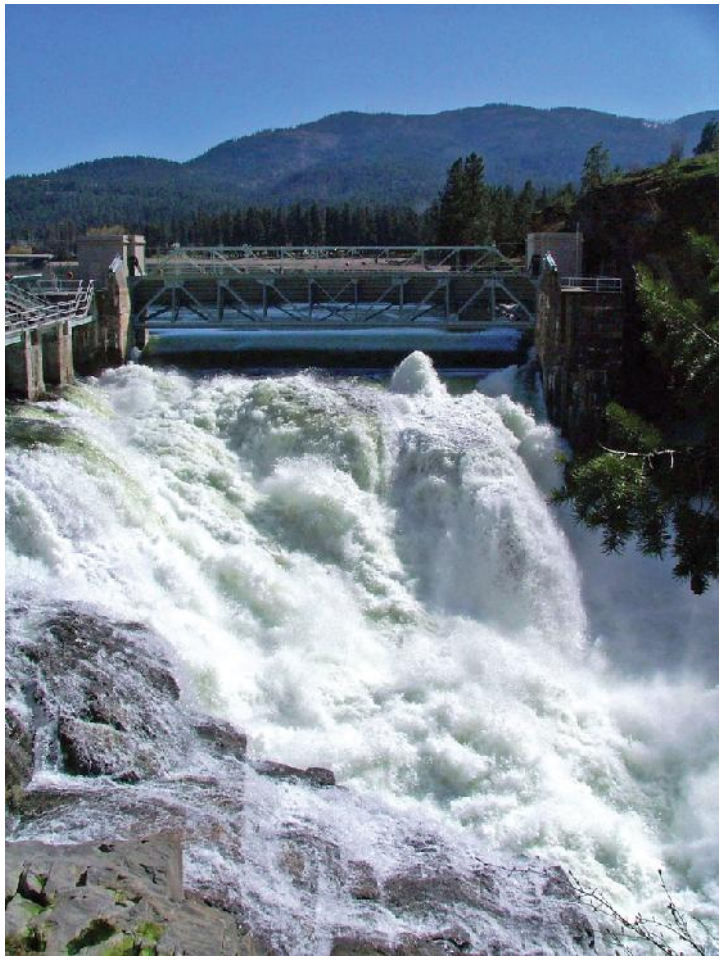
Idaho Updates

- Spokane River Dissolved Oxygen TMDL Implementation Advisory Committee – Annual Meeting
- By: Robert Steed
- IDEQ , Surface Water Ecologist
- June 16, 2016

Activities: Spokane River

- Spokane River Metals TMDL Watershed Advisory Group
- Harmful Algae Blooms
- Other
  - IPDES
  - Coeur d Alene Lake Management Plan



Idaho Spokane River §303(d) Listing

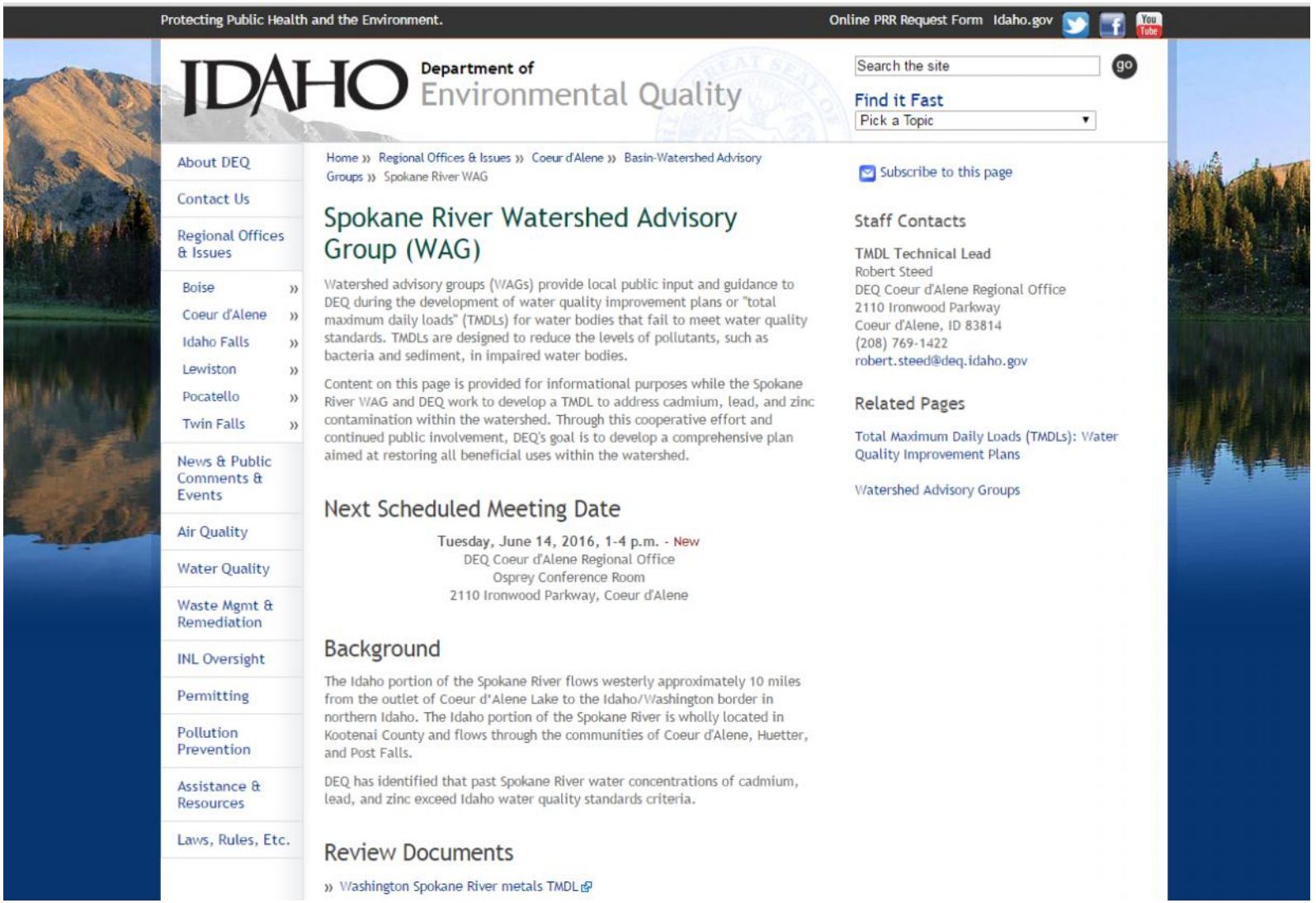
- 1994 303(d) List
  - MTU (Metals (unknown))
- 2010 Integrated Report
  - **Cadmium, Lead, Zinc**, Phosphorus (Total)
    - ID17010305PN003_04 Spokane River - Post Falls Dam to Idaho/Washington border
    - ID17010305PN004_04 Spokane River - Coeur d'Alene Lake to Post Falls Dam
- 2012 Integrated Report (no change from 2010)
- Proposed 2014 Integrated Report (no change)

Spokane River Metals TMDL Watershed Advisory Group

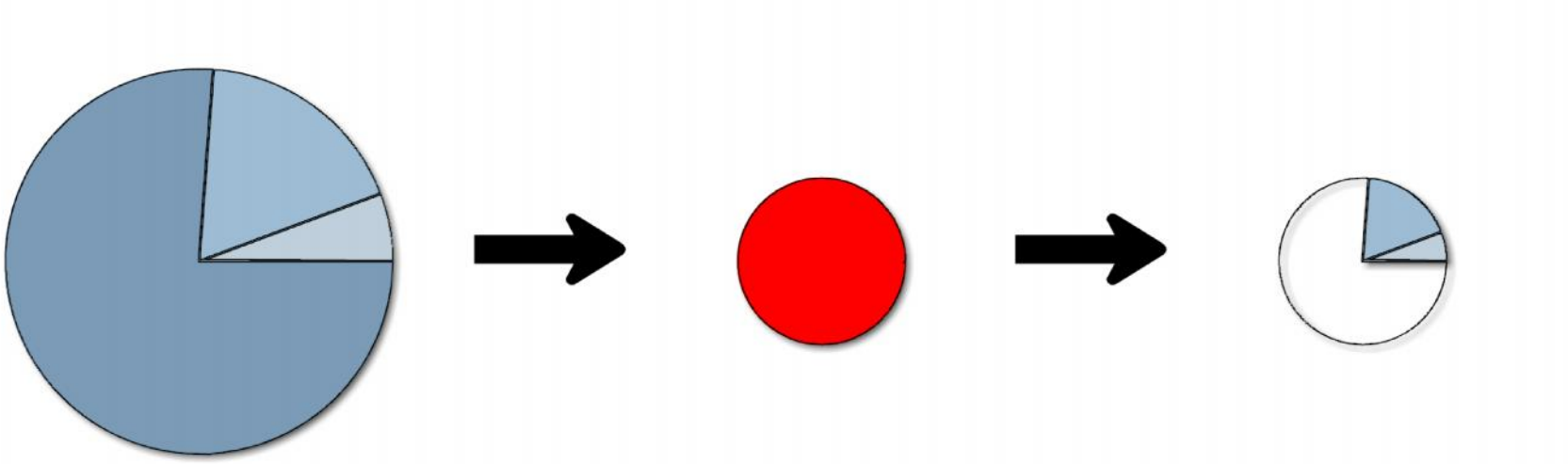
- Dissolved Cadmium, Lead and Zinc
- TMDL development meetings held at Idaho DEQ Coeur d'Alene Regional Office
- First Tuesday of the month

http://www.deq.idaho.gov/regional-offices-issues/coeur-dalene/basin-watershed-advisory-groups/spokane-river-wag/

or search “Spokane WAG”



What is a TMDL
(Total Maximum Daily Load)



Existing Load
Upstream Sources
Point Sources
Non-point Sources

Target Load
Idaho Water Quality Standards
Numeric Criteria

Load Allocations
Point Sources
Non-point Sources

Criterion Continuous Concentration (CCC)

- **4-day average concentration of a toxic substance to ensure adequate protection of sensitive species of aquatic organisms from chronic toxicity**

$$CCC = WER \times e^{(mc \times \ln(hardness) + bc)} \times Chronic\ Conversion\ Factor$$

Metal	CCC	WER	mA	bA	mc	bc	Acute	Chronic	C1	C2	hardness calc mg/L
Cadmium	0.223909	1	0.8367	-3.56	0.6247	-3.344	1.011337	0.976337	na	na	20
Lead	0.540968	1	1.273	-1.46	1.273	-4.705	0.993001	0.993001	na	na	25
Zinc	36.49789	1	0.8473	0.884	0.8473	0.884	0.978	0.986	7400	26000	25

2013 – 2015 Idaho DEQ monitoring

4 day average concentration for comparison to chronic criteria

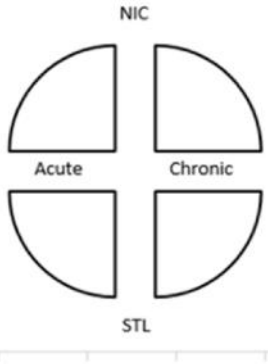
Criteria Compliance

Station	Analyte	Criterion	Ascending	Descending	Lake Level	Drawdown	Rain on Snow
NIC	Dis-Cd	Acute (CMC)	no 0/32	no 0/35	no 0/21	no 0/5	no 0/14
STL	Dis-Cd	Acute (CMC)	no 0/33	no 0/35	no 0/21	no 0/5	no 0/13
NIC	Dis-Pb	Acute (CMC)	no 0/32	no 0/35	no 0/21	no 0/5	no 0/14
STL	Dis-Pb	Acute (CMC)	no 0/33	no 0/35	no 0/21	no 0/5	no 0/13
NIC	Dis-Zn	Acute (CMC)	**yes 32/32**	**yes 15/35**	no 0/21	**yes 1/5**	**yes 14/14**
STL	Dis-Zn	Acute (CMC)	**yes 33/33**	**yes 9/35**	no 0/21	no 0/5	**yes 13/13**

Station	Analyte	Criterion	Ascending	Descending	Lake Level	Drawdown	Rain on Snow
NIC	Dis-Cd	Chronic (CCC)	**yes 4/7**	**yes 1/11**	no 0/8	no 0/5†	no 0/2
STL	Dis-Cd	Chronic (CCC)	no 0/9	no 0/12	no 0/7	no 0/5†	no 0/2
NIC	Dis-Pb	Chronic (CCC)	**yes 2/4**	**yes 2/10**	no 0/8	no 0/5†	no 0/2
STL	Dis-Pb	Chronic (CCC)	**yes 3/5**	**yes 1/11**	no 0/7	no 0/5†	no 0/2
NIC	Dis-Zn	Chronic (CCC)	**yes 7/7**	**yes 4/11**	no 0/8	**yes 1/5†**	**yes 2/2**
STL	Dis-Zn	Chronic (CCC)	**yes 9/9**	**yes 2/12**	no 0/7	no 0/5†	**yes 2/2**

Spokane River Conditions

Total Mass Daily Load Criteria by Cycle



	Ascending	Descending	Regulated	Draw Down	Rain on Snow
Cd Cadmium					
Pb Lead					
Zn Zinc					

Credit, Corrie Bouchard (IDEQ/INBRE intern)

HAB Trend

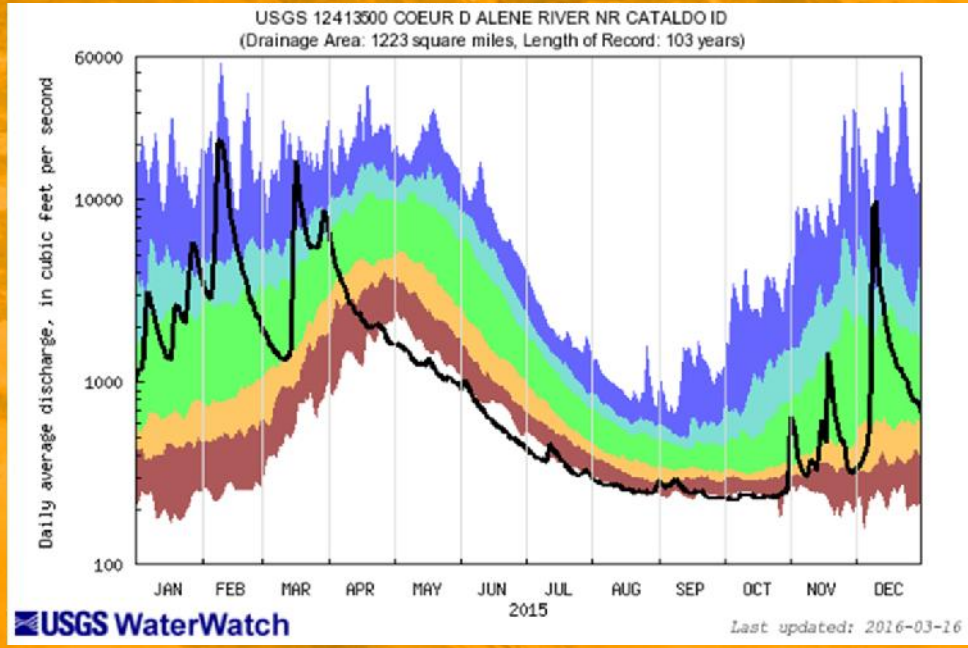
"The frequency and geographic distribution of documented CyanoHABs seem to have dramatically increased in recent decades in the United States and globally" – Interagency Working Group on Harmful Algal Blooms, Hypoxia and Human Health – Report to Congress 2008

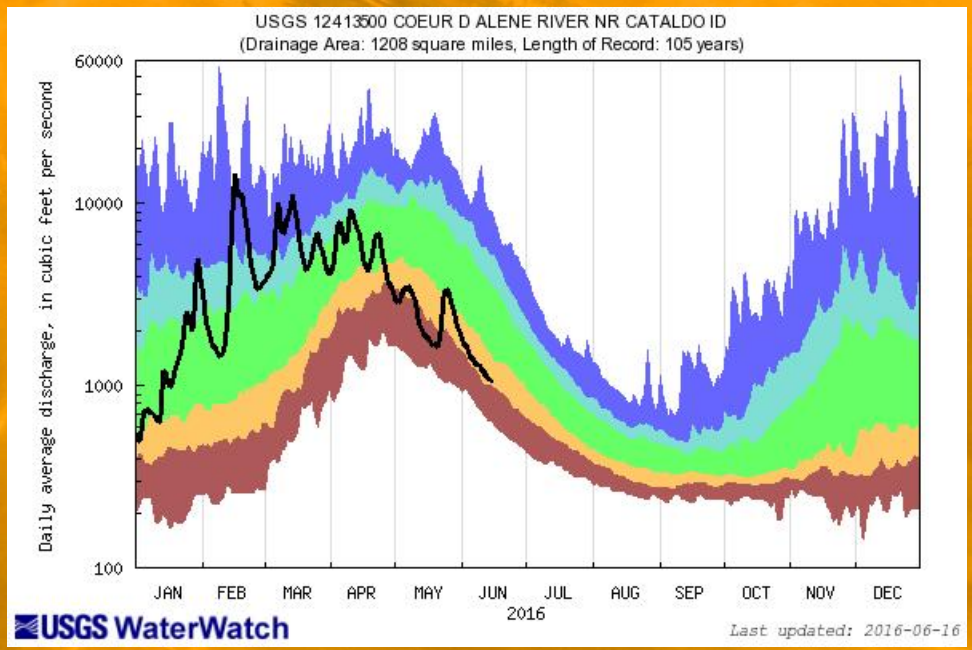
What are the most important conditions leading to cyanobacteria blooms?

- *Water temperature:* Most algae favor temperatures between 60°F and 80°F; optimum conditions for many cyanobacteria are in even warmer waters, while some cyanobacteria grow at temperatures below 60°F.
- *Nutrients:* Elevated levels of nutrients foster algae and cyanobacteria growth.
- *Flow:* Quiescent or low-flow conditions favor cyanobacteria blooms. Turbulence disrupts buoyancy, and light can be limited at depths where there is vertical circulation in the water column.

2015 Weather and Runoff

- Western states had a “top 10” warm spring
- An intense heatwave impacted the northwest in late June

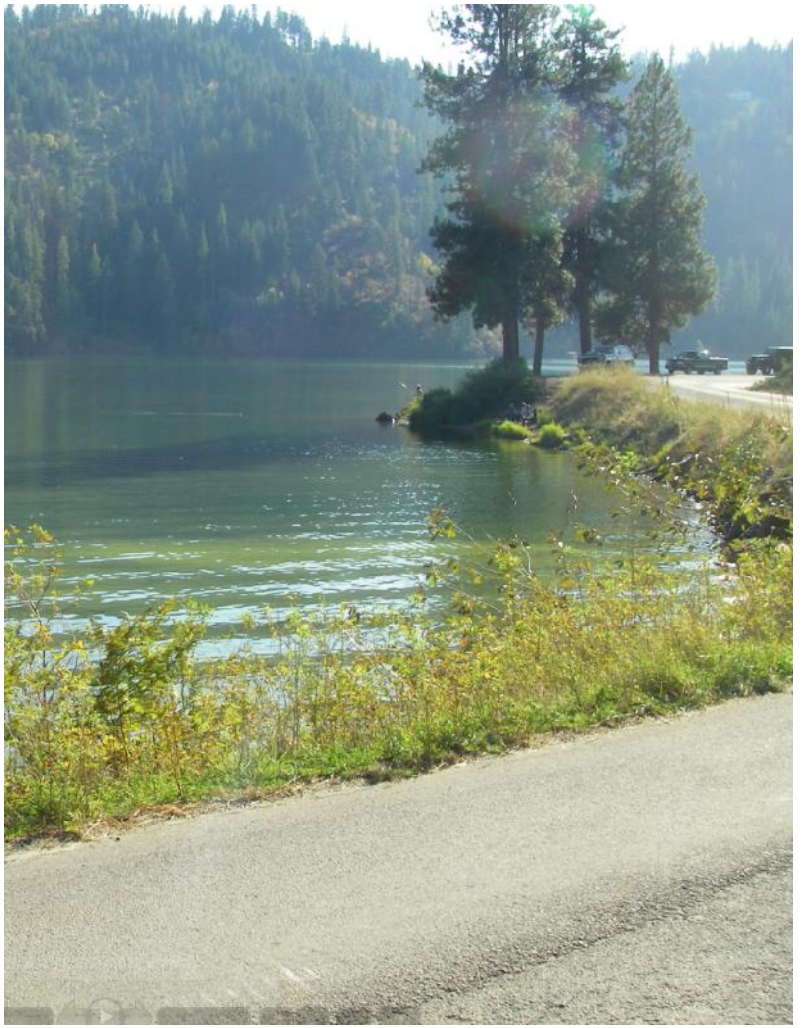




Fernan Lake

- History of Past HAB
- Gloetrichia → Anabaena Microcystis, Woronichinia Aphanizomenon.

Year	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007				X				
2008					X	X		
2009								
2010								
2011								
2012			X					
2013		X	X			X	X	
2014			X	X	X	X	X	
2015		X	X	X	X	X	X	X

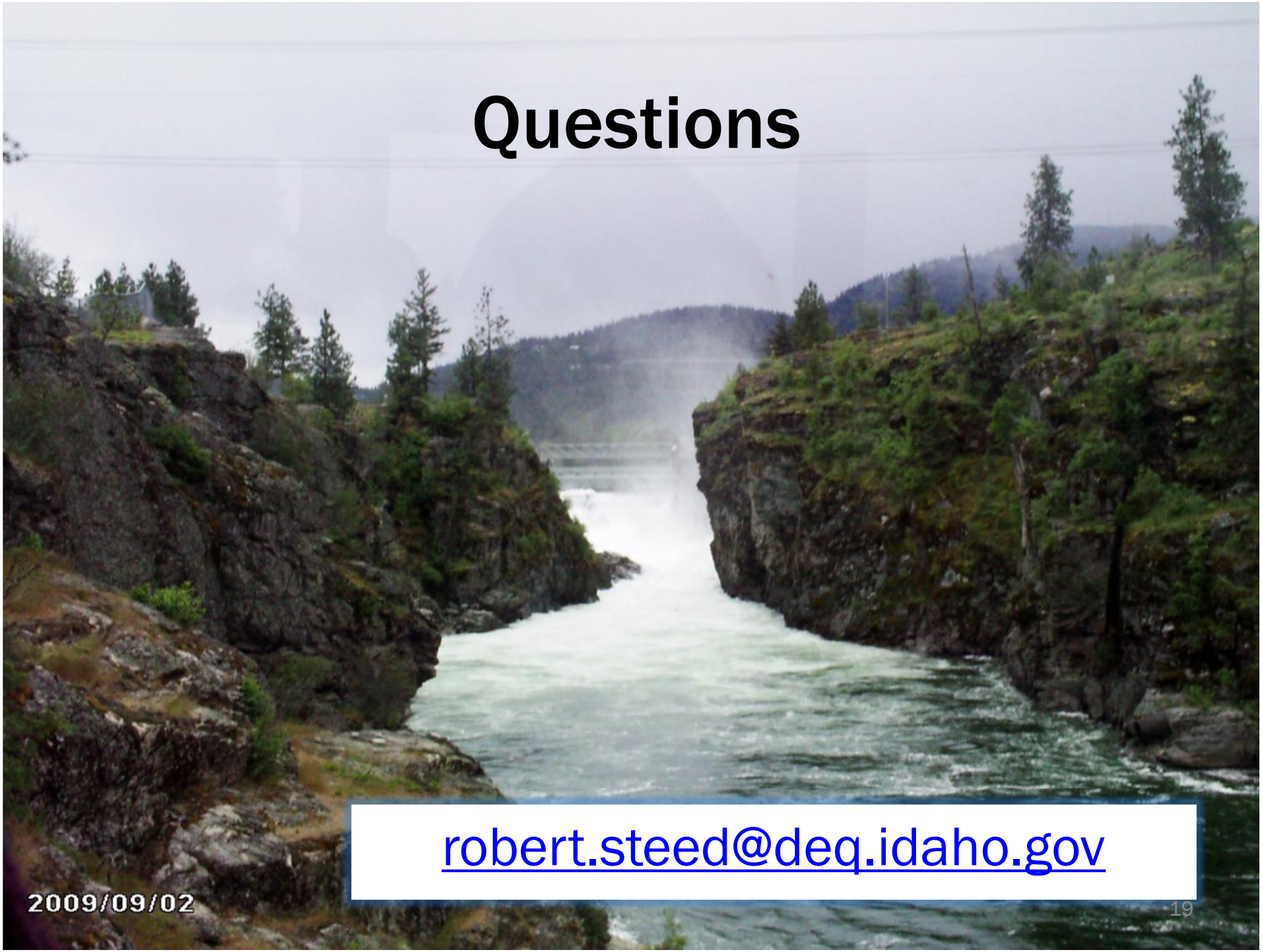


Hayden Lake 2015

- Start 7/5/2015
- End 10/7/2015
- 89 Days
- Public Health Advisory Issued
- > $6,000 Samples
- > 500 Hours Staff
- Anabaena Dominated
- Max Microcystin 1.08 ppb

Avondale Lake 2015

Questions



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