



CTA-149-Our Health Depends On The Health Of The Ocean

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Our Health Depends On The Health Of The Ocean — And The Ocean Is Sick

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MIAMI HERALD VIA GETTY IMAGES

Some algae blooms produce toxins that can cause severe respiratory problems if we inhale them — and gastrointestinal and neurological problems if we eat seafood or drink water contaminated with them.

The [hundreds of dead manatees that have been washing up](#) on Florida's beaches this year certainly pull at people's heartstrings. And they make for a shocking visual during the nightly news.

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The cause of the animals' deaths, on the other hand, makes for arguably less exciting coverage. But it's important that we talk about it because algal blooms are having a global impact on our health and signal broader environmental changes.

Algae are aquatic plants that range in size from microscopic phytoplankton to kelp the height of tall trees (bigger species are commonly called seaweeds) and come in shades from green to brown to red. Many algae species can accumulate and form blooms, some of which produce toxins that can cause severe respiratory problems if we inhale them — and gastrointestinal and even neurological problems if we eat seafood or drink water contaminated with them.

And this is concerning, because the geographic extent, frequency and duration of blooms seem to be increasing. As climate change causes waters [to warm](#) and agricultural runoff and pollution cause [nutrient levels to increase](#), humans create conditions for some [blooms to become enormous](#).

Algal blooms are natural phenomena and can occur anywhere in the world when ocean conditions are right for a particular species. The current bloom off the west coast of Florida is the longest one recorded there in a decade (10 months and counting) and is caused by *Karenia brevis*, an algae species that makes brevetoxin. [Brevetoxin](#) is tasteless and odorless but can cause coughing, bronchial spasms, numbness, vertigo and vomiting, among other symptoms. To protect the public, the state government declared a state of emergency, closing beaches and fisheries and causing major tourism disruptions. Economic losses have been significant.

Our health depends on the health of the ocean. Ocean conservation is not only about saving manatees; it's about protecting human health.

Unfortunately, this is hardly the first such event in recent memory. In 2015, *Pseudo-nitzschia* algae formed a bloom of [unprecedented](#) size and duration, from Vancouver, British Columbia, all the way to Southern California. Because this algae produces the potent neurotoxin domoic acid, the dungeness crab fishery had to be [shut down for several months](#) to protect the public. On the West Coast, where these blooms are a regular occurrence, a [robust monitoring program](#) is in place. In Florida, where *Karenia* blooms occur regularly, there is even [an app](#) that informs people about the potential for respiratory illnesses from breathing in toxic fumes at various beaches.

But algae species are now popping up in unexpected places where they may go temporarily unnoticed — and local authorities may not be equipped to deal with them. *Pseudo-nitzschia* blooms started producing dangerous levels of domoic acid in the Northeast United States for the first time [two years ago](#) and are now becoming an annual occurrence in Maine. The Caribbean has long had *Gambierdiscus* algae that produce ciguatoxins that accumulate in fish and cause ciguatera food poisoning in humans (with a broad range of symptoms including heart arrhythmias and hallucinations), but now [it's occurring in new places](#), making it harder to avoid using just historical knowledge.

Toxic blooms can have disastrous economic impacts, as well. In Chile, a massive bloom of *Alexandrium catenella* in 2016 contaminated offshore salmon farms, [killing 100,000 tons of salmon](#), or more than [11 percent of the country's annual production](#). This devastated Chile's aquaculture industry and led to social unrest. A [new round of blooms](#) is sweeping through the Chilean coasts again this year.

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Even when they aren't toxic, algal blooms can still bring major disturbances with them. In China, leading up to the 2008 Olympics, there was a bloom so thick [that it almost canceled the sailing competition](#). It [took around 20,000 people and 1,000 boats to clean it up](#) in time and was perhaps caused by nutrient pollution upstream. In the United Arab Emirates, [algal blooms clog desalination plants](#), causing them to slow or even stop water production and necessitating the development of new filtration technologies.

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In the Caribbean, blooms of Sargassum seaweed have become [so massive in recent years](#), the seaweed washes up on beaches over a meter thick, releasing sulfur compounds that irritate the human respiratory system when it decomposes. Given that coastal tourism is the main industry in the Caribbean, heaps of smelly algae covering the sand have a significant economic impact.

Fresh water isn't getting by unscathed, either. In 2014 in Toledo, Ohio, a bloom of cyanobacteria, which produces the toxin microcystin, contaminated [the municipal water supply](#), making the water undrinkable for half a million residents for two days.

Health-wise, these blooms disproportionately affect specific groups of people. Elderly persons are [more susceptible to respiratory impacts](#) from brevetoxin, which is a major concern given the high average age on Florida's Gulf Coast population. [Animal studies show](#) that long-term harm can result when developing brains are exposed to domoic acid, which suggests fetuses and young children may be particularly sensitive to the toxin. Subsistence fishermen may be unaware of harvest bans and continue to collect affected seafood; tourists may be less aware of the proper precautions to take during blooms in areas they're visiting.

To better manage all of these blooms and their associated health risks, we need to learn a lot more about the algae that create blooms. What conditions make these algae grow? Push them to produce toxin? Cause them to die off? To answer these questions, we must invest in scientific research. We need to expand and innovate monitoring and warning systems and develop a stronger ability to predict blooms. We also need to understand more about the health effects of these toxins — which are some of the most dangerous natural compounds known to humankind. Fresh water isn't getting by unscathed, either.

Continued support for research programs like the [Centers for Oceans and Human Health](#) is critical. Another key step? Passing [the latest reauthorization](#) of the federal [Harmful Algal Bloom and Hypoxia Research Control Act](#), which was introduced by Sen. Bill Nelson (D-Fla.) last year, passed the Senate and has been lingering in the House with no action.

Support for these research programs and for locations dealing with major toxic blooms must escape legislative gridlock. This week, Sens. Nelson and Marco Rubio (R-Fla.) proposed a spending bill amendment that would [direct \\$1 million of Centers for Disease Control funds](#) to address the human health impacts of Florida's bloom. That is a start, but these blooms are causing increasing problems all over the U.S., so we need a sustained nationwide

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research and management effort. The threats posed by blooms will only increase as we continue to migrate to our coasts and inland waters and to increasingly rely on the ocean for resources.

One thing is very clear: Our health depends on the health of the ocean. Ocean conservation is not only about saving manatees; it's about protecting human health. These blooms are yet another warning that humans need to take much more care with how we impact the planet. Otherwise, the harms we inflict on the ocean will continue coming back to bite us again and again.

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