

Scientists race to prevent wipeout of world's coral reefs

March 13 2017, by Elena Becatoros



This combination of two photos taken in March and May 2016 released by The Ocean Agency/XL Catlin Seaview Survey shows bleached coral, left, and the same coral which has died in Lizard Island on Australia's Great Barrier Reef. Coral reefs, unique underwater ecosystems that sustain a quarter of the world's marine species and half a billion people, are dying on an unprecedented scale. Scientists are racing to prevent a complete wipeout within decades. (Richard Vevers and Christophe Bailhache/The Ocean Agency/XL Catlin Seaview Survey via AP)

There were startling colors here just a year ago, a dazzling array of life beneath the waves. Now this Maldivian reef is dead, killed by the stress

of rising ocean temperatures. What's left is a haunting expanse of gray, a scene repeated in reefs across the globe in what has fast become a full-blown ecological catastrophe.

The world has lost roughly half its coral reefs in the last 30 years. Scientists are now scrambling to ensure that at least a fraction of these unique ecosystems survives beyond the next three decades. The health of the planet depends on it: Coral reefs support a quarter of all marine species, as well as half a billion people around the world.

"This isn't something that's going to happen 100 years from now. We're losing them right now," said marine biologist Julia Baum of Canada's University of Victoria. "We're losing them really quickly, much more quickly than I think any of us ever could have imagined."

Even if the world could halt global warming now, scientists still expect that more than 90 percent of corals will die by 2050. Without drastic intervention, we risk losing them all.

"To lose coral reefs is to fundamentally undermine the health of a very large proportion of the human race," said Ruth Gates, director of the Hawaii Institute of Marine Biology.

Coral reefs produce some of the oxygen we breathe. Often described as underwater rainforests, they populate a tiny fraction of the ocean but provide habitats for one in four marine species. Reefs also form crucial barriers protecting coastlines from the full force of storms.



This May 2016 photo released by The Ocean Agency/XL Catlin Seaview Survey shows coral that has bleached white due to heat stress in the Maldives. Coral reefs, unique underwater ecosystems that sustain a quarter of the world's marine species and half a billion people, are dying on an unprecedented scale. Scientists are racing to prevent a complete wipeout within decades. (The Ocean Agency/XL Catlin Seaview Survey via AP)

They provide billions of dollars in revenue from tourism, fishing and other commerce, and are used in medical research for cures to diseases including cancer, arthritis and bacterial or viral infections.

"Whether you're living in North America or Europe or Australia, you should be concerned," said biologist Ove Hoegh-Guldberg, director of the Global Change Institute at Australia's University of Queensland. "This is not just some distant dive destination, a holiday destination. This is the fabric of the ecosystem that supports us."

And that fabric is being torn apart.

"You couldn't be more dumb ... to erode the very thing that life depends

on—the ecosystem—and hope that you'll get away with it," Hoegh-Guldberg said.

Corals are invertebrates, living mostly in tropical waters. They secrete calcium carbonate to build protective skeletons that grow and take on impressive colors, thanks to a symbiotic relationship with algae that live in their tissues and provide them with energy.



In this May 2016 photo released by The Ocean Agency/XL Catlin Seaview Survey, a boat sails near a coral reef that has been bleached white by heat stress in the Maldives. Coral reefs, unique underwater ecosystems that sustain a quarter of the world's marine species and half a billion people, are dying on an unprecedented scale. Scientists are racing to prevent a complete wipeout within decades. (The Ocean Agency/XL Catlin Seaview Survey via AP)

But corals are sensitive to temperature fluctuations, and are suffering

from rising ocean temperatures and acidification, as well as from overfishing, pollution, coastal development and agricultural runoff.

A temperature change of just 1 to 2 degrees Celsius (1.8 to 3.6 degrees Fahrenheit) can force coral to expel the algae, leaving their white skeletons visible in a process known as "bleaching."

Bleached coral can recover if the water cools, but if high temperatures persist for months, the coral will die. Eventually the reef will degrade, leaving fish without habitats and coastlines less protected from storm surges.

The first global bleaching event occurred in 1998, when 16 percent of corals died. The problem spiraled dramatically in 2015-2016 amid an extended El Nino natural weather phenomenon that warmed Pacific waters near the equator and triggered the most widespread bleaching ever documented. This third global bleaching event, as it is known, continues today even after El Nino ended.

Headlines have focused on damage to Australia's famed Great Barrier Reef, but other reefs have fared just as badly or worse across the world, from Japan to Hawaii to Florida.



In this May 2016 photo released by The Ocean Agency/XL Catlin Seaview Survey, an underwater photographer documents an expanse of dead coral at Lizard Island on Australia's Great Barrier Reef. Coral reefs, unique underwater ecosystems that sustain a quarter of the world's marine species and half a billion people, are dying on an unprecedented scale. Scientists are racing to prevent a complete wipeout within decades. (The Ocean Agency/XL Catlin Seaview Survey via AP)

Around the islands of the Maldives, an idyllic Indian Ocean tourism destination, some 73 percent of surveyed reefs suffered bleaching between March and May 2016, according to the country's Marine Research Center.

"This bleaching episode seems to have impacted the entire Maldives, but the severity of bleaching varies" between reefs, according to local conditions, said Nizam Ibrahim, the center's senior research officer.

Worst hit have been areas in the central Pacific, where the University of Victoria's Baum has been conducting research on Kiritimati, or Christmas Island, in the Republic of Kiribati. Warmer water temperatures lasted there for 10 months in 2015-2016, killing a staggering 90 percent of the reef.

Baum had never seen anything like it.

"As scientists, we were all on brand new territory," Baum said, "as were the corals in terms of the thermal stress they were subjected to."



This May 2016 photo provided by the Ocean Agency/XL Catlin Seaview Survey shows coral bleaching in the Maldives. Coral reefs, unique underwater ecosystems that sustain a quarter of the world's marine species and half a billion people, are dying on an unprecedented scale. Scientists are racing to prevent a complete wipeout within decades. (The Ocean Agency / XL Catlin Seaview Survey via AP)

To make matters worse, scientists are predicting another wave of elevated ocean temperatures starting next month.

"The models indicate that we will see the return of bleaching in the South Pacific soon, along with a possibility of bleaching in both the eastern and western parts of the Indian Ocean," said Mark Eakin, coral reef specialist and coordinator of the National Oceanic and Atmospheric Administration's Coral Reef Watch, which uses satellites to monitor environmental conditions around reefs. It may not be as bad as last year, but could further stress "reefs that are still hurting from the last two years."

The speed of the destruction is what alarms scientists and conservationists, as damaged coral might not have time to recover before it is hit again by warmer temperatures.

But some may have a chance.

Last month, Hoegh-Guldberg helped launch an initiative called 50 Reefs, aiming to identify those reefs with the best chance of survival in warming oceans and raise public awareness. His project partner is Richard Vevers, who heads the XL Catlin Seaview Survey, which has been documenting coral reefs worldwide.



In this March 2016 photo released by The Ocean Agency/Reef Explorer Fiji, a snorkeler swims above coral that has bleached white due to heat stress in Fiji. Coral reefs, unique underwater ecosystems that sustain a quarter of the world's marine species and half a billion people, are dying on an unprecedented scale. Scientists are racing to prevent a complete wipeout within decades. (Victor Bonito/The Ocean Agency /Reef Explorer Fiji via AP)

"For the reefs that are least vulnerable to climate change, the key will be to protect them from all the other issues they are facing—pollution, overfishing, coastal development," said Vevers, who founded The Ocean Agency, an Australian organization seeking new technologies to help mitigate some of the ocean's greatest challenges. If the reefs remain healthy and resilient, "they can hopefully become the vital seed-centers that can repopulate surrounding reefs."

Nature itself is providing small glimmers of hope. Some of Kiribati's corals, for example, are showing tentative signs of a comeback.

But scientists don't want to leave it to chance, and are racing ahead with experiments they hope might stave off extinction.

"We've lost 50 percent of the reefs, but that means we still have 50 percent left," said Gates, who is working in Hawaii to breed corals that can better withstand increasing temperatures. "We definitely don't want to get to the point where we don't intervene until we have 2 percent left."

Going a step further, she is also trying to "train" corals to survive rising temperatures, exposing them to sub-lethal heat stress in the hope they can "somehow fix that in their memory" and survive similar stress in the future.

"It's probably time that we start thinking outside the box," Gates said. "It's sort of a no-win game if we do nothing."



This March 2016 photo released by The Ocean Agency/XL Catlin Seaview

Survey shows coral bleached white by heat stress in New Caledonia. Coral reefs, unique underwater ecosystems that sustain a quarter of the world's marine species and half a billion people, are dying on an unprecedented scale. Scientists are racing to prevent a complete wipeout within decades. (The Ocean Agency/XL Catlin Seaview Survey via AP)



This May 2016 photo provided by the Ocean Agency/XL Catlin Seaview Survey shows a snorkeler surveying the coral bleaching in the Maldives. Coral reefs, unique underwater ecosystems that sustain a quarter of the world's marine species and half a billion people, are dying on an unprecedented scale. Scientists are racing to prevent a complete wipeout within decades. (The Ocean Agency/XL Catlin Seaview Survey via AP)



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More information: NOAA Coral Reef Conservation:
coralreef.noaa.gov/

The Ocean Agency: www.theoceanagency.org/

50 Reefs: 50reefs.org/

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Citation: Scientists race to prevent wipeout of world's coral reefs (2017, March 13) retrieved 15 May 2024 from <https://phys.org/news/2017-03-scientists-wipeout-world-coral-reefs.html>

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