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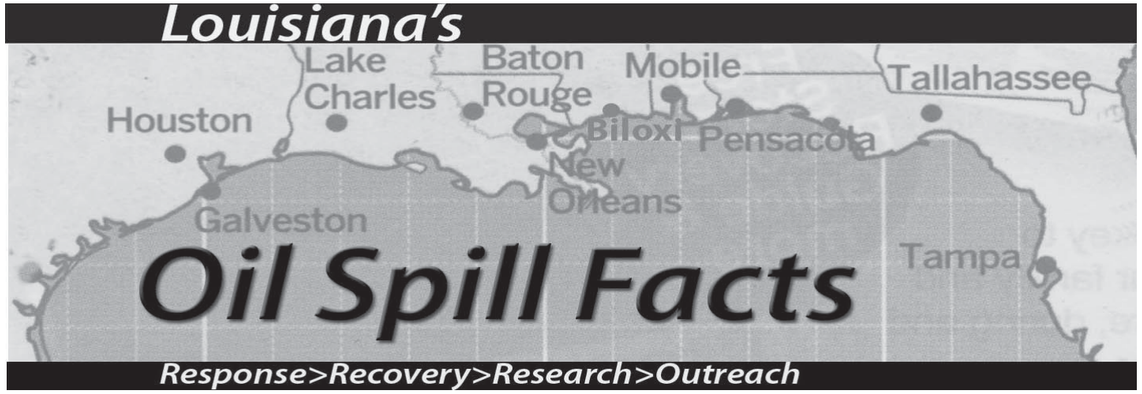

Understanding Conflicting Scientific Information Regarding the Deepwater Horizon Oil Spill

Introduction

There is a great deal of scientific debate and uncertainty related to the Deepwater Horizon oil spill and its effects on the Gulf of Mexico. This material is designed to make you aware of ongoing and future research and to prepare you for some of the potential conflicting findings and conclusions being drawn while scientists continue to understand both the short- and long-term ecological effects of the spill on the near-shore and offshore ecosystems.

The Incident

Oil flowed unabated from approximately 5,000 feet below the sea surface beginning on April 20, 2010, with the explosion of the Deepwater Horizon drilling platform in the Gulf of Mexico. An estimated 35,000 to 60,000 barrels of crude oil surged from the well each day and covered an area of 2,500 square miles. This oil spill is the largest in U.S. history with more than 200 million gallons of MC252 LA Sweet Crude leaked. In attempts to mitigate oil pollution on shore, more than 1.8 million gallons of dispersant were used below the surface at the well head and on the sea surface where slicks were observed. Ultimately, the flow was capped on July 15, 2010, but the severity of environmental effects is still a matter of scientific debate.

Some of the Problems

One of the primary reasons for uncertainty in the scientific community is the relatively short time frame since the incident began. For those suffering economic losses because of the disaster, this may sound ludicrous. But definitive, well-done scientific studies take time to set up, conduct, analyze and pass the scrutiny of other qualified scientists. The process of peer review by other scientists ensures that studies' conclusions match the information demonstrated and that the methods used to obtain the information were appropriate. This somewhat time-consuming process is critical to guaranteeing scientific value and confidence.

Many of the studies and conclusions reported in the news media have not been going on long enough to receive this kind of scrutiny – and many of the scientific studies that are planned have not even started.

Exceptions to this are the high-volume, much-scrutinized and reproduced results related to the safety of consuming seafood from the Gulf. These studies and testing protocols were given top priority from the beginning. While they did take some time initially, the process has worked well, and all evidence clearly indicates seafood from the Gulf is safe for consumption.

More problematic and time consuming is trying to understand the spill's effects on the overall health and reproductive capacity of the many animals and plants that inhabit the Gulf of Mexico. This research must take into account that there might have been severe damage to certain organisms, but it will take time to study the life cycles of the organisms that inhabit the vast Gulf region and draw any firm conclusions. In cases like this, scientists must look for "holes" in the yearly populations of certain fish, other marine animals or plants. Because they are looking for such things as missing age classes, reductions in larvae or decreases in historical populations, this type of research can take years to define and illuminate a problem – if one exists at all.

Recent Scientific Debate on the Effects of Dispersants on Marine Life

Preliminary data released by scientists under contract with British Petroleum suggests the toxicity of oil, dispersants and oil/dispersant combinations may not result in the consequences many initially feared. Most of these studies are continuing to determine if those early findings will be verified.

Despite media claims that little is known about the toxicity of dispersants used in this disaster (predominantly Corexit 9500), there were a number of studies conducted long before the spill examining the toxicity of Corexit and its individual components.

One frequent question involves the concentration of dispersants applied and whether the mixture of dispersants, sea water and oil can cause harm to fish eggs, larvae or planktonic animals or plants? A study done by the BP science group collected large volumes of water from underneath oil slicks that had been sprayed with Corexit. This water was used to conduct toxicity tests on fish, crustaceans and algae. The results of these preliminary acute and chronic toxicity tests done in May and June indicated the finfish Inland silversides (*Menidia beryllina*) showed no sign of toxicity in any sample, and the crustacean Mysid shrimp (*Mysidopsis bahia*) demonstrated no sign of toxicity. Results for the algae (*Skeletonema costatum*) were less conclusive because they showed some reduction in the numbers of the initial test population. This led researchers to wonder if the water sample killed algae cells or prevented reproduction of some algae and if this was caused by the dispersant, oil or turbid (cloudy) water.

This kind of information sometimes is in conflict with statements by reputable universities and scientists who believe the immense amount of oil and the unprecedented use of so much dispersant will have significant negative effects on the planktonic and deep-sea environments by reducing various species numbers and/or these species ability to grow and reproduce. Those beliefs may be based on other evidence, perhaps from other incidents, or some of their own laboratory or preliminary on-site studies. Many of these researchers are just beginning to conduct their own studies, however, and in time their efforts may support or contradict some of the initial data interpretations by the BP scientists. It is even possible that BP scientists may change some of their preliminary assertions as they continue their research.

How Much Oil is Still Out There?

The debate about how much oil is still in the Gulf is by far the most contentious. The BP team recently revealed evidence a plume or anomaly, possibly of highly dispersed oil, existed 1,000 to 1,300 meters below the surface and that it was moving toward the northeastern Gulf of Mexico. They further indicated the plume was diminishing in size and attributed that to both bacterial degradation (as evidenced by slightly reduced oxygen availability around the plume) and normal dilution as the plume naturally dispersed through current movement. They cautioned this finding was based on light reflection from oil or other organic matter, using a process called flourmetry, and that the plume could be made up of both oil and other components. Further monitoring and sampling of this area was to continue, with water samples to be taken to analyze oil concentrations.

Louisiana's Oil Spill Facts Response>Recovery>Research>Outreach

Government agencies recently released a statement declaring approximately 75 percent of the oil that had been released into the Gulf was either dispersed and breaking down rapidly or had been burned, skimmed or collected at the well-head or on shore. About 25 percent remained in an undetermined state. This observation was met with severe criticism by some experienced and respected experts at several major universities.

The University of Georgia questioned the government's findings and concluded approximately 75 to 80 percent of the oil remained in an undetermined state and only about 25 percent actually could be accounted for. A recent study by Woods Hole Oceanographic Institute found a large subsea plume of oil with no oxygen degradation around it, indicating to those scientists that the microbes were consuming the oil slowly and not efficiently. Within one week of the Woods Hole study's publication in Science, other scientists from the Lawrence Berkeley National Laboratory in California published a study in the same journal reporting that a microorganism was found in extremely high concentrations in these undersea plumes and that it was capable of reducing the amount of oil by about half in a three-day period. This perhaps new species or subspecies of oil-consuming microbe is indeed good news if this finding stands the test of future studies. This oil-eating bug apparently multiplies rapidly, consumes oil quickly, works efficiently at cold temperatures and does so without reductions in the dissolved oxygen level in surrounding waters.

What Do We Make of This Conflicting Information?

Remember, what we learn from this disaster generally will come in bits and pieces over time. No single study or experiment will be able to answer all the questions. Many studies may continue to be at odds, agreeing on some points and differing substantially on others. The only sure thing is that as the investigations go on, a general trend or consensus will emerge and will be the most scientifically based facts with which political leaders, businesses and the general public can make future decisions or historical assessments.

When listening to or reading any conclusions or theories regarding this or any other controversy, stakeholders must view all with a healthy dose of skepticism. It is wise to look closely to determine if the authors are expressing opinions based on past experiences or knowledge or if the conclusions are based on empirical information and data related directly to the question at hand. Both can be relevant, but the ultimate truth will be determined by a broad range of scientists who concur on conclusions that are based on the best scientific evidence. That takes time.