

## Study: Oil Means More Arsenic In Seawater

Besides the oil already spilling into the Gulf of [Mexico](#) at the rate of up to 60,000 barrels daily, a group of British scientists says one can expect to see elevated levels of arsenic as well.

Lee Celano / REUTERS

Oil being burned off the surface near the Deepwater Horizon spill. A group of British scientists says oil may raise arsenic levels in the Gulf.



The research, published in the journal *Water Research*, showed that oil prevents naturally-occurring arsenic from being filtered out of the water by the sediment on the ocean floor. Oil coats the individual sediment particles and blocks the arsenic making contact with the minerals that would ordinarily bind to it.

Mark Sephton, a geochemistry professor and one of the lead authors, said the problem is that ordinarily, arsenic -- often naturally occurring -- will bind to goethite, a mineral that is one of the most common minerals found in ocean sediments. Goethite is an iron oxide similar to rust. The binding allows the sediment to filter out the arsenic.

When a lot of oil is spilled into the water, the process slows down, pushing up the concentrations of arsenic. The rate at which arsenic is removed also levels off at a lower level than if the water were clear.

The tests were in the laboratory, using artificial goethite. The oil was from southern England, an area called Witch Farm. First, the group varied the acidity (pH), salinity and goethite levels of the water, to see how fast the arsenic reacted with the goethite. Then they did the same experiments with oil in the water.

In one experiment, using water at a pH of 8, which is close to that of seawater, without oil the absorption rate was between 50 and 60 micromoles per gram of goethite in the first hour, and went up to about 90 after an hour, where it levels off. A micromole of arsenic weighs about 7/100,000ths of a gram.

With the oil in the water those levels drop to between 10 and 20 micromoles per gram in the first hour, and top out at about 40 after the four-hour mark.

Knowing how much arsenic is absorbed can help in drawing a "risk map" for areas of ocean where there are plans to drill for oil, by looking at how much goethite there is, and having a better idea of how it reacts with oil and arsenic. The experiments had nothing to do with the disaster at [BP](#)'s Deepwater Horizon oil rig, Sephton said. It was actually focused on the waters of Southeast Asia, where oil drilling is also taking place. "It was originally focused on decommissioning wells," he said. "We were looking at the potential for release."

Sephton hasn't planned any trips to the Gulf yet, but says if the mechanism he and his fellow scientists found is correct, one would expect to see high levels of arsenic in the water.

"It's a really unfortunate natural experiment," Sephton said.