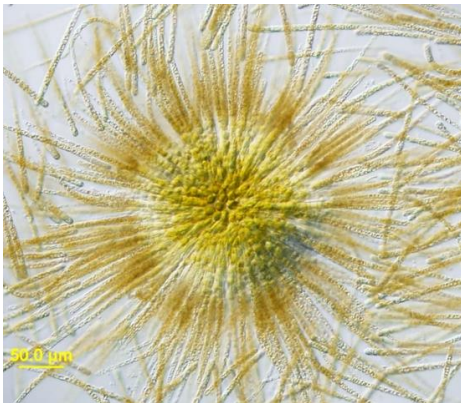


Harmful Algal Blooms (HABs) in Oregon



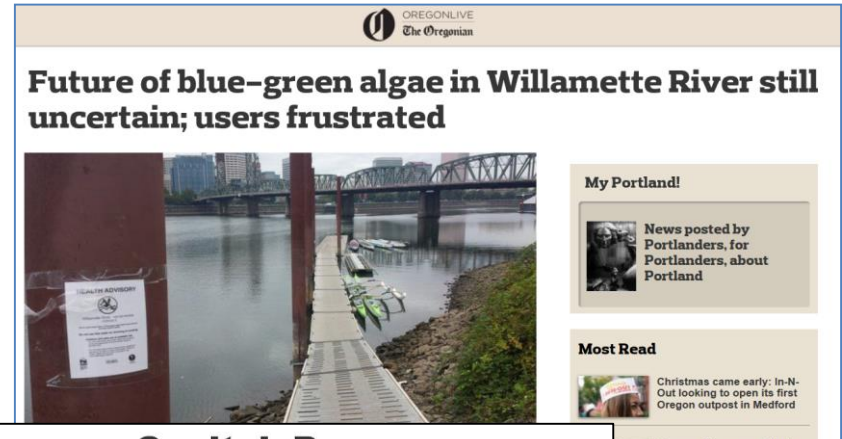
Agency roles,
Response capacity,
and Public health



April 2nd, 2019
Presentation to the Joint Ways & Means
Subcommittee on Natural Resources

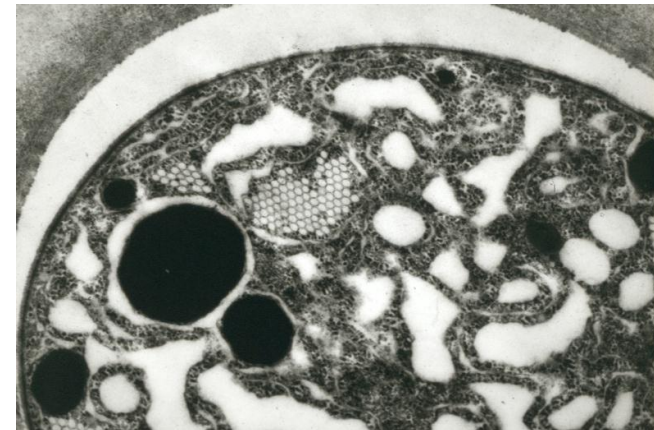
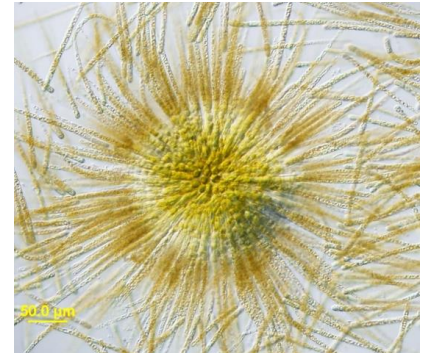
Harmful Algal Blooms Impacts

- Toxic to humans, pets, livestock and fish
- Negative effects on drinking water, recreational opportunities, agricultural products, and aquatic habitat
- Health, economic and environmental implications



What are Harmful Algal Blooms (HABs)?

- Cyanobacteria - simple?
- First life forms: 3.5 billion years old
- First photosynthesizers
- Adjustable buoyancy
- Explosive bloom potential
- May produce toxins



DEQ's Roles in Harmful Algae Bloom Management

- Data collection and monitoring of blooms
- Laboratory analysis to support OHA advisories
- Assessment of the possible factors contributing to HABs and developing management solutions
- OHA is responsible for issuing advisories related to HABs



DEQ role: Identify potential causes

Causes are waterbody specific and may involve one or more factors:

- High rates of nutrient input
- Warm water temperatures
- Slow moving or stagnant water
- Invasive species



Potential mitigation strategies

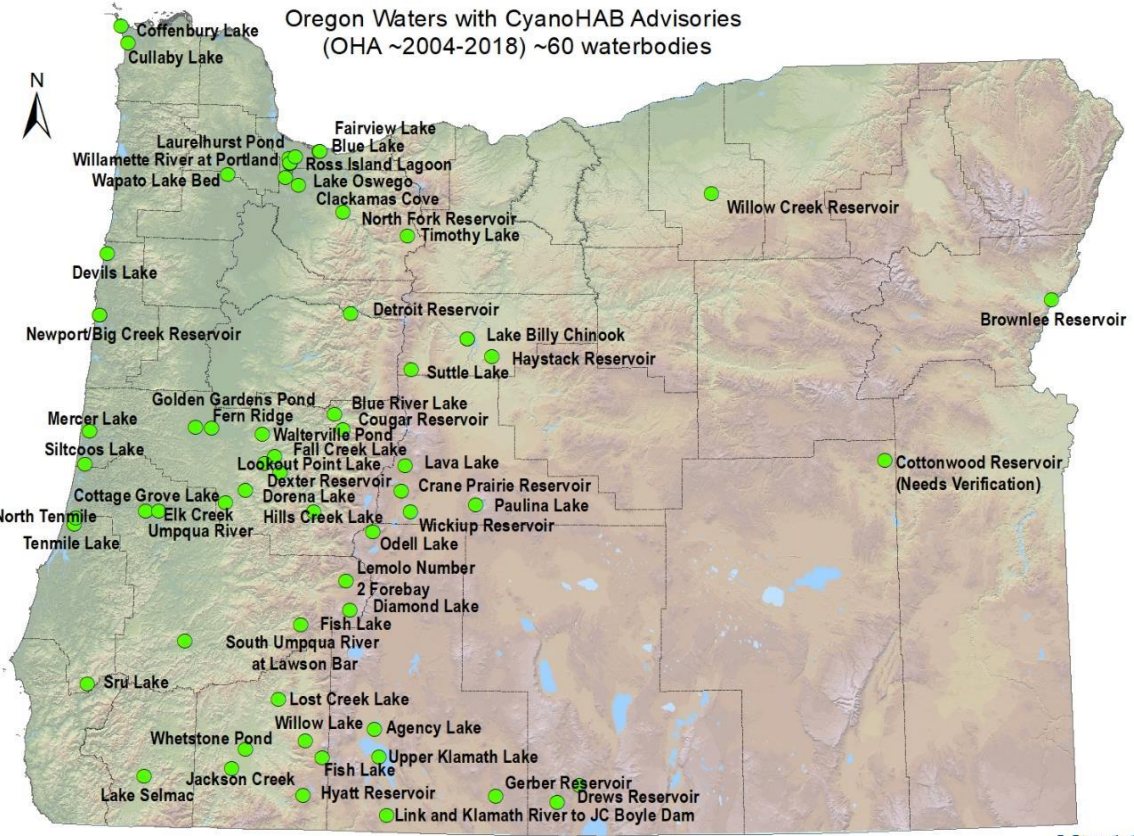


- Strategies are waterbody specific and may include:
 - Reducing nutrient inputs from:
 - Point sources of wastewater
 - Leaky septic systems
 - Agricultural runoff
 - Urban stormwater
 - Fertilizers
 - Restoring vegetation next to waterbodies to provide shading
 - Promoting water movement and/or mixing
 - Preventing and/or controlling invasive species

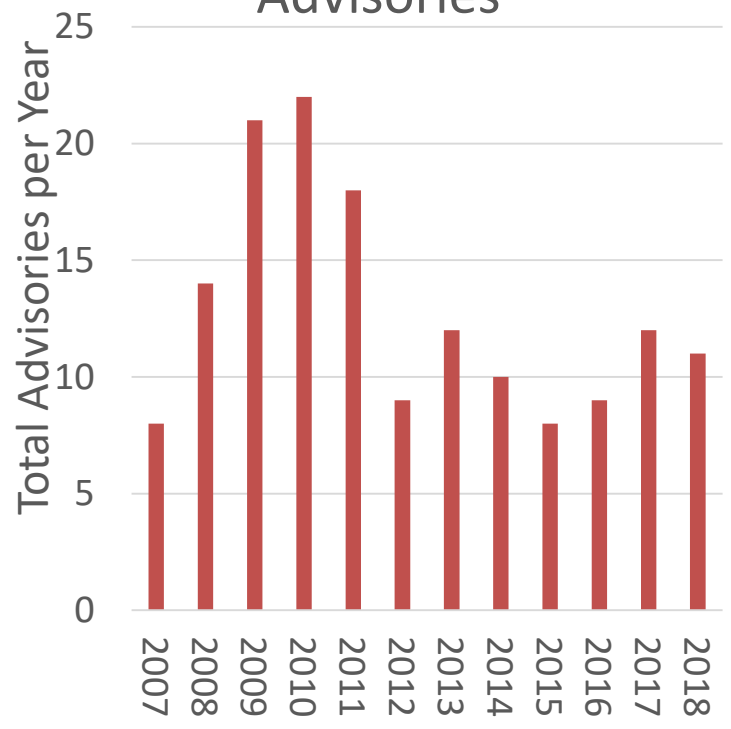
<https://www.oregon.gov/deq/wq/Pages/Harmful-Algal-Blooms.aspx>

Harmful Algae Bloom Recreational Advisories

Oregon Waters with CyanoHAB Advisories
(OHA ~2004-2018) ~60 waterbodies



Contact Recreation Advisories




2008 OHA receives 5-year grant from CDC for HABs occurrences resulting in more rec advisories posted

Detroit Lake

- Late May of 2018 a bloom formed in Detroit Lake
- A drinking water advisory for vulnerable populations in the Salem area was issued on May 29th (after cyanotoxins were detected in treated water)

May 29, 2018


City of Salem issues drinking water advisory



Late this afternoon, the city of Salem issued the following press release regarding a "Do Not Drink" notice for tap water in the cities of Salem, Turner, Suburban East Salem Water District, and Orchard Heights Water Association. The city is recommending that vulnerable people including infants, children under six, people with compromised immune systems, people receiving dialysis treatment, people with pre-existing liver conditions, pets, pregnant women or nursing mothers, or other sensitive populations should follow this advisory.

Everyone may use tap water for showering, bathing, washing hands, washing dishes, flushing toilets, cleaning and doing laundry.

Please see the full press release below for more information or visit cityofsalem.net.



DRINKING WATER ADVISORY

City of Salem: MAY 29, 2018,
CYANOTOXINS PRESENT IN DRINKING WATER DO NOT DRINK THE TAP WATER -- INFANTS, YOUNG CHILDREN AND OTHER VULNERABLE INDIVIDUALS
 Applies to City of Salem, City of Turner, Suburban East Salem Water District, and Orchard Heights Water Association
WHY IS THERE AN ADVISORY? Low levels of cylindrospermopsin and microcystin (cyanotoxins) have been found in treated drinking water. These toxins are created by algal blooms in the source of City of Salem drinking water, Detroit Reservoir.
 To ensure the greatest quality of drinking water, City of Salem voluntarily samples for such toxins during algal events. Samples were collected on May 23, 2018, and May 25, 2018.



State of Oregon
Department of
Environmental
Quality

Salem Cyanotoxin Incident

- 33 days of Do Not Drink Advisory for vulnerable population.
- Local emergency response with State support.
- City, County and National Guard operated bulk water distribution sites, some operated 24/7.
- City engineering consultants installed powdered activated carbon pre-treatment within weeks.
- OHA cyanotoxin emergency rules adopted within 3 weeks.



HABs and Protecting Public Health

OHA's role:

- Recreational Use Advisories. Evaluate available HABs information and data for a water body and determine whether a recreational advisory is warranted based on current advisory guidance and protocol.
- Regulate Public Water Supplies. Require public drinking water systems with sources susceptible to HABs to monitor for cyanotoxins at their intakes and take appropriate action in the event of detections.

Drinking Water Regulations

- OHA adopted emergency regulations in July 2018 requiring about 100 water systems to: sample biweekly for cyanotoxins, report data and issue public notices if health advisory levels are exceeded.
- 8 water systems had raw water detections. None in treated drinking water. No new advisories issued.
- Permanent regulations adopted in December 2018. Require about 58 water systems to sample biweekly May-Oct using an ORELAP certified lab or DEQ lab.

Recreational Use Advisories

- Sampling of water bodies is voluntary and based on cooperation of several local, state and federal agencies
- Not all water bodies are monitored.
- OHA Environmental Health staff review available data against health-based Recreational Use Values to determine if an Advisory is warranted.
- Use Advisories are non-regulatory, public information.

Advisory Levels

Recreational Use Guidance Values:

Table 2. Health advisory RUVs for cyanotoxins in Oregon recreational waters (µg/L)

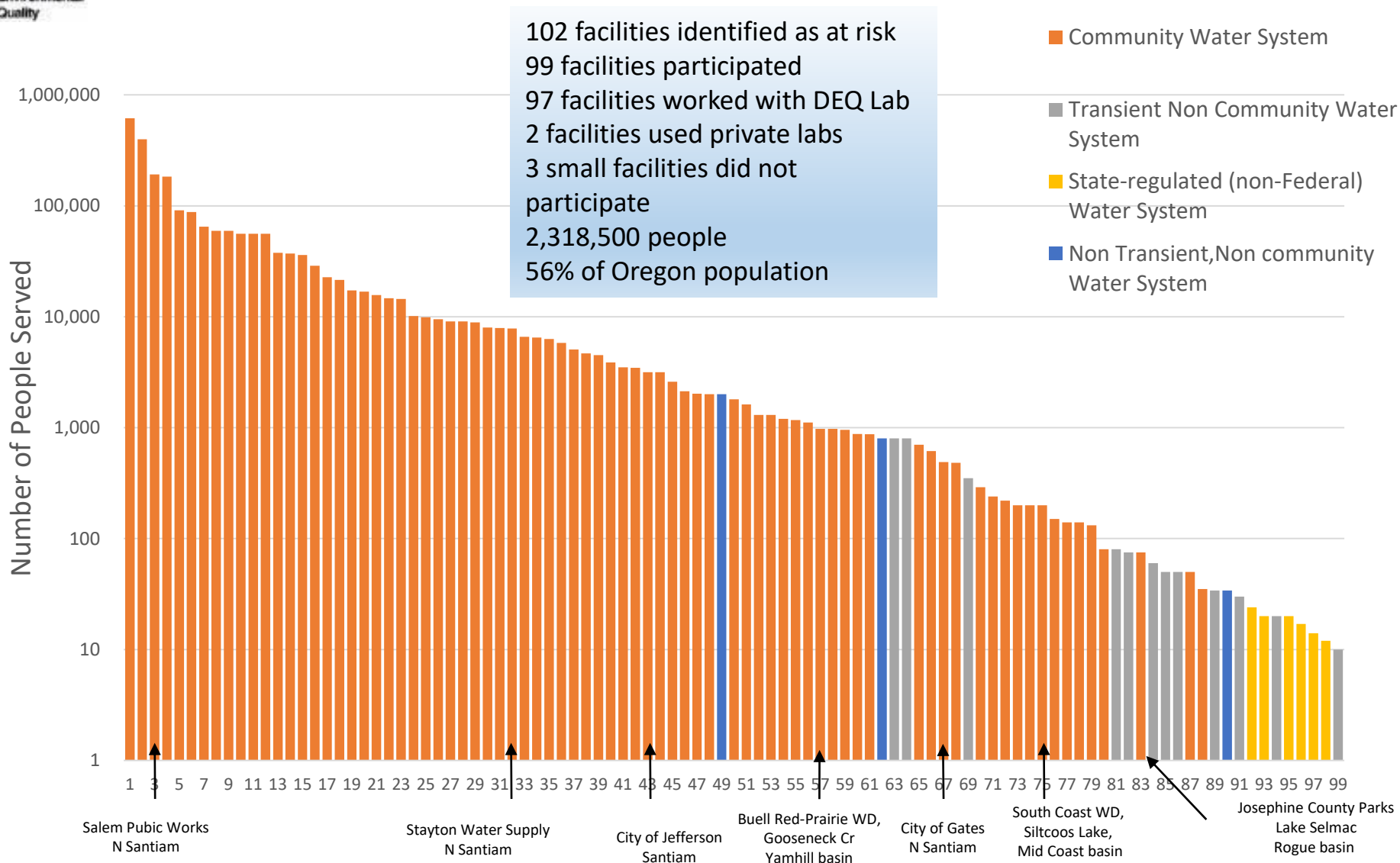
<i>RUVs*</i>	<i>Microcystin</i>	<i>Anatoxin-a</i>	<i>Saxitoxin</i>	<i>Cylindrospermopsin</i>
	4	8	4	8

Drinking water:

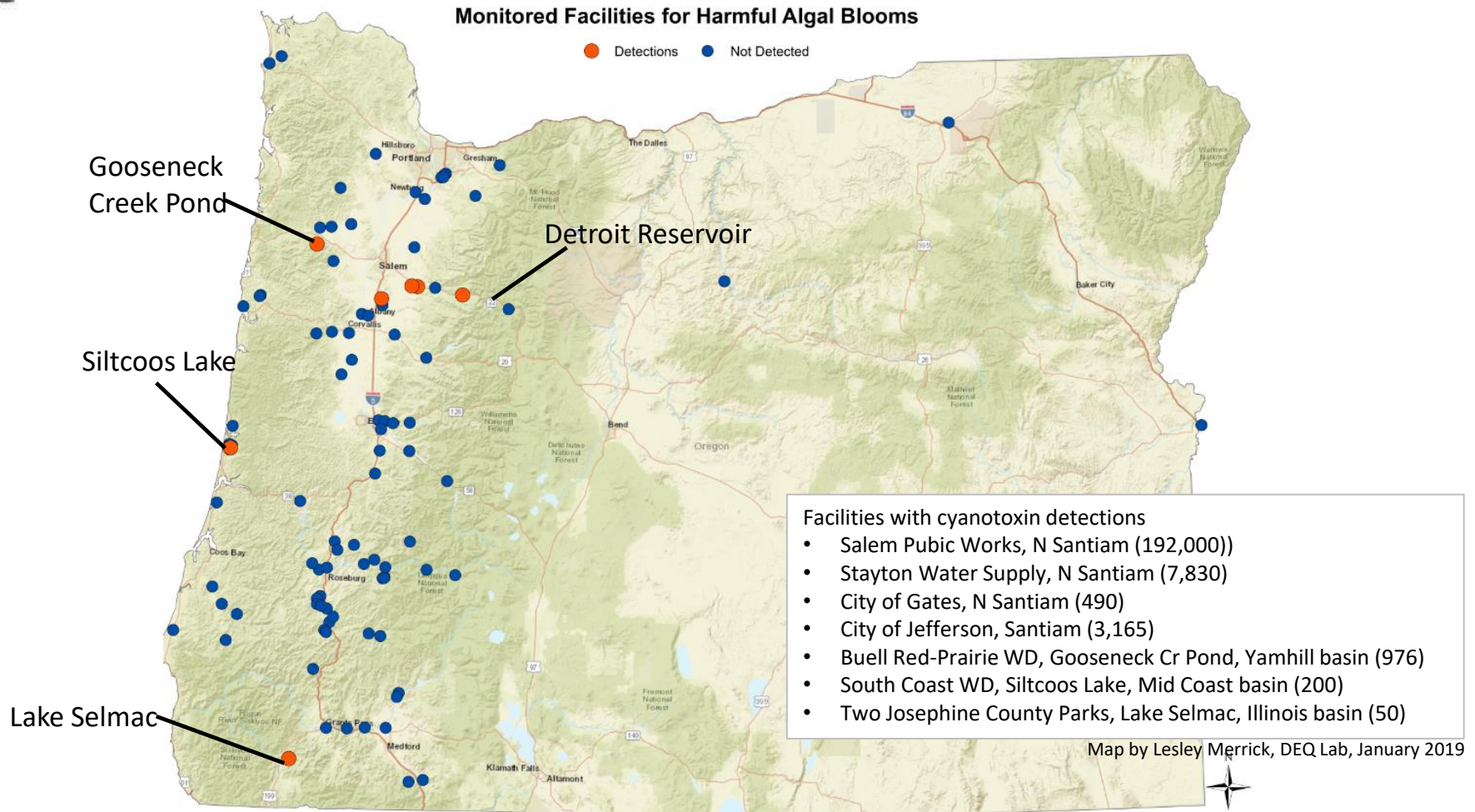
EPA and Oregon have established Health Advisory Levels for:

Cyanotoxin	For Vulnerable People (ppb)	For Age 6 and Above (ppb)
Total Microcystins	0.3	1.6
Cylindrospermopsin	0.7	3

Oregon Drinking Water Facilities Under the OHA Emergency Cyanotoxin Monitoring Rule



Monitoring public water systems

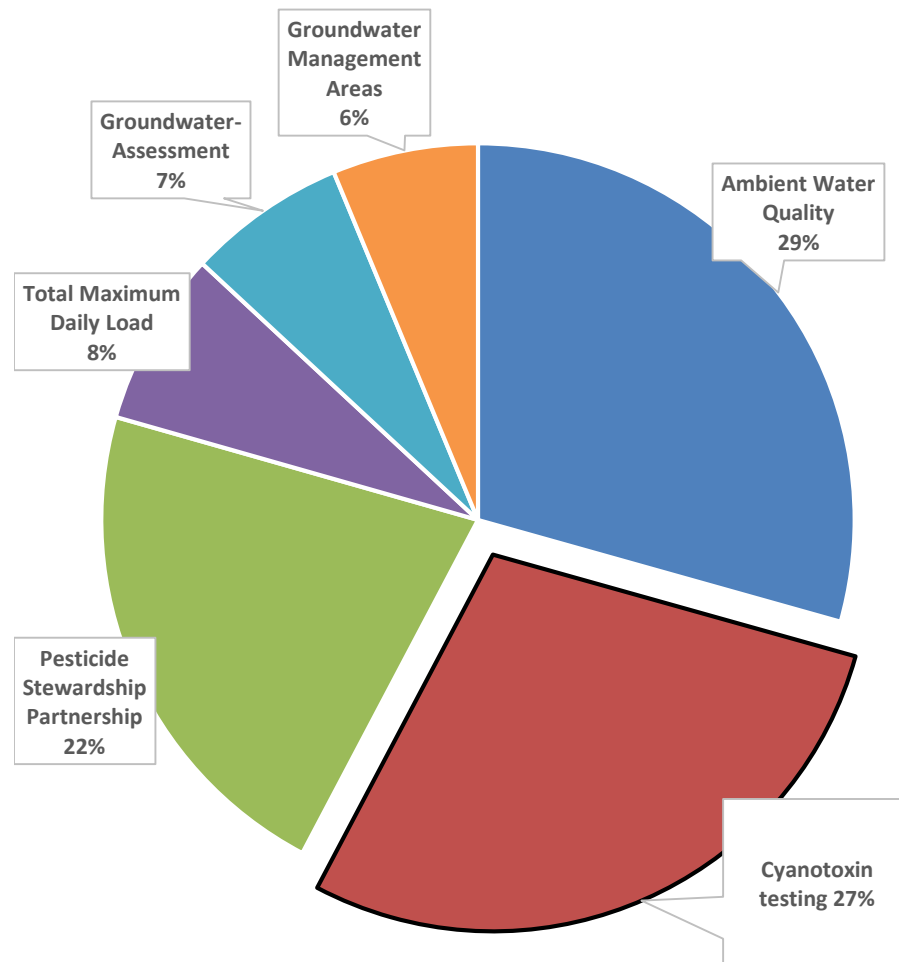




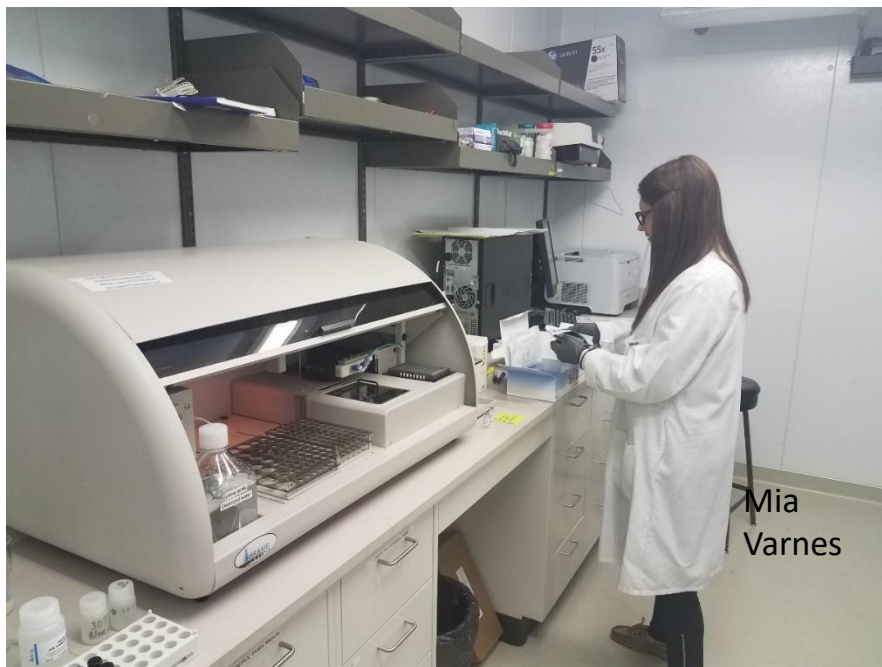
State of Oregon
Department of
Environmental
Quality

2018 DEQ Laboratory Activity for Water Quality Monitoring Programs

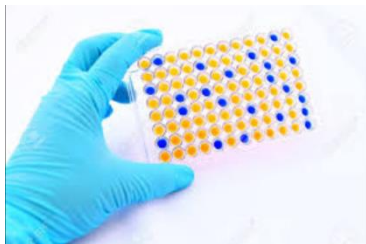
Number of Samples
(n=1,269)



Analytical Testing for Cyanotoxins



**ELISA: Enzyme Linked
Immunosorbent Assay**



**LC MS/MS: Liquid Chromatography with
double mass spec**

Emergency funding

September 26th 2018

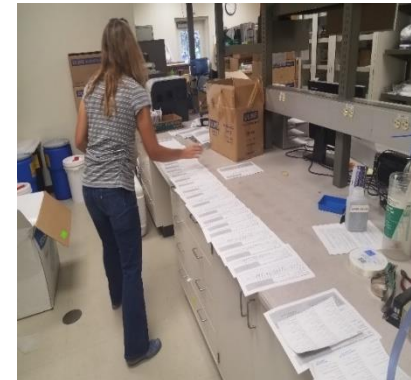
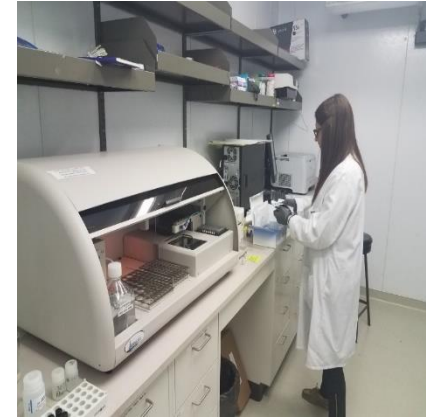
- E-board appropriated \$380,000 from the emergency fund for:
 - Reimbursement for costs incurred during 2018 HAB season
 - Limited duration funding for cyanotoxin testing from public drinking water facilities through June 2019



State of Oregon
Department of
Environmental
Quality

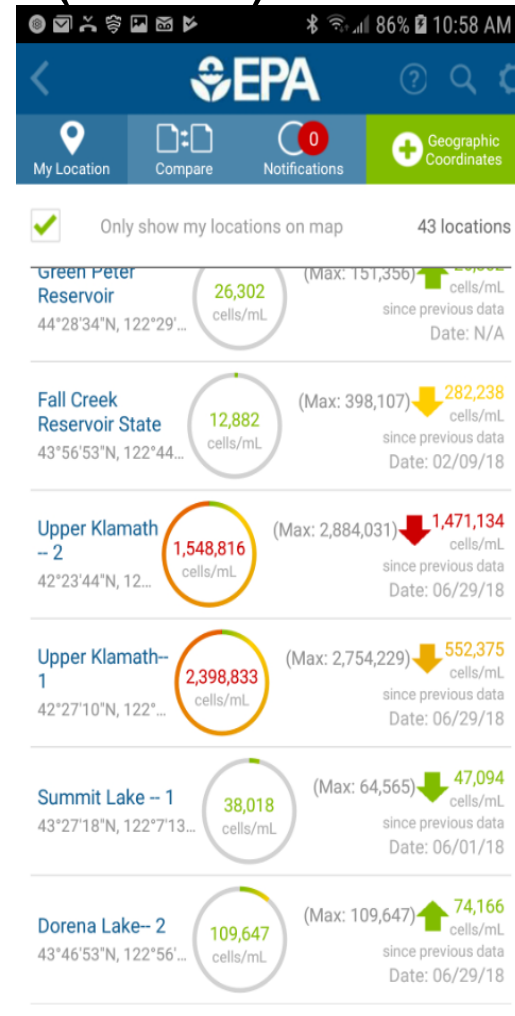
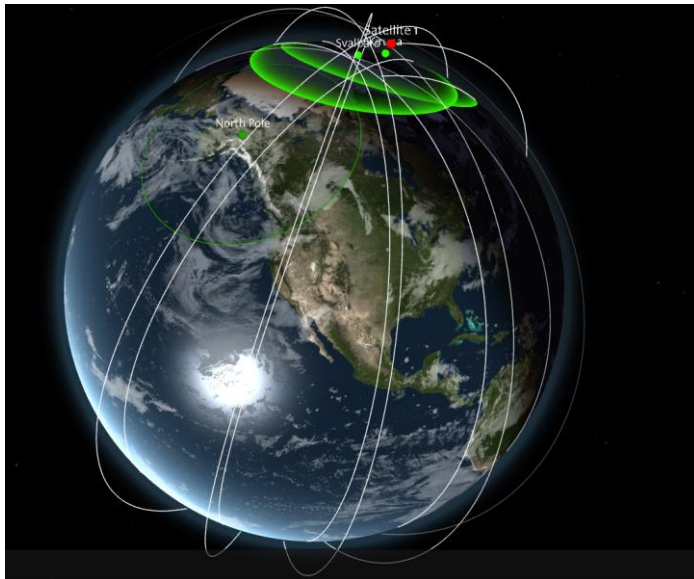
Challenges for the DEQ Lab

- Short lead time to set up program.
- New instrument, method development and analysis
- Large program with many partners: 97 participating facilities monitored by DEQ.
- Short holding time: 48 hours.
- Quick turn-around time: two days
- Laboratory Information System glitches
- Sample shipping/receiving logistics
- UPS problems, late samples



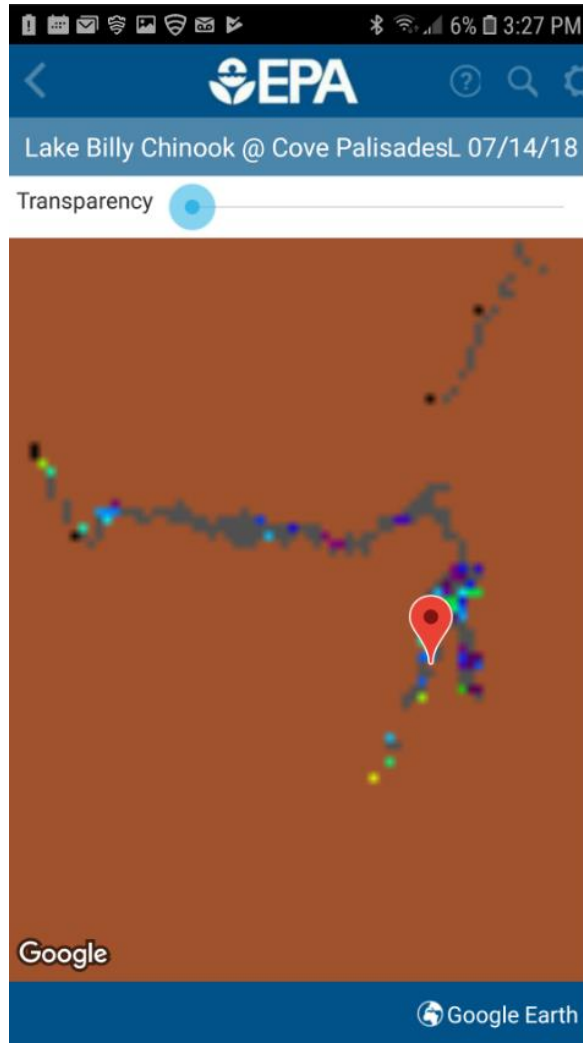
Additional Monitoring Opportunities

Sentinel 3a satellite - Ocean and Land Color Instrument (OLCI)





Max. length	28 mi (45 km)
Surface area	4,000 acres (1,600 ha)
Average depth	102 ft (31 m)
Max. depth	415 ft (126 m)
Shore length ¹	72 mi (116 km)
Surface elevation	1,945 ft (593 m)



Lake Billy Chinook algae health advisory expanded

Alert now covers all three arms of the lake

By: KTVZ.COM news sources
Posted: July 11, 2018 05:11 PM PDT
Updated: July 11, 2018 05:11 PM PDT

[f](#) [t](#) [v](#) [e](#)



Green scum of blue-green algae evident in early summer in areas of Lake Billy Chinook (File photos: Oregon Health Authority)

SALEM, Ore. - The Oregon Health Authority said Wednesday it has updated a recreational use health advisory issued June 22 for part of Lake Billy Chinook to cover all three arms of the lake, based on the latest test results.

The original advisory extended from the cove at Burns South Campground

What more could be done to better protect Oregonians from CyanoHABs?

- Increase capacity to proactively detect blooms across the state
- Coordinate monitoring activities and provide analytical support for volunteer organizations and other partners
- Refine sampling methodology and requirements for optimal efficiency and accuracy
- Increase assessment of waterbodies with repeated CyanoHABs to determine causes and possible solutions

Questions?



CyanoHAB in Lake Billy Chinook, August 2016
Source: www.ktvz.com



CyanoHAB in Ross Island Lagoon, July 2015
Source: www.kptv.com

Documents can be provided upon request in an alternate format for individuals with disabilities or in a language other than English for people with limited English skills. To request a document in another format or language, call DEQ in Portland at 503-229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696; or email deqinfo@deq.state.or.us.