

Text 1

## Global warming: Australia's Great Barrier Reef is experiencing 'mass bleaching' event

This is the seventh such episode in 26 years, a frequency that's alarming scientists. In all, 98% of its 3,000 reefs have been impacted, home to some 1,500 species of fish.

By Isabelle Dellerba

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*A diver observes the coral bleaching at Southern Great Barrier Reef, Keppel Islands, Australia, March 5, 2024. AIMS/RENATA FERRARI / VIA REUTERS*

Unsurprisingly, the Great Barrier Reef is facing the worst-case scenario. Not only has climate change triggered a deleterious cycle, but it is also accelerating. On Friday, March 8, the Australian authorities announced that, for the seventh time in 26 years, a process of "mass bleaching" was affecting the world's largest living structure, located off the northeast coast of the island continent. This marks the fifth occurrence in eight years.

According to aerial surveys conducted over 300 reefs covering two-thirds of the marine park, the damages appear to be significant. "The problem with the current episode is its extent. It seems to

be affecting the whole of the Great Barrier Reef, including the southern part, which has been affected less often and where the reefs, in relatively good condition, are home to a high proportion of endemic species," explained Andrew Baird, a marine ecology researcher at James Cook University, who fears that this new bleaching event will prove to be "of unprecedented proportions." Studies are underway to determine its exact extent and depth. Its severity will also depend on the evolution of ocean temperatures over the coming weeks.

Bleaching is a phenomenon of coral decline caused by rising surface water temperatures, resulting in the expulsion of symbiotic algae that give coral its vibrant color. If water stress diminishes quickly, marine organisms can recover. Otherwise, they begin to die off. Some are more resilient than others.

#### Unprecedented levels of thermal stress

Since the first major episode in 1998, the ecosystem covering about the size of Italy has been affected in 2002 and then, at an accelerated frequency from 2016, with massive bleaching events in 2016, 2017, 2020, 2022, and now 2024. In total, 98% of its 3,000 individual reefs have been impacted – home to some 1,500 species of fish.

"The higher the frequency of episodes, the less time corals have to recover, and the more fragile they become," explained Baird. "This frequency is likely to become annual in the decades to come. And obviously, the Great Barrier Reef, as we know it, would not survive such pressure," added the scientist. In the Townsville area, where he's based, he has already noticed a change in species composition, with more underwater grasses and fewer massive coral colonies.

In the summer of 2022, scientists were also alarmed to find that the structure was experiencing bleaching for the first time in a La Niña year, a climatic phenomenon usually characterized by abnormally low water temperatures on the southern coasts. On July 4, 2023, when the World Meteorological Organization announced the return of El Niño – synonymous with rising temperatures in the antipodes – they warned that the Great Barrier Reef was heading for a period of very high risk, something which materialized over the summer in unprecedented levels of thermal stress in the Central and Southern regions.

#### Pessimistic scientists

"We must act against climate change. We must protect our unique sites and the plants and animals that inhabit them," responded Environment Minister Tanya Plibersek in a statement on March 8. Listed by UNESCO since 1981, the organization's experts recommended its inclusion on the list of World Heritage in Danger in 2021, being concerned about the state of conservation of the site. In August 2023, considering that measures taken by the Labor government could "significantly change the situation," they eventually proposed "reinforced support" to Australia.

Having come to power in 2022, the government led by Anthony Albanese (Labor) announced an investment of A\$4.4 billion (€2.7 billion) in May 2023, to improve water quality and help the reef adapt to the climate crisis. He also raised the island continent's greenhouse gas emissions reduction target to 43% by 2030 compared with 2005 levels.

Nevertheless, scientists have few illusions. According to a study published in February 2022 in the journal *PLOS Climate*, 99% of corals are going to suffer catastrophic consequences if the rise in average temperature reaches 1.5°C compared with the pre-industrial era. This mark was exceeded, for the first time in 12 consecutive months, between February 2023 and January 2024.

# The New York Times

## ***Missing a Global Climate Target Could Spell Disaster for These Polar Bears***

One group in Hudson Bay might have roughly a decade left because sea ice is becoming too thin to support them as they hunt, according to new research.

**By Austyn Gaffney**

June 13, 2024

Polar bears in the southern Hudson Bay could go extinct as early as the 2030s because the sea ice that helps them hunt for food is thinning, a new study suggests.

“We’ve known that the loss of Arctic sea ice would spell disaster for polar bears, so this might be the first subpopulation that disappears,” said Julianne Stroeve, the lead author of the study, which was published Thursday in the journal *Communications Earth & Environment*.

Last month, the eastern half of Hudson Bay, home to the world’s most-studied polar bears, went ice free a month earlier than usual.

Polar bears are used to an ice-free season of about four months when they rely on fat reserves until ice reforms and they can hunt blubber-rich seals from the floes. But the presence of sea ice doesn’t guarantee the bears will be able to hunt; it needs to be thick enough to support them.

While earlier studies looked at the expanse of sea ice coverage to determine the survivability of the species, Dr. Stroeve and her colleagues used climate models from the Intergovernmental Panel on Climate Change’s most recent report to project when the remaining ice would be too thin for the bears to hunt successfully.

While there is no consensus on how much ice is needed to support an adult male polar bear, the study relied on field research to determine a base line of about 10 centimeters, or just under four inches.

Polar bears excel at dealing with minimal resources when it comes to ice. They crawl. They shimmy on their bellies. They extend their limbs as far apart as possible, spreading their mass more evenly over the ice. Sometimes they still fall through. That’s not usually a problem for the bears, who are strong swimmers, but it’s a bigger problem if they’re hunting seals. Crashing through the ice is like an alarm going off, alerting seals to the presence of predators.



Geoffrey York, senior director of research and policy at Polar Bears International and co-author of the study, said polar bears need thick ice for the sprint they typically need to catch a seal. Sea ice, with a high salt content, is more plastic and resilient than glass-like freshwater ice. But other experts said 10 centimeters was pushing it.

“We always try to look for a metric to use,” said Andrew Derocher, professor of biological sciences at the University of Alberta. “But 10 centimeters is pretty thin. I can’t land a helicopter on that ice. It needs to be about twice that thick for polar bears to be really using it.”

Elisabeth Kruger, a manager at the World Wildlife Fund who focuses on the Arctic, said the modeling was less severe than it could have been. “That’s actually pretty daunting,” she said.

The ice-free season is now about a month longer than what polar bears are habituated to. Studies show that when the ice-free period extends to six months, even the hardiest Hudson Bay bears, generally healthy adult males, will struggle to survive.

Polar bears are what is known as an indicator species, meaning they predict the health and viability of the broader Arctic ecosystem. The concurrent loss of sea ice with depletion in snow cover significantly affects their preferred diet of ringed seals, which have a hard time keeping pups alive in their birthing dens if snow levels drop below 32 centimeters.



Last year, global temperatures temporarily hit 1.5 degrees Celsius above preindustrial levels. Under the Paris climate pact, countries agreed to try to limit global warming to that level or lower to avert the worst effects of global warming. While the temperature rise isn’t permanent, Dr. Stroeve and other scientists said polar bears in this region could not survive if temperatures surpassed 2.1 degrees Celsius above the preindustrial benchmark.

Today, there are about half as many polar bears in Western Hudson Bay as there were in 1987.

“Our best analysis is that we’ll still have polar bears until the end of the century,” said Dr. Derocher, referring to the 19 subpopulations that live throughout the Arctic. “But that’s very unlikely in Hudson Bay.”

Hudson Bay bears are unlikely to move from their habitats, even when conditions become untenable. At some point, First Nations and Inuit communities might have to change their traditional polar bear harvest just to preserve the bear population. Towns might have to figure out ways to deter bears from seeking human food during times of distress to minimize human-bear conflict. Long-term possibilities could include distributing polar bear kibble, but Dr. Derocher said that it wasn’t possible to sustain a subpopulation that way indefinitely.

“Beyond dealing with greenhouse gas emissions,” Dr. Derocher said, “there are no possible actions for long term management of the population.”

### **Text 3**



## **Why the death of the honeybee was greatly exaggerated**

Honeybees are too valuable to go extinct. Not every species will be so fortunate.

by Bryan Walsh

Apr 5, 2024

One consequence of being a journalist since, oh, the 20th century, is that you accumulate a track record.

In the hundreds and hundreds of stories I’ve published over the last 25 years, some look eerily prescient (like this cover story from 2017 warning about a coming pandemic). Some are weird. (Did I really write a story in 2007 about bars in Tokyo where men dress up as English butlers to entertain female customers? Apparently.)

And then there are the stories that maybe haven’t aged all that well. Case in point: In 2013, I wrote a feature for Time magazine with the cover line: “A world without bees.”

The gist of it is that colony collapse disorder (CCD) — a still not fully understood syndrome that began killing honeybee colonies in large numbers beginning around the mid-2000s — was in danger of wiping out honeybees altogether in the US. And that in turn would mean catastrophe for the many crops that depend on honeybee pollination.

An advantage (or drawback) of being in journalism this long is that the predictions you made, say, 11 years ago, have time to play out. And as you may have noticed on your last visit to the supermarket, our agricultural system hasn’t collapsed.

Almonds — which are so dependent on commercial honeybee pollination that something like 42 billion bees are used during almond trees’ spring growing season — have seen their acreage more

than double since 2007, when CCD was first identified. If honeybees were truly dying out, you wouldn't see almond milk everywhere.

As the Washington Post's Andrew Van Dam wrote in a delightful column last week, the US may actually have more honeybees now than it ever has before. Data from the US Department of Agriculture's extremely detailed Census of Agriculture indicates that there were, quite precisely, 3,800,015 honeybee colonies in the US in 2022.

That's a startling 31 percent increase from 2007, and a larger increase than any other domesticated animals. Even chickens, which usually top these sorts of data tables.

So does that mean those who (ahem) predicted a possible "world without bees" were wrong? Yes. Does it mean that everything's all good with *Apis mellifera*, better known as the Western honeybee?

Not quite, because honeybees are still dying in massive numbers. According to the most recent survey data, beekeepers lost 48.2 percent of their managed honeybee colonies between April 2022 and April 2023, chiefly due to infestations of Varroa mites and the viruses associated with them. That's nearly 10 percentage points higher than the previous year.

So we have a situation where there are apparently more honeybee colonies than there have ever been but honeybees are still dying by the billions from CCD and assorted other threats. What gives?

A lot of the confusion, it turns out, stems from the difference between how we think about honeybees and how we actually use them.

### **Honeybees aren't what you think**

There's a reason the USDA is in charge of counting up how many honeybee colonies there are in the US, and not, say, the Interior Department or the Environmental Protection Agency. That's because honeybees aren't a wild species — they're essentially a farmed one.

Honeybees aren't even native to North America — they're colonists of a kind, first brought here by European settlers in the 17th century. And while a small number of them today are used to produce honey, the vast majority are effectively harnessed as biological machines to support specialized agriculture.

Consider the great spring almond pollination. Some 80 percent of the world's almond supply comes from California's Central Valley with trees that need honeybees for pollination. So every spring, beekeepers from around the US bring their colonies to California to carry out that lucrative pollination. And it's lucrative: About \$4 of every \$5 spent on what the USDA calls "bee fertility assistance" goes to support the almond crop.

That, in part, is why bee colony numbers have kept growing even as the toll from CCD and other threats to honeybees have continued to mount. Simply put, honeybees are so valuable that even as they continue to die in large numbers, it's economically viable to keep replacing them. (Another contributor, as the Post story points out, is that agriculture tax breaks make it valuable for more farmers to raise a small number of bee colonies on their land.)

Rather than thinking of honeybees as a species in peril like the red wolf or the right whale, a better analogy is to factory-farmed chickens. Like chickens, honeybees are stressed to the killing point by the conditions of mass farming (in the bees' case, the stress of being moved across the country

to service California almond trees). And just like chickens — where H5N1 bird flu has been taking a severe toll on poultry farms — honeybees contend with diseases and parasites that feast on their weakened condition.

Yet both chickens and honeybees are so valuable that it's in farmers' economic interest to more than replace what they lose, with the result that numbers keep going up. Which is not the same thing as saying that honeybees are doing all right.

"You wouldn't be like, 'Hey, birds are doing great. We've got a huge biomass of chickens!'" Eliza Grames, a biologist at Binghamton University, told the Post. "It's kind of the same thing with honeybees."

### **Bees are what they're worth**

A lot of the coverage at the height of the beepocalypse fears — my story included — used the mass death of honeybees as a symbol of how human beings had pulled nature out of whack. But it's not, mostly because there is nothing natural about the way we've used honeybees over the past few decades, just as there is nothing natural about a factory farming system that raises and kills nearly 10 billion chickens each year.

Capitalism, as it turns out, is really, really good at finding solutions to scarcity when enough money is on the line. The mid-2000s moment that CCD was first entering the public consciousness also marked the height of fears around "peak oil": the idea that the world had entered a terminal decline in oil production, with cataclysmic results for the global economy. And there was reason to believe this was true: On January 2, 2008, oil hit \$100 a barrel for the first time, while US oil production had been declining for decades.

Capitalism, though, finds a way. In part because oil had become so valuable, companies and governments invested in new technologies and new efforts to find unknown or previously untapped resources. Cut to today, when the world is producing more oil than it did during the peak days of "peak oil" and the US has become the single largest oil producer ever.

So we have honeybees and we have oil because that's what the market demands. But the market doesn't care about the condition of those billions of hard-working bees any more than it cares about the climate consequences of keeping the oil taps flowing, because it ultimately doesn't care about that which cannot be priced. Unless we require it to.

Which is why the real beepocalypse isn't found among those millions of managed honeybee colonies, but among the thousands of wild, native bee species, nearly half of which are in some danger of extinction. No commercial beekeepers are coming to their rescue.

We won't have a world without honeybees anytime soon, but we may be headed toward a world where they are the only bees.