



Self-Supplied Household Water Systems are Vulnerable to Cyanotoxins and Other Contaminants

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Cyanobacteria and harmful algal blooms (HABs) are a known, escalating climate-driven threat to drinking water. While some public drinking water systems drawing from affected bodies of water may test for the toxins produced by these blooms, rural California homes that draw their household water directly from lakes, rivers, and nearshore wells may also be affected by cyanobacteria. Household treatment for these self-supplied systems are not typically designed to eliminate cyanotoxins from water, and in some cases may exacerbate the problem. Other contaminants, such as nitrates and coliform bacteria, may also escape home treatment systems. Tracking California at the Public Health Institute and the Big Valley Band of Pomo Indians are collaborating to monitor and raise awareness of this threat to clean drinking water in Lake County.

Cyanotoxin Monitoring in Lake County

Since 2014, the **Big Valley Band of Pomo Indians** has closely monitored levels of cyanobacteria in Clear Lake and [published these results online](#). During the summer of 2021, much of Clear Lake was impacted by severe cyanobacterial blooms.

From June – October 2021, the **Cal-WATCH (California Water: Assessment of Toxins for Community Health) program** – funded by the Centers for Disease Control and Prevention and implemented as a partnership between Tracking California and the Big Valley Band of Pomo Indians – **identified nearly 500 Lake County homes that had close proximity to Clear Lake and were self-supplied (not served by public water systems)**. Cal-WATCH reached out to these target homes via mailings and door hangers to the identified addresses and through social media outreach efforts. These parcels are highlighted in **Figure 1**.

Methodology of Cal-WATCH Water Testing

Participants were offered free one-time testing of their household water and treatment systems. In total, **46 households participated in the program**, including **31 households drawing water directly lake water intakes and 15 households using groundwater from a well within 50 feet of the lake's shoreline**. Tap water (post-treatment) was tested at least once for cyanotoxins, nitrates, coliform bacteria, and – if at risk to exposure – herbicides. **Residents were asked about their household water treatment systems, which included chlorine, UV, and filtered treatments**. They were also asked about their **water consumption habits**, for example if tap water was used for cooking, bathing, drinking, tooth brushing, and irrigation. Results of these tests were returned to the participants with a complete, non-technical explanation of the risks assessed and identified.

Overview of Household Water Testing Findings

The testing procedure tested for four cyanotoxins: Microcystin, Anatoxin-A, Cylindrospermopsin, and Saxitoxin. It identified microcystin in **22 of the 31 participating homes that draw water from Clear Lake**. Microcystin was not identified in any of the tested well water systems. Of the 22 homes with a detectable presence of microcystin, **15 had microcystin levels of at least 0.3 µg/L, which is above EPA health advisory levels**. Microcystin was also found in all types of household water filtration systems, including those using chlorine, UV, and filtration treatments.

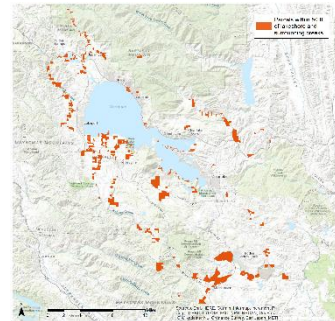


Figure 1: Map of Targeted Residential Parcels Surrounding Clear Lake

Policy Recommendations

Self-supplied household water systems, which are often found in rural communities, are vulnerable to environmental contaminants at levels that may adversely impact human health. Though **these water systems are not required to meet the U.S. EPA Safe Drinking Water Act (SDWA) standards, many of the homes at risk are vacation or long-term rental properties**. Renters are unlikely to be aware of these risks, or understand the importance of using alternative water sources. For these reasons, **property owners who rent homes not on public water systems should be required to meet the SDWA requirements through additional testing**.

To limit exposure to cyanotoxins in rural household water sources, **state and local governments should support and encourage the expansion of public water systems into rural areas wherever possible**.

Big Valley Band of Pomo Indians found high levels of microcystin in their surface water testing. Microcystin also made its way into the drinking water of homes with lake water intakes. Based on these results, **stakeholders and water body managers should consider surveillance and additional testing for microcystin and other cyanotoxins at other water bodies with self-supplied drinking systems during periods of high algal blooms**.

Service providers contracted by property owners have no drinking water treatment training requirements. Public water systems are required to have licensed operators with ongoing training, and must pass certification exams. **The increasing challenges of treating water quality should require that contractors who design and treat surface water have state-mandated certifications**.