

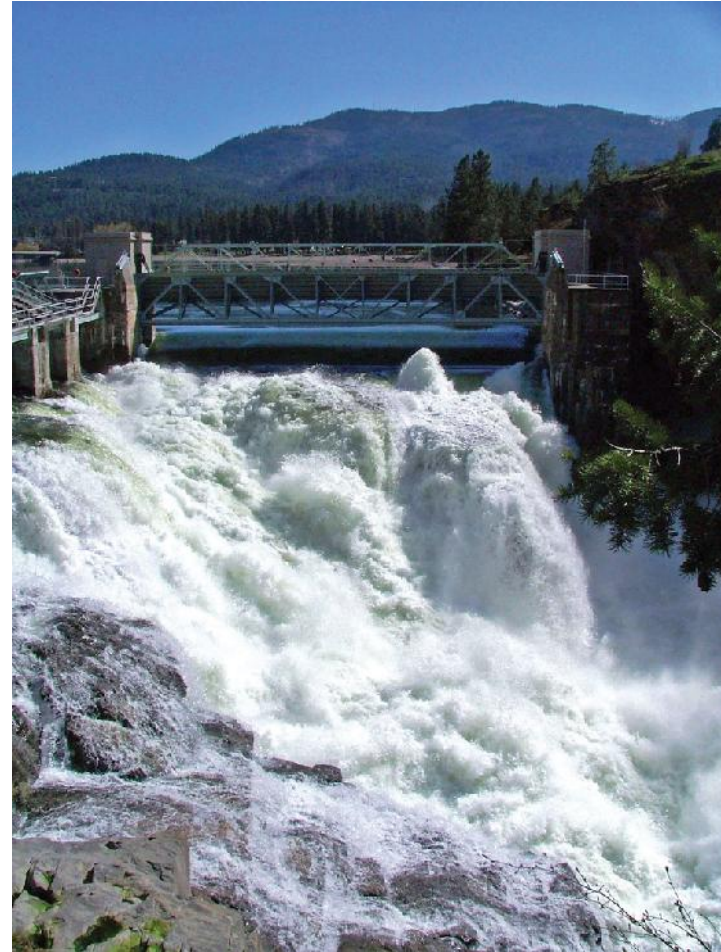
# Idaho Updates

- **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”

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**Spokane River Watershed Advisory Group (WAG)**

Watershed advisory groups (WAGs) provide local public input and guidance to DEQ during the development of water quality improvement plans or "total maximum daily loads" (TMDLs) for water bodies that fail to meet water quality standards. TMDLs are designed to reduce the levels of pollutants, such as bacteria and sediment, in impaired water bodies.

Content on this page is provided for informational purposes while the Spokane River WAG and DEQ work to develop a TMDL to address cadmium, lead, and zinc contamination within the watershed. Through this cooperative effort and continued public involvement, DEQ's goal is to develop a comprehensive plan aimed at restoring all beneficial uses within the watershed.

**Next Scheduled Meeting Date**

Tuesday, June 14, 2016, 1-4 p.m. - **New**  
DEQ Coeur d'Alene Regional Office  
Osprey Conference Room  
2110 Ironwood Parkway, Coeur d'Alene

**Background**

The Idaho portion of the Spokane River flows westerly approximately 10 miles from the outlet of Coeur d'Alene Lake to the Idaho/Washington border in northern Idaho. The Idaho portion of the Spokane River is wholly located in Kootenai County and flows through the communities of Coeur d'Alene, Huetter, and Post Falls.

DEQ has identified that past Spokane River water concentrations of cadmium, lead, and zinc exceed Idaho water quality standards criteria.

**Review Documents**

» Washington Spokane River metals TMDL [↗](#)

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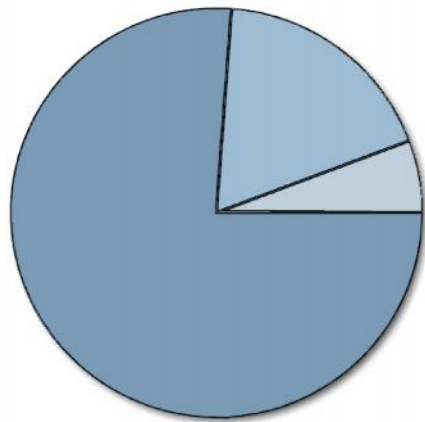
Total Maximum Daily Loads (TMDLs): Water Quality Improvement Plans

Watershed Advisory Groups

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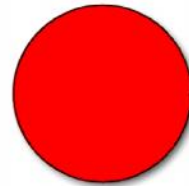
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# What is a TMDL (Total Maximum Daily Load)



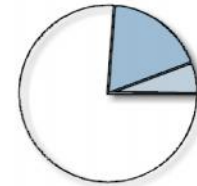
## Existing Load

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

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

Metal	CCC	WER	mA	bA	mc	bc	Acute	Chronic	C1	C2	hardness calc mg/L
Cadmium	0.22390 9	1	0.8367	-3.56	0.6247	-3.344	1.01133 7	0.976337	na	na	20
Lead	0.54096 8	1	1.273	-1.46	1.273	-4.705	0.99300 1	0.99300 1	na	na	25
Zinc	36.4978 9	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



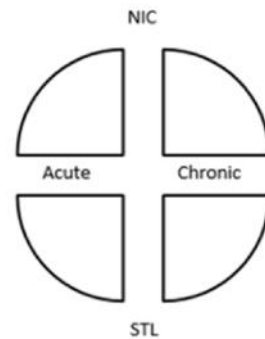
# Criteria Compliance

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)	<b>yes 32/32</b>	<b>yes 15/35</b>	no 0/21	<b>yes 1/5</b>	<b>yes 14/14</b>
STL	Dis-Zn	Acute (CMC)	<b>yes 33/33</b>	<b>yes 9/35</b>	no 0/21	no 0/5	<b>yes 13/13</b>

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

# Spokane River Conditions

Total Mass Daily Load Criteria by Cycle



	Ascending	Descending	Regulated	Draw Down	Rain on Snow
<b>Cd</b> Cadmium					
<b>Pb</b> Lead					
<b>Zn</b> Zinc					



The background of the slide is a microscopic image of cyanobacteria. It shows numerous thin, brownish, filamentous structures that are branched and radiating from central points, resembling starbursts or fan-like shapes. The filaments are composed of individual cells, some of which are slightly larger and darker than others, possibly representing heterocysts. The overall appearance is that of a dense, interconnected network of these microscopic organisms.

## 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

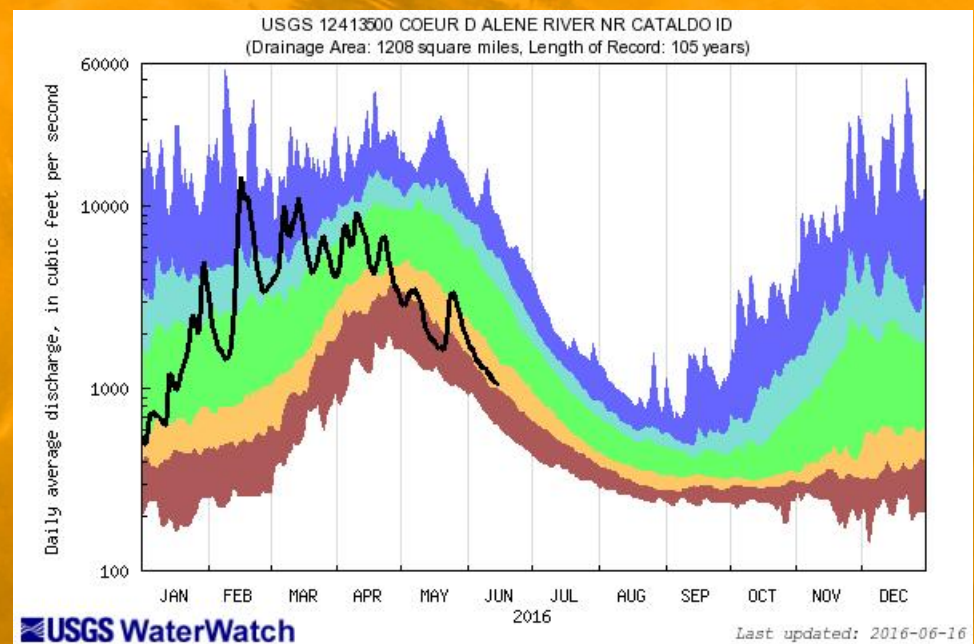
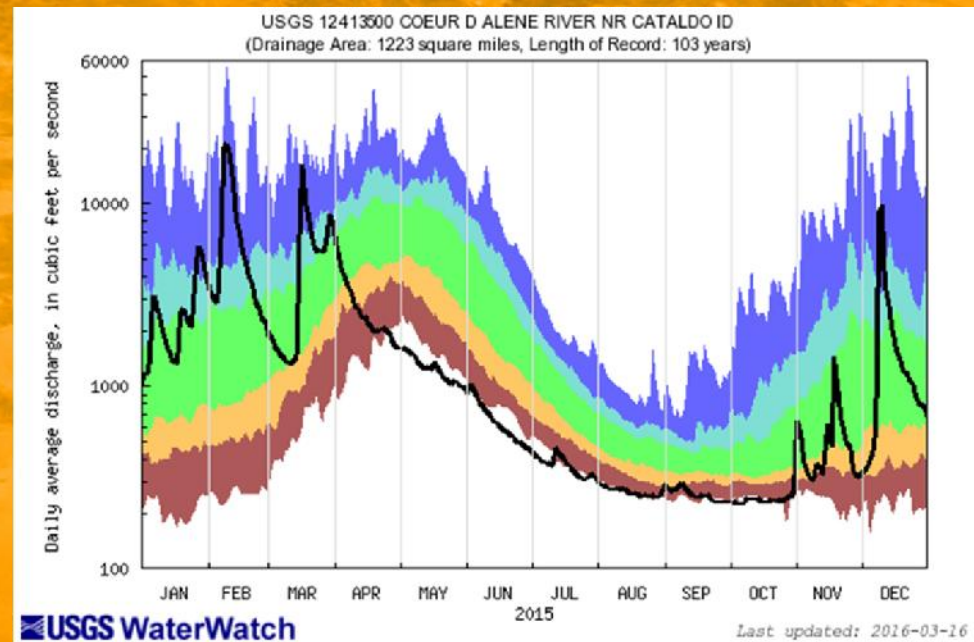
## What are the most important conditions leading to cyanobacteria blooms?

- **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.

07/14/2015 12:

# 2015 Weather and Runoff

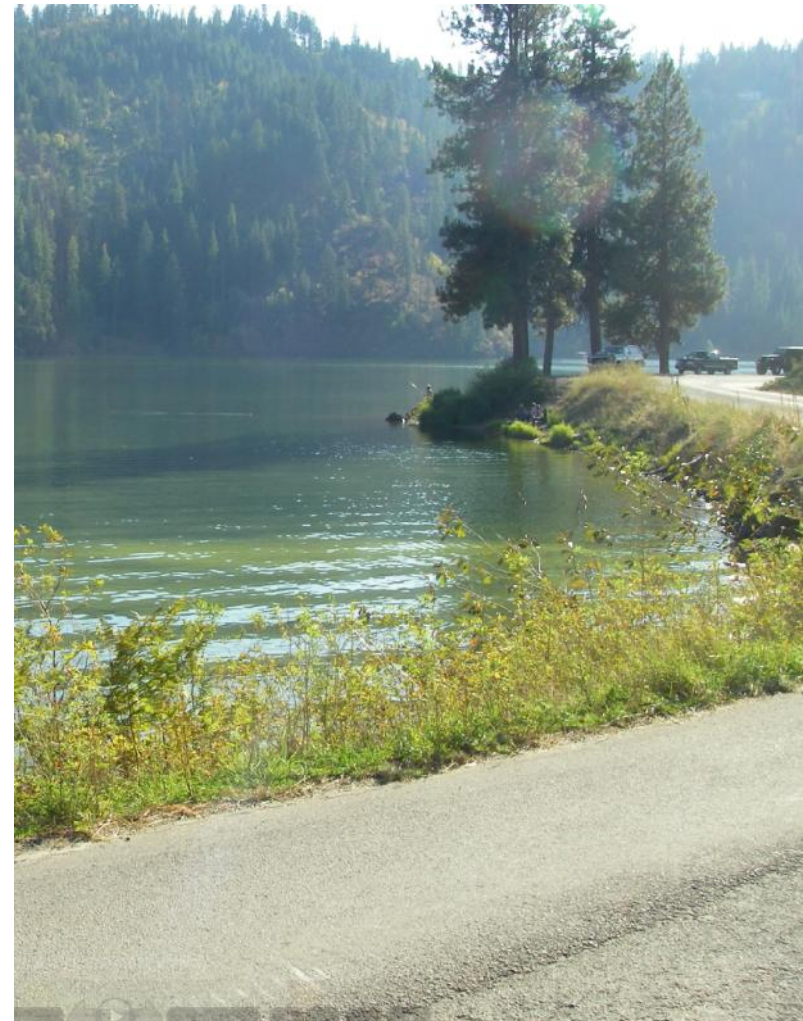
- Western states had a “top 10” warm spring
- An intense heatwave impacted the northwest in late June



# 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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2009/09/02