

# Impact of Deepwater Horizon oil spill on coral is deeper and broader than predicted

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Coral colony from a previously discovered coral community 13 km from the spill site showing damage from the Deepwater Horizon oil spill. Corals from this community were used as models to identify damage from the oil spill in two newly discovered coral communities. A few small branches with living gold-colored coral polyps are present on the left side of the image. Credit: Fisher lab, Penn State University

A new discovery of two additional coral communities showing signs of damage from the Deepwater Horizon oil spill expands the impact

footprint of the 2010 spill in the Gulf of Mexico. The discovery was made by a team led by Charles Fisher, professor of biology at Penn State University. A paper describing this work and additional impacts of human activity on corals in the Gulf of Mexico will be published during the last week of July 2014 in the online Early Edition of the journal *Proceedings of the National Academy of Sciences*.

"The footprint of the impact of the [spill](#) on coral communities is both deeper and wider than previous data indicated," said Fisher. "This study very clearly shows that multiple coral communities, up to 22 kilometers from the spill site and at depths over 1800 meters, were impacted by the spill."

The oil from the spill in the Gulf of Mexico has largely dissipated, so other clues now are needed to identify marine species impacted by the spill. Fisher's team used the current conditions at a coral community known to have been impacted by the spill in 2010 as a model "fingerprint" for gauging the spill's impact in newly discovered coral communities.

Unlike other species impacted by the spill whose remains quickly disappeared from the ocean floor, corals form a mineralized skeleton that can last for years after the organism has died. "One of the keys to coral's usefulness as an indicator species is that the coral skeleton retains evidence of the damage long after the oil that caused the damage is gone," said Fisher. The scientists compared the newly discovered coral communities with one they had discovered and studied around the time of the oil spill, using it as a model for the progression of damage caused by the spill over time. "We were able to identify evidence of damage from the spill in the two coral communities discovered in 2011 because we know exactly what our model [coral colonies](#), impacted by the oil spill in 2010, looked like at the time we found the new communities."

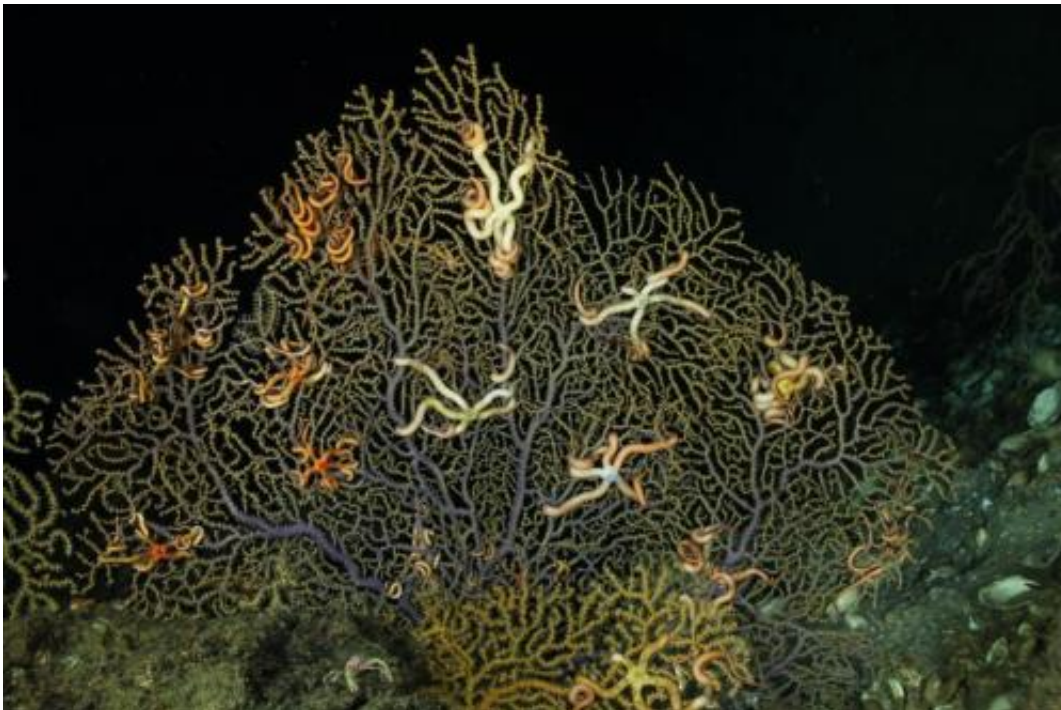


Several colonies of coral with attached anemones and brittle star from a previously discovered coral community 13 km from the spill site showing damage from the Deepwater Horizon oil spill. Corals from this community were used as models to identify damage from the oil spill in two newly discovered coral communities. The extensive brown growth on the normally gold-colored coral is not found on healthy colonies. Credit: Fisher lab, Penn State University

Corals are sparse in the deep waters of the Gulf of Mexico, but because they act as an indicator species for tracking the impact of environmental disasters like the Deepwater Horizon blowout, the effort to find them pays off in useful scientific data. "We were looking for coral communities at depths of over 1000 meters that are often smaller than the size of a tennis court," said Fisher. "We needed high-resolution images of the coral colonies that are scattered across these communities and that range in size from a small houseplant to a small shrub."

To begin the search, the team used 3D seismic data from the Bureau of Ocean Energy Management to identify 488 potential coral habitats in a 40 km radius around the spill site. From that list they chose the 29 sites they judged most likely to contain corals impacted by the spill. The team then used towed camera systems and Sentry, an autonomous underwater vehicle (AUV), which they programmed to autonomously travel back-and-forth across specific areas collecting images of the sites from just meters above the ocean floor. Finally, the team used a Shilling ultra-heavy-duty remote-operated vehicle (ROV), to collect high-resolution images of corals at the sites where they were discovered.

"With the cameras on board the ROV we were able to collect beautiful, high-resolution images of the corals," said Fisher. "When we compared these images with our example of known oil damage, all the signs were present providing clear evidence in two of the newly discovered coral communities of the impact of the Deepwater Horizon oil spill."



A colony of coral with attached brittle star from a previously discovered coral community 13 km from the spill site showing damage from the Deepwater Horizon oil spill. Corals from this community were used as models to identify damage from the oil spill in two newly discovered coral communities. The patchy brown growth on the normally gold-colored coral is not found on healthy colonies. Credit: Fisher lab, Penn State University

In searching for coral communities impacted by the Deepwater Horizon oil spill, the team also found two coral sites entangled with commercial fishing line. These additional discoveries serve as a reminder that the Gulf is being impacted by a diversity of human activities.

**More information:** *Proceedings of the National Academy of Sciences*.  
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