaller vessel's transom, in the gunwale or in the existing seawater system of any large vessel, or even on a stationary structure like a pier or buoy, multiplying opportunities to gather valuable and timely data from numerous locations. The sensors send data via satellite to servers maintained by SeaKeepers for immediate analysis by the state-of-the-art USF laboratories where it is calibrated and evaluated before being forwarded on to NOAA and the National Coastal Data Distribution Center for release to the larger scientific community at no charge. The sensors utilized also have photo-optical capabilities, which can help scientists identify the BP oil more easily because different types of oil absorb light at different wavelengths and have a different color signature from seawater.

SeaKeepers has had early success with companies agreeing to install these sensors, but is actively soliciting funding and more vessels to host them. "The more data that can be gathered from the open and coastal waters…the better equipped scientists will be to provide answers on the effect of the oil spill," says Dean C. Klevan, president and CEO of SeaKeepers. "The long-term implications [of the oil spill] won't be known for years, so we are taking our ongoing relationship with the University of South Florida and weaving this into a larger effort," he adds.

Vessels that travel the same area repeatedly (be they pleasure boats, petroleum or container ships) effectively become research vessels simply by carrying the new hydrocarbon sensors.

Recently, Carnival Cruise Lines agreed to equip its *Triumph*, *Legend* and *Miracle* ships, which cruise out of New Orleans, Tampa and New York. They will assist in mapping the extremely diluted hydrocarbon plumes at the shelf break, in the loop current and in the Gulf Stream. Their operation in clean water is important in establishing a baseline for future studies. These ships can provide data from greater depths, an important capability. On smaller boats, sensors can be dropped from wires or dragged by "gliders" closer to the ocean floor to map deep plumes.

"There are vast areas of ocean where we have no data," says Dr. Luther. "Data from Seakeepers systems help tremendously to fill these voids in our knowledge base, especially on distribution of oil."

Finding answers to the question of how much oil and where the BP oil has gone will not be easy and will likely require collaboration among public, private and scientific entities. The International SeaKeepers Society fosters and encourages this type of collaboration. — **Marilyn DeMartini**

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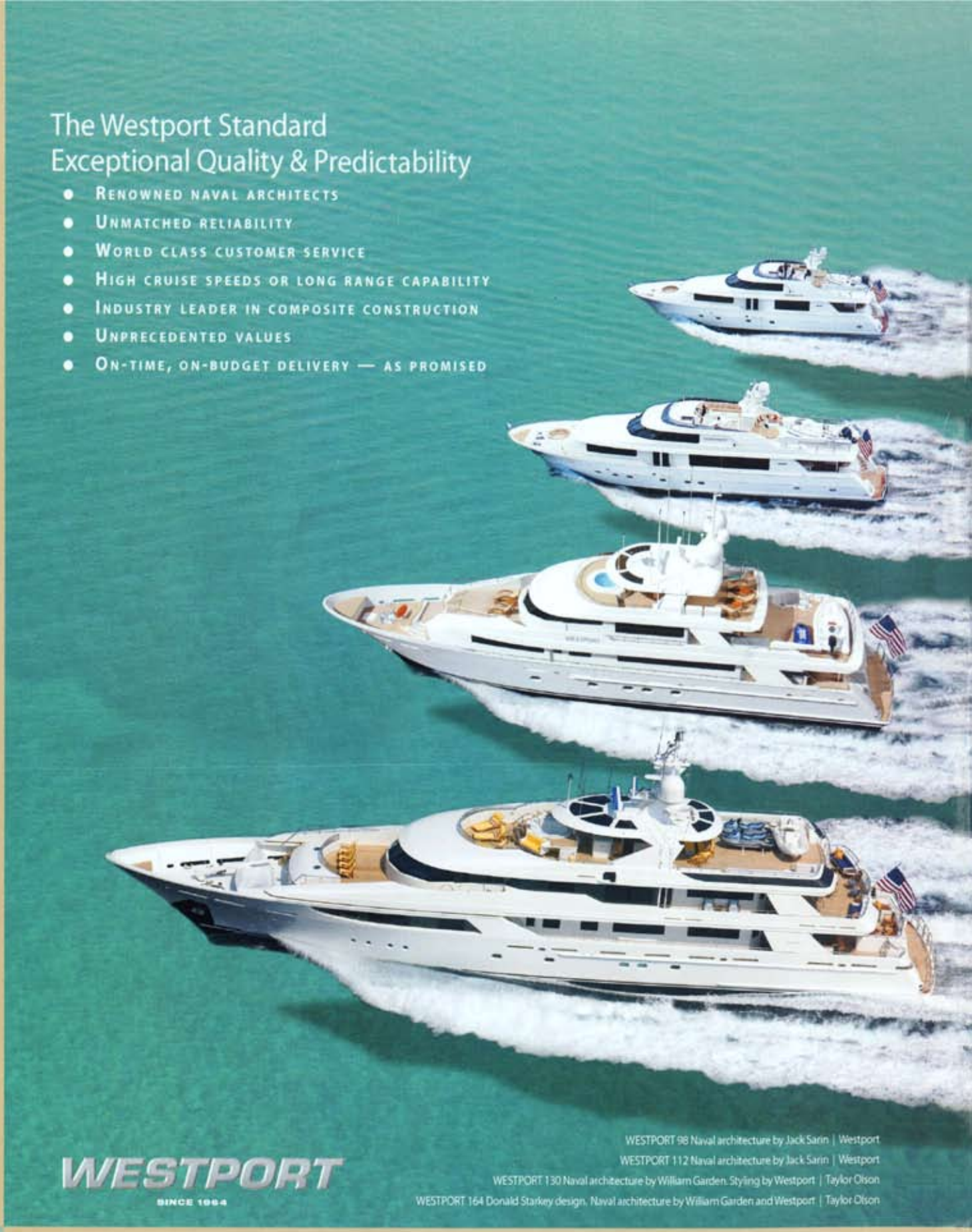

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