

Why toxic algae blooms are on the rise across California — and expected to get worse

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Santiago Mejia/The Chronicle

Rising temperatures and stagnant water generally signal trouble for human life, but they

make for a great environment for [the bright, blue-green scum](#) often found in lakes, rivers and reservoirs that flourishes and blooms in hot weather.

These scum blooms, known as harmful algal blooms, are natural parts of the ecosystem, but can also release toxins that [sicken or even kill people and animals](#). They're [becoming more common](#) as temperatures rise and water systems are starved and disrupted, threatening not only public and wildlife health, but the state's water supply, as well as beloved recreation areas like Lake Merritt in Oakland.

“With climate change, it's clear that this issue will get more severe,” said Marisa Van Dyke, a senior environmental scientist with the State Water Resources Control Board working on harmful algal bloom issues. Besides hot weather, a primary cause of the toxic blooms is excess nutrients in bodies of water, which, in California, often come from agricultural runoff.

Nearly 70 California lakes, rivers and reservoirs, including several in the Bay Area, have issued [“caution,” “warning” and “danger” advisories](#) so far this year. Eight of those belong in the “danger” category, including Lake Del Valle, a drinking water reservoir and popular recreation site in Alameda County. Officials have suspended swimming at Lake Del Valle's popular beaches.

The [“danger” level](#), according to state guidelines, indicates that no person — or animal — should swim in the water, nor drink or cook with it. Fish from rivers or lakes with this advisory should not be eaten, even after cleaning.

Since the state began maintaining [a repository of voluntary reports](#) of harmful algal blooms in 2016, reports in California have increased severalfold, from fewer than 100 in 2016 to more than 600 in 2021. Part of this increase is explained simply by the fact that more people and agencies have become aware of the problem and therefore made more reports.

At least three different sections of Clear Lake in Lake County have also reported dangerous levels of harmful algal blooms in 2022. The lake, which used to be a vibrant getaway, is one of the places where the toxic blooms' impacts have been far-reaching, says Carly Nilson, another state water board scientist focusing on the issue.

“The recurring noxious blooms every single year are getting so bad now,” she said. “Economically, they're facing quite a bit of constraint there, because they're just not getting the recreation anymore and the influx of tourists,” she said. “And the community that lives around the lake is not accessing the water they paid money to live near,” she added.



The California Water Quality Monitoring Council reports a dangerous amount of harmful algal bloom at Lake Del Valle in Livermore.

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“Not to mention, also these blooms create a pretty abrasive odor,” Nilson said. “In a lot of cases, they can’t even open their windows in the summer because it gives them headaches and other kinds of respiratory issues.”

The writing is on the wall, many experts agree. Harmful algal blooms appear to be increasing not only in frequency, but also in duration and toxicity, here in California and globally.

“It will get a lot worse if we let it get out of control,” said Kate Poole, a California-based

senior director of the water division at the Natural Resources Defense Council, a nonprofit environmental advocacy group.

To the untrained eye, toxic blooms, which vary in size, appearance and color, can be difficult to distinguish from non-toxic algae growth. Cyanobacteria, a common form of harmful algal bloom, have a bright blue-green tint and are also called blue-green algae, according to the state water board's [guide on how to distinguish them from nontoxic algae](#). Blooms can also appear as mats of algae in shallow water.

“Not all algae are harmful, but these particular outbreaks are, and you don’t want to drink it,” Poole said.

Chart: John Blanchard, Source: NOAA Chart: John Blanchard, Source: NOAA

Beyond staying away and informing others to do the same, experts say there aren’t many realistic options when it comes to dealing with harmful algal blooms that are established in a body of water.

In some cases, chemicals can be used to break up the blooms, Van Dyke said. But that’s not really an effective nor a long-term solution, partly because the impact of the chemicals is short-lived.

In terms of ensuring drinking-water safety, reservoirs like Lake Del Valle are well equipped with various [water quality monitoring devices, as well as filtration systems](#) that treat the water before it reaches customers.

But treating water also comes at a price — one that will continue to escalate if the blooms get worse. “The more that these outbreaks occur in the source of our drinking water, the higher the treatment costs to make sure that water is safe,” Poole of the Natural Resources Defense Council explained.

In most cases, there’s nothing to do except wait for the blooms to go away on their own. The best thing is to prevent the blooms from growing in the first place, experts say.

A big part of preventing these toxic blooms at a larger scale is to reduce [excess nutrients](#) in the water that promote algal growth, Poole said. That would mean reducing agricultural runoff, which is a major contributor.



Above: Denea (left) and Frankie Marhx board their boat Lake Del Valle. Below: The lake has been invaded by algal bloom.

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Preventing the blooms requires rigorous tracking of where they are happening, says Barbara Barrigan-Parrilla, executive director of Restore the Delta, a community-based environmental group. "It's like COVID," she said. "You have to track it to be able to mitigate it."

The group conducts its own routine monitoring in the Sacramento-San Joaquin River Delta, modeled after the monitoring systems of tribal communities, which were among the first to examine this issue. Native American tribes in the Klamath Basin, in far Northern California

and Southern Oregon, [developed the first water quality standards for the toxins](#) in harmful algal blooms.

She said the group found that harmful bacteria are consistently seen where harmful algal blooms have occurred in the past — underscoring the importance of preventing them in the first place.

But government agencies have limited resources to monitor possible outbreaks, as well as investigate and respond to ones that already happened.

“We prioritize our limited funding for water testing,” Van Dyke of the water board said.

“Currently, there are no federal or state regulatory standards for cyanotoxins in recreational water or drinking water,” [according to the state water quality monitoring council](#).

There is also no mandate for water body managers to report harmful algal blooms to the public or environmental agencies, nor a comprehensive monitoring program, according to state officials — which is why groups like Restore the Delta are doing their own.

As it stands, the advisory levels are informed by voluntary reports by managers of the bodies of water, such as the [East Bay Regional Park District](#), which oversees Lake Del Valle and many other lakes in the region.

Van Dyke says required — not recommended — routine monitoring and reporting would greatly improve state officials’ ability to start addressing harmful algal blooms.

Beyond that, reducing toxic bloom outbreaks at a larger scale would require addressing the root causes of the problem — warming temperatures, drying water systems and stagnant water among them, all symptoms of the changing climate.

Harmful Algal Bloom resources

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“It’s really hard to address those in drought conditions,” Nilson said. “But really addressing some of those key drivers is necessary so that (toxic blooms) don’t get worse.”

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