

Status of HABs in Fresh and Estuarine Waters

SCCWRP Commission Meeting

June 5, 2026

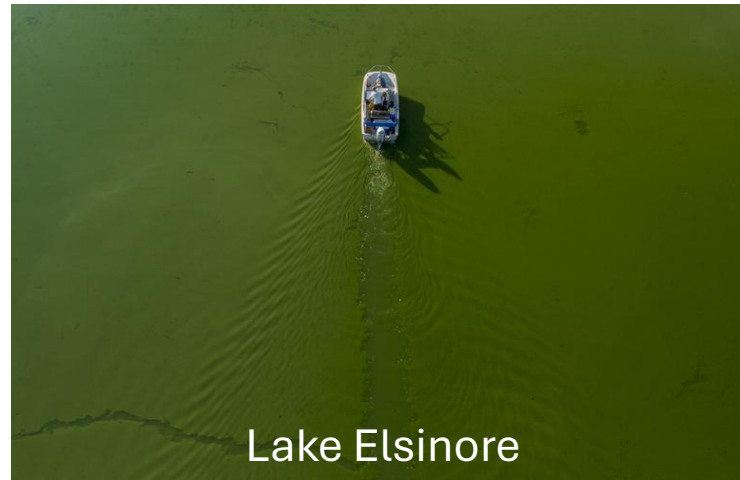
Available data says freshwater HABs are ubiquitous

- Blooms reported across multiple waterbody types
- Blooms occur throughout the year
- Record breaking cyanotoxin levels in some CA systems

Rivers & Streams



Lakes



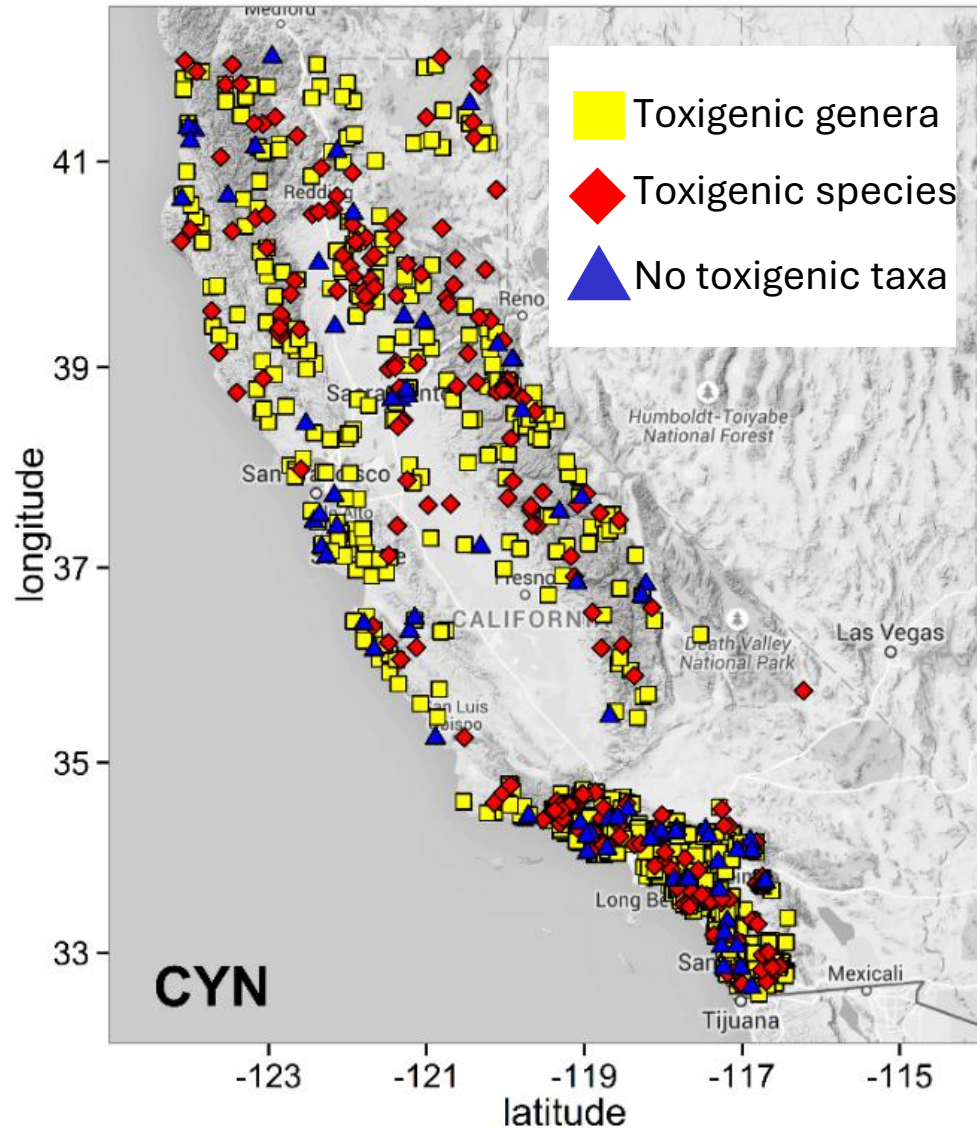
Estuaries



We'll look at what we know by waterbody type

Toxigenic benthic cyanobacteria common in California

Toxin producing cyanobacteria



2007 - 2013

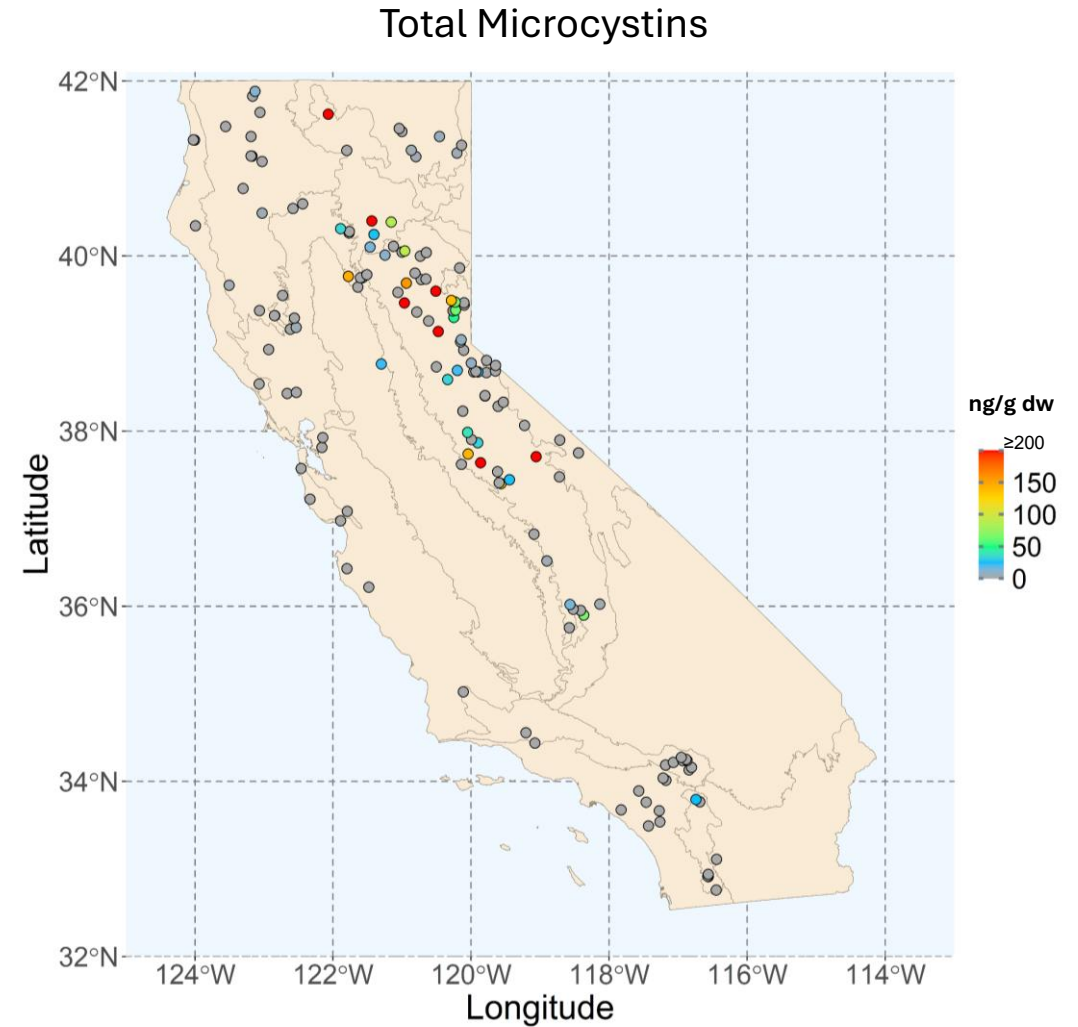
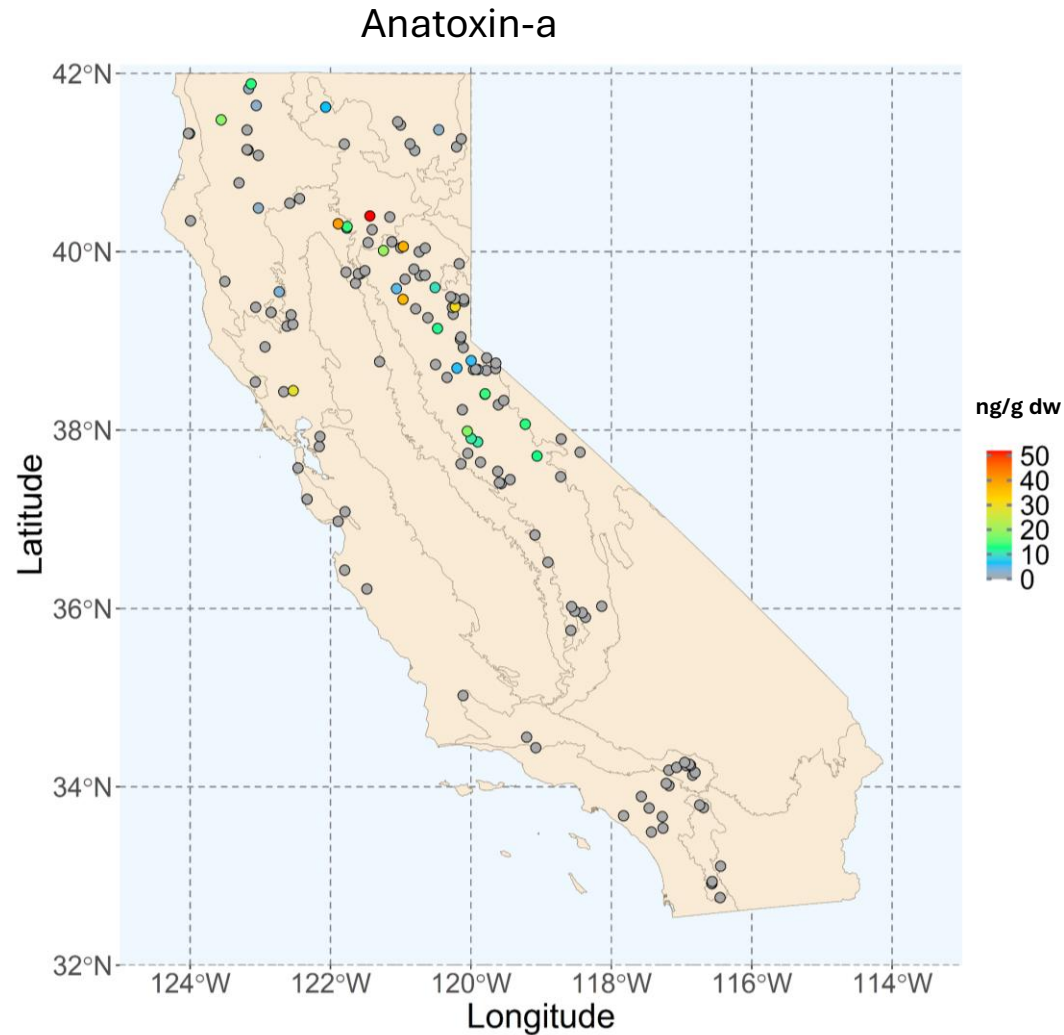
1,280 sites

90% of stream kilometers support toxic genera

23% of stream kilometers support toxic species

Working to document cyanotoxin prevalence in streams

More recent opportunistic sampling from algae bioassessment programs (RCMP and PSA)



Many lakes & reservoirs have chronic blooms

- Chronic blooms in lakes and reservoirs across nearly every region of California
- Blooms can be intense
 - Cyanotoxin levels in some lakes among highest in nation
- Blooms in these systems often make the news

High cyanotoxin levels raise concerns for individual private intakes that draw water from Clear Lake

LAKE COUNTY NEWS REPORTS POSTED ON MONDAY, 25 JULY 2022 03:17 [f](#) [t](#) [G+](#) [in](#) [p](#) 25 JULY 2022

LOS ANGELES

Danger advisory issued at Upper Castaic Lake over toxic algae bloom

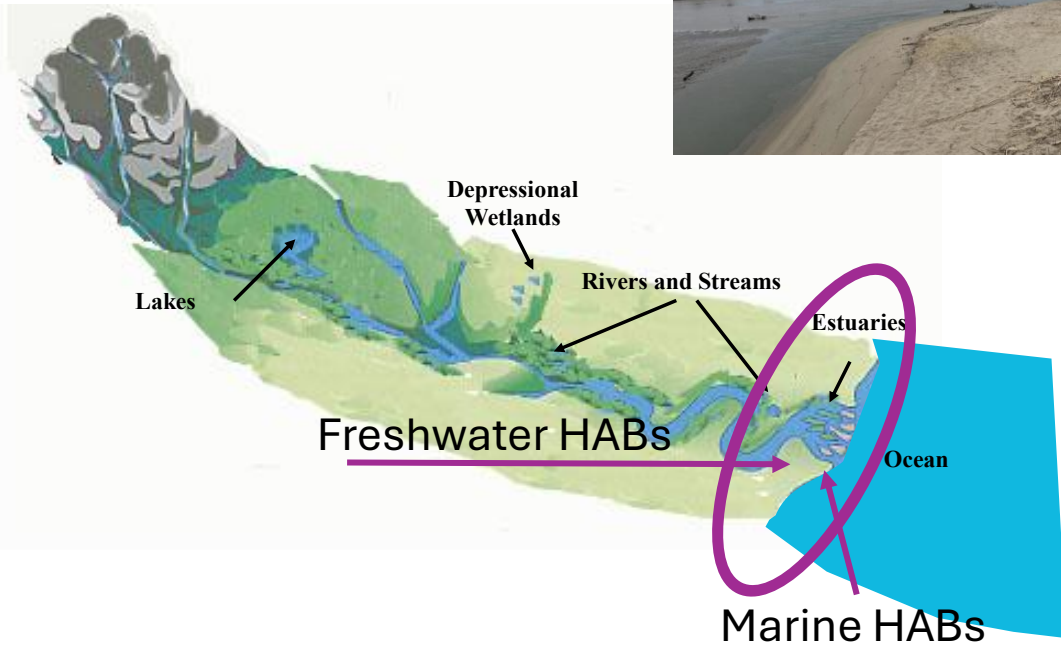
CLIMATE & ENVIRONMENT

Lake Elsinore isn't safe to swim in. Here's what to know about the toxic algal bloom

CLIMATE & ENVIRONMENT

People and pets urged to avoid San Bernardino lake due to toxic algal bloom

Cyanotoxins are present in many estuaries

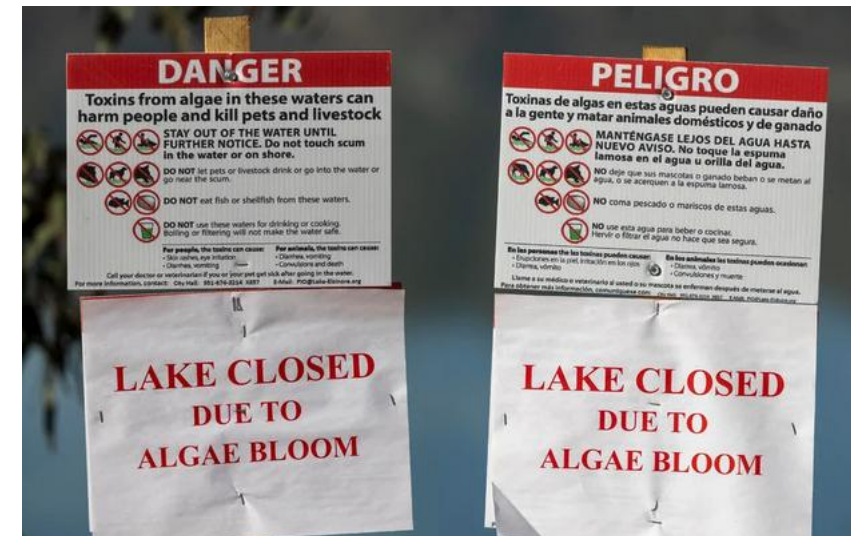


- Freshwater HAB toxins prevalent in estuaries statewide
- Microcystins in estuarine and coastal
 - Water
 - Shellfish and fish
 - Marine mammals
 - Birds
- Major impacts from excessive biomass as well

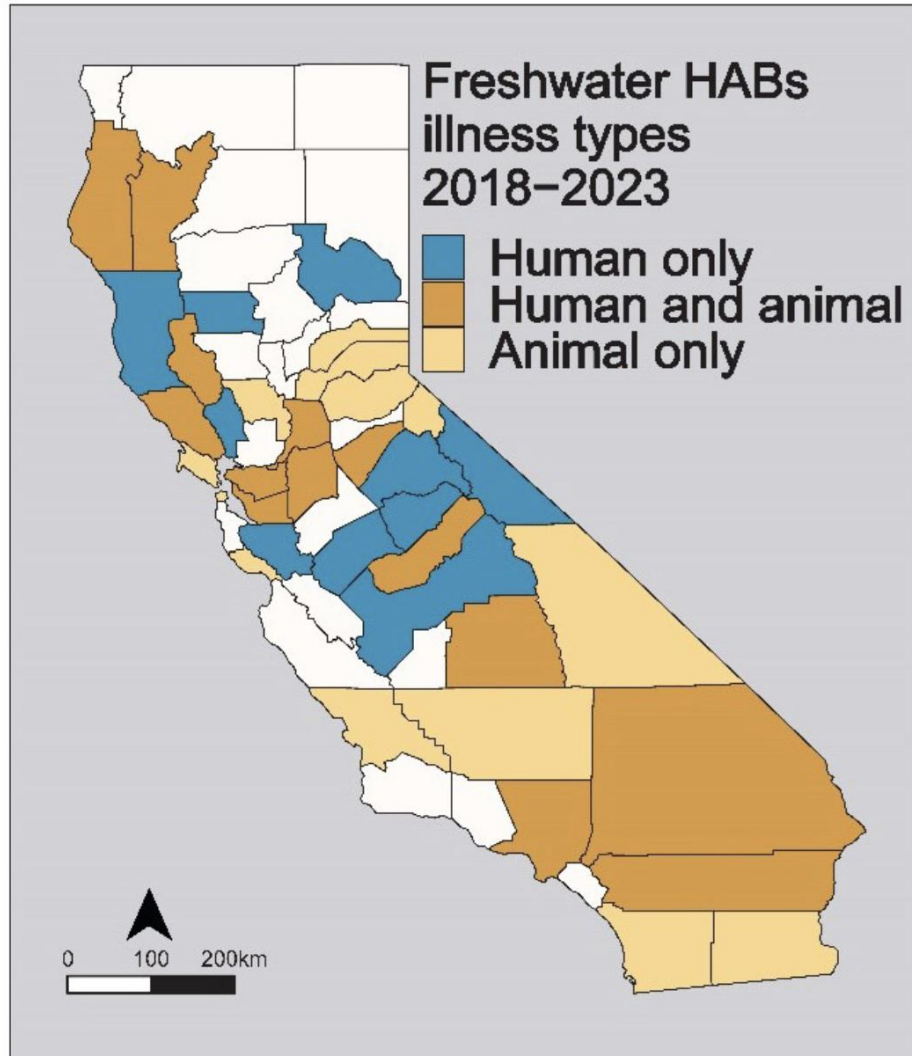
Freshwater HAB are impacting beneficial uses

Multiple impacts and effects

- Record number of lakes closed for recreation
- Dog & wildlife deaths attributed to cyanotoxins make the news annually
- Private water intakes contaminated with cyanotoxins



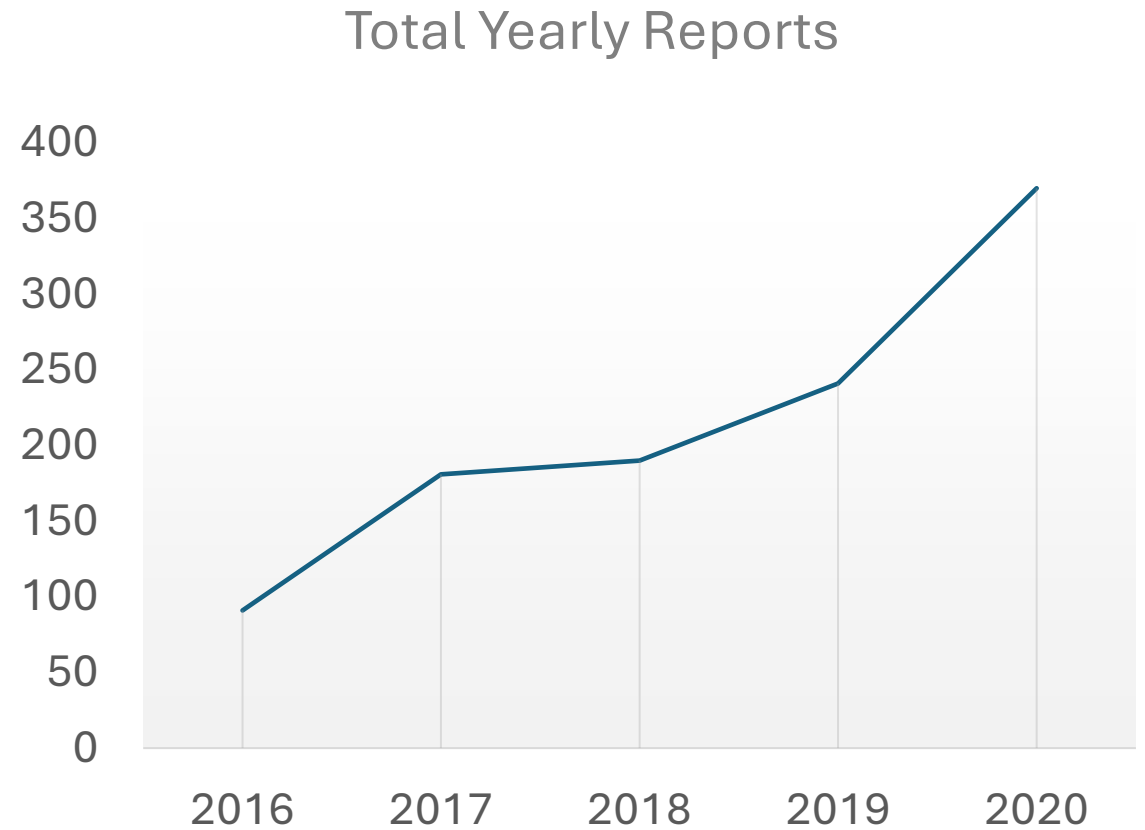
Illness tracking efforts also highlight geographic scope



- Health tracking efforts are coming online
- These also rely on public reports so likely providing an underestimation of impacts

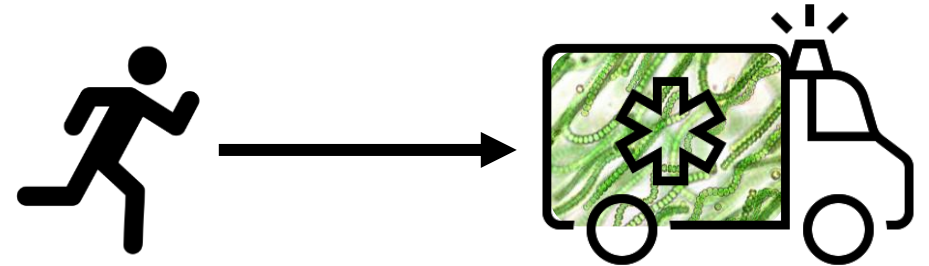
We think blooms are increasing (or at least reporting of blooms)

- Public reports have quadrupled since inception of tracking
- Many systems with recurring reports
- Blooms also occurring in 'new' places



Why haven't I given you quantitative answers?

- Monitoring of toxic HABs in inland and estuarine waters is limited
- Mostly reactionary monitoring
 - Event response efforts are typically triggered by a report of an existing bloom
 - Pre-holiday assessments helps protect recreation during peak periods
 - Limited number of systems have routine, ambient monitoring



Major efforts to enhance management and monitoring ongoing

HABs toolbox status varies by system type

Water Column Cyanobacteria

Advanced



Benthic Cyanobacteria

Science in progress



Wadeable streams



Water Column Cyanobacteria Toxin Monitoring Science is Advanced

Water Column Cyanobacteria



- Key indicators have been identified
- FHAB Program has protocols and MQOs for priority indicators
- Laboratory processing approaches established
- Remote sensing tools exist to support monitoring and assessment

Science of Water Column Cyanobacteria Toxin Thresholds Is Robust

Water Column Cyanobacteria



- Strong science
 - OEHHA generated
 - Community acceptance by CCHABs
- Caveats on applicability
 - Likely under protective of tribal uses, dogs, & aquatic life
- Precedent
 - US EPA drinking water guidance
 - California recreational use advisories
 - 303(d) listing and TMDLs

Benthic HAB monitoring methods are less developed, *but* work is happening now to advance it!

- Indicators and field methods identified by CCHAB working group
- Laboratory methods are in development for some key indicators
- Current satellites not tractable, but other remote approaches possible in coming years

Benthic Cyanobacteria



Wadeable streams



Science of Benthic Cyanobacterial Thresholds Needs More Work

Benthic Cyanobacteria

Emerging science

- No consensus on how translate benthic toxin to water column equivalent risk
- FHAB program is building a database to define what levels are “naturally occurring”



Wadeable streams



Questions