

Negotiated Rulemaking  
Docket No. 58-0102-1502

# Update to Copper Criteria for Aquatic Life Use

April 20, 2016



Idaho Department of Environmental Quality

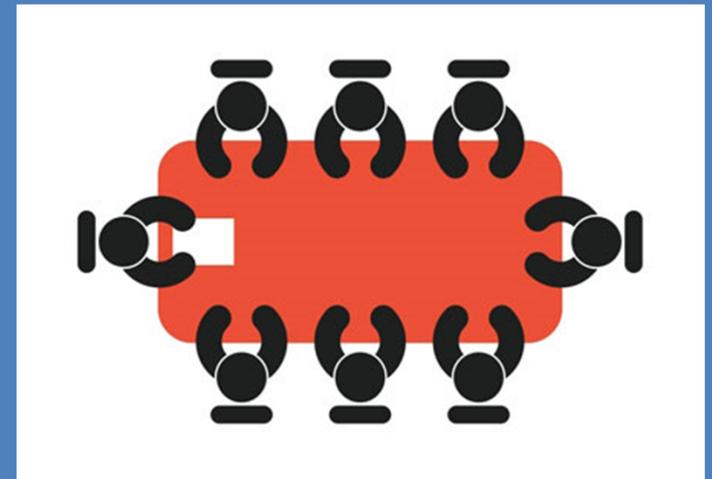
# Outline

- Review of previous rulemaking meetings
  - Review of comments received
- Missing parameters
- What's going on in Oregon?
- Options
  - Comparison of approaches
  - Critical conditions
- Guidance
- Timeline



# Review

- Two meetings to date:
  - 10/29/2015
    - Background on copper issues in Idaho, biotic ligand model (BLM), and why revising
    - Discussed implementation issues
      - Default criteria, default inputs



# Review

- Discussed multiple linear regression (MLR)
- Discussed monitoring requirements
- Chris Mebane - overview on how BLM compares to hardness-based criteria for  
—predicting toxicity
- Solicited input from committee

# Review



– 12/11/2015

- Reviewed comments from October meeting
  - Preference for BLM over MLR
- More discussion BLM implementation
  - Low-end (or minimum) of instantaneous water quality criteria (IWQC) distribution, fixed monitoring benchmark (FMB)
  - Default criteria vs. default inputs
  - How often to monitor?

# Review

- Recommendations
  - Use BLM, reference specific model version and date

# Review

- Recommendations
  - Until discharger/site has sufficient data to produce BLM criteria, we will implement BiOp interim measures to provide protection of aquatic life

NOAA	US F&WS
25% mixing zone for new or reauthorized discharges OR, show passage is unlikely to be impeded AND conduct biological monitoring.	Snails- no mixing zone for copper in occupied snail habitat  Fish-zone of passage

# Review

- Recommendations
  - Compliance, monitoring requirements, and default criteria are implementation issues that will be addressed through guidance

# Comments Received

- Association of Idaho Cities (AIC)
- Copper Development Association (CDA)/Windward
- EPA R10



# Association of Idaho Cities

- Recommends using BLM over MLR approach
- Support the collection of appropriate data from effluents and receiving stream to properly implement BLM



# CDA/Windward

- Provided significant comments regarding:
  - Sensitivity of BLM to DOC; appropriate even at high DOC
  - BLM toxicity predictions in soft waters; BLM is protective of sensitive species even in soft waters

# CDA/Windward

- BLM model reference – suggest update to most recent, remove reference to version number and instead stipulate that must generate criteria consistent with EPA's 2007 criteria



# CDA/Windward

- Fixed monitoring benchmark – clarified how FMB should be interpreted- to evaluate ambient copper concentrations
- Default criteria – recommend that even if adopted, should still allow for site-specific BLM criteria

# EPA R10

- Reference supplementary materials on implementation
  - Need for sufficient data to account for spatial and temporal variability
  - Define waterbody segments where criteria apply
  - Reconciling multiple IWQC
  - Estimating input parameters

# EPA R10

- For statewide approach: “it is particularly important for DEQ to provide binding default values for the *input parameters* to be used in the absence of ambient data.”

# EPA R10

- Recommend using default inputs from draft missing parameters document



# EPA R10

IDAHO ADMINISTRATIVE CODE  
Department of Environmental Quality

IDAPA 58.01.02  
Water Quality Standards

A		B Aquatic life		Human health for consumption of:				
(Number) Compound	<sup>a</sup> CAS Number	<sup>b</sup> CMC (µg/L)	<sup>b</sup> CCC (µg/L)	Water & organisms (µg/L)	Organisms only (µg/L)			
		B1	B2	C1	C2			
1	Antimony	7440360		5.6	c	640	c	
2	Arsenic	7440382	340 e	150 e	10	d	10	d
3	Beryllium	7440417				h		h
4	Cadmium	7440439	1.3 i	0.6 i		h		h
5a	Chromium III	16065831	570 i	74 i		h		h
5b	Chromium VI	18540299	16 e	11 e		h		h
6	Copper	7440508	17 i	11 i		h		h
7	Lead	7439921	65 i	2.5 i		h		h
8a	Mercury	7439976						

Note: In 2005, Idaho adopted EPA's recommended methylmercury fish tissue criterion for protection of human health. The decision was made to remove the old tissue-based aquatic life criteria and rely on the fish tissue criterion to provide protection for aquatic life as well as human health. Thus, current Idaho water quality standards do not have mercury water column criteria for the protection of aquatic life. While EPA approved the fish tissue criterion in September 2005, it had withheld judgment on Idaho's removal of aquatic life criteria. On December 12, 2008, EPA disapproved Idaho's removal of the old aquatic life criteria. The water column criteria for total recoverable mercury effective for federal Clean Water Act purposes are located at <http://www.deq.idaho.gov/epa-actions-on-proposed-standards>.

Recommend replacing reference criteria values in table

# EPA R10

- Implementation procedure development should be part of DEQs rulemaking procedure and rule submittal to EPA



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# Missing Parameters

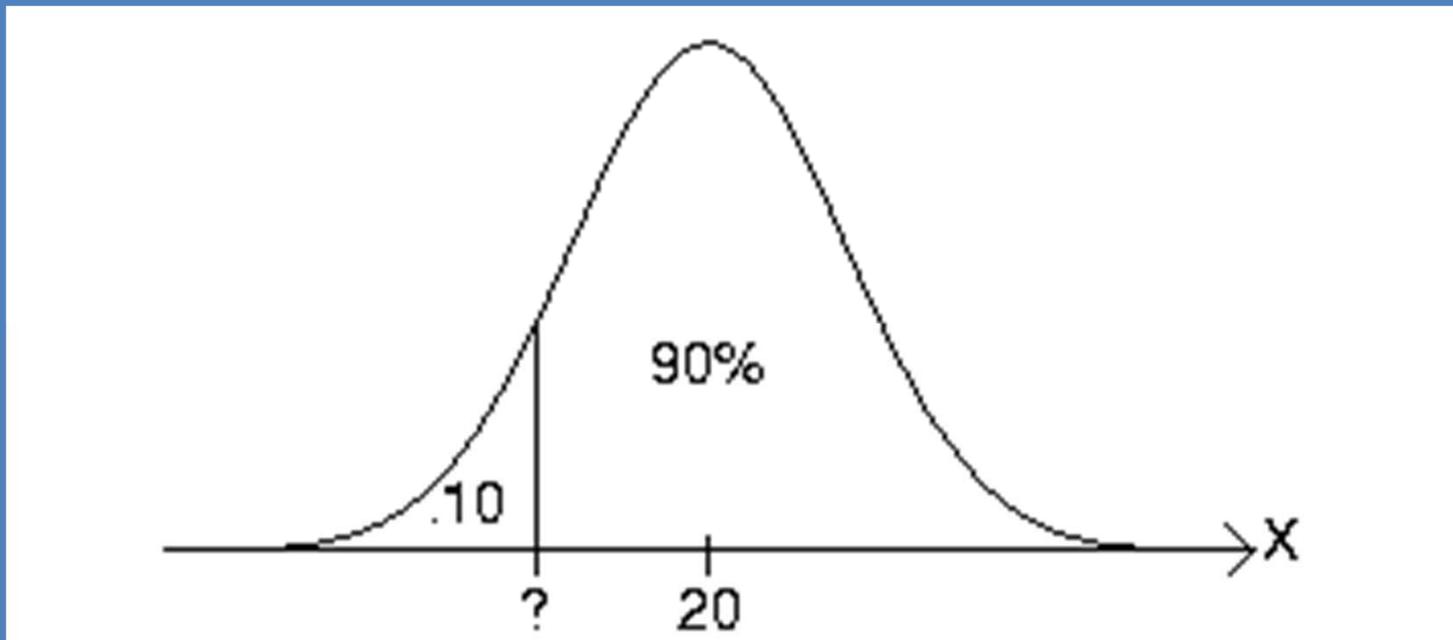
- Draft document released February 2016
- Recommends default *inputs* to be used when data are missing

**Draft Technical Support Document:  
Recommended Estimates for Missing  
Water Quality Parameters for  
Application in EPA's Biotic Ligand Model**



# Missing Parameters

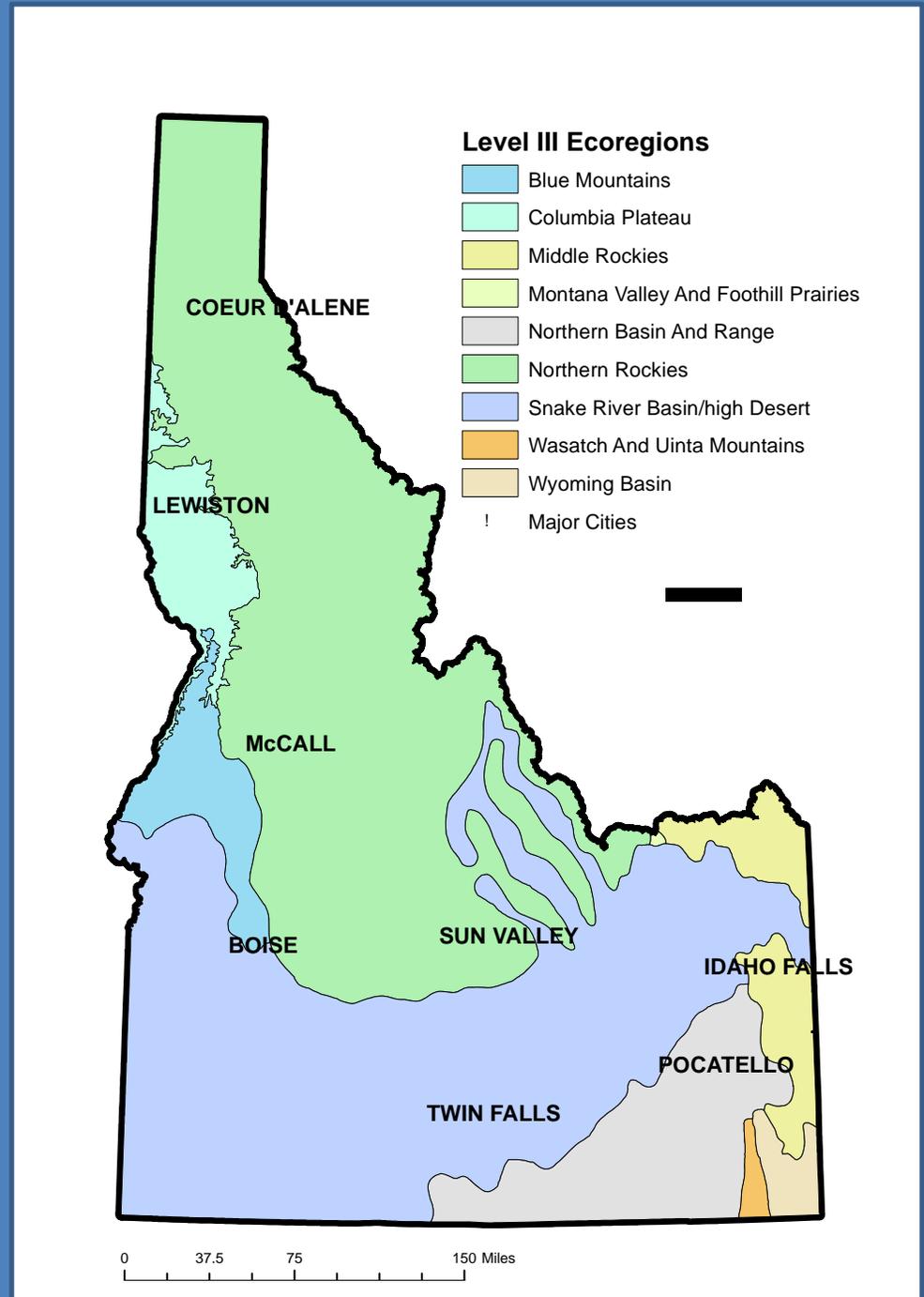
- Inputs are from low end of the distribution of data for each parameter, regardless of timing



# Missing Parameters

- Defaults based on Level III ecoregions
  - Geochemical ions
  - DOC
- Recommend measure pH and temperature

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# Missing Parameters

- Use stream order to refine ecoregional (Level III) defaults

**Table 8. Recommended 10<sup>th</sup> percentile conductivity, GIs, and hardness estimates for SO Group 1 through 3 (number of stations shown in parentheses if n<10)**

Ecoregion	Conductivity	Calcium	Magnesium	Sodium	Potassium	Alkalinity	Chloride	Sulfate	Hardness
1	58	6.0	0.8	1.3	0.1	44	0.6	1.1	18.28
2	74	8.8	2.8	3.9	0.5		2.8	3.3	33.48

**Table 9. Recommended 10<sup>th</sup> percentile conductivity, GIs, and hardness estimates for SO group 4 through 6 (number of stations shown in parentheses if n<10)**

Ecoregion	Conductivity	Calcium	Magnesium	Sodium	Potassium	Alkalinity	Chloride	Sulfate	Hardness
1	52	3.6	1.0	2.0	0.2	15	1.6	2.2	13.1
2									
3									

**Table 10. Recommended 10<sup>th</sup> percentile conductivity, GIs, and hardness estimates for SO group 7 through 9 (number of stations shown in parentheses if n<10)**

Ecoregion	Conductivity	Calcium	Magnesium	Sodium	Potassium	Alkalinity	Chloride	Sulfate	Hardness
1	111	12	3.4	4.3	0.8	56	2.3	6.3	43.94
2									
3									



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# Oregon...



# EPA Proposed Rule for Oregon

- **INPUTS:** use site-specific data to determine BLM criteria

# EPA Rule for Oregon

- OUTPUTS: 10<sup>th</sup> percentile of IWQCs for a site
  - BUT, if <10 data points are available
    - Use minimum IWQC

# EPA Rule for Oregon

- If inputs are unavailable, use defaults from DRAFT missing parameters document (DOC, Ca, Mg, Na, K, SO<sub>4</sub>, Cl, alkalinity)
  - 10<sup>th</sup> %ile of existing within each of Oregon's Level III ecoregions
  - 10<sup>th</sup> %ile by stream order within Level III ecoregion
- Measure pH, temperature



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# Options

- Four options for discussion and comment



# Options

1. Move forward with current preliminary draft rule – all implementation (including defaults) in guidance

*Aquatic life criteria for copper are derived from the Biotic Ligand Model, Version X.X.X. (June 2007).*

# Options

## 2. Model after EPA's Oregon proposal

- 10<sup>th</sup> percentile of IWQCs
- Use DRAFT missing parameters approach to produce conservative defaults when data are absent
- Measure pH and temperature

# Options

3. *Use low end of distribution of IWQC (10<sup>th</sup> %ile? Minimum?).*

Use conservative default criteria when data are absent

- Follow NOAA BiOp and expand to all waters (Appendix C)

*Table 3. Ranges of chronic copper criterion concentrations estimated for critical late summer/fall baseflow conditions in subbasins within the range of anadromous salmonids in the Snake River basin, Idaho.*

Subbasin	Common subbasin geologic characteristics	Critical late-summer Cu benchmark concentration (µg/L)	Based upon EPA's 2007 Cu chronic criterion (CCC) using data collected or estimated using:
Selway, Lochsa, MF Clearwater R	Granitic or intrusive rocks from Idaho Batholith or Precambrian metamorphic rocks	0.6	St Joe River at Red Ives, 9/14/2007; SF Coeur d'Alene R at Pinehurst, 9/10/2007; NFCDA Fig 25
SF Clearwater River	Idaho Batholith	1	SF Clearwater at Stites Extrapolated using low conductivity measured in undisturbed streams in the Salmon R basin (Ott and Maret 2003), ~30 µs/cm, pH 6.9, using DOC of 1 mg/L and then estimating major ions with regression equations from streams in Coeur d'Alene R with similarly low conductivity
MF and SF Salmon and tributaries	Idaho Batholith	1	
Upper Salmon R	Idaho Batholith and Challis volcanics	3	Snake River (Fig. 24); Johnson Creek at Yellow Pine, 10/10/2007
Upper Salmon R tributaries	Challis volcanics	3	Assumed similar to Panther Creek
Panther Creek	Challis volcanics and Idaho Batholith	3	Minimum BLM=CCC calculated for low-flow, low DOC conditions from a 1994 dataset (Maest <i>et al.</i> 1995)
Lemhi and Pahsimeroi Rivers	Tertiary sediments from ancient lake bottoms	6	Pahsimeroi at Ellis, 9/18/2007
Lower Salmon (downstream of SF Salmon)	Diverse	3	Salmon River at White Bird, 9/27/2007
Snake River	Diverse	6	Minimum BLM calculated for Snake River at mouth (Burbank, WA)

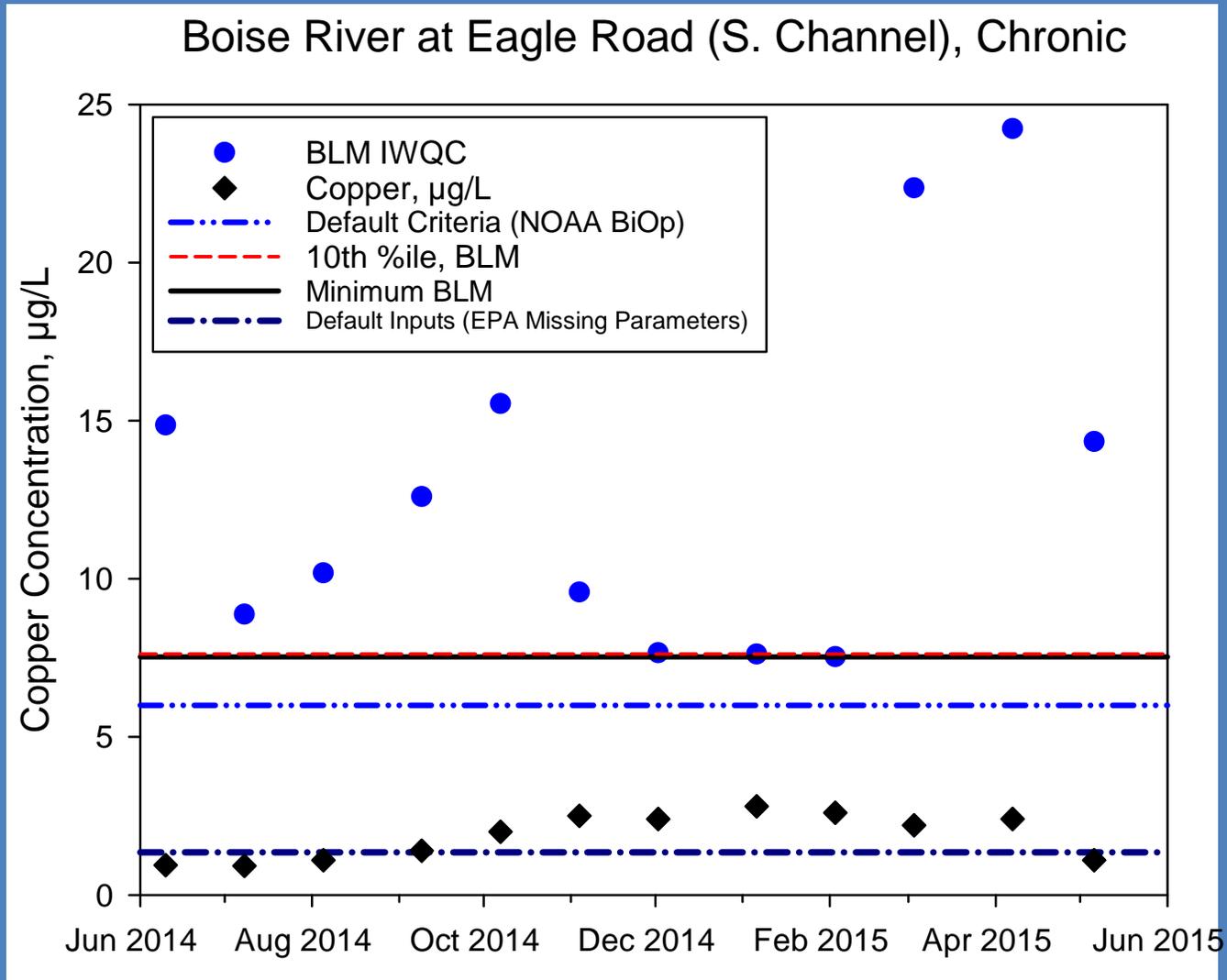
# Options

4. *Use low end of distribution of IWQC (10<sup>th</sup> %ile? Minimum?).*

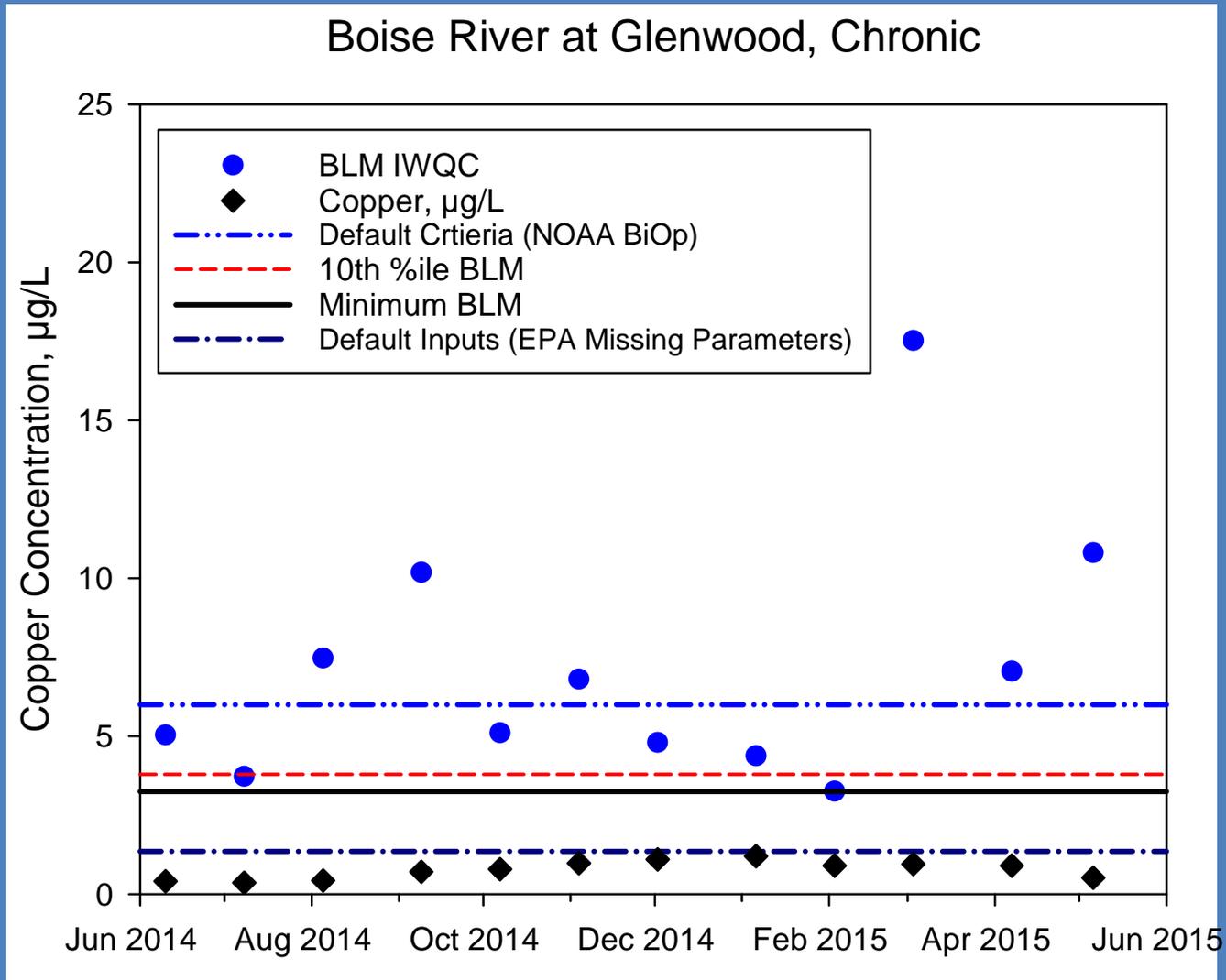
Collect statewide data to identify critical conditions throughout state

- Develop conservative default criteria to use when data are absent

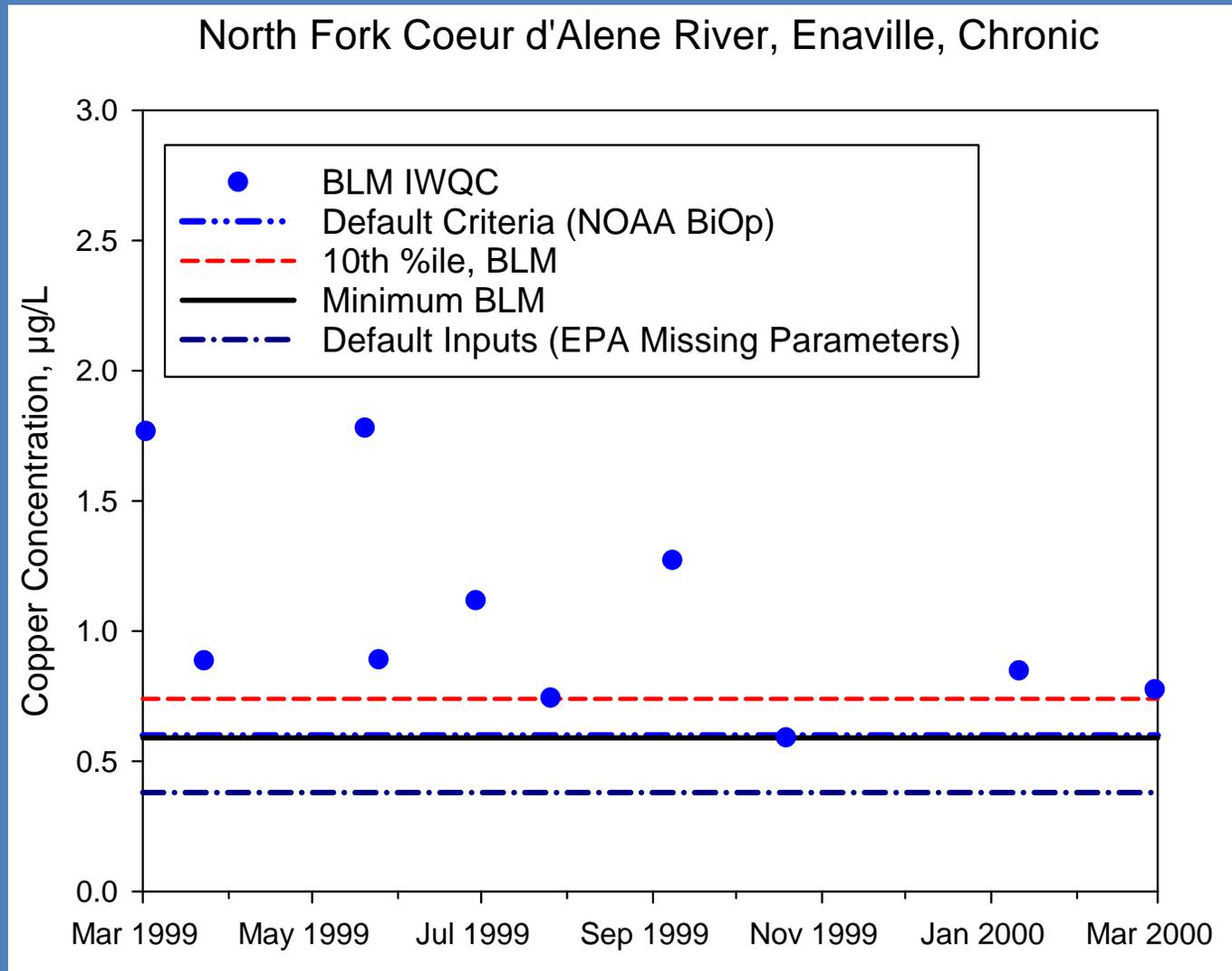
# Comparison of Approaches



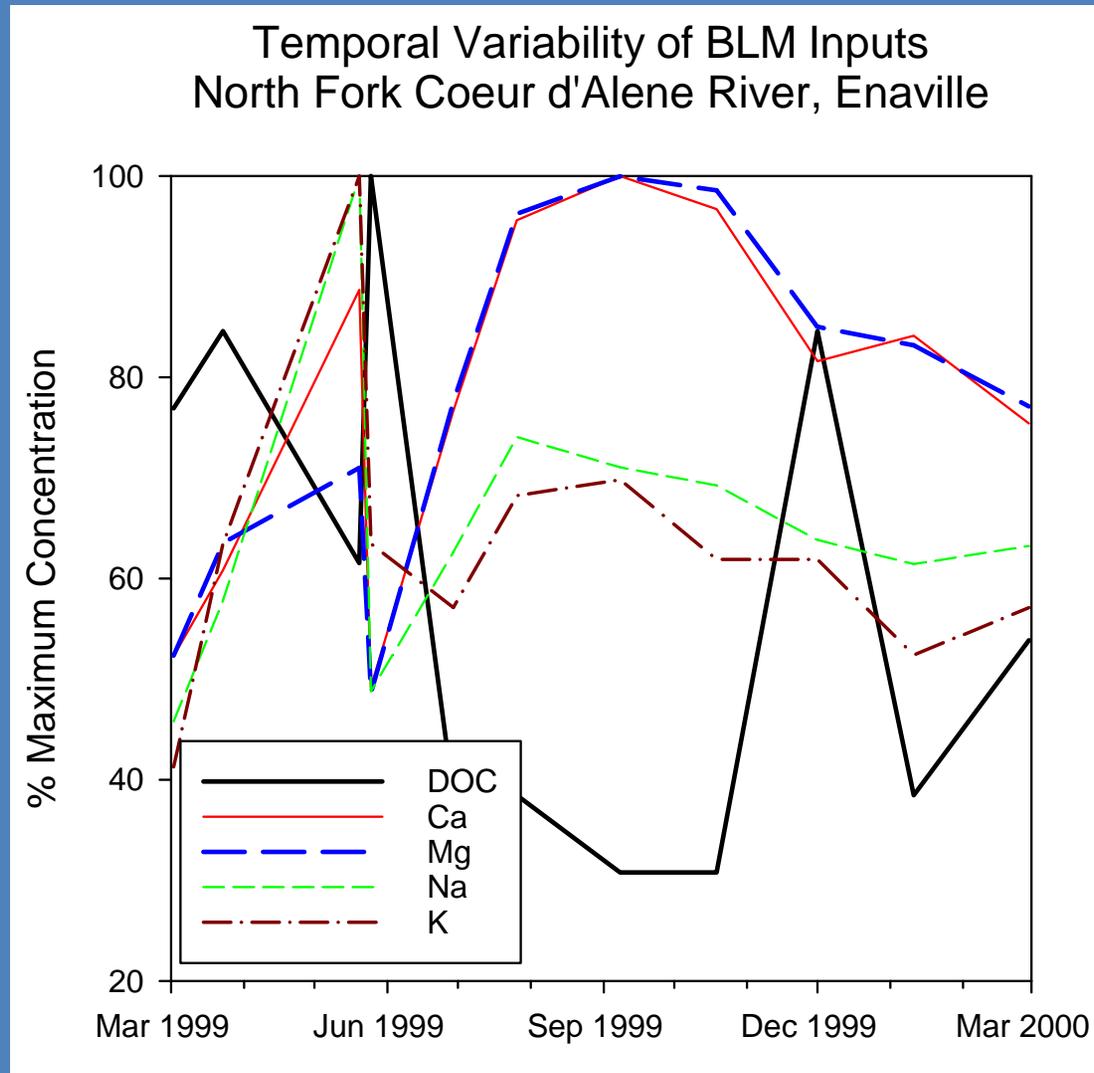
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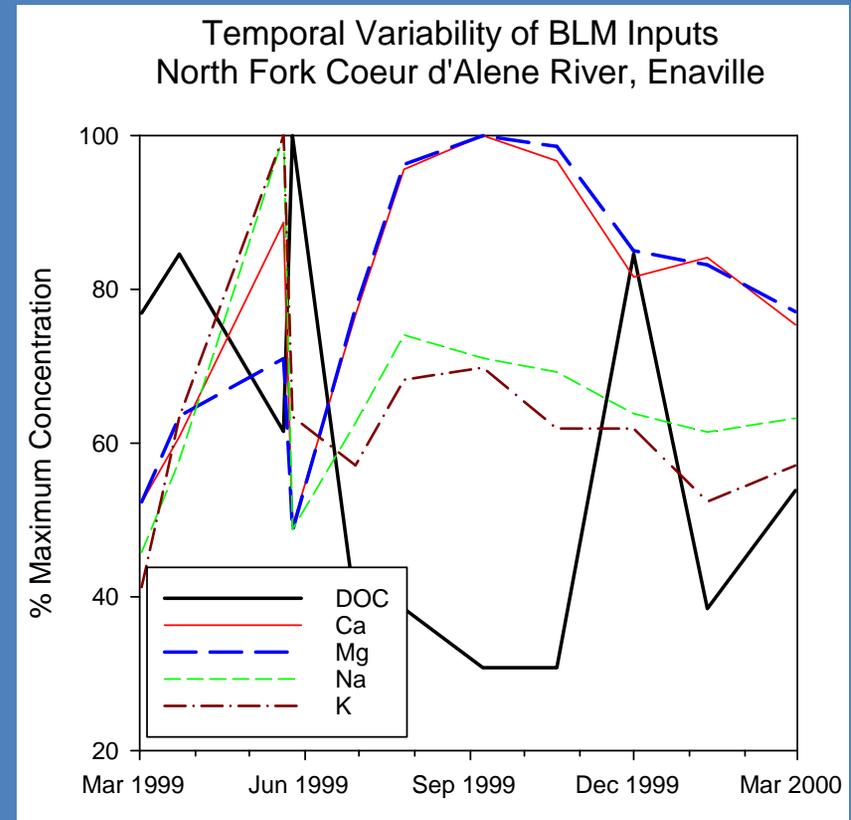


# Comparison of Approaches



# Critical Conditions

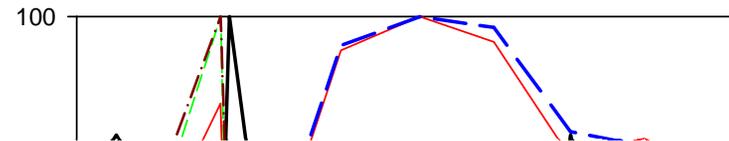
- Generally, critical conditions occur during late summer baseflow conditions (DOC is lowest)



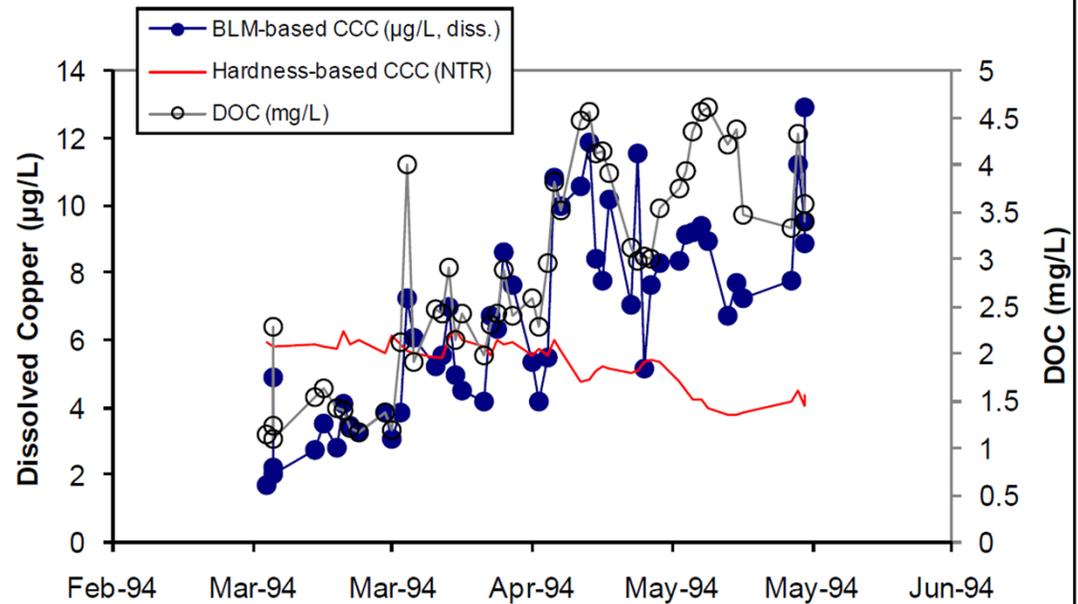
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Temporal Variability of BLM Inputs  
North Fork Coeur d'Alene River, Enaville



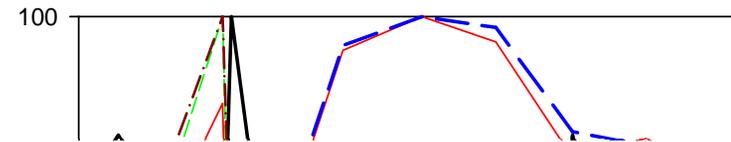
Panther Creek d/s of Blackbird Creek



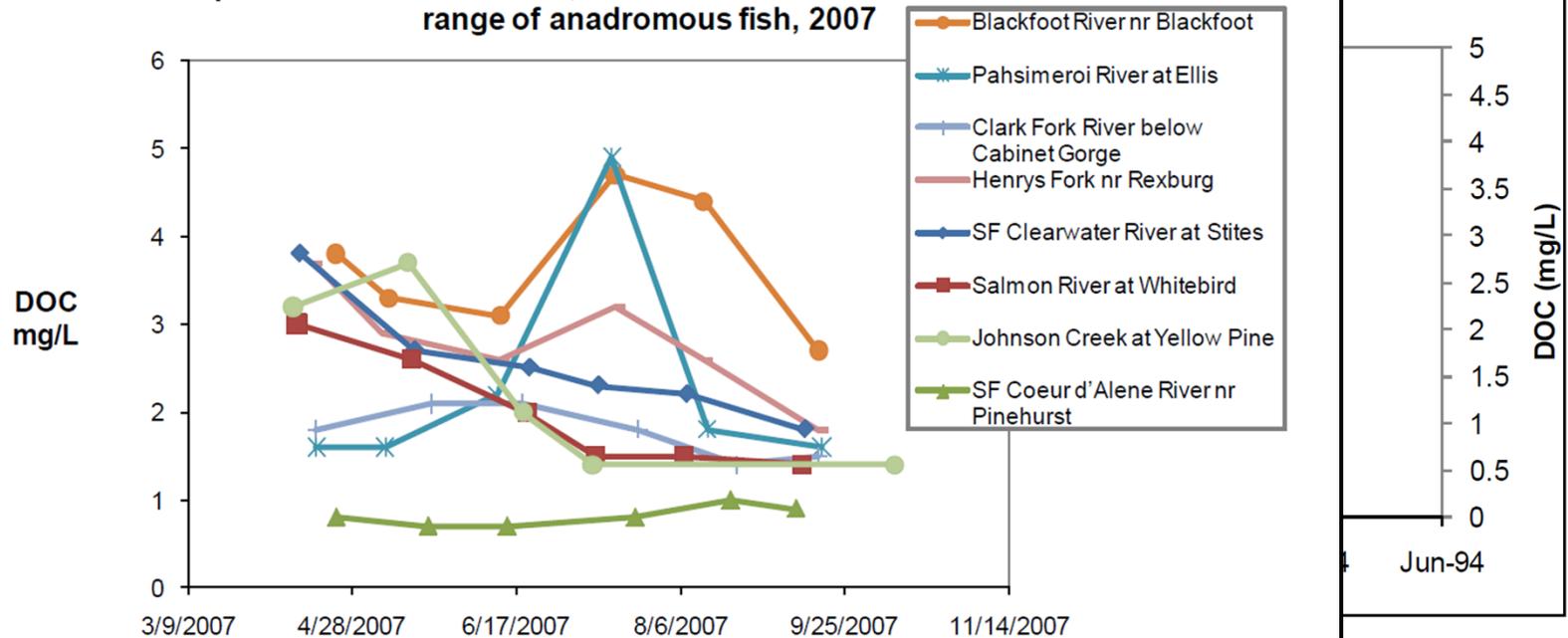
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Temporal Variability of BLM Inputs  
North Fork Coeur d'Alene River, Enaville



DOC patters in Idaho streams, considered relevant to streams with the range of anadromous fish, 2007



# Questions of pH

- pH is highly variable at any given site-  
seasonally, daily, hourly
  - Can predict minimum, choose reasonable minimum for most waters
  - 434 BURP sites where pH was measured, minimum was 6.45, 10<sup>th</sup> %ile was 7.4

# Summary

- Option 1. Preliminary draft rule (reference BLM only): all implementation left as guidance
  - Does not provide certainty to stakeholders, dischargers, and regulators
  - Provides greatest flexibility

# Summary

- Option 2. Use DRAFT missing parameters to develop defaults
  - Missing parameters are DRAFT and may change
  - Highly conservative and are likely overprotective in most cases
  - Still requires pH and temperature data

# Summary

- Option 3. NOAA BiOp default criteria
  - Uses surrogates; extrapolation from other waters based on likely similarity
  - Would require further refinement to extrapolate to waters outside range of anadromous fish
  - Provides default criteria; additional certainty and ease of implementation, would not require any data collection to implement

# Summary

- Option 4. Monitoring to develop default criteria
  - Relies on characterization of critical conditions
  - Requires monitoring up front for development, but then provides for default criteria
  - Will require significant analysis to determine appropriate monitoring locations and how to apply to other waters
  - May alter timeline and prevent meeting May 2017 deadline from RPAs
  - Will provide Idaho-specific data and most closely resemble actual conditions



# Guidance Development Process

- Where we go from here depends upon comments received from this rulemaking



# Guidance

- Guidance determined by direction
- Would like to develop with stakeholders
- Will determine how criteria are implemented

# Guidance

- Next meeting scheduled for June 2
  - Initiate guidance development
  - Identify sites for monitoring

# Timeline

- Dependent on direction
  - Initial goal – May 2017
  - May delay depending on option selected



# Comments

- Please provide written comments by May 9, 2016
  - Options for moving forward
  - Timeline

# Comments

- Submit all written comments by mail, fax or e-mail to:

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# Questions



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