Managing Harmful Algal Blooms

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Photo by Isaac Ochoa, Chemehuevi Tribe at Nuwuvi Park, Lake Havasu

Presentation Overview

- 1. Harmful Algal Blooms 101
- 2. EPA Clean Water Act Programs
- 3. Other EPA tools
- 4. Panel: Tribal Experiences
- 5. Q&A

Harmful algal **blooms (HABs)** are rapid, overgrowths of photosynthetic organisms in water.

CALIFORNIA NEWS

State officials warn of 'dangerous' algae bloom in Southern California lake

by: <u>Travis Schlepp</u> Posted: Jun 26, 2024 / 06:27 PM PDT Updated: Jun 26, 2024 / 06:27 PM PDT



In an aerial view, a boat motors through green water during a harmful algal bloom (HAB) of blue-green algae, also known as Cyanobacteria, at Lake Elsinore on August 25, 2022 in ... **Read More**

Report of dog death on social media triggers investigation into harmful algal booms in South Lake Tahoe

News Follow News | Jul 8, 2024



Planktonic

Cyanobacteria

 Not all HABs are cyanobacteria blooms

Not all cyanobacteria are bad
Specific type of HAB (CyanoHABs) produces toxins (Cyanotoxins)

Planktonic vs Benthic



Figure 40. Anabaena sp. mats and floating detached mats (Photograph: Keith Bouma-Gregson)



Figure 41. Anabaena sp. on shoreline (Photograph: Rich Fadness)

What makes it harmful?

Different cyanobacteria can produce different toxins (aka Cyanotoxins) with affects like:

- Liver failure
 - Microcystin- most common chronic toxin
- Kidney damage
 - Cylindrospermopsin
- Neurological distress
 - Anatoxin
 - Saxitoxin
- Skin irritation





Tribal Cultural Use Conceptual Freshwater Harmful Algal Bloom (FHAB) Impact Pathway

Native peoples were given their land by Creator and honor Creator and their Ancestors by maintaining traditions and cultural landscapes. This is the connection between the land and the people. Uses can be repetitive, gender assigned and long term. Exposures can occur second hand through the use and trade of plants and animals that have been in contact with HABs.



Developed by Big Valley Band of Pomo Indians and Karuk Tribe with assistance from Meyo Marrufo and Dr. Jeanine Pfeiffer 2019.



Common CWA 106 Program Activities



Water Quality Monitoring

QAPP development, monitoring equipment, lab analysis, staff salaries and benefits



Outreach and Education

Earth Day activities, newsletters, website, educational videos, field trips, etc.

+including HABs!



Training/Travel

EPA Water Quality Standards Academy, RTOCs/Annual Conference, Online Courses

CWA 319 Program

► HABs Activities Under CWA 319

- Riparian Area Restoration/Planting
- Wetland Restoration
- Exclusion Fencing
- Watershed Planning
- Outreach & Education

▶ Required

 Nonpoint Source Assessment Report and Management Plan

- Region 9 Points of Contact
 - Howard Kahan
 - Larry Maurin
- Links
 - National: <u>https://www.epa.gov/nps/contacts-nonpoint-source-nps-pollution-programs#epa</u>
 - Region 9: <u>https://www.epa.gov/tribal-pacific-sw/r9tribalcwa#319</u>

Water Quality Standards: Three Parts



Uses



Criteria



Antidegradation

How the waterbody will be used

Recreation, aquatic life, cultural uses, subsistence fishing, etc.

Water quality necessary to protect the uses

Numeric values or narrative statements

Framework for maintaining and protecting water quality that has already been achieved

Probability of Adverse Effect to Freshwater Life

Water Quality Criteria to Address HABs

EXISTING EPA RECOMMENDED CRITERIA

- CRITERIA TO ADDRESS NUTRIENT
 POLLUTION IN LAKES AND RESERVOIRS
- ECOREGIONAL NUTRIENT CRITERIA FOR RIVERS AND STREAMS
- RECREATIONAL CRITERIA OR SWIMMING ADVISORIES FOR MICROCYSTINS AND CYLINDROSPERMOPSIN



Site-Specific Criteria

 Can develop site-specific criteria that are tailored to local conditions and uses (e.g. cultural and traditional uses)

Resources for Developing Water Quality Standards

EPA NUTRIENT SCIENTIFIC TECHNICAL EXCHANGE PARTNERSHIP & SUPPORT (N-STEPS)

- TECHNICAL ASSISTANCE TO TRIBES FOR ALL STAGES OF NUTRIENTS CRITERIA DEVELOPMENT
- PLANNING, SCIENTIFIC LITERATURE REVIEW, DATA PREPARATION AND ANALYSIS, MODEL DEVELOPMENT, PEER REVIEW



https://www.epa.gov/nutrient-policy-data/n-steps-program

Contact EPA Region 9 Nutrient Coordinator to get started: Eric Dubinsky <u>dubinsky.eric@epa.gov</u>

BloomWatch

Bloom Watch

- Cyanobacteria Monitoring Collective: crowdsourcing to find and report potential cyanobacteria blooms
 - 1. Use bloomWatch app to take good photos of potential blooms,
 - 2. Submit your photos to the project,
 - 3. Send info to the relevant state agency
- Mobile App or Web-based platform
- •<u>Data Dashboard</u> for bloom reports visualizes data from the app, and from <u>iNaturalist's Cyanoscope</u> and the CyanoToxin clearinghouse
- •Observations are displayed on <u>How's My Waterway</u> to see other water quality data related to HABs



CyAN App Remote Satellite CyanoHAB Imaging in Surface Water







Freshwater Forecasting

- 7-day forecast predicts probability of CyanoHAB in lakes
- Posted weekly for over 2,000 lakes and reservoirs
- Overall prediction accuracy of 90%
- Should inform monitoring efforts, not replace it!



HAB Forecasts | US EPA

Region 9 Lab Support

- Free lab analysis of samples for Microcystin using ELISA method
- Provides analysis for ~800 samples a year
- Ongoing support for Klamath Tribal Water Quality Consortium
- The lab is looking to expand its capacity and capabilities for additional toxins analysis and drinking water methods in the future



Photo Credit: CA Water Board

