EPA's Activities on Harmful Algal Blooms
OLA Annual Meeting

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EPA's Approach to Addressing HABs

Interdisciplinary Approach

- Ecologists
- Microbiologists
- Toxicologists
- Epidemiologists
- Chemists
- Hydrologists
- Biologists
- Oceanographers
- Modelers and Statisticians
- Engineers
- Taxonomists
- Public Health Specialists
- Economists
- Veterinarians

EPA R10 HABs program - overview

- EPA R10 – AK, ID, OR, WA and 271 Tribal Nations.
- Two Central POCs in Region 10 - HABs coordinator for national programmatic work and regional ambient waters program; and drinking water treatment lead. Multiple staff assist with HABs program implementation
- Region 10 Lab has EPA analytical methods set up to run ambient and drinking water samples for three toxins: cylindrospermopsin, anatoxin-a, total microcystins. Third party accredited.
- Primary goal of EPA regional HABs program is to assist state and tribal partners in building capacity to effectively respond to and manage HABs issues. We track events and help provide technical support and assistance. Conduct regional research projects to further inform our understanding.

Guidance Recommendations for Cyanotoxins

Drinking Water Health Advisories - June 2015

- Microcystins and Cylindrospermopsin
- HAs are non-regulatory guideline values set at levels anticipated to not create adverse health effects for specific exposure durations.
- Bottle-fed infants and pre-school children: MCs 0.3 µg/L and CYL 0.7 µg/L
- School-age children and adults: MCs 1.6 µg/L and CYL 3 µg/L

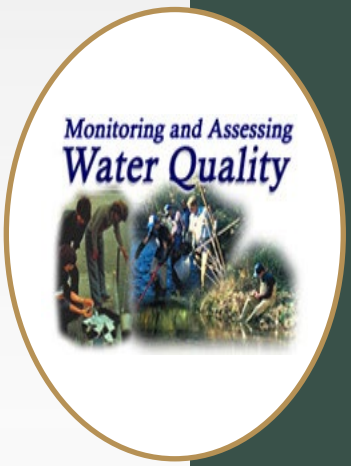
Recommended Human Health Recreational Ambient Water Quality Criteria/Swimming Advisories – May 2019

- Microcystins and Cylindrospermopsin
- MCs 8 µg/L and CYL 15 µg/L

Ambient Water Assessment

National Aquatic Resource Surveys (NARS)

- The National Aquatic Resource Surveys (NARS) are collaborative programs between EPA, states, and tribes
- They are nationally-consistent studies of the nation's aquatic resources, designed to report on the condition of lakes, rivers/streams, coastal waters and wetlands.
- Survey parameters: Indicators associated with the presence of blooms and some cyanotoxins.
- National Lakes Assessment occurred in 2022
- National Rivers and Streams Assessment will occur 2023-2024



EPA's Ambient Water Quality Criteria to Address Nutrient Pollution in Lakes and Reservoirs

- EPA published updated national nutrient criteria recommendations for lakes and reservoirs in 2021
- Hypoxia, microcystins, and zooplankton models can be used to derive chlorophyll *a* criteria, in turn used to derive TN and TP criteria
- Models are stressor-response based
- Models were updated in 2022
- FAQs under development

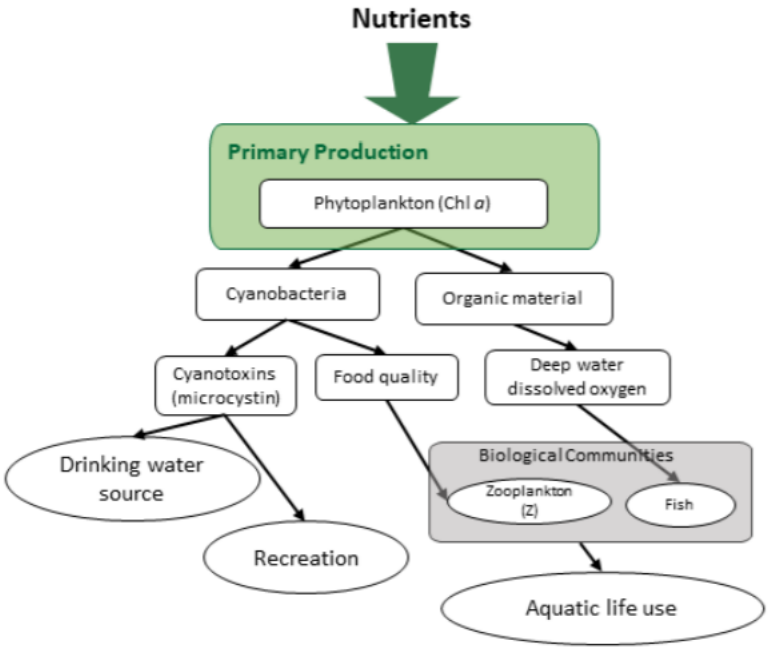


Figure 3. Simplified conceptual model showing pathways selected for analysis.

https://www.epa.gov/nutrient-policy-data/ambient-water-quality-criteria-address-nutrient-pollution-lakes-and-reservoirs

Bipartisan Infrastructure Law Funding Allocated to EPA

FACT SHEET: EPA & The Bipartisan Infrastructure Law

November 6, 2021

Following the passage of the historic Bipartisan Infrastructure Investment and Jobs Act, the U.S. Environmental Protection Agency (EPA) will be making significant investments in the health, equity, and resilience of American communities. With unprecedented funding to support our national infrastructure, EPA will improve people's health and safety, help create good-paying jobs, and increase climate resilience throughout the country.

The single largest investment in water that the federal government has ever made.

State & Tribal Grants	55.426 billion
Clean Water State Revolving Fund Traditional	11.713 billion
Drinking Water State Revolving Fund Traditional	11.713 billion

https://www.epa.gov/infrastructure/fact-sheet-epa-bipartisan-infrastructure-law funding allocated over 5 years; started in FY 22

News Releases: Region 10 CONTACT US

Biden-Harris Administration Announces $18M in Bipartisan Infrastructure Law Funding to Address Emerging Contaminants like PFAS in Drinking Water in Oregon

February 16, 2023

Contact Information
EPA Region 10 Public Affairs Office (r10_press_team@epa.gov)

News Releases: Region 10 CONTACT US

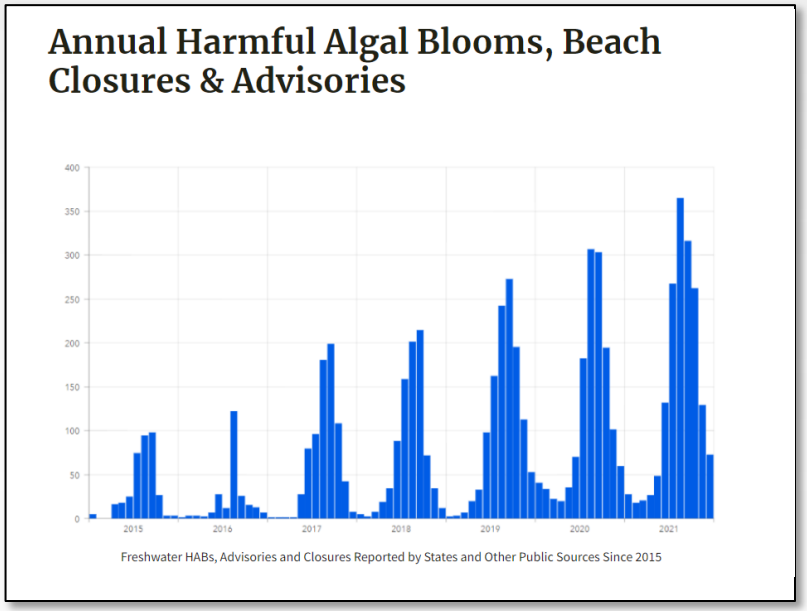
Biden-Harris Administration Announces $26M for Clean Water Infrastructure Upgrades Through the Bipartisan Infrastructure Law in Oregon

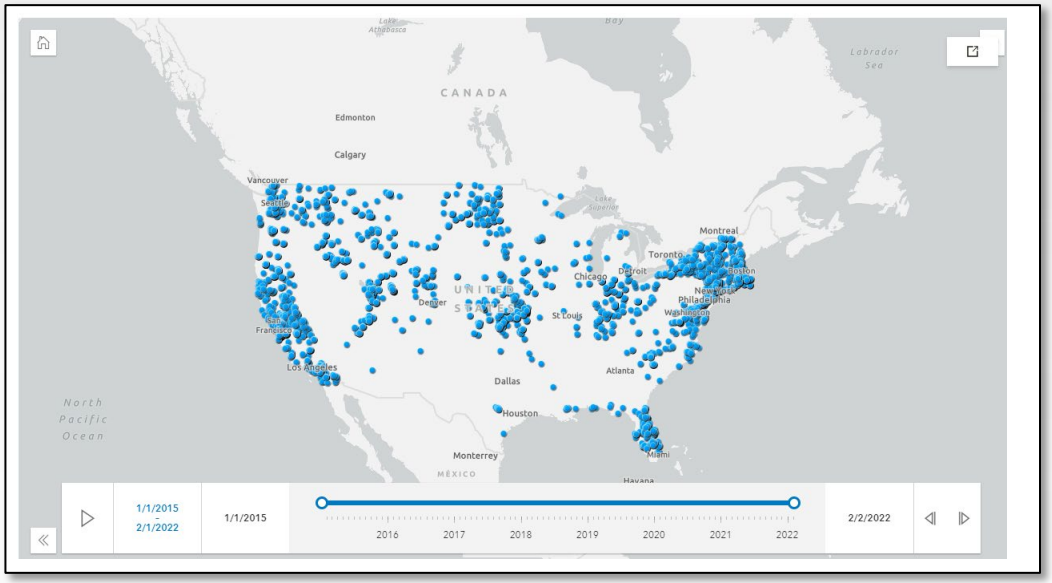
Nearly half of funding for states, Tribes, and territories is available as grants and forgivable loans for critical water infrastructure projects that will help underserved communities across the country

February 24, 2023

Clean Water State Revolving Fund FAQs on Emerging Contaminants- includes certain HABs controls

EPA HABs Storymap with Advisories Timeseries





https://storymaps.arcgis.com/stories/d4a87e6cdfd44d6ea7b97477969cb1dd

Additional recent national program developments and tools

- Final CCL5 (2022) includes cyanotoxins (as a group)
  - Draft CCL 6 update - February 17, 2023 - EPA is requesting nominations of chemicals, microbes, or other substances for consideration on the Draft CCL 6. The public may nominate contaminants by following the instructions contained in the Federal Register notice for CCL 6 nominations. The deadline for nominations is April 18, 2023.

  Federal Register Notice: Drinking Water Contaminant Candidate List 6 - Nominations
- EPA's CyanoHABs Website
- EPA's Benthic HABs Discussion Group
- EPA Memorandum on Nutrients – April 5, 2022

2022 Reported Freshwater HABs Advisories

- **In the PNW**, ID, OR, WA have monitoring and response programs for freshwater HABs; OR only state with drinking water regulations for state-identified vulnerable Public Water Systems

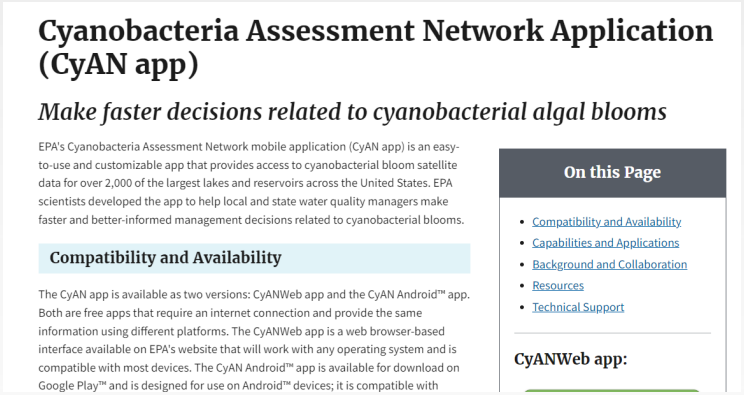
- 2022: ~140 waterbodies with detections with ~16 raw water intakes for PWS with detects (no do not drink advisories issued)

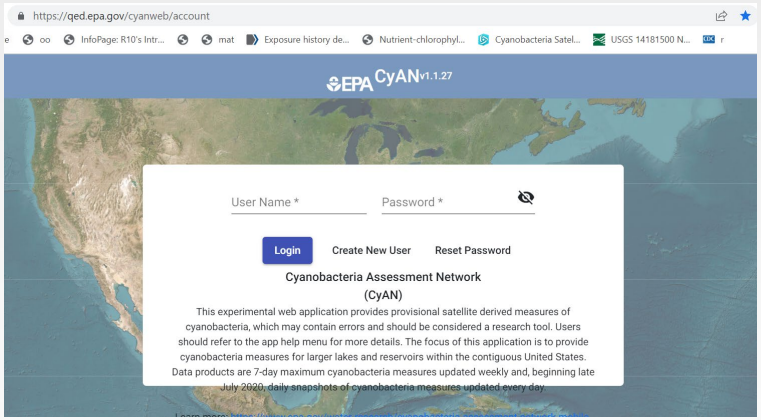
	WA	OR	ID	R10 Totals
Total Active/State	1	1	2	4
Total Lifted/State	26	4	15	45
2022 Total Events		49		

Note – almost all event monitoring is responsive for cyanotoxins after observed scum/identified bloom and limited to peak bloom period for most waters, May-Nov. That is why we say, "when in doubt, stay out"

Regional HABs Research: CyAN Web App Features & Data Provision

- Development of CyAN satellite data web app data display tools for CONUS

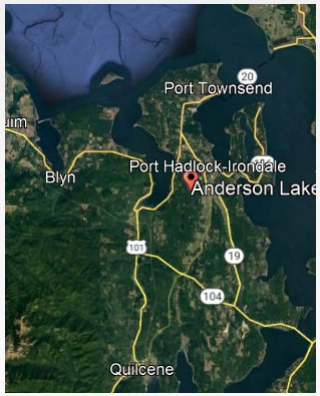




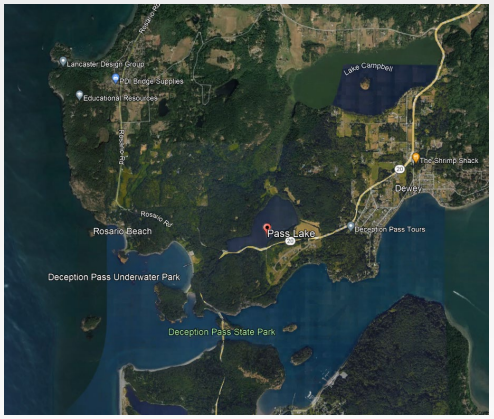
Some example enhancements - On the fly time series visualization, and data export by polygon (multiple waters)

- AK and other states' CyAN data available on NASA's site: https://oceandata.sci.gsfc.nasa.gov/api/cyan_file_search

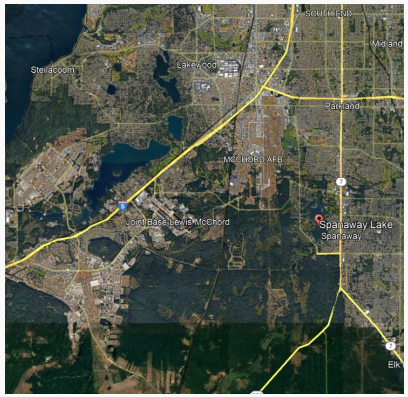
Regional HABs Research: CyanoHABs gene fingerprinting (qPCR) data



Anderson Lake, WA – high concentrations of anatoxin-a and detects of microcystins



Pass Lake, WA anatoxin-a producers (high concentrations certain years) with microcystin detects



Spanaway Lake, WA microcystin producers (high concentrations) with some anatoxin-a detects

Detroit Lake, OR cylindrospermopsin and microcystin producers

Regional HABs Research: Benthic HABs Pilot

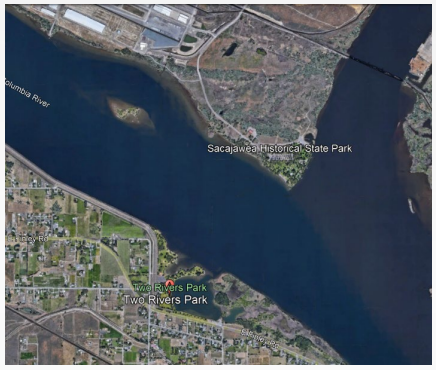
Starting in 2023-2024 – benthic HABs pilot study, Columbia River Tri-Cities- draft list of locations for 2024 (subject to change)

Ringold Boat Launch, Hanford Reach

Leslie Groves Park, Richland, WA

Bateman Island, Richland, WA

Figure 5-2. Trigger level sign.



Two Rivers Park, Kennewick WA

Benthic harmful cyanobacterial blooms are complex –no standard methods

Bouma-Gregson et al. 2018,

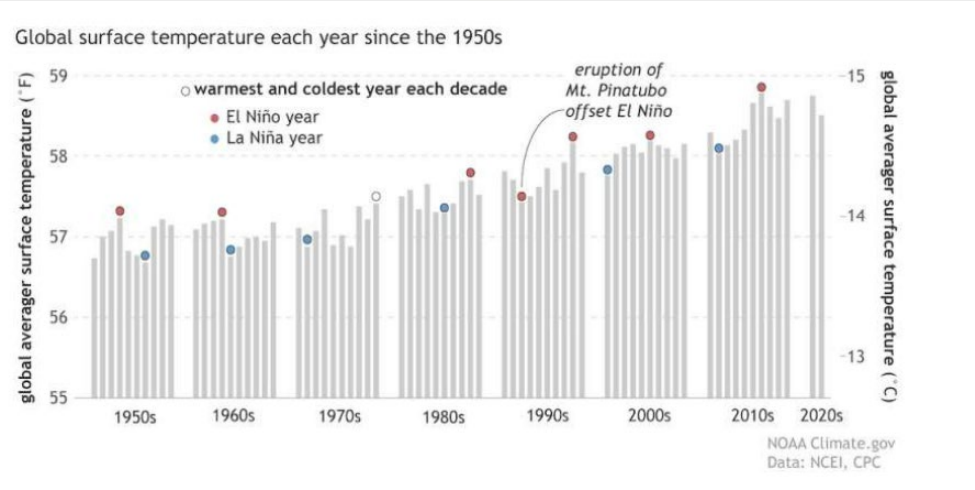
0197669

Benthic HABs Research Questions and Approach

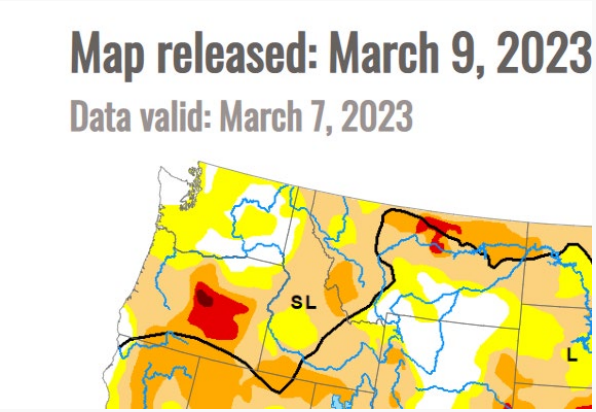
- How extensive are benthic mats? How do we quantify the contribution of phytoplankton and benthic HCBs to the total water column cyanotoxin concentration?
- What are the most appropriate methods for collecting a benthic HCB sample for determining cyanotoxin concentrations and cyanobacterial taxonomic representation?
- What methods should be used for processing a benthic HCB sample including shipping, extracting, and analytical methods?
- Are there less expensive proxies for identifying the presence of benthic HCBs during sampling?

Targeted Metrics
Water column grabs
Benthic HCB grabs
Periphyton and other benthos heterogeneity
Spatial extent
Temporal variability

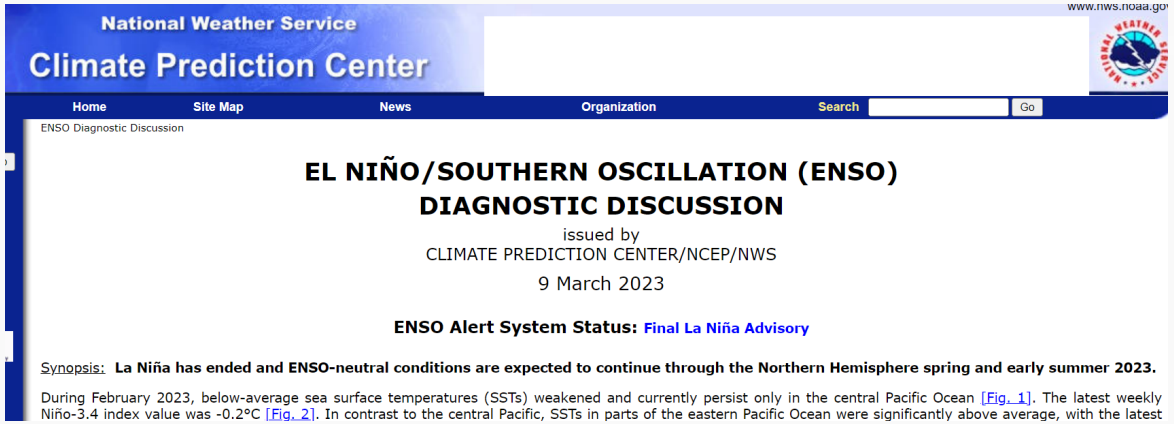
What will 2023 bring? No more La Nina



After a La Nina “three-peat” the current prediction is for ENSO-neutral through early summer 2023; likely El Nino “after” (late summer/fall?)



Source: https://droughtmonitor.unl.edu/



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For urgent after-hours issues please contact the EPA Spill Hotline: 206-553-1263; select the menu option for Regional Duty Officer
EPA's Cyanobacteria HABs Website
www.epa.gov/cyanohabs

Extra Slides

Technical Support Resources

- Analytical methods development (2015/2016)

Method numbers:

  - –544 (microcystins and nodularin-R)
  - –545 (anatoxin-a and cylindrospermopsin)
  - –546 (Adda ELISA Method for microcystins and nodularins).

- Recommendations for Public Water Systems to Manage Cyanotoxins in Drinking Water (2015)
- Cyanotoxin Management Plan Template and Example Plans (2016)
- Water Treatment Optimization for Cyanotoxins Document (2016)
- Drinking Water Cyanotoxin Risk Communication Toolbox (2016)
- EPA Cyanotoxins Drinking Water Webpage
- Recreational Water Communication Toolbox for Cyanobacterial Blooms (2017)
- Recommendations for Cyanobacteria and Cyanotoxin Monitoring in Recreational Waters (2019) and Final Technical Support Document (2021)
- EPA Cyanobacteria and Cyanotoxins in Recreational Waters Webpage

Outreach and Tools

- EPA's Cyanobacteria HABs Webpage
- Freshwater HABs Newsletter and Outreach
- Fact Sheets
  - Cyanobacteria and Cyanotoxins: Information for Drinking Water Systems
  - Climate Change and Harmful Algal Blooms
- Video on Tools for Addressing the Risks of Cyanotoxins in Drinking Water
- Video with EPA Scientist Nick Dugan on algal water treatment studies: https://www.youtube.com/watch?v=mnok5G0HBgM
- Citizen Science Tools for CyanoHABs
- Federal Funding For Prevention, Monitoring and Treatment of HABs - Workshop Summary (2021)
- To sign up for EPA's Listserv, email epacyanohabs@epa.gov