

# Sick of swine flu? Toxic algae could be the next big threat

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With a new theory surfacing that toxic algae rather than asteroids killed the dinosaurs, scientists are still trying to unravel the mystery of what caused a massive algae bloom off the Northwest Coast that left thousands of seabirds dead and may have sickened some surfers and kayakers.

The bloom, which stretches roughly 300 miles from Newport, Ore., north to the Canadian border, still persists, though it's a shadow of its September and October peak.

Whipped by waves and storms, the microscopic [phytoplankton](#), which had turned the ocean a rust color, broke apart, releasing toxins and creating meringue-like foam that coated the feathers of birds like spilled oil. Up to 10,000 birds died of [hypothermia](#) in September, and researchers are still trying to come up with a count for October.

Researchers are also checking reports that surfers and kayakers who came in contact with the foam may have suffered cold-like symptoms, including temporary loss of smell and taste. The toxins also may have become aerosolized and affected beachcombers. In another strange twist, pathologists performing necropsies found that some of the birds lacked normal bacteria in their stomachs and other internal organs.

"It's definitely a warning sign of something," said Julia Parrish, a professor of aquatic and fishery sciences at the University of Washington. "We don't know what."

Blooms of the single-cell, saltwater algae species known as *Akashiwo sanguinea* have been found in Puget Sound, the [Chesapeake Bay](#) and elsewhere around the world. The bloom off the Northwest coast, however, is huge compared with others. At its height, there were 1.5 million algae cells per quart of water. The bloom was up to 65 feet deep and miles wide.

In only one other instance -- a smaller bloom in 2007 in California's [Monterey Bay](#) -- have the cells broken apart to create a toxic froth. And this particular specie of algae usually likes warmer water than that found off the Northwest Coast.

No one is sure what ignited the bloom. Some scientists think it could be caused by climate change, which has raised ocean temperatures and made the water more acidic -- both conditions could favor this algae species. Others say it could be the result of such weather conditions as El Nino or the Pacific decadal oscillation, a long-lived El Nino-like pattern of Pacific climate variability.

The bloom could have been fed by nutrients washed down the Columbia River from farms in eastern Washington and Oregon, or from an ocean condition known as upwelling, where cold water rich with nutrients is pushed toward the surface by the wind.

Or, it could just be the rhythms of the ocean, which scientists are just starting to understand.

"The ocean does have a natural pulse," said Vera Trainer, a Seattle-based research oceanographer for the National Oceanic and Atmospheric Administration. "Is this part of the pulse or is this something different? We want to find out. But some of this is very unusual. We are looking at this very intensely."

Even as Trainer, Parrish and others study the bloom off the Northwest Coast, one of the scientists who developed the theory linking toxic algae to mass extinctions said it fit in with the research he and his partner were working on.

"That's exactly what we are talking about," said John Rodgers, an ecotoxicologist at Clemson University in South Carolina, who along with James Castle, a geologist at Clemson, developed the killer algae theory.

Rodgers was on the road last week in the Midwest, collecting samples of algae to analyze back in his lab. He said he and Castle have found ancient deposits of blue-green algae that produce toxins and deplete oxygen that coincide with five mass extinctions millions of years ago. Though he said algae may not have been the only cause for the extinctions, he said it was a major factor.

The blue-green algae was freshwater algae in ponds, lakes and rivers that could have been ingested by prehistoric animals. The toxins also may have been absorbed by plants that were later eaten by animals or become airborne and breathed in by animals.

"They certainly didn't die on the same day or week," Rodgers said. "This happened over hundreds of years."

Even though there are thousands of species of algae, only several hundred produce toxins, he said.

Though the bloom off the Northwest coast is in salt water rather than fresh water, Rodgers said such blooms were well worth keeping an eye on.

"They are changing, expanding their ranges into places never seen before and in densities never seen before," Rodgers said. "It's hard to ignore,

and as the data grows, we are becoming more and more convinced."

Rodgers said his theory has been peer reviewed and is gaining acceptance among scientists.

Current climate conditions are becoming strikingly similar to those that existed during the time of the mass extinctions, he said.

In a paper published in March in the journal Environment Geosciences, Rodgers and Castle wrote that their findings "gives us cause for concern and underscores the importance of careful and strategic monitoring as we move into an era of global climate change."

Scientists studying the bloom off the Northwest are wary when asked about Rodgers' and Castle's theory.

"I would be cautious about it," Trainer said.

Raphael Kudela, a [toxic algae](#) expert and ocean sciences professor at the University of California at Santa Cruz, thinks algae blooms such as those off the Northwest Coast are becoming more frequent.

"It is consistent with climate change," Kudela said, adding that a bloom like this in the chilly waters of the Northwest was "very unusual."

As for the killer algae theory, Kudela said, "People who study harmful algae don't dismiss it. But it can't be proved."

Parrish doesn't quite know what to make of the theory that algae killed dinosaurs. Back when life was just starting, she said, algae and other single-cell organisms excreted oxygen that created the atmosphere.

"The claim [algae](#) had a humongous effect on the atmosphere is correct,"

Parrish said. "Whether it caused mass extinctions, I don't know."

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