

Scientists race to prevent wipeout of world's coral reefs

By ELENA BECATOROS
Associated Press

SOUTH ARI ATOLL, Maldives — 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.

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.

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.

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.

Fresh Starts: Program provides students with a sense of accomplishment

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program, said she spoke several years ago with Astoria High School Principal Lynn Jackson, who made a straightforward proposition.

"We needed a greenhouse," she said. "They needed an educational program."

With help from Home Depot's volunteer arm Team Depot, the district and the master gardeners, the dilapidated greenhouse was refurbished with new shelving, storage and a planting table.

For the past several years, master gardeners have come in once a month between September and May, teaching students planting, cutting, transplanting and other basic gardening skills. The greenhouse is part of the Youth Transition Program, a statewide partnership to prepare high school students with disabilities for employment and career-technical training, but



Danny Miller/The Daily Astorian

Students in the Fresh Starts program make hypertufa flower pots.

is open to anyone interested in gardening.

Each year, the master gardeners work with students to

create hanging plants, sedum wreaths and other horticultural presents. In exchange, the high school lets the mas-

ter gardeners store their plants for a spring garden seminar.

On Tuesday, Holen and fellow master gardeners Linda

Holmes and Pamela Garner prepared a mix of Portland cement, vermiculite and peat moss used by students to make hypertufa flower pots, their bases made from cardboard boxes, a wicker basket, a pottery bowl and an Oxi-Clean bucket.

Students shoveled and spooned the hypertufa mix into the forms, hollowed out in the middle with bottles, fishing floats and Tupperware containers. Next month, the students will pop their pots out of the forms and plant them with cacti and sedum for the plant sale in May.

"These children have the opportunity that they could work in a capacity like a greenhouse, something that's repetitious and they have plenty of support for them," Holen said. "And I just love seeing that possibility — you can see it in their eyes, they start to grow when they do this."

Getting out

Gardening is something freshman Ryan Breitmeyer said he remembers his mother doing, and that he would like to learn more about.

"It's really relaxing for me," he said. "There's really no rush when you're doing it by yourself."

Breitmeyer said he enjoys getting out of the classroom and around campus, whether it's planting in the greenhouse or interacting with other students at lunch.

Overseeing the students each month in the greenhouse is Deborah Stemper, a specialist in Astoria, Jewell and Knappa school districts with the Youth Transition Program.

Stemper said the Fresh Starts program provides students with a sense of accomplishment when they see their finished products.

"It's a wonderful tool to work with the kids to help them develop skills," she said. "The benefits are endless."

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