

No dead zones observed or expected as part of BP Deepwater Horizon oil spill: NOAA report

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The National Oceanic and Atmospheric Administration (NOAA), the U.S. Environmental Protection Agency (EPA) and the Office of Science and Technology Policy (OSTP) released a [report](#) today that showed dissolved oxygen levels have dropped by about 20 percent from their long-term average in the Gulf of Mexico in areas where federal and independent scientists previously reported the presence of subsurface oil. Scientists from agencies involved in the report attribute the lower dissolved oxygen levels to microbes using oxygen to consume the oil from the BP Deepwater Horizon oil spill.

These [dissolved oxygen](#) levels, measured within 60 miles of the wellhead, have stabilized and are not low enough to become “[dead zones](#).” A dead zone is an area of very low dissolved oxygen that cannot support most life. Dead zones are [commonly observed](#) in the nearshore waters of the western and northern Gulf of Mexico in summer, but not normally in the deep water layer (3,300 - 4,300 feet) where the lowered oxygen areas in this study occurred. Dead zones, also known as hypoxic areas, are defined in marine waters as areas in which dissolved oxygen concentrations are below 2 mg/L (1.4 ml/L).

“All the scientists working in the Gulf have been carefully watching dissolved oxygen levels because excess carbon in the system might lead to a dead zone. While we saw a decrease in oxygen, we are not seeing a continued downward trend over time,” said Steve Murawski, Ph.D.,

NOAA's Chief Scientist for Fisheries and the head of the Joint Analysis Group. "None of the dissolved oxygen readings have approached the levels associated with a dead zone and as the oil continues to diffuse and degrade, hypoxia becomes less of a threat."

Since the Deepwater Horizon incident began, EPA and NOAA have systematically monitored dissolved oxygen levels along with other parameters from the sea surface to about 5,000 feet deep near the spill site. Data from 419 locations sampled on multiple expeditions by nine ships - NOAA Ships Gordon Gunter, Henry Bigelow, Nancy Foster and Thomas Jefferson and the research vessels Brooks McCall, Ferrel, Jack Fitz, Ocean Veritas and Walton Smith - over a three-month period, were analyzed for this report.

The JAG report does not specifically address the question of the rate of biodegradation of oil, which cannot be determined looking only at dissolved oxygen data. But it references a recently published peer reviewed study conducted by researchers at the Department of Energy's Lawrence Berkeley National Laboratory. Using field sampling and laboratory experiments, the scientists found that half-lives of some components of the oil were in the range of 1.2 to 6.1 days. Their results suggest that the light components of the oil are being rapidly degraded by microbes. This report also did not find hypoxic oxygen levels.

The report released today documenting moderately low dissolved oxygen levels is also consistent with a study recently published by academic researchers led by the Woods Hole Oceanographic Institution and supported by the National Science Foundation and NOAA, who also reported they did not find dead zones where they found subsurface oil.

"It is good news that dissolved oxygen has not reached hypoxic levels in these deepwater environs," said Shere Abbott, Associate Director for Environment at the Office of Science and Technology Policy. "This

work testifies to the nation’s commitment to applying the best science and technology — directly through federal agencies and indirectly through the support of cutting-edge academic research — to understand environmental impacts in the Gulf and in all our treasured ocean ecosystems.”

Dissolved oxygen levels reported by the JAG were measured using a range of different instruments and methods including dissolved oxygen sensors and Winkler titrations. The dissolved oxygen data underwent preliminary quality control (QC) and quality assurance (QA) described in Appendix 4 of the report.

Dissolved [oxygen levels](#) are continuously monitored as part of the EPA monitoring protocols required for the use of subsea dispersants. If concentrations had fallen below 2 mg/L (1.4 mL/L) - hypoxic levels - the Unified Command would have considered discontinuing the use of subsurface dispersants. Based on evidence to date, dissolved oxygen did not decrease to these levels. The lowest dissolved oxygen measured was 3.5 mg/L (2.5 mL/L), which is above hypoxic levels. However, this report does not discuss the broad ecosystem consequences of hydrocarbons released into the environment.

This report is the third analytical report from the federal Joint Analysis Group (JAG) about ongoing Deepwater Horizon / BP research and monitoring. The JAG comprises scientists from NOAA, EPA and OSTP and was established to facilitate cooperation and coordination among the best scientific minds across the government and provide a coordinated analysis of information related to subsea monitoring in the Gulf of Mexico.

Provided by NOAA

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