

# Yessotoxins produced by phytoplankton caused summer mass shellfish mortality events in Washington

June 18 2021, by Samantha Larson

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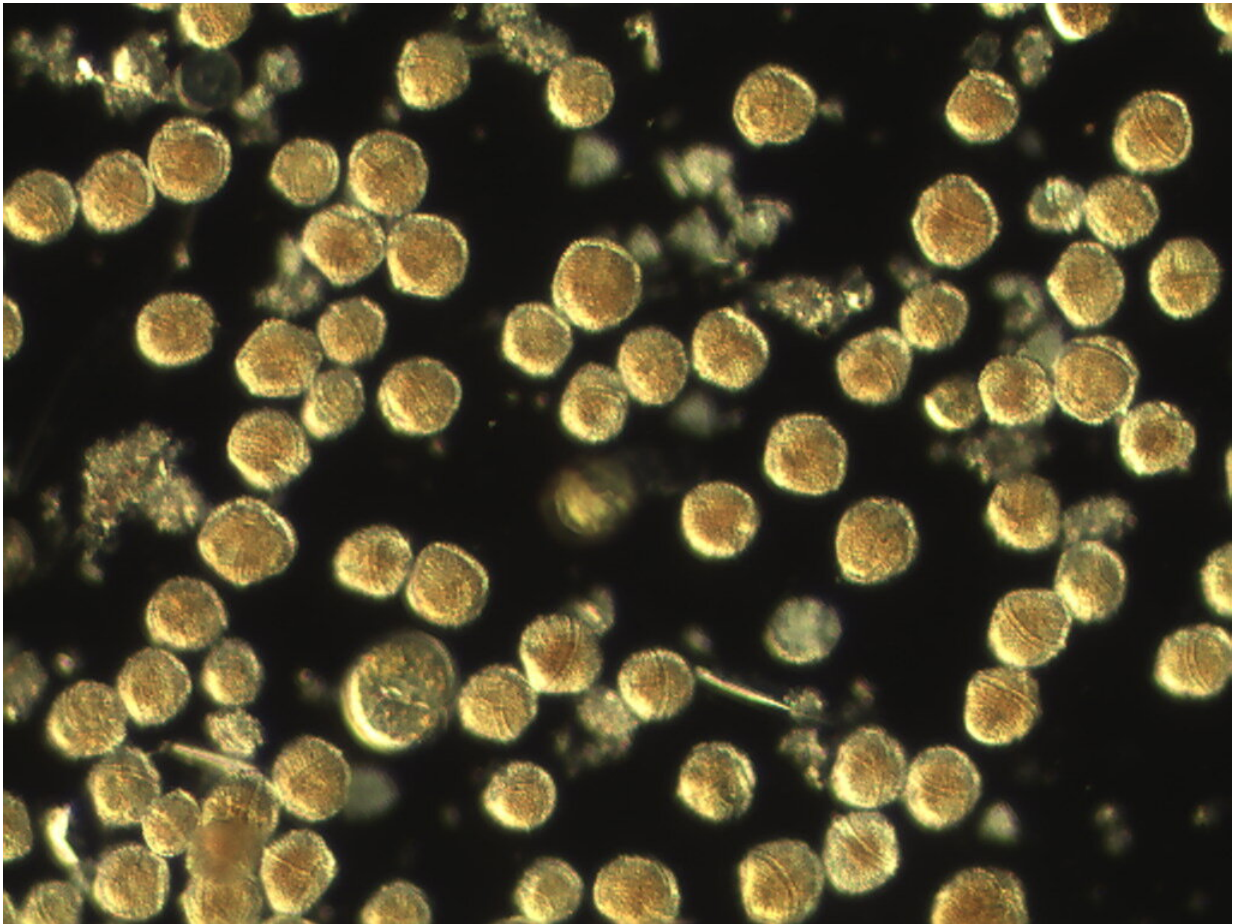
Dying clams on Hood Canal, Rocky Bay, 2019. Credit: King et al, Harmful Algae, 2021

Back in the summers of 2018 and 2019, the shellfish industry in Washington state was rocked by [mass mortalities of its crops](#).

"It was oysters, clams, cockles—all bivalve species in some bays were impacted," said Teri King, aquaculture and marine water quality specialist at Washington Sea Grant based at the University of Washington. "They were dying, and nobody knew why."

Now, King and partners from NOAA National Centers for Coastal Ocean Science, NOAA Northwest Fisheries Science Center, Northwest Indian College and AquaTechnics Inc. think that they have finally sleuthed out the culprit: high concentrations of yessotoxins, which are produced by blooms of certain phytoplankton. The researchers' findings were published last month in the open-access journal *Harmful Algae*.

Because [yessotoxins](#) are not a threat to human health, their presence in Washington has not been closely monitored. The researchers dug through data that had been collected by the NOAA Northwest Fisheries Science Center and NOAA National Centers for Coastal Ocean Science for different purposes, coupled it with current observations from the SoundToxins phytoplankton monitoring program, and discovered that these algae species, *Protoceratium reticulatum* and *Akashiwo sanguinea*, are correlated with shellfish mortality events stretching as far back as the 1930s.



The algae species *Protoceratium reticulatum*, seen under a microscope. Credit: Teri King/Washington Sea Grant

In 2018 and 2019, with SoundToxins partners' eyes on the water, and reports of dying shellfish from the Washington Department of Fish & Wildlife and the shellfish industry, the research team was able to collect shellfish and water samples for analysis. This set the table to help answer the mystery of what was causing summer mortality in Washington state shellfish.

These findings have significant implications for shellfish growers in the region.

"We are working towards being able to help growers count the cells of yessotoxin-producing organisms in the water and correlate it to an action level," King explained. "SoundToxins has been conducting similar work for the Washington Department of Health for three 'human health' marine biotoxins since 2006. Adding the 'shellfish killing' plankton species to the real-time mapping capability of the SoundToxins partnership would allow for shellfish producers and natural resource managers to make informed decisions, such as harvesting their product early or otherwise strategizing to save as much crop as possible."



Clams on Rocky Bay watershed, Case Inlet, July 2019. Credit: Teri King/Washington Sea Grant

King said this research is also a demonstration of the value of partnerships between [shellfish](#) producers, plankton monitors, Native tribes, agencies and researchers.

"We were a team of oceanographers, biologists and chemists working together to answer these questions," King said. "People are able to think differently when you have different people at the table."

Sometimes, it's even the key to solving the longstanding mysteries that have been taking place right in your backyard.

**More information:** Teri L. King et al, Hiding in plain sight: Shellfish-killing phytoplankton in Washington State, *Harmful Algae* (2021). [DOI: 10.1016/j.hal.2021.102032](#)

Provided by University of Washington

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