

2022 DELTA SCIENCE FELLOW **FACT SHEET**



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Focus Identifying environmental conditions driving cyanobacterial multi-species blooms and their toxicity using genome resolved metagenomics

Award \$241,410

Research Mentor

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Community Mentors

Dr. Keith Bouma-Gregson,
US Geological Survey

"Cyanotoxins can affect drinking water and recreation – impacting millions of Californians. This project can not only inform management practices but safeguard public health."

PROJECT

In recent years, the Sacramento-San Joaquin Delta has seen a rise in the diversity and prevalence of toxic species within cyanobacterial blooms. This project aims to utilize genome-resolved metagenomics to examine the genetic diversity of cyanobacteria and their capacity to produce cyanotoxins. It will also explore the interactions between cyanobacteria and other microbes present in a cyanobacterial bloom. Ultimately, by better understanding microbial diversity in the Delta, the goal is to better predict what environmental conditions prompt the appearance of newly identified cyanotoxins.

TIMELINE

2022-2023 Sampling of potentially harmful cyanobacterial blooms conducted in the South and Central Delta, and limited initial sample processing.

2023-2024 Continued sample processing, including sequencing of the genomes of cyanobacteria and co-occurring bacteria; identification of gene clusters responsible for the biosynthesis of cyanotoxins; statistical assessment of blooms.

IMPACTS

There are critical knowledge gaps around the full toxic potential of the increasingly diverse harmful cyanobacterial blooms in California. The results from the project will inform ongoing public health monitoring by state and county agencies and will be critical to improving forecasts of bloom activity.

