Idaho DEQ Efforts Harmful Algal Blooms

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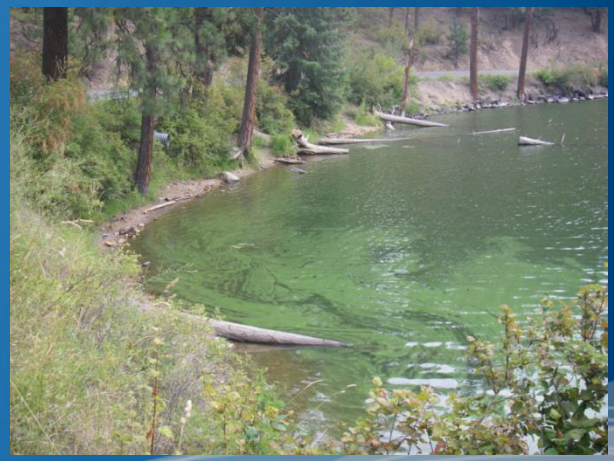
Idaho Department of Environmental Quality (DEQ)

March 30, 2016

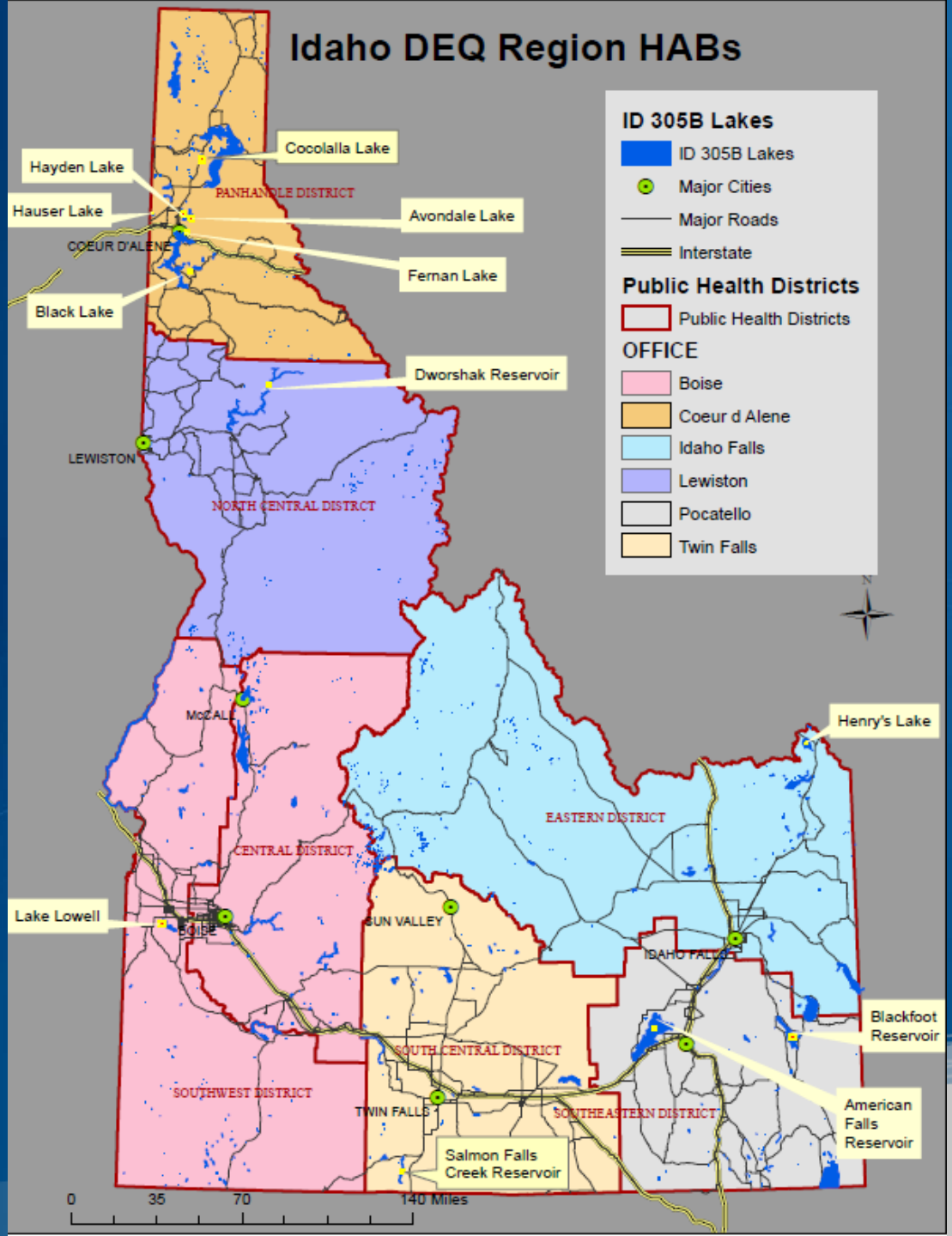
History of Blooms in Idaho

- **Historical Reports of Cyanotoxin Issues:**
  - Black Lake (1985 and 1986) – death of dogs, cattle, and deer
  - Cascade Reservoir (1993 to 1996) – 23 cattle died
- **Reports Increasing in Recent Years**
- **HABs Detected in all 6 Idaho DEQ Regions**



Idaho Waterbodies with HABs

- **Boise Region**
  - Lake Lowell
- **Coeur d'Alene Region**
  - Avondale Lake
  - Black Lake
  - Cocolalla Lake
  - Fernan Lake
  - Hayden Lake
  - Hauser Lake
- **Idaho Falls Region**
  - Henry's Lake
- **Pocatello Region**
  - American Falls Res.
  - Blackfoot Res.
- **Lewiston Region**
  - Dworshawk Res.
- **Twin Falls Region**
  - Salmon Falls Creek Res.


Idaho DEQ Region HABs
ID 305B Lakes
ID 305B Lakes
Major Cities
Major Roads
Interstate
Public Health Districts
Public Health Districts
OFFICE
Boise
Coeur d Alene
Idaho Falls
Lewiston
Pocatello
Twin Falls
Cocolalla Lake
Hayden Lake
Hauser Lake
Avondale Lake
Fernan Lake
Black Lake
Dworshak Reservoir
Henry's Lake
Lake Lowell
Blackfoot Reservoir
American Falls Reservoir
Salmon Falls Creek Reservoir
PANHANDLE DISTRICT
COEUR D'ALENE
LEWISTON
NORTH CENTRAL DISTRICT
McCALL
CENTRAL DISTRICT
BOISE
SUN VALLEY
EASTERN DISTRICT
IDAHO FALLS
SOUTH CENTRAL DISTRICT
SOUTHWEST DISTRICT
TWIN FALLS
SOUTHEASTERN DISTRICT
N
0
35
70
140 Miles

Idaho HAB Timeline – 2015

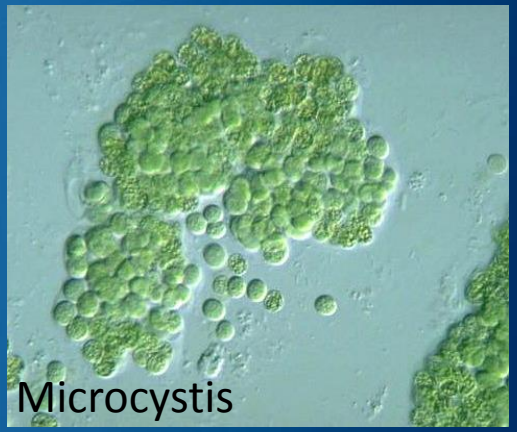
DEQ Region	June	July	August	Sept.	Oct.	Nov.
Coeur d'Alene	Fernan	Fernan Avondale Hayden	Fernan Avondale Hayden	Fernan Avondale Hayden	Fernan Avondale Hayden Black	Fernan Black
Idaho Falls			Henry's			
Pocatello				Blackfoot R.		
Lewiston				Dworshawk	Dworshawk	
Boise					Lake Lowell	

- Health advisories posted for all noted waterbodies except for Blackfoot Reservoir
- Advisories also posted for Hayden and Fernan lakes in 2014

2015 Taxa List – Idaho HABs

- *Anabaena* (5 waterbodies)
- *Aphanizomenom* (5 waterbodies)
- *Gloeotrichia* (4 waterbodies)
- *Lyngbya* (2 waterbodies)
- *Microcystis* (5 waterbodies)
- *Woronichinia* (5 waterbodies)

Anabaena

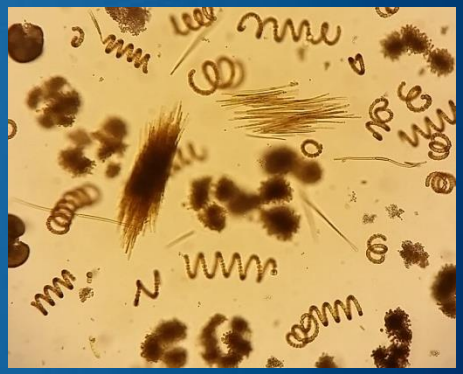

Microcystis

Guidance and Response Strategies

- **Idaho DEQ and Department of Health and Welfare (DHW) Finalized a State-wide Blue-green Algae Bloom Response Plan Oct. 2015**
  - Response associated with recreational waters

Response Plan

- Response Kit
- Sample Collection
- Sample Preservation, Transport and Handling
- Decontamination Procedures
- Laboratory Analyses
- Response to Event
- Communications



Response Plan

- Respond to Public Complaint
- Identify if a Problem Exists
  - Bloom presence
  - Collect and preserve grab samples
- Quantify Problem (Lab Analysis)
  - Identify and enumerate species
  - Measure toxicity
- Determine Need for Public Health Warning

Decision-making Scheme for Blue-green Algae Health Risks

Risk Measurement	Decision	Action: Posting	Action: News Release
1. Is surface scum visible and associated with toxigenic* species?	Yes	Recommend posting by public health districts (PHD) in conjunction with water body management agency	DEQ and PHD make determination
	No	Proceed to 2	
2. Is the sum of all potentially toxigenic* taxa ≥100,000 cells/mL?	Yes	Recommend posting by PHD in conjunction with water body operator	DEQ and PHD make determination
	No	Proceed to 3	
3. Is the density of Microcystis or Planktothrix ≥40,000 cells/mL?	Yes	Recommend posting by PHD in conjunction with water body operator	DEQ and PHD make determination
	No	Do not recommend posting	

* Toxigenic taxa include *Anabaena, Microcystis, Planktothrix, Nostoc, Coelosphaerium, Anabaenopsis, Aphanizomenom, Gloeotrichia, Woronichinia, Oscillatoria,* and *Lyngbya*. Additional taxa are known to be potentially toxic and may be added to the list in the future.

Adapted from ODHS 2015

Monitoring

- Most Monitoring is Reactive, Based on Public Reports of Blooms
- Some Field Offices are Planning to Monitor Proactively, Concurrent with other Field Efforts (e.g. invasive species monitoring)
- State-wide HAB Tracking Table Developed

Reporting

- State-wide HAB Tracker
- Staff Reports
- At-a-Glance

Reporting

Regional Office	Primary Investigator	Investigation Type	Date	Waterbody	Id and Enum Samples Taken	Toxin Samples Taken	Do conc. exceed criteria	Health Advisory Issued	Health District Coord	Notice Posted
Boise RO	Jenkins, Stephanie	Preliminary	9/29/2015	Lake Lowell	Yes	Yes	Yes	Yes	Yes	Yes
Boise RO	Jenkins, Stephanie	Preliminary	7/9/2015	Payette Lake	Yes	Yes	No	No	No	No
Coeur d'Alene RO	Steed, Robert	Preliminary	6/29/2015	Avondale Lake	Yes	No	Yes	Yes	Yes	
Coeur d'Alene RO	Larson, Kristin	Follow-up	7/7/2015	Avondale Lake	Yes	Yes	Yes	Yes	Yes	No
Coeur d'Alene RO	Larson, Kristin	Follow-up	7/16/2015	Avondale Lake	Yes	No	Yes	Yes	Yes	No
Coeur d'Alene RO	Steed, Robert	Follow-up	7/23/2015	Avondale Lake	Yes	Yes	Yes	Yes	Yes	No
Coeur d'Alene RO	Steed, Robert	Follow-up	8/5/2015	Avondale Lake	Yes	Yes	Yes	Yes	Yes	No
Coeur d'Alene RO	Steed, Robert	Follow-up	8/17/2015	Avondale Lake	Yes	Yes	Yes	Yes	Yes	No
Coeur d'Alene RO	Larson, Kristin	Follow-up	8/25/2015	Avondale Lake	Yes	No	Yes	Yes	Yes	Yes
Coeur d'Alene RO	Steed, Robert	Preliminary	9/2/2008	Black Lake	No	No	No	No	No	No
Coeur d'Alene RO	Pettit, Glen	Preliminary	9/12/2008	Cocolalla Lake	Yes	No	Yes			
Coeur d'Alene RO	Cooper, Craig	Preliminary	3/5/2014	Coeur d'Alene Lake	Yes	No	No	No	No	No

Reporting

HAB At-A-Glance

Report prepared: 9/14/2015

Water Body: Hayden Lake	DEQ region: Coeur d'Alene	Start date: 7/5/2015	No. days: 89
Health Advisory: ☒yes ☐no, 7/9	Press Release: ☒yes ☐no, 7/9	Posted: ☒yes ☐no, 7/9	End date: 10/7/2015
Sample analysis costs: $6,000	No. field investigations: 9	≈ DEQ staff field hours: 150	≈ DEQ staff follow-up office hours: 150
Previous Blooms: ☒yes ☐no, 7/07, 8/12, 7/13, 7/14		Complaint Initiated: ☒yes ☐no	Continued recreation: ☒yes ☐no

Wind stacking at Sportsman's Access fishing dock, 7/14/2015

Cyanobacteria species present (#/mL)

Sp.	Maximum	Minimum
Anabaena	7,440,000	3,000
Microcystis	18,558	0
Aphanizomenon	140,117	0
Woronichinia	81,000	0
Gloetrichia	10,350	0

Extent of bloom and transition at Henry's Point, 8/5/2015

Surface Scum in Bob's Bay 8/25/2015

Sample Results:

Date	Type	Anabaena (#/mL)	Microcystis (#/mL)	Aphanizomenon (#/mL)	Woronichinia (#/mL)	Gloetrichia (#/mL)	Microcystin (ppb)
7/8	Scum	576,000					
7/14	Open	3,000					
7/14	Scum	7,440,000					0.513†
7/14	Open	11,400					<0.15
7/23	Open	483,451		140,117			
7/23	Open	41,756					
7/23	Open	203,216	18,558				
8/5	Open	14,750	1,000				<0.15
8/17	Open	7,188					
8/17	Scum	24,150	11,500				
8/25	Open	8,100	2,200				<0.15
8/25	Scum	2,227,500			81,000	32,400	1.08
8/25	Scum	204,930	11,150		10,350		0.36
8/25	Open	9,484					0.23
9/4‡	Scum	3,240	32,400				<0.6
9/4‡	Open	287	4,600				<0.6
9/4‡	Open	9,890	3,450				

More data available than displayed

Notes: There are many private domestic water intakes on Hayden Lake. The bloom is isolated to the northern arm of Hayden Lake (Usually north of Henry Point) which complicates response, and requires tracking of the transition between HAB water and clean water. We received a record number of inquiries with this bloom. Posting ineffective, notices are missing or dilapidated. Public awareness due to press release and/or word of mouth.

† Anatoxin-a was also evaluated on 7/14 scum sample and was found to be below detection limit. ‡ Significant non-blue-green bloom of the flagellate *Trachlemonas sp.* occurring (taste, odor).

Bloom Prevention and Mitigation

- Applicable ID WQS Narrative Criteria in the Context of Beneficial Uses
  - Excess nutrients (IDAPA 58.01.02.200.06)
  - Floating, suspended, or submerged matter (58.01.02.200.05)
  - Toxic substances (IDAPA 58.01.02.200.02)
- Some TMDL Objectives are to Control Nuisance Aquatic Growth
- No Active HAB Mitigation Conducted

Coordination and Public Outreach

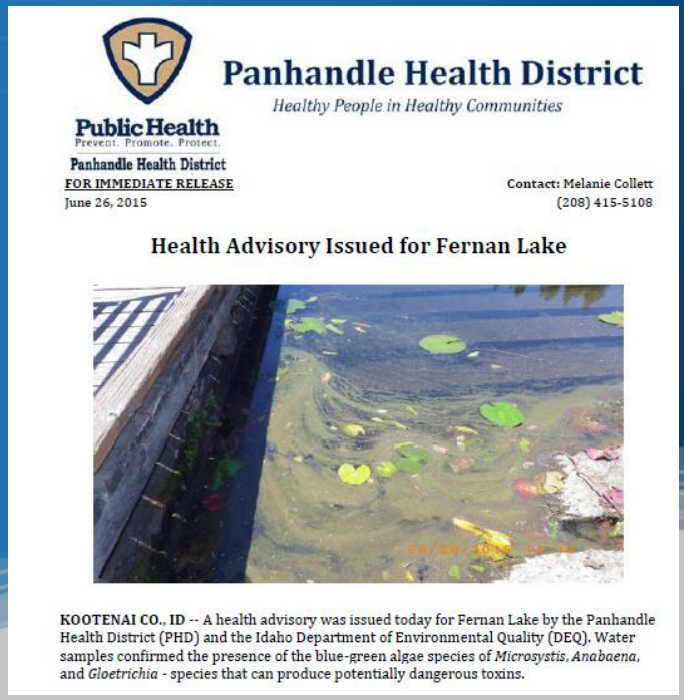
- ID Public Health Districts (primary contact)
- U.S. Fish and Wildlife Service (Refuges)
- ID Dept. of Fish & Game
- Army Corps of Engineers
- Bureau of Reclamation
- Dept. of Agriculture
- City of Boise

Role of Idaho DEQ

- **Identify if Problem Exists**
  - Determine presence/absence of blue-green algae bloom
  - Identify species present
  - Enumerate number of cells or colonies
- **Coordinate with Public Health Districts**
  - When public health advisories/postings warranted
  - When public communication necessary

Role of Public Health Districts

- **Public Health Districts (7 in ID)**
  - Responsible for issuing health advisories
  - Responsible for postings/removal of postings
  - DEQ coordinates closely during this process
- **Health Districts Work Closely with DHW**



Panhandle Health District

Healthy People in Healthy Communities

Public Health
Prevent. Promote. Protect.

Panhandle Health District

FOR IMMEDIATE RELEASE

June 26, 2015

Contact: Melanie Collett
(208) 415-5108

Health Advisory Issued for Fernan Lake

KOOTENAI CO., ID -- A health advisory was issued today for Fernan Lake by the Panhandle Health District (PHD) and the Idaho Department of Environmental Quality (DEQ). Water samples confirmed the presence of the blue-green algae species of *Microsystis, Anabaena,* and *Gloetrichia* - species that can produce potentially dangerous toxins.

Public Outreach

- Postings
- Social Media
- Website
  - FAQ
  - Advisories
  - Interactive Map

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Home » Water Quality » Surface Water » Blue-Green Algae

Blue-Green Algae and Harmful Algal Blooms

Blue-green algae are not algae at all but are photosynthetic bacteria, also known as cyanobacteria. There are several species of blue-green algae, which thrive under their own unique conditions and produce a variety of toxins. Blue-green algae are naturally occurring and usually present in a water body, but they typically exist in numbers too small to cause problems. Blue-green algae growth is influenced by a variety of environmental conditions including temperature, flow, nutrient levels, light, weather, vertical mixing in the water column, and pH levels.

Given the right conditions, high concentrations of blue-green algae can occur and form a bloom. Blooms can vary in appearance, sometimes looking like mats, foam, or surface scum. Blooms can range in color from blue and bright green to brown and red. Some blooms produce a foul odor. Not all blooms are toxic, but when toxic harmful algal blooms do occur they present a health risk to humans, pets, and livestock. Exposure may occur from ingestion, skin contact, or inhalation. Exposure can result in a range of health effects from skin irritation and stomach upset to neurotoxic effects and at very high levels, death. Symptoms in humans are rare; anyone with symptoms should seek medical attention.

If you observe a blue-green algae bloom, contact your DEQ regional office.

Blue-Green Algae Health Advisories

Health advisories are typically issued by the public health districts, who work closely with DEQ staff.

There are no current health advisories.

Take the following precautions when an advisory is in effect:

- Avoid exposure to water experiencing a harmful algal bloom. Take extra precautions to ensure children, pets, and livestock are not exposed to the water.
- Do not consume water with a blue-green algae bloom. Neither boiling nor disinfecting removes blue-green algae toxins from water.
- If fish are known to have been exposed to a blue-green algae bloom, only consume the fillet portion (remove the fat, organs, and skin). Wash hands after handling. The risk associated with consuming fish caught in waters with a blue-green algae bloom is unknown. Toxins produced by blue-green algae can accumulate in the viscera of fish (e.g., liver and kidneys).

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DEQ Resources

Blue-Green Algae Response Plan (2015)

More Information

Harmful Algal Blooms (EPA webpage)

Harmful Algal Blooms Brochure (IDHW brochure)

Related Pages

Drinking Water

Additional Needs

- Training – Internal and External
- Public Education
- Resources
  - Funding for signs, microscopes, & toxin sampling
- EPA Recreational Criteria for Cyanotoxins
- Quality Assurance Plan

Idaho DEQ Point of Contacts

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Questions?