

# At least 200,000 tons of oil and gas from Deepwater Horizon spill consumed by gulf bacteria

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Deepwater Horizon oil spill. Credit: NASA

Researchers from the University of Rochester and Texas A&M University have found that, over a period of five months following the disastrous 2010 Deepwater Horizon explosion and oil spill, naturally-occurring bacteria that exist in the Gulf of Mexico consumed and removed at least 200,000 tons of oil and natural gas that spewed into the deep Gulf from the ruptured well head.

The researchers analyzed an extensive data set to determine not only how much oil and gas was eaten by [bacteria](#), but also how the characteristics of this feast changed with time.

"A significant amount of the oil and gas that was released was retained within the ocean water more than one-half mile below the sea surface. It appears that the hydrocarbon-eating bacteria did a good job of removing the majority of the material that was retained in these layers," said co-author John Kessler of the University of Rochester.

The results published this week in *Environmental Science and Technology* include the first measurements of how the rate at which the bacteria ate the oil and gas changed as this disaster progressed, information that is fundamental to understanding both this spill and predicting the behavior of future spills.

Kessler noted: "Interestingly, the oil and gas consumption rate was correlated with the addition of dispersants at the wellhead. While there is still much to learn about the appropriateness of using dispersants in a natural ecosystem, our results suggest it made the released hydrocarbons more available to the native Gulf of Mexico microorganisms. "

Their measurements show that the consumption of the oil and gas by bacteria in the deep Gulf had stopped by September 2010, five months after the Deepwater Horizon explosion. "It is unclear if this indicates that this great feast was over by this time or if the microorganisms were simply taking a break before they start on dessert and coffee" said Kessler. "Our results suggest that some (about 40%) of the released hydrocarbons that once populated these layers still remained in the Gulf post September 2010, so food was available for the feast to continue at some later time. But the location of those substances and whether they were biochemically transformed is unknown."

Previous studies of the Deepwater Horizon spill had shown that the oil and gas were trapped in underwater layers, or "plumes", and that the bacteria had begun consuming the oil and gas. By using a more extensive data set, the researchers were able to measure just how many tons of

hydrocarbons released from the spill had been removed in the deep Gulf waters. The team's research suggests that the majority of what once composed these large underwater plumes of oil and gas was eaten by the bacteria.

Professor John Kessler, recently appointed as Associate Professor in the Department of Earth and Environmental Sciences of the University of Rochester, worked with graduate research assistant Mengran Du at Texas A&M University to analyze over 1300 profiles of oxygen dissolved in the Gulf of Mexico water spanning a period of four months and covering nearly 30,000 square miles.

The researchers calculated how many tons of oil and gas had been consumed and at what rate by first measuring how much oxygen had been removed from the ocean. Mengran Du explained that "when bacteria consume oil and gas, they use up oxygen and release carbon dioxide, just as humans do when we breathe. When bacteria die and decompose, that uses up still more oxygen. Both these processes remove oxygen from the water." Du added that it is this lower oxygen level that the researchers could measure and use as an indicator of how much oil and gas had been removed by microorganisms and at what rate.

**More information:** [pubs.acs.org/doi/abs/10.1021/es301363k](https://pubs.acs.org/doi/abs/10.1021/es301363k)

Provided by University of Rochester

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