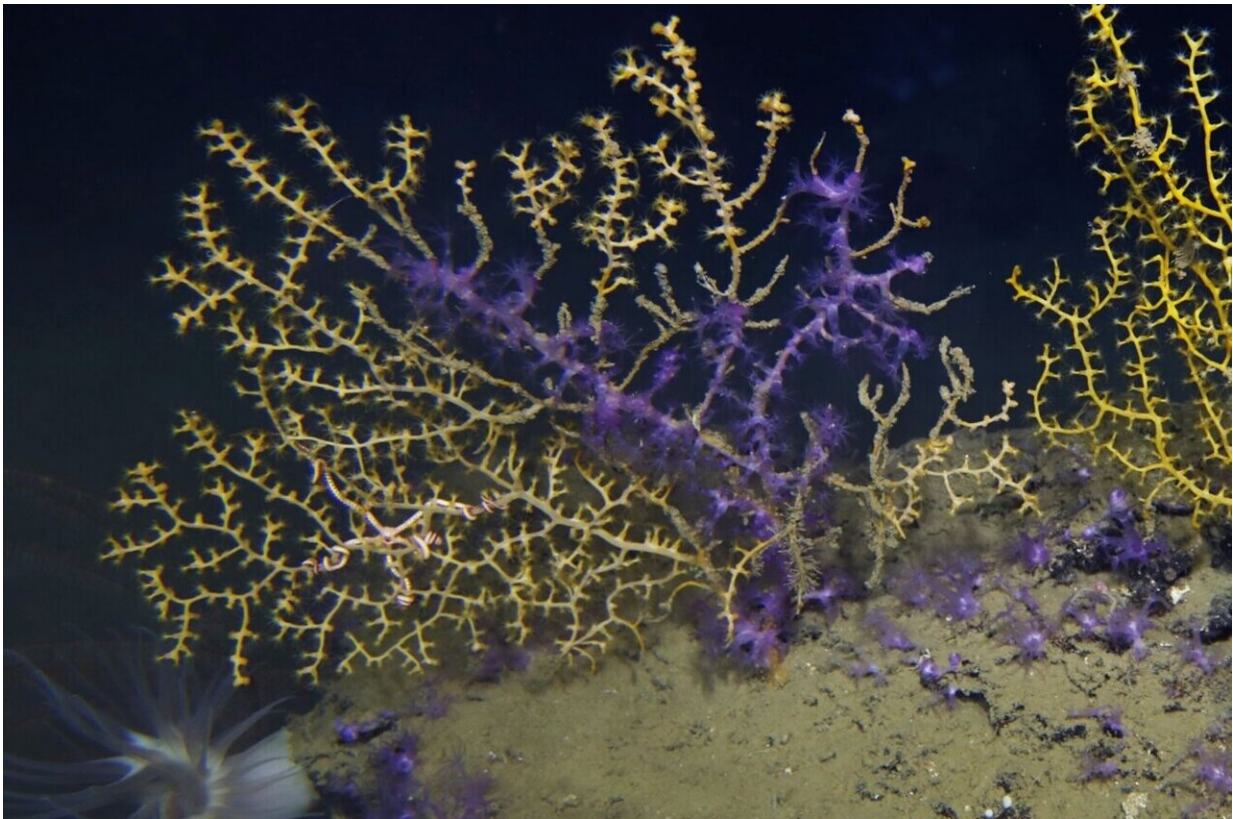


# Gulf corals still suffering more than a decade after Deepwater Horizon oil spill

February 20 2024, by Rebecca Dzombak

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Once a deep-sea *Paramuricea* coral was exposed to oil and dispersants, the damaged areas became ripe for colonization by other parasitic corals. Here, the coral is being completely overgrown by purple *Trachythela* corals. Credit: NOAA, Oceaneering

Deep-water corals in the Gulf of Mexico are still struggling to recover

from the devastating *Deepwater Horizon* oil spill in 2010, scientists report at [the Ocean Sciences Meeting](#) in New Orleans. Comparing images of more than 300 corals over 13 years—the longest time series of deep-sea corals to date—reveals that in some areas, coral health continues to decline to this day.

The spill slathered hundreds of miles of shoreline in oil, and a slick the size of Virginia coated the ocean surface. Over 87 days, 134 million gallons of oil spilled directly from the wellhead at a depth of 1520 meters (nearly 5000 feet) into the Gulf. While the spill was most visible at the surface, negative ecological impacts extended hundreds of meters into the ocean.

In [a presentation](#) on Tuesday, 20 February, scientists will show that deep-water corals remain damaged long after the spill. Over 13 years, these coral communities have had limited recovery—some even continuing to decline.

"We always knew that deep-sea organisms take a long time to recover, but this study really shows it," said Fanny Girard, a marine biologist and conservationist at the University of Hawai'i at Mānoa who led the work. "Although in some cases coral health appeared to have improved, it was shocking to see that the most heavily impacted individuals are still struggling, and even deteriorating, a decade later."

The findings can help guide deep-water restoration efforts following oil spills.



Healthy *Paramuricea biscaya* coral is bright yellow, like this specimen in a reference far from exposure to the 2010 Deepwater Horizon. Researchers compared corals from this area to corals growing near the spill. Credit: NOAA, Pelagic Research Services

### **Delicate and damaged**

A few months after the Deepwater Horizon well was capped, an interdisciplinary team of researchers surveyed the ocean floor 6 to 22 kilometers (3.7 to 13.7 miles) from the wellhead to record the damage. About 7 miles away and at 1,370 meters (4,495 feet) depth, they found a dense forest of tree-like *Paramuricea* corals that looked sickly.

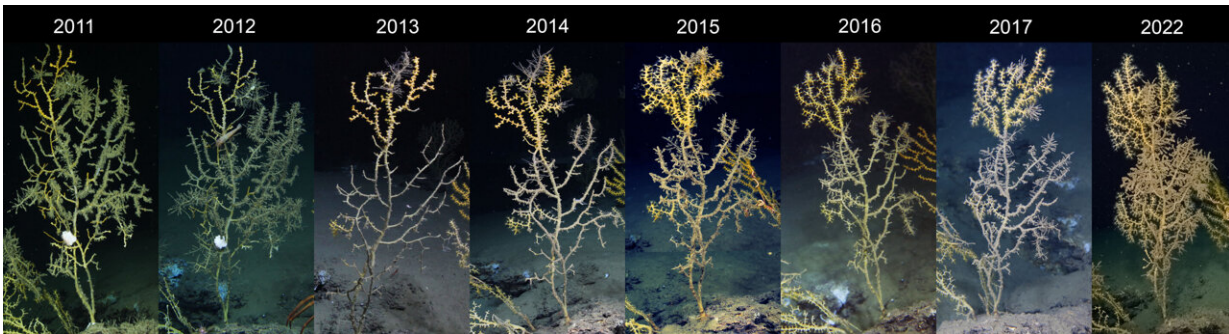
"These corals were covered in a brown material," Girard said. Testing

showed the sludge contained traces of a combination of oil and chemical dispersants. A few months later, the researchers found two additional coral sites at 1,580 meters and 1,875 meters (4921 and 6233 feet, respectively) deep that were similarly damaged.

Deep-sea corals are suspension feeders and may have ingested contaminated particles, leading to the observed health impacts, the researchers said. Direct exposure to [toxic chemicals](#) contained in the mixture of oil and chemicals may have also damaged coral tissue. However, to date, scientists still do not exactly know how the oil and dispersants affected these vulnerable organisms.

Every year from 2010 to 2017, scientists visited those three sites to monitor damages, measure growth rates, and note any recovery of the corals as part of a large initiative aiming to understand ecosystem impacts better and improve our ability to respond to future [oil spills](#). They used a remotely operated vehicle to take high-resolution photographs of corals at all three impacted sites and two far-removed reference sites, tracking more than 300 corals overall.

The researchers visited these sites again in 2022 and 2023 as part of the Habitat Assessment and Evaluation project, one of the projects funded through the Natural Resource Damage Assessment settlement. The images allowed the team to measure changes to [coral health](#) over time, including noting any breaks along the delicate branches of the coral caused by exposure to oil pollution.



Time series of a damaged coral in the Gulf of Mexico following the Deepwater Horizon oil spill. Credit: Fanny Girard/NOAA

### **Still suffering after all these years**

The scientists found that even by 2022, the affected corals continued to show signs of stress and damage from the oil spill. The brown coating they had first observed was long gone, but upon closer inspection, the corals were weak and prone to breaking. The scarred spots where branches fell off were leaking mucus, and some corals whose skeletons were exposed had been colonized by other parasitic coral species.

"Not only were some of these corals not recovering, but some of them seemed to be getting worse," Girard said. She added that if the impacts are too heavy, ecosystems can struggle to recover at all, especially given the onslaught of climate change-related stressors like ocean acidification. "It's really important to prevent damage in the first place, and the way to do that is through protection measures."

Girard notes that their work is being used to inform restoration strategies, including trying to grow [deep-sea corals](#) for coral propagation from transplants, deploying artificial anchoring sites for recolonization or protecting the deepwater communities, and letting nature heal itself.

In the coming years, the team will continue to monitor the corals, looking for signs that they're getting better—or worse.

**More information:** Abstract: [agu.confex.com/agu/OSM24/meeting.cgi/Paper/1486000](https://agu.confex.com/agu/OSM24/meeting.cgi/Paper/1486000)

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