REIFFS IN PERIL

Australia’s Great Barrier Reef is suffering from the largest-ever coral bleaching event. Can the reef recover?

ESSENTIAL QUESTION:
How does the health of corals affect reef ecosystems?

Just off Australia’s northeastern coast lies the largest living structure in the world—the Great Barrier Reef. It stretches some 2,000 kilometers (1,200 miles) and was built entirely by coral polyps. These tiny marine organisms live in colonies and build hard skeletons under themselves, forming reefs (see How Corals Build Reefs, right).

Coral reefs provide food and shelter for fish and other animals. Normally, the Great Barrier Reef is bursting with life. But recently, the reef has come under threat—along with others like it around the globe.

This March, biologists made an alarming discovery: They found that 93 percent of the Great Barrier Reef is suffering from coral bleaching, when the corals that make up a reef turn white. The scientists think many of the corals won’t survive.

“It’s the worst bleaching event in history,” says Ruth Gates, a marine biologist at the University of Hawaii.

A HEATED PROBLEM

Bleaching happens when corals are exposed to water temperatures that are warmer than usual. Warmer water puts stress on corals. In response, they expel tiny plantlike organisms, called algae, that normally live inside their tissues and give them their color.

Corals and algae’s relationship is an example of mutualism, when two organisms living together benefit from one another. The corals protect the algae, and the algae make food for the corals. Corals also capture prey, but it’s estimated that algae provide corals with up to 90 percent of their energy.
When temperatures get too high, the algae living in corals can no longer function. "That makes the corals want to get rid of them," says Gates. "When corals bleach, that's the breakdown of their relationship." Without colorful algae, corals' white skeletons show through their transparent tissues.

Ocean temperatures have been on the rise because of global climate change. This year, an unusually strong El Niño, a warm climate pattern that affects the Pacific Ocean every few years, worsened the problem. The combined effects have caused the longest-lasting coral-bleaching event on record. The bleaching started in 2014.

HOPE FOR CORALS

When bleaching happens, the entire reef ecosystem suffers. Corals have trouble reproducing and become more vulnerable to disease. They can no longer support the reef inhabitants that rely on them.

But Gates believes corals can make a comeback. She has discovered that some corals seem to withstand bleaching events better than others. Gates and her team are working on breeding these hardier corals, which could be implanted into dying reefs in the future. They're also introducing corals to warmer temperatures in their lab to see if they can adapt.

"We can give corals a leg up," says Gates. "Someday, if we need to, we can put these corals in the ocean to help reefs survive." 

—Amy Barth

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