California CyanoHAB Network (CCHAB)*

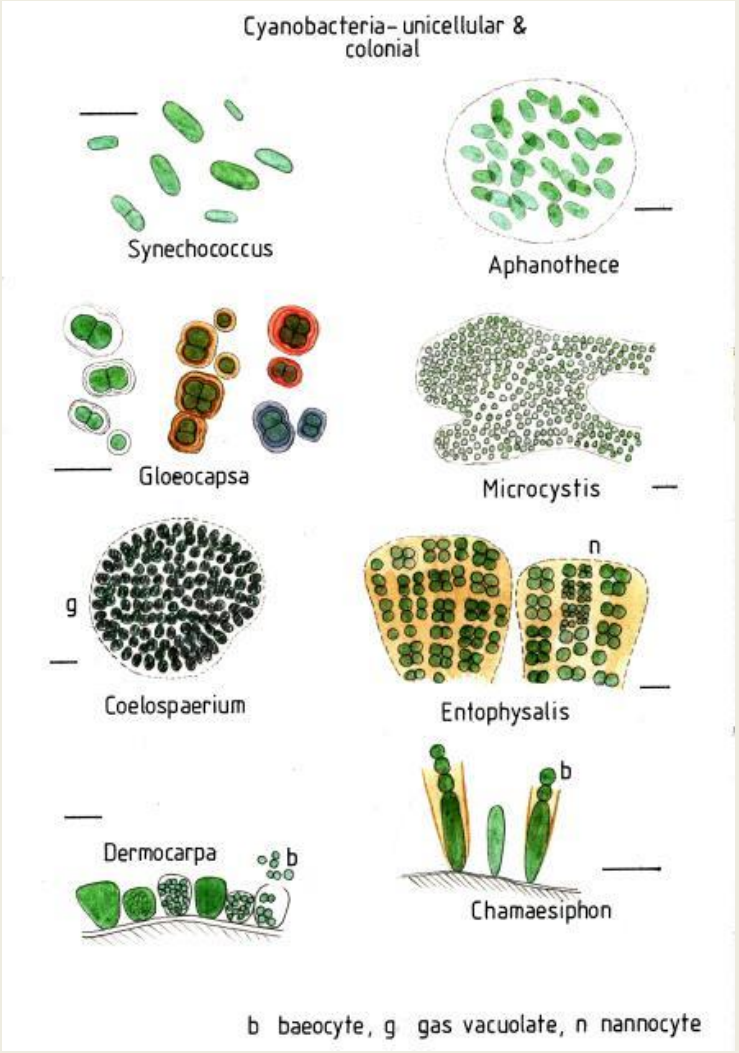
Johanna Weston
State Water Board
Ocean Unit

California Water Quality Monitoring Collaboration Network Webinar
November 21, 2013

* Formally the Statewide Blue Green Algae Public Working Group

Cyanobacteria and Algal Blooms

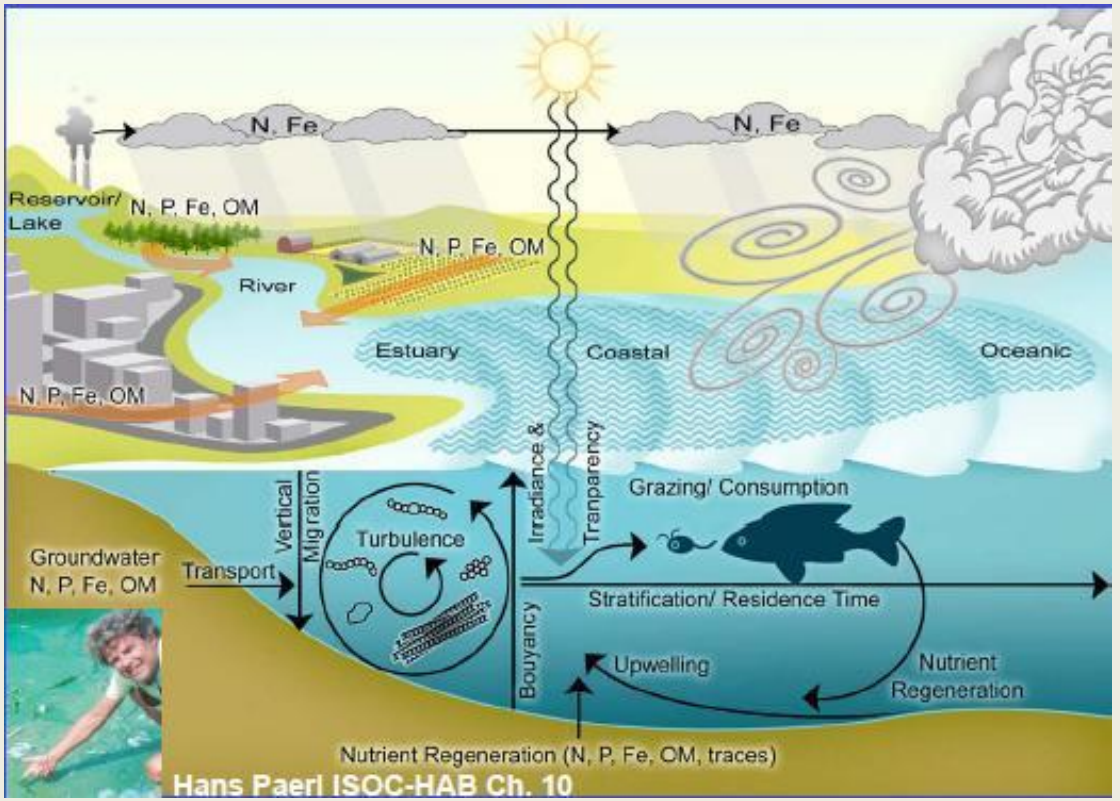
- Singled-celled bacteria that photosynthesize (i.e. have chlorophyll-a).
- Often called blue-green algae.
- Algal Blooms
  - Extremely high cell densities
  - Visible accumulation
  - Dominated by a single or few species



What Causes Algal Blooms?

Many environmental factors can influence algal blooms.

- Nutrients
- Turbidity
- Circulation Patterns
- Biological Community Interactions.



Harmful Algal Blooms

- HAB can occur when water use is impaired due to excessive accumulations of algae.
- Ecological Concerns
  - Low dissolved oxygen
- Economic Concerns
  - Recreation
  - Taste and odor
- Public Health Concerns
  - Toxicity

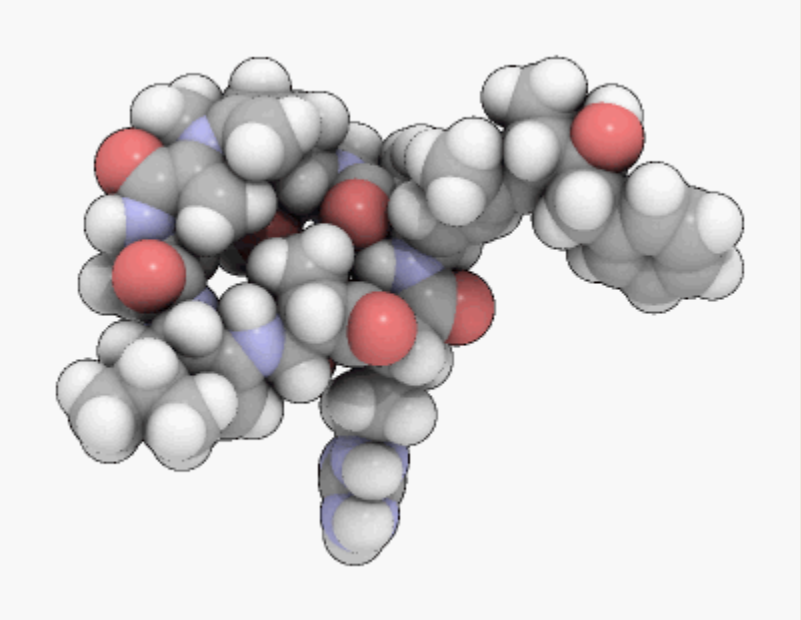
Cyanobacteria and Toxins

- **Cyanotoxins** – Chemicals produced by some cyanobacteria species that may affect the liver, nervous system, and/or skin.
  - **Microcystin** (*Microcystis*)
  - **Anatoxin-a** (*Anabaena, Aphanizonmenon*)
  - **Clindrospermopsin** (*Anabaena, Aphanizonmenon, Clyindrospermopsis)*
  - **Saxitoxin**

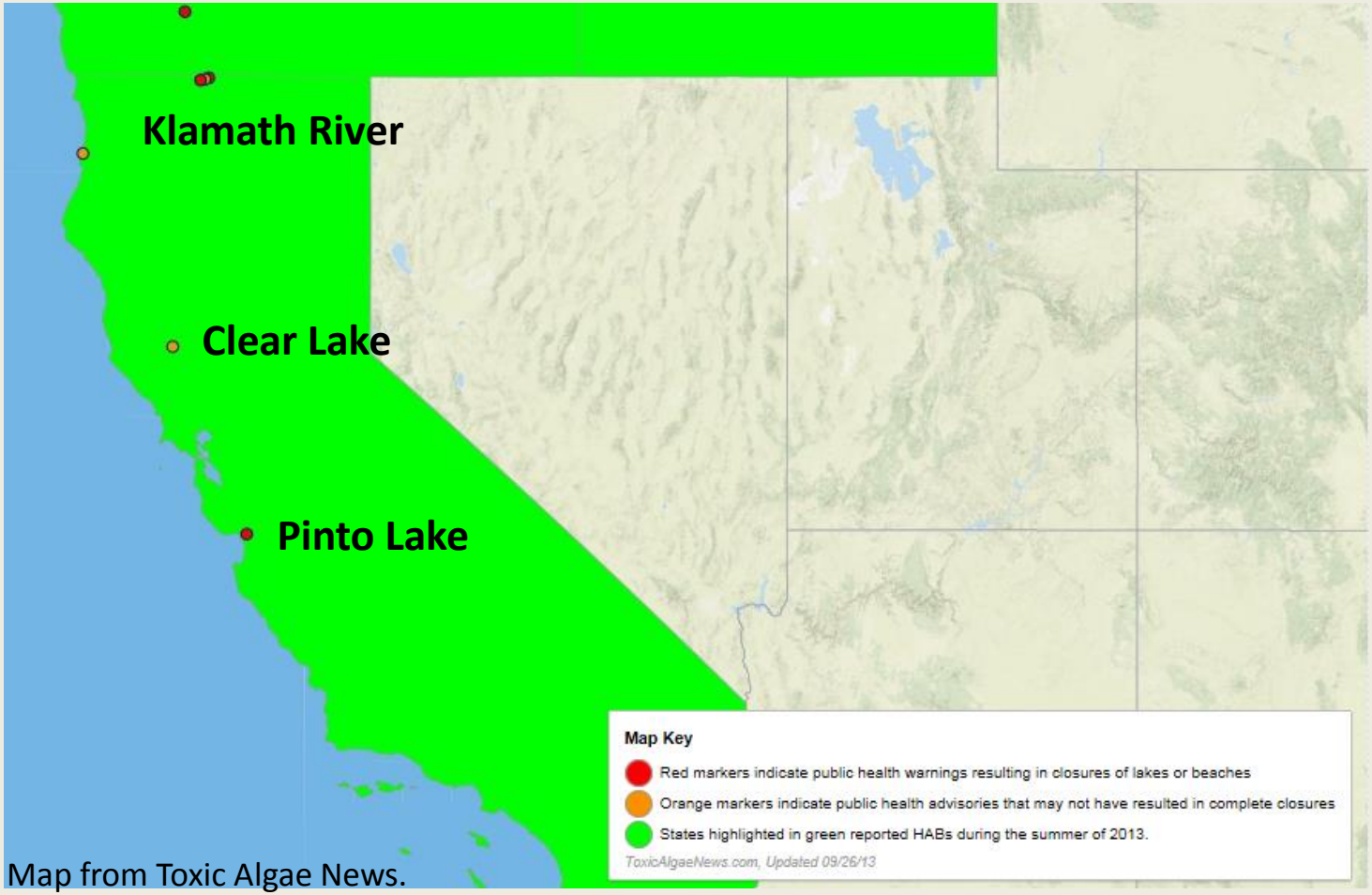
Photo L. Merchant-Masonbrink

Microcystin

- Most commonly detected cyanotoxin.
  - > 70 variants
  - Microcystin-LR
- Exposure - Ingestion
- Impacts the liver.
  - No Human Deaths.
- WHO Tolerable Daily Intake - 1 µg/L

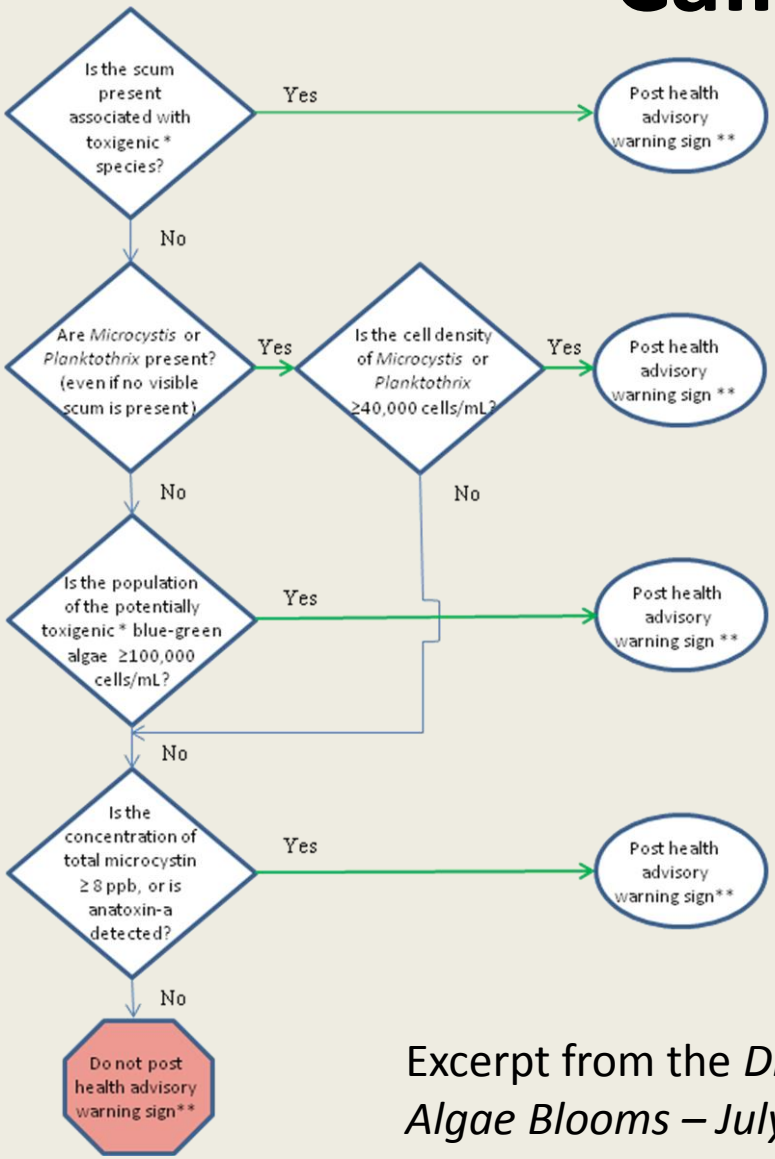


Where are CyanoHABs in California?



Map from Toxic Algae News.

How are CyanoHABs Addressed in California?



Excerpt from the *Draft Voluntary Statewide Guidance for Blue-Green Algae Blooms – July 2010*

Challenges to CyanoHABs

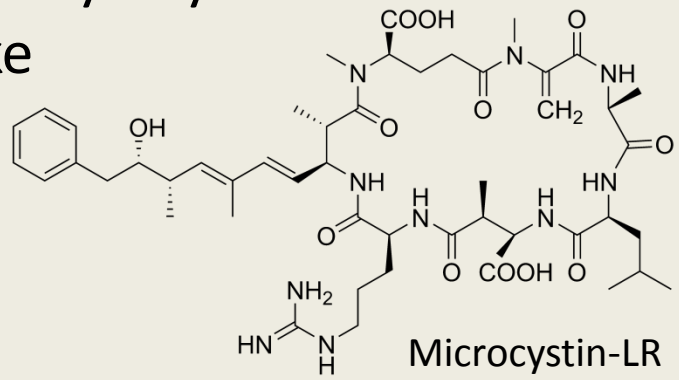
- Complex set of environmental factors.
- Diverse set of stakeholders.
- Multiple regulatory agencies.
  - US EPA
  - Department of Public Health
  - Water Board
- Based on World Health Organization guidance levels.
- Lack of statewide consistency in monitoring.
- Challenges to posting and public use of water bodies.

Fall 2005: State Water Board Workshop on Record-Setting Toxigenic Blooms on Klamath River Reservoirs

- High Levels of Persistent & Bioaccumulative Microcystin Toxins Produced By Reservoir Blooms.
- USEPA, SWRCB, and RWQCB Coordination & Information-Sharing With Tribal Representatives, Local Agencies, And Other Interested Parties.
- Establishment of Statewide BGA Working Group.

Accomplishments

- Meets twice a year.
- Draft Voluntary Guidance about Harmful Algal Blooms
- OEHHA Report on Suggested Action Levels for Blue Green Algae Toxins (Cyanotoxins)
- Two Trainings on HABs identification and sampling
- State Water Board Funded:
  - Water quality investigation on Klamath River Reservoirs
  - Development of LC-MS/MS methods for analysis of cyanotoxins
  - Sea Otter Poisoning Cases near Monterey Bay
  - Nonpoint Source Project for Pinto Lake

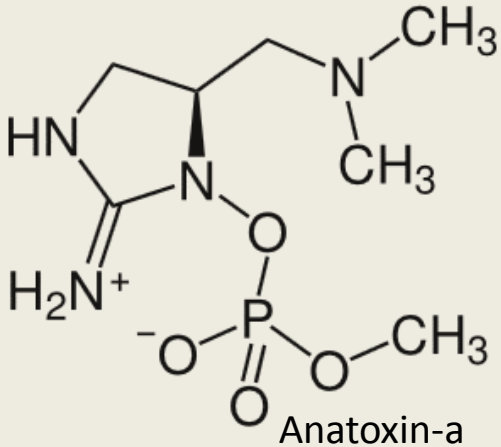


Microcystin-LR

Collaborations

DIVERSE group of members

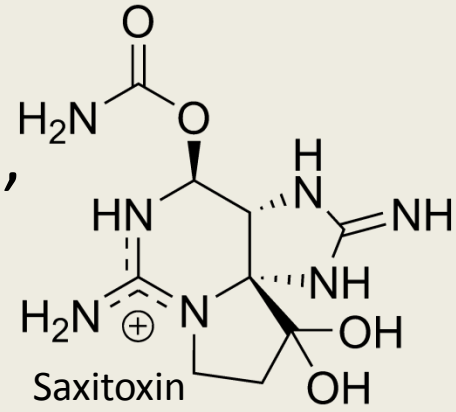
- Agencies (State Water Board, Regional Water Boards, OEHHA, DFW, CDPH, DWR, U.S. EPA, USGS, FWS)
- Tribal Governments (Karuk Tribe and Yurok Tribe)
- Local Health Departments (Siskiyou County, Humboldt County, Del Norte County)
- Cities (City of Watsonville, San Mateo)
- Academics and Researchers (UC Davis, UC Santa Cruz, Cal State MLML, SCCWRP, SFEI)
- Metropolitan Water and PacifiCorps
- Many others



Anatoxin-a

Freshwater Cyanobacteria Workshop 2012 Outcomes

- Hosted by Surface Water Ambient Monitoring Group (SWAMP).
- Develop long-term vision and strategic plan for cyanotoxins in California.
  - Identify and prioritize management questions
  - Synthesize existing data and identify data gaps
  - Develop communication tools
- Form a coordinated network through collaborations between federal, tribal, state, regional, and local agencies.



Saxitoxin

Moving Forward

- Define the Mission
- Establish a Steering Committee
- Establish Subgroups
- Establish Short-Term Goals
- Meetings: March 22 & May 6, 2013

Goals

1. Promote improvements of **coordination, monitoring, and management** of harmful cyanobacteria blooms and effects in freshwater and marine ecosystems throughout California.
2. Develop **collaborative relationships** among entities (e.g. federal, tribal, state, and local agencies) responsible for addressing cyanobacteria concerns and impacts to beneficial uses.
3. Make **efficient use** of federal, tribal, state, regional, and academic resources to address cyanobacteria concerns by sharing information, avoiding duplicative efforts, promoting research, monitoring, and assessment, identifying technical and policy gaps, and communicating cyanobacteria concerns to the public.

Steering Committee

- One *Facilitator* – Johanna Weston, State Water Board
- One representative from a *Federal Agency*
- One representative from a *State Agency*
- One representative from a *Local Agency*
- One representative from the *User/Regulated Community*
- One *Tribal* representative
- One *HABMAP* representative
- One representative from the *Academic Community*
- One representative from the *Environmental Community*

Subgroups

1. **Statewide Guidance**
   - Establish criteria to support regulatory agencies.
   - Revise statewide draft guide to reflect input of the group and future guidance.
2. **Communication (Education and Outreach)**
   - Centralized website.
   - List server for CCHAB – cchab@sccwrp.org
   - Updated signage and outreach tools.
   - Develop a training academy course to help outreach.
   - Contact list for Regional Boards and other agencies for whom to contact when the public calls regarding bloom concerns.
   - Educational pamphlet .

Subgroups (cont.)

3. **Data Compilation**
   - Cyanotoxin data compilation.
4. **Research**
   - Library of peer-review journal articles and current state of science.
5. **Monitoring, Assessment, and Reporting**
   - Statewide map of BGA blooms and cyanotoxin data.
6. **Strategic Plan and Funding**

The objective of CCHAB is to continue to work collaboratively to address cyanobacteria concerns in California.

http://www.swrcb.ca.gov/water_issues/programs/bluegreen_algae/index.shtml

http://www.cdph.ca.gov/healthinfo/environhealth/water/Pages/Bluegreenalgae.aspx

Johanna Weston

Ocean Standards Unit

State Water Resources Control Board

johanna.weston@waterboards.ca.gov

916-327-8117