March 23, 2026

State experiences in developing/applying cyanotoxin thresholds to protect animal health

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Public Health Division

Agenda

- Oregon Recreational CyanoHAB Program overview
- Dog safety cyanotoxin guideline development
- Implementation of dog safety guidelines

House Bill 3409 (2023)

The Department of Environmental Quality (DEQ), in coordination with the Oregon Health Authority (OHA), shall:

- Develop and maintain a coordinated state agency for harmful algal bloom monitoring and response strategy.
- Produce timely and high-quality data that allow the authority to determine the level of risk of harm or injury to public health by the occurrence of harmful algal blooms.
- Prioritize monitoring of water bodies that are susceptible to harmful algal blooms and that are bodies of water accessed by the public for recreational use.

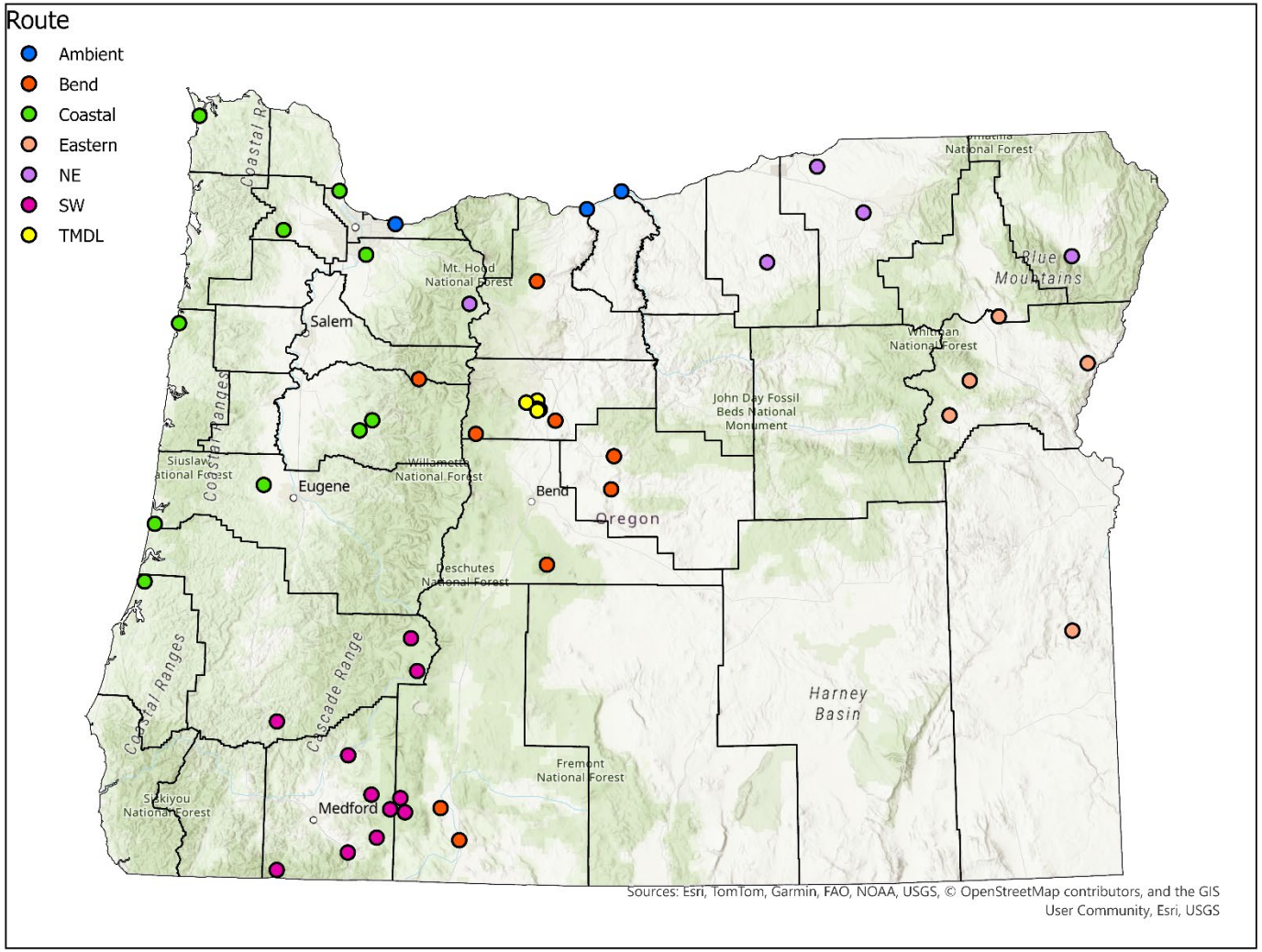
House Bill 3409 continued

- Develop a protocol for issuing hazard advisory alerts to the public in the occurrence of a harmful algal bloom.
- Develop and implement strategies for reducing pollutants that contribute to the occurrences of harmful algal blooms and the frequency and severity of harmful algal blooms.

State of Oregon
DEQ Department of Environmental Quality

OREGON HEALTH AUTHORITY

2025 Recreational Monitoring Network



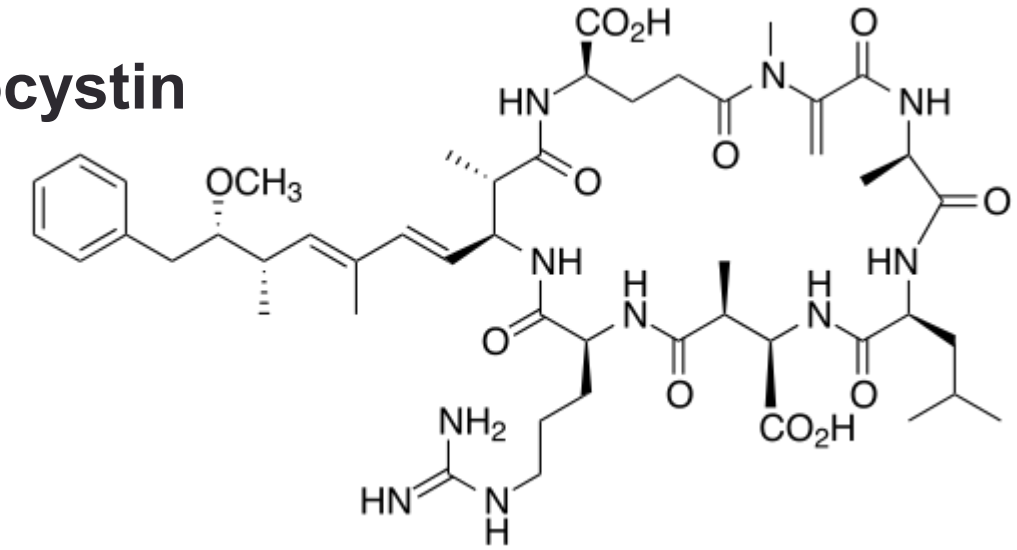
- 45 Sites
- 5 Routes + 2 programs
- 4 Cycles

Sampling and Testing

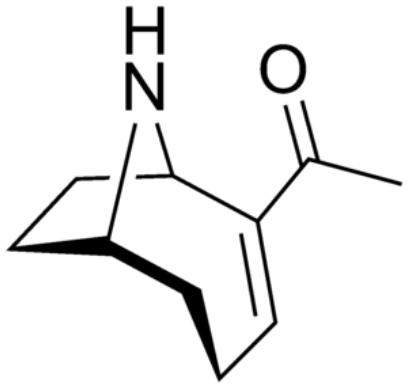
- Always aiming for “worst case scenario” sample
- Sampling in area of highest recreation (docks, swimming beaches, etc.)
- Test for all four toxins at once
- ELISA (enzyme-linked immunosorbent assay) test – color producing reaction where color corresponds to amount of cyanotoxin present

Toxins we test for in Oregon

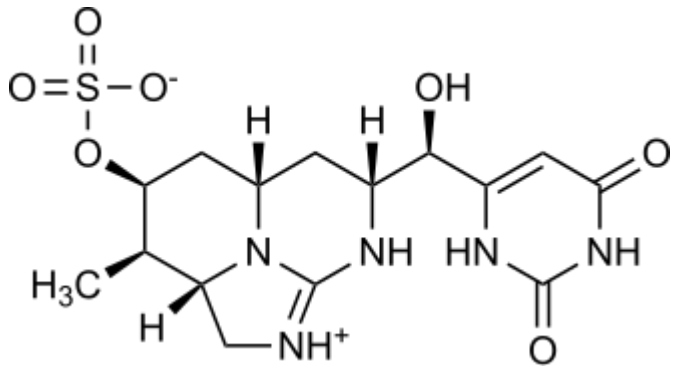
Microcystin



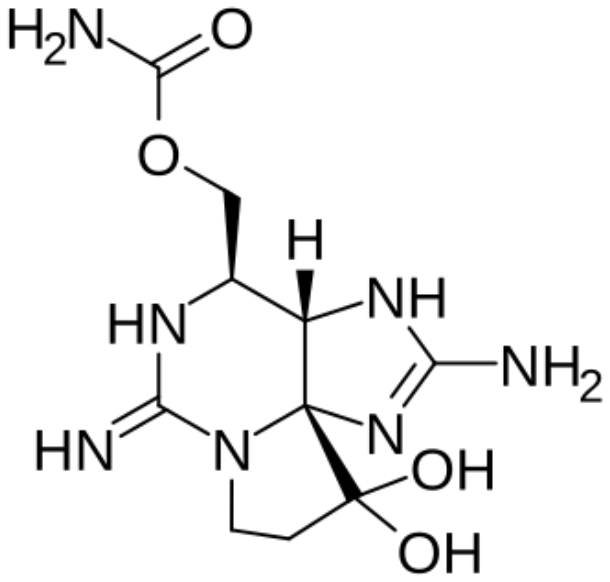
Anatoxin-a



Cylindrospermopsin



Saxitoxin



Recreational use values (RUVs) and dog safety values (µg/L)

	Microcystin	Cylindro-spermopsin	Anatoxin-a	Saxitoxin
RUVs	8	15	15	8
Dog Safety	0.2	0.4	0.4	0.02

Elements of a Toxicity Threshold Value

- Health guideline value (HGV) (e.g.,Reference dose, Tolerable daily intake, Minimal risk level, etc.) (µg/kg/day)
- Exposure factors

$$\text{Dog} - \text{specific guidance value } (\mu g/L) = \frac{\text{Health Guideline Value } (\mu g/kg/day)}{\text{Exposure factor for dogs } (0.255 \text{ L/kg/day}*)}$$

*From CalEPA 2012 guidance

Dog-specific Guideline Values

- Used same health guideline values as for people*
- Used California EPA's 2012 water intake rate for dogs (0.255 L/kg/day) as the exposure factor

	Microcystin	Cylindro-spermopsin	Anatoxin-a	Saxitoxin
Dog Safety	**0.2**	**0.4**	**0.4**	**0.02**

*Except for saxitoxins; added additional UF of 10 for extrapolating from people to dogs.

Anatoxin-A Oregon Health Guideline Value

- Critical toxicological study: Fawell 1994 and 1999
- 10 male and 10 female mice per exposure group (0, 100, 500, 2,500 µg/kg/day)
- Dosed orally by gavage daily for 28 days

$$Health\ Guideline\ Value = \frac{NOAEL}{Uncertainty\ Factors} = \frac{100\ \mu g/kg/day}{1{,}000} = 0.1\ \mu g/kg/day$$

Uncertainty factor breakdown: 10 for animal to human extrapolation, 10 for human variability, 10 for database limitations

Saxitoxins Oregon Health Guideline Value

- Critical Study: European Food Safety Authority 2009 reference dose (0.5 µg/kg/day)
- Based on case reports of toxicity in people from eating contaminated shellfish

$$Health\ Guideline\ Value = \frac{NOAEL}{Uncertainty\ Factors} = \frac{0.5\ \mu g/kg/day}{10} = 0.05\ \mu g/kg/day$$

Uncertainty factor breakdown: 10 for database limitations*

*Original value did not include this UF, but followed Ohio's lead in adding in 2014

Dog-specific Guideline Values

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Implementation of RUVs and dog safety values

- Issue advisories for water bodies that exceed OHA-established **Recreational Use Values** (RUVs)
- Track cyanotoxin results
- Educate and inform the public regarding health risks
- Conduct health investigations
- Build capacity of our partners to monitor water bodies
- Work with DEQ to determine if a water body is susceptible to cyanoHABs

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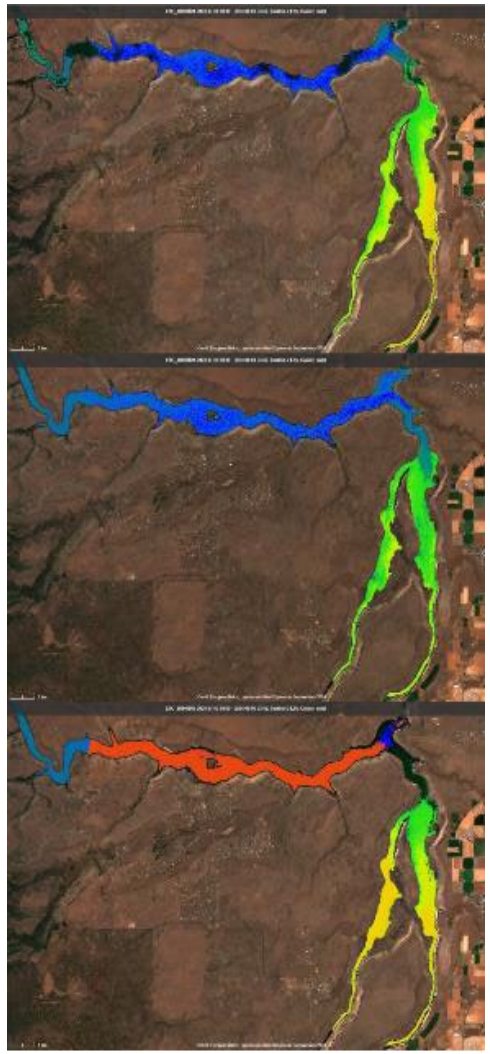
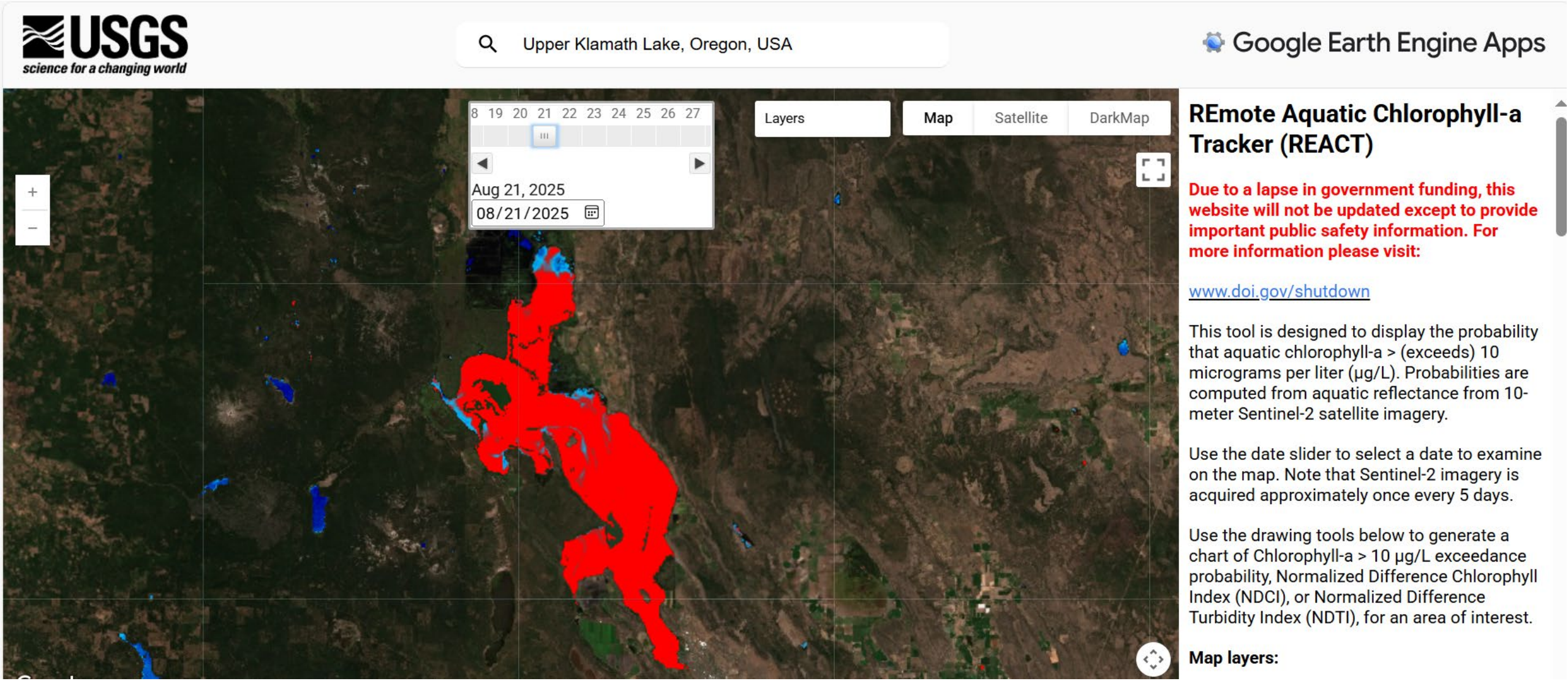
Response to cyanoHABs: notification and verification

- Toxin results
- Reports from water body managers or DEQ samplers
- Bloom and illness reports from the public
- Photos
- Satellite imagery



Satellite imagery



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Advisory process

“Advisory” (posted to OHA website and publicized with news release)

Site is known to have public recreational or occupational contact with water, partners are available and willing to post advisory signage on site, plus one of the following criteria are met:

1. **Visible scum:** Visible scum is indicated with supporting photographs or satellite imagery **and** sampling can be done within 1 business day; this advisory will be confirmed or lifted based on cyanotoxin analysis.
2. **Toxin-based Monitoring:** Analysis showing cyanotoxin levels above OHA RUVs.

What does an advisory mean?

- NOT a closure
- Minimize contact with the water
- Recommend not swimming or engaging in activities that cause water to spray in face
- Kayaking/canoeing, picnicking, birdwatching, hiking okay
- Fishing and eating fish typically okay if you remove fat, skin, and organs and wash the fish with fresh source of water
- Keep pets away from the water

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Advisory process continued

“Precaution” (posted to OHA website, no news release)

All the following criteria are met:

1. Photos submitted by public are deemed by OHA/DEQ to represent a possible cyanoHAB **or** satellite data indicate a possible cyanoHAB.
2. Site is known to have public recreational or occupational contact with water.
3. Immediate (< 1 business day) water quality testing is unavailable due to resources limitations, remoteness, etc.

Advisory table

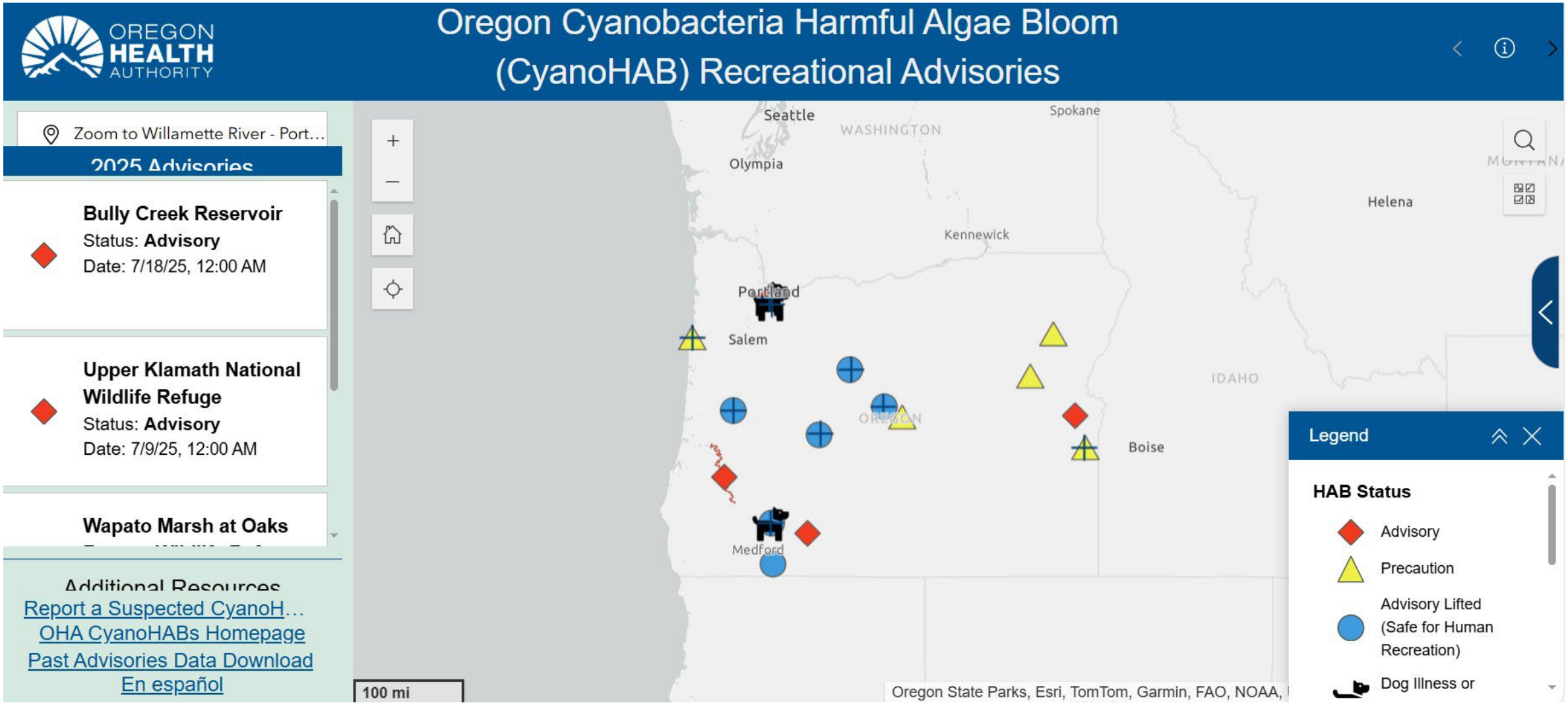
Advisory Levels

= Advisory in effect = Precaution in effect = Advisory/precaution has been lifted

- Advisory: Cyanotoxins have been confirmed through testing and are at unsafe levels, or a bloom has been sighted and water will be sampled within 1 business day.
- Precaution: A bloom has been sighted and water sampling is unavailable within 1 business day due to limited resources.
- Advisory/Precaution Lifted: An 'Advisory' is lifted when water testing shows safe levels. If a site has previously tested at unsafe levels, regular testing continues until the bloom is visibly gone and cyanotoxins are at safe levels. A 'Precaution' is lifted when testing shows cyanotoxin levels are safe, or when the bloom is visibly gone.

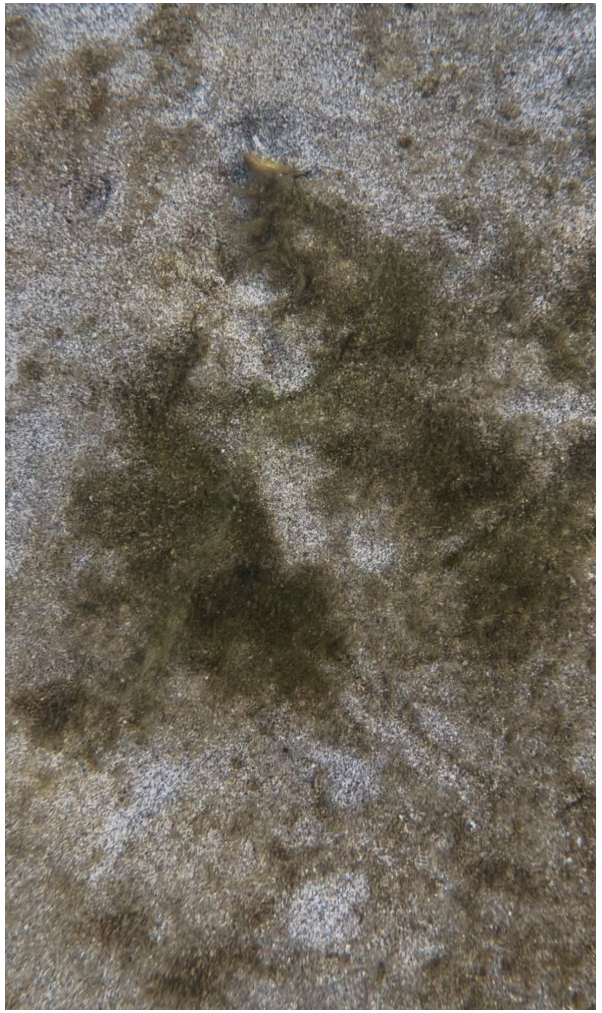
Waterbody	Status	Date/Link	County	Toxin	Data
Bully Creek Reservoir	Advisory	7/18/2025	Malheur	Microcystin	> 10 ug/L
Thief Valley Reservoir	Precaution	7/18/2025	Baker & Union		
Upper Klamath National Wildlife Refuge	Advisory	7/9/2025	Klamath	Microcystin	2,304.5 ug/L
Antelope Flat Reservoir	Precaution	7/9/2025	Crook		
Unity Reservoir	Precaution	7/1/2025	Baker		

Advisory map



Emergent issue – Benthic cyanoHABs

- Investigate reports of dog illness or death
- Coordinate with WA colleagues
- Created benthic-specific signs



Communications – dog illness or death

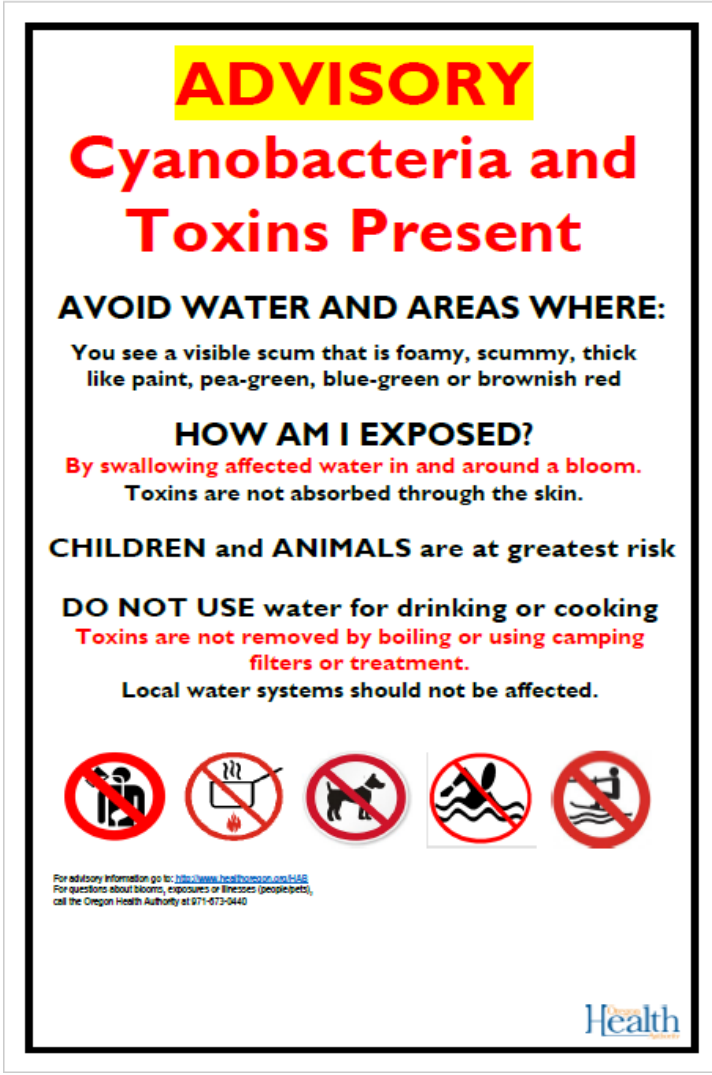
“CyanoHAB-related dog illness or death”

- Dog icon posted to OHA website at location of exposure and remains on the website for the remainder of the monitoring season
- “Dog illness/death" physical sign posted with date of dog death at public access points or sign boards at water body of exposure

Site is known to have public recreational or occupational contact with water, plus one of the following criteria are met:

1. OHA receives a report that a dog has died or has become sick from a potential benthic or planktonic cyanoHAB **AND** OHA has followed-up with treating veterinarian for diagnosis or toxin present to confirm likely exposure **OR** illness or death with toxin present above RUVs.

Communication



Communication Continued

CHECK FOR ALGAE

Toxic algal mats may be present in this water

Mats can be attached to the bottom, detached and floating, or washed up on shore

If you see algal mats:

Do NOT let children or adults touch, eat or swallow any algal mats.

Do NOT let dogs eat algal mats or drink from the water.

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Call your doctor or veterinarian if you or your pet get sick after contacting or ingesting algae. For more information on toxic algae visit: healthoregon.org/hab

For more information, contact
hab.health@odhsoha.oregon.gov
1-877-290-6767

Public Health Division

Cyanobacteria Harmful Algae Bloom Program

OREGON HEALTH AUTHORITY

Dog death reported due to possible cyanobacteria exposure at Sellwood Riverfront Park

Date of Exposure – June 9, 2025

Location of Exposure – Sellwood Riverfront Park – water, near dock

For more information or to report a boom or illness, visit or contact:
http://healthoregon.org/hab; hab.health@odhsoha.oregon.gov; 1-877-290-6767

Communication continued

An official website of the State of Oregon How you know » Language

OREGON HEALTH AUTHORITY

About OHA | Programs and Services | Oregon Health Plan | Health System Reform | Licenses and Certificates | Public Health | Jobs

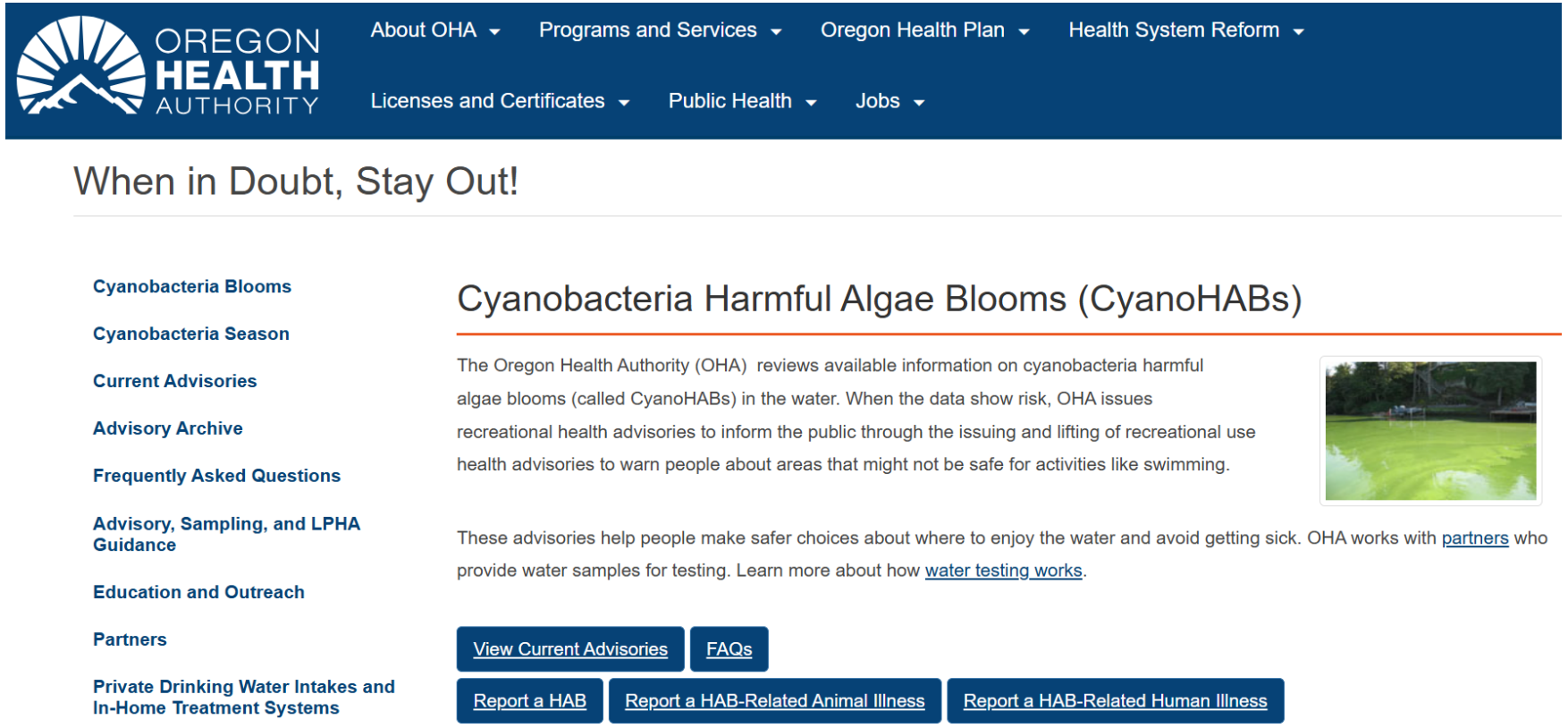
- Cyanobacteria Blooms
- Cyanobacteria Season
- Current Advisories
- Advisory Archive
- Frequently Asked Questions
- Advisory, Sampling, and LPHA Guidance
- Education and Outreach
- Partners
- Private Drinking Water Intakes and In-Home Treatment Systems
- The Water Sampling Process
- Contact Us

Get information about cyanobacteria harmful algae blooms (CyanoHABs), exposure pathways, health effects, and the science behind the blooms.

Risk Communications Toolkit

- Cyanobacteria blooms communication plan English (pdf) | Spanish (pdf)
- Cyanobacteria Harmful Algae Blooms English (pdf) | Spanish (pdf)
- Be Aware of Cyanobacteria Harmful Algae Blooms (CHABs) in Oregon Waters English (pdf) | Spanish (pdf)
- Five Things to Know about Cyanobacteria Harmful Algae Blooms English (pdf) | Spanish (pdf)
- Cyanobacteria Harmful Algae Blooms Can Make People and Animals Sick English (pdf) | Spanish (pdf)
- Safe Fishing and Recreation in Oregon Waters - What to Know About CHABs English (pdf) | Spanish (pdf)
- Lake Safety Comic - Looks like you're headed down to play at the lake. Do you know about CHABs? English (pdf) | Spanish (pdf)
- When Renting Lake Property - Know Your Risks From CHABs English (pdf) | Spanish (pdf)
- Precaution signage template English (Word)
- Dog Safety alert English (pdf) | Spanish (pdf)
- Benthic cyanoHABs Combination English and Spanish (pdf)
- Protect your livestock English (pdf) | Spanish (pdf)

Educational resources



hab.health@odhsoha.oregon.gov

http://healthoregon.org/hab

Bloom and illness reporting

One Health Harmful Algal Bloom System (OHHABS)

- Investigate human and animal illness
- Report HAB-related illnesses to the Centers for Disease Control and Prevention (CDC) for national surveillance program
- Communicate with other states

CDC Biospecimen Pilot – objectives

Pilot Program Objectives

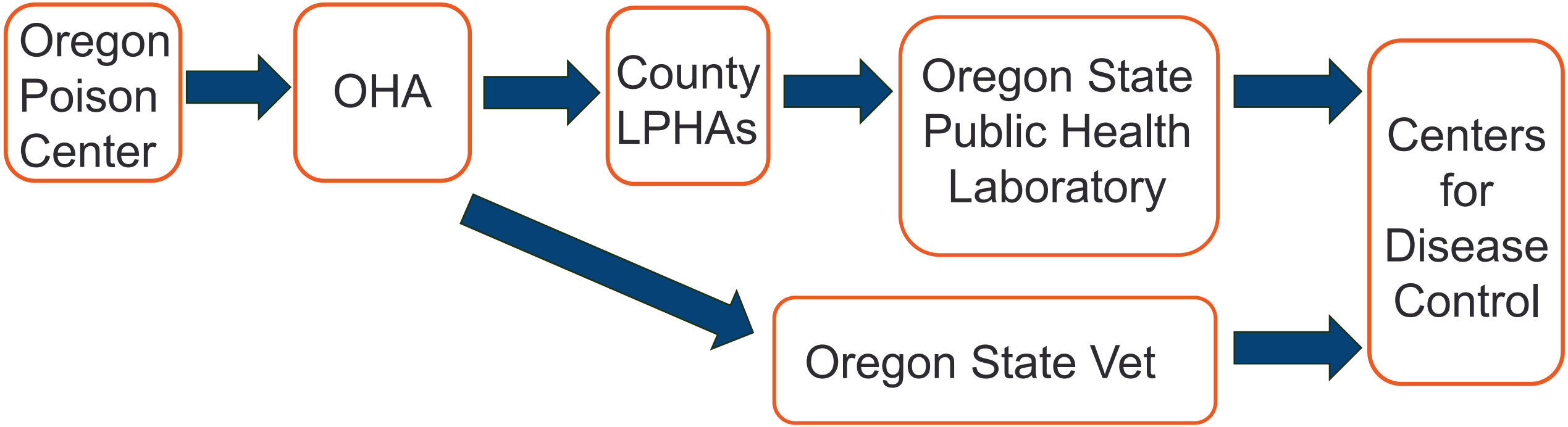
- Test biospecimens for HAB toxins (microcystins, anatoxin-a, dihydroanatoxin-a) and related metabolites

- Accept urine and serum for humans and urine for dogs

- Enhance surveillance of HAB-associated illnesses in the United States by strengthening evidence of HAB toxin exposure as a cause of clinical illness.

CDC Biospecimen Pilot – Oregon's process

Test for microcystin, anatoxin-a and their metabolites in **human plasma and urine** and **dog urine** after harmful algae bloom exposure



Program Successes

- Carrying out regular monitoring and response monitoring to select waterbodies
- Building partnerships with local public health authorities and waterbody managers
- Expanding capacity through coordination with local, state, and federal partners, including partners of shared waters in neighboring states

Program Successes - Continued

- Updated advisory map and information – our advisory page had nearly 89,000 views in 2025 alone, with thousands more visits on our other webpages throughout the year.

- Collecting samples for Centers for Disease Control Biospecimen Pilot Program

Thank you

You can get this document in other languages, large print, braille or a format you prefer free of charge. Contact the Cyanobacteria Harmful Algae Bloom program at hab.health@odhsoha.oregon.gov or 1-877-290-6767 (voice/text). We accept all relay calls.

Environmental Public Health
Cyanobacteria Harmful Algae Bloom (CyanoHAB) Program
800 NE Oregon St.
Portland, OR 97232
1-877-290-6767
http://healthoregon.org/hab

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