Nutrient Work Group

September 14, 2022

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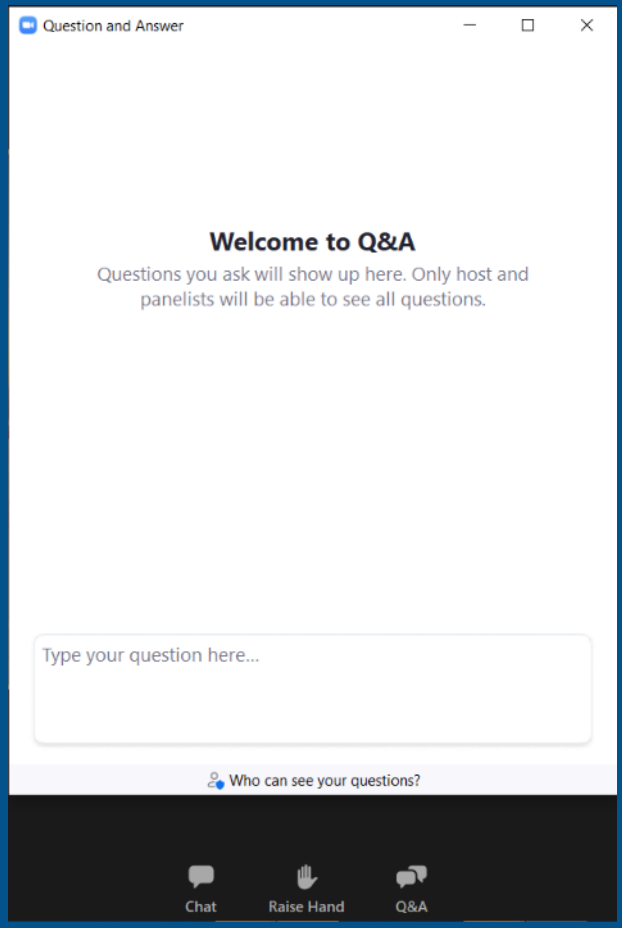
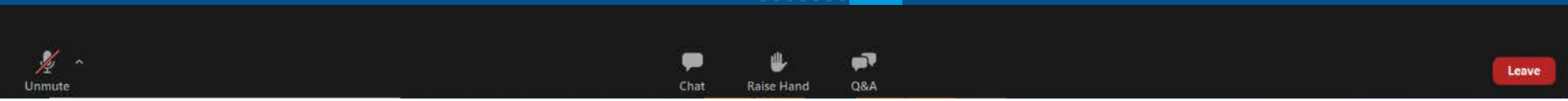
Welcome!

- This meeting has been converted to a webinar
- NWG members will be panelists
- Members of the public can raise their hand or use the Q&A feature to ask questions during the public comment portion of the meeting
- *9 raises your hand if you're on the phone
- State your name and affiliation before providing your comment





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Agenda

Meeting Goal: Discuss updated response variables and thresholds

Preliminaries

- Nutrient Work Group Roll Call

DEQ Updates

- Action Items from August 24 Meeting

AMP Process

- Addressing EPA's Technical Comments on Response Variables and Thresholds
- Initial Discussion of Processes for Translation of the Narrative and Updating the Nutrient Assessment Method

Public Comment & Close of Meeting

- Public Comment
- Next Meeting & Potential Schedule Changes

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Roll Call

Nutrient Work Group Members

Interest Group	Representative	Substitute
Point Source Discharger: Large Municipal Systems (>1 MGD)	Louis Engels	
Point Source Discharger: Middle-Sized Mechanical Systems (<1 MGD)	Shannon Holmes	
Point Source Discharger: Small Municipal Systems with Lagoons	Rika Lashley	
Point Source Discharger: Non-POTW	Alan Olson	
Municipalities	Kelly Lynch	
Mining	Tammy Johnson	
Farming-Oriented Agriculture	Rachel Cone	
Livestock-Oriented Agriculture	Raylee Honeycutt	
Conservation Organization - Local	Kristin Gardner	
Conservation Organization – Regional	Sarah Zuzulock	Stephanie Bonucci
Conservation Organization – Statewide	David Brooks	
Environmental Advocacy Organization	Guy Alsentzer	
Water or Fishing-Based Recreation	Wade Fellin	
Federal Land Management Agencies	Andy Efta	
Federal Regulatory Agencies	Tina Laidlaw	
State Land Management Agencies	Jeff Schmalenberg	
Water Quality Districts / County Planning Departments	Nick Banish	
Soil & Water Conservation Districts – West of the Continental Divide	Samantha Tappenbeck	
Soil & Water Conservation Districts – East of the Continental Divide	Dan Rostad	
Wastewater Engineering Firms	Scott Buecker	
Timber Industry	Julia Altemus	

Action Items

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A Watershed Approach

- EPA defines a "watershed approach" as:
  A coordinated framework for environmental management that focuses public and private efforts on the highest priority problems within hydrologically-defined geographic areas taking into consideration both ground and surface water flow

- DEQ is following this approach by:
  - Using HUC boundaries for AMP watersheds
  - Including a stakeholder process
  - Basing the process on strong science and data

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Remaining Topics to Discuss

- **AMP process**
- **TMDL – AMP interaction**
- Addressing EPA's technical comments in August 2021 letter on response variables and thresholds
- Translation of the narrative for all CWA programs
- AMP – MPDES permit interaction
- Reasonable potential analysis
- Nutrient assessment method process
- Protection of downstream uses
- Revised guidance document
- Final rule language
- Case study

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Response Variables & Thresholds

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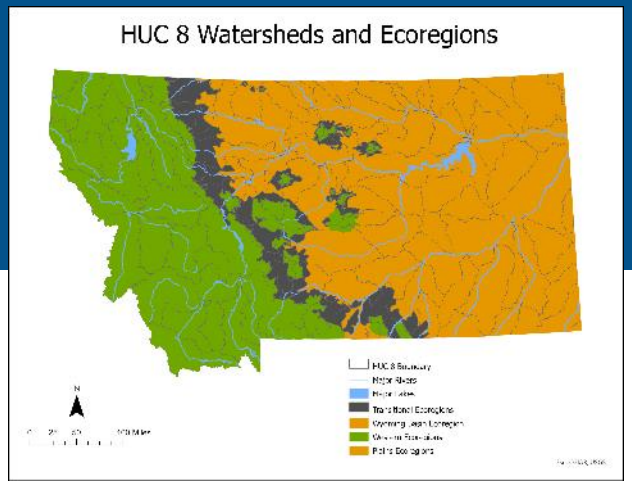
Proposed Narrative Nutrient Standards Translator for Wadeable Streams and Medium Rivers

The DRAFT translator is a matrix of causal (nutrient) and response variables. Specified response variables and thresholds are associated with specific beneficial uses and regions of the state. "**X**" indicates the variable applies. If marked with X, variable would be required to be measured at monitoring sites in an AMP monitoring plan.

			Response Variable (threshold)				
Region	**Associated Benefical Use**	**Nutrient Causal Variables (*see* nutrient concentration ranges, by ecoregion)**	**DO Delta**	**Benthic Chl*a* ; AFDW**	**% filamentous algae bottom cover**	**Macroinvertebrates**	***Notes***
Western and transitional ecoregions	Recreation	**X**		**X** (150 mg Chla/m^2; 35 g AFDM/m^2)	**X** (30% cover)		
Western and transitional ecoregions	Aquatic Life	**X**	**X** (TBD; probably ~3.0 or less)			**X** (metric, threshold TBD)	
Western and transitional ecoregions, high gradient streams (>1% slope)	Aquatic Life	**X**				**X** (metric, threshold TBD)	*Slope break based on findings in 3/19/2014 DEQ study (memo)*
Eastern ecoregions	Aquatic Life	**X**	**X** (TBD; probably ~5.0)			**X** (metric, threshold TBD)	



Data to be collected during Applicable growing seasons

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Ecoregional Ranges*

Ecoregional Zone	Ecoregion (Level III)	Ecoregion (Level IV)	Maximum Recommended Range	
			Total Phosphorus (µg/L)	Total Nitrogen (µg/L)
Western	Northern Rockies (15)	all	20 - 40	210 - 1,210
Western	Canadian Rockies (41)	all	23 - 62	325 - 821
Western	Idaho Batholith (16)	all	20 - 62	210 - 718
Western	Middle Rockies (17)	all except 17i	20 - 40	210 - 1,210
Western	Middle Rockies (17)	Absaroka-Gallatin Volcanic Mountains (17i)	61 - 105[b]	Use values from the lower end of the range for the Middle Rockies (17)
Western (transitional)	Northwestern Glaciated Plains (42)	Sweetgrass Upland (42l), Milk River Pothole Upland (42n), Rocky Mountain Front Foothill Potholes (42q), and Foothill Grassland (42r)	23 - 80[c]	445 - 775
Western (transitional)	Northwestern Great Plains (43)	Non-calcareous Foothill Grassland (43s), Shields-Smith Valleys (43t), Limy Foothill Grassland (43u), Pryor-Bighorn Foothills (43v), and Unglaciated Montana High Plains (43o)[a]	20 - 41[d]	439 - 1,125
Eastern	Northwestern Glaciated Plains (42)	all except those listed above for 42	70 - 150	540 - 1,830
Eastern	Northwestern Great Plains (43) and Wyoming Basin (18)	all except for those listed above for 43, and 43c below	70 - 150	540 - 1,830
Eastern	Northwestern Great Plains (43)	River Breaks (43c)	None recommended	None recommended

[a] For the Unglaciated High Plains ecoregion (43o), the range applies only to the polygon located just south of Great Falls, MT.

[b] Based on the 25th and 75th percentiles of the natural background concentrations in this level IV ecoregion.

[c] Lower end based on streams' origins in the Canadian Rockies; upper end based on 75th percentile of natural background for these ecoregions.

[d] Lower end based on similarity to Middle Rockies, upper end based on Elk Creek reference site.

*Subject to final review and refinement prior to rulemaking

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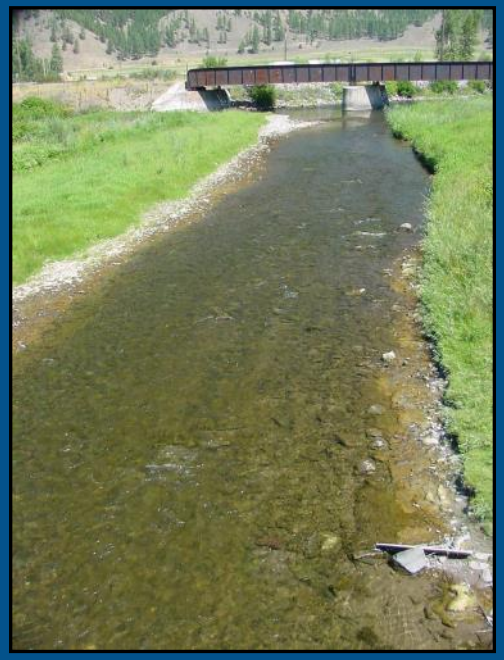
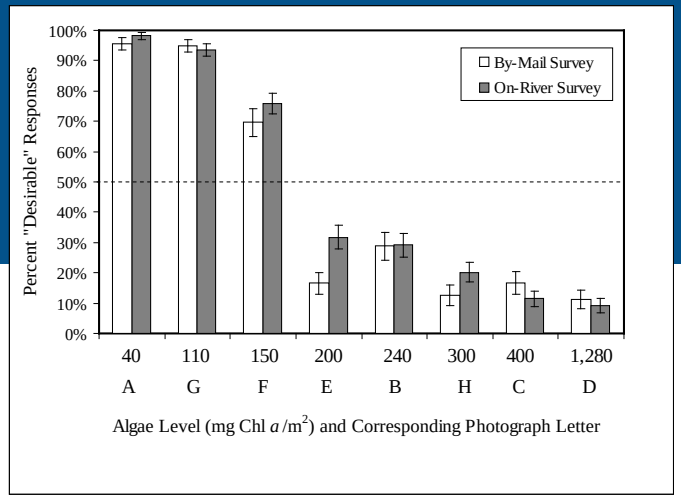
Attached algae quantified as milligrams of chlorophyll *a* per square meter of streambed (Chl*a*/m^2), AFDW (g/m^2), and % cover

40 mg Chl*a*/m^2
10 g/m^2
~5% bottom cover



120 mg Chl*a*/m^2
~32 g/m^2
~30% cover

300 mg Chl*a*/m^2
~120 g/m^2
>60% cover



From Suplee *et al.* (2009). JAWRA 45: 123-140.

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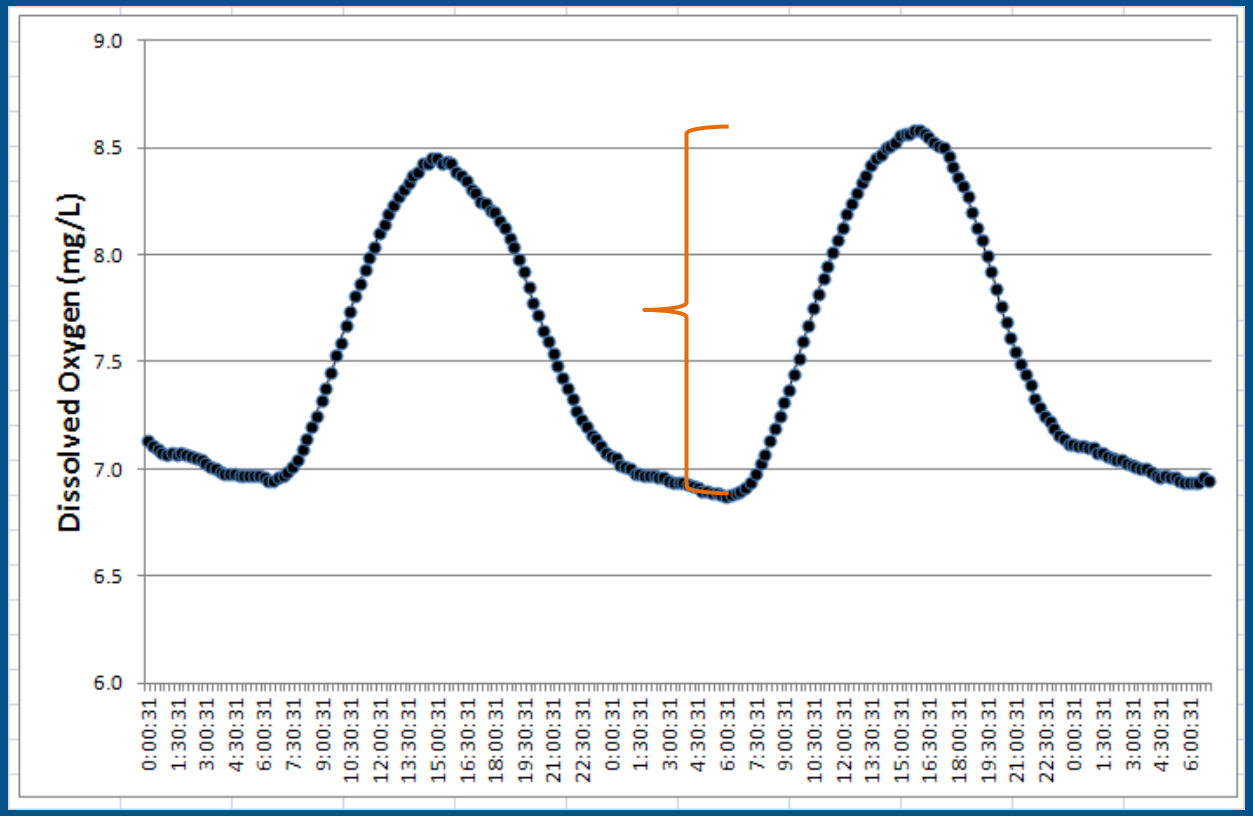
Dissolved Oxygen Delta (Daily Change): Wadeable Streams and Medium Rivers



Dissolved Oxygen Delta:
Daily High minus Daily Low

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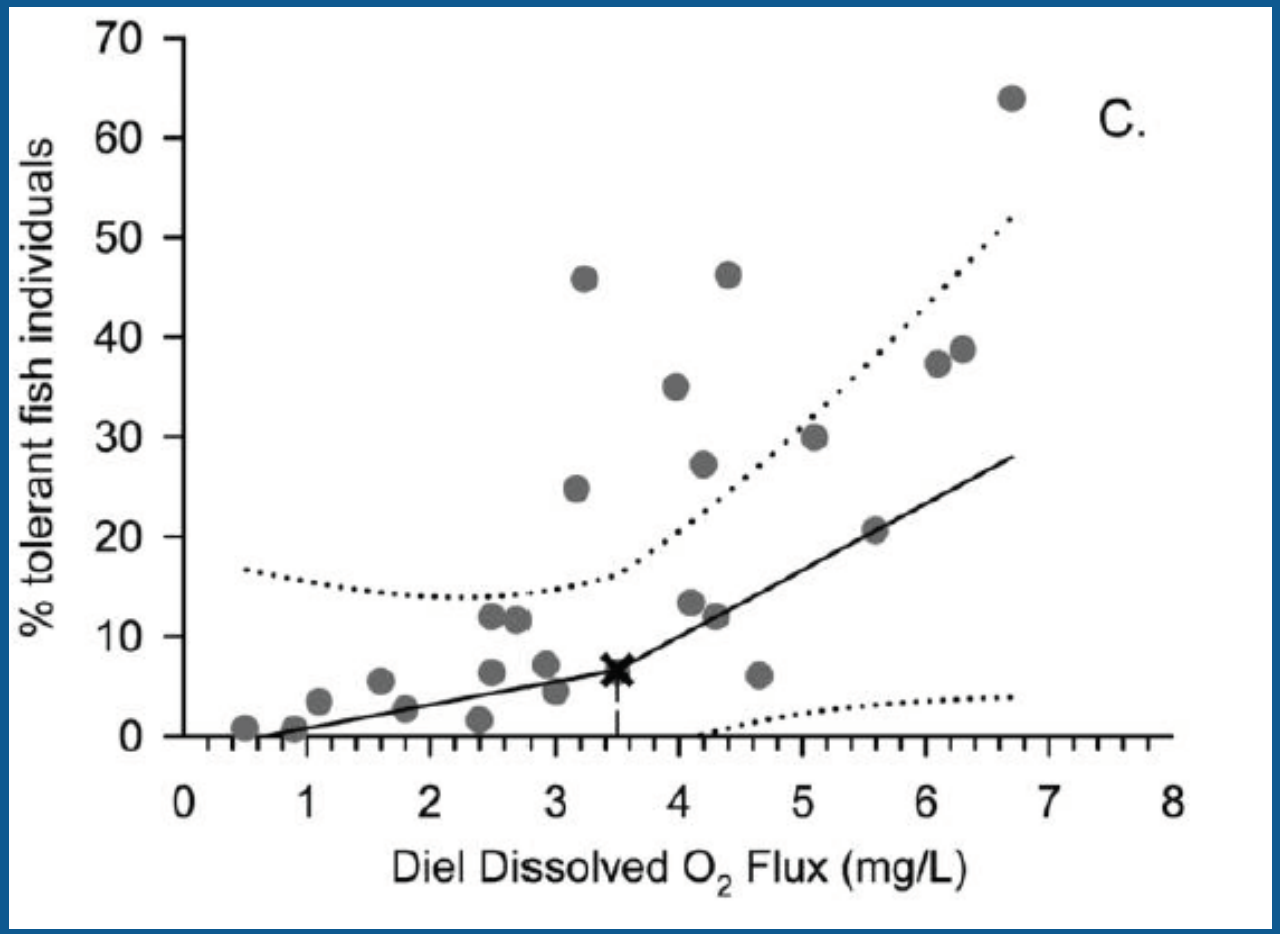

Excessive DO delta is associated with undesirable changes in aquatic life (e.g., loss sensitive fish species in Minnesota)

Figure from Heiskary and Bouchard (2015), river nutrient study.

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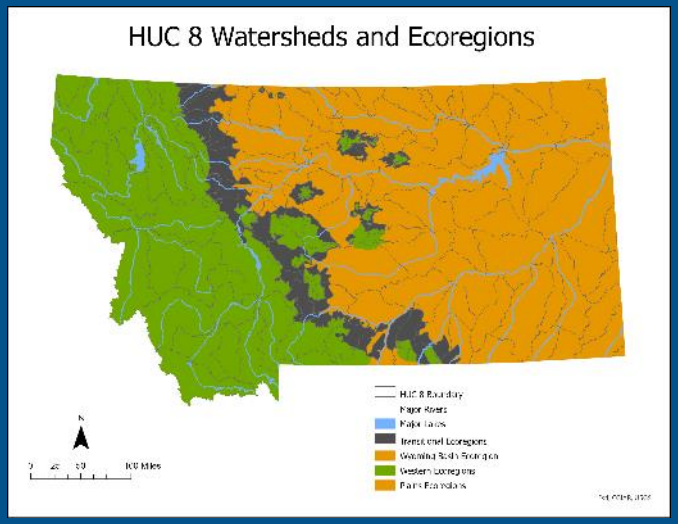
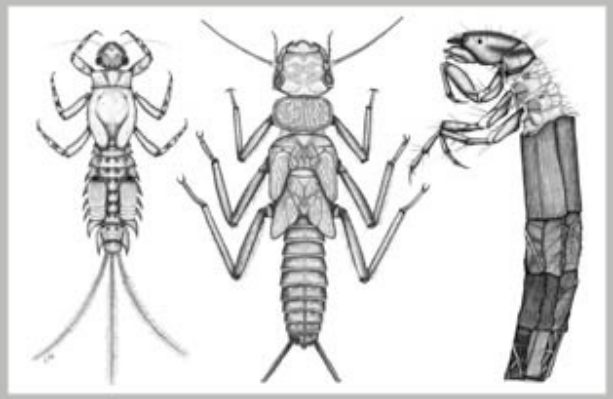
Example DO Delta Thresholds

Entity	Dissolved Oxygen Delta	Use Protected/Instream Value
MT: Assessment Method (2016)	5.3	Non-salmonid fishes and associated aquatic life
Minnesota PCA (2015)	3-4.5	Aquatic life; vary by region (4.5 similar to E. MT ecoregions)
Ohio EPA (2015)	6.5	Trophic Condition Status, per Stream Nutrient Assessment Procedure



Wadeable Streams & Medium Rivers: Macroinvertebrates



- Direct measure of the aquatic life beneficial use; respond to eutrophication in weeks/months; easy to collect

- Responsive to eutrophication in western and eastern Montana
  - HBI part of nutrient assessment method since 2010
  - Plains metric responded to nutrient additions in eastern MT stream nutrient-dosing study (more..)

  - Different metrics and threshold needed for each part of the state
    - Metric & threshold identification would be included as part of this work

    - Goal is select the best metric responding to eutrophication for each major geographic zone

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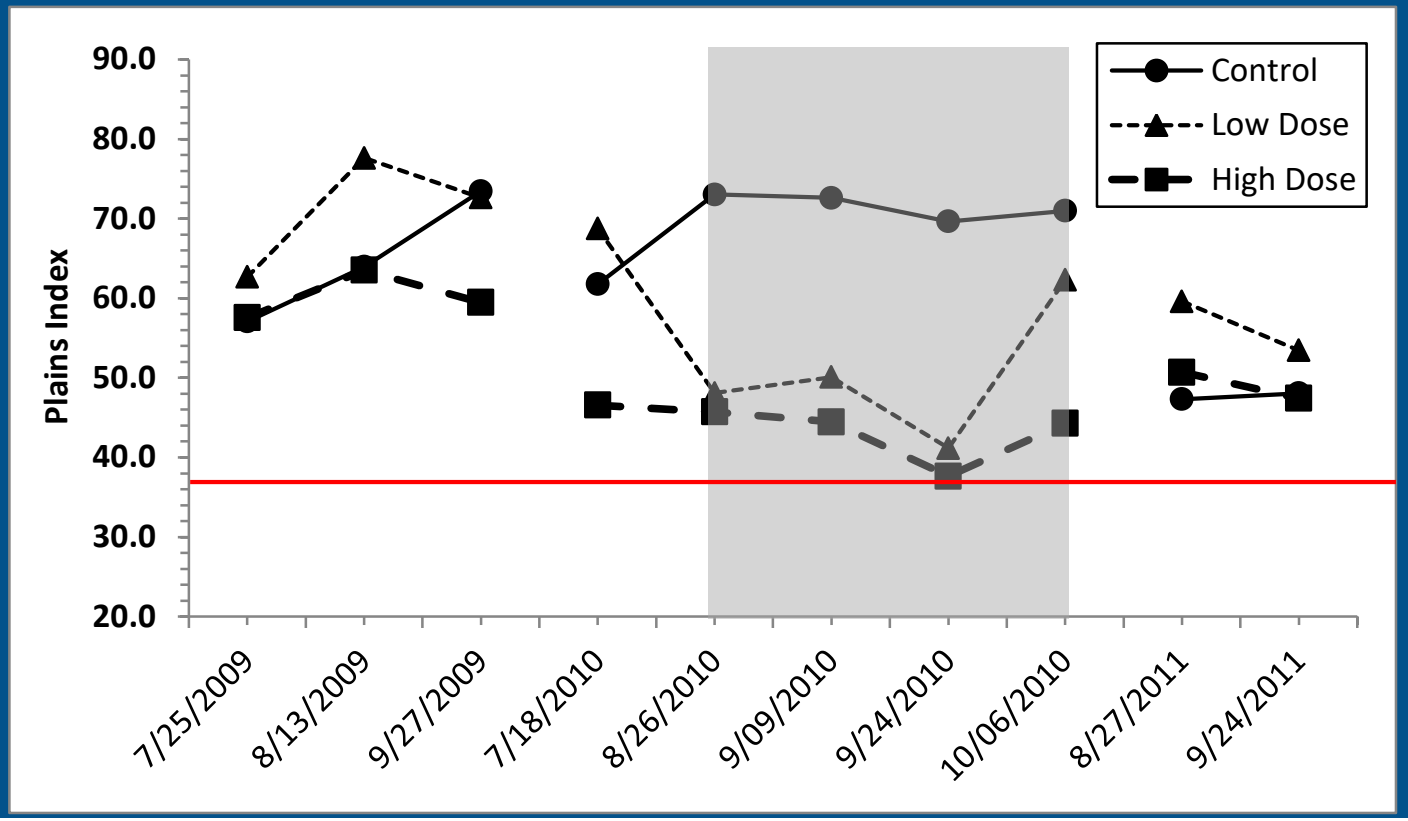
Macroinvertebrate metrics responded to a controlled eutrophication study in an eastern Montana stream



From Suplee *et al.* 2016. Whole Stream Nitrogen and Phosphorus Addition Study. MT DEQ.

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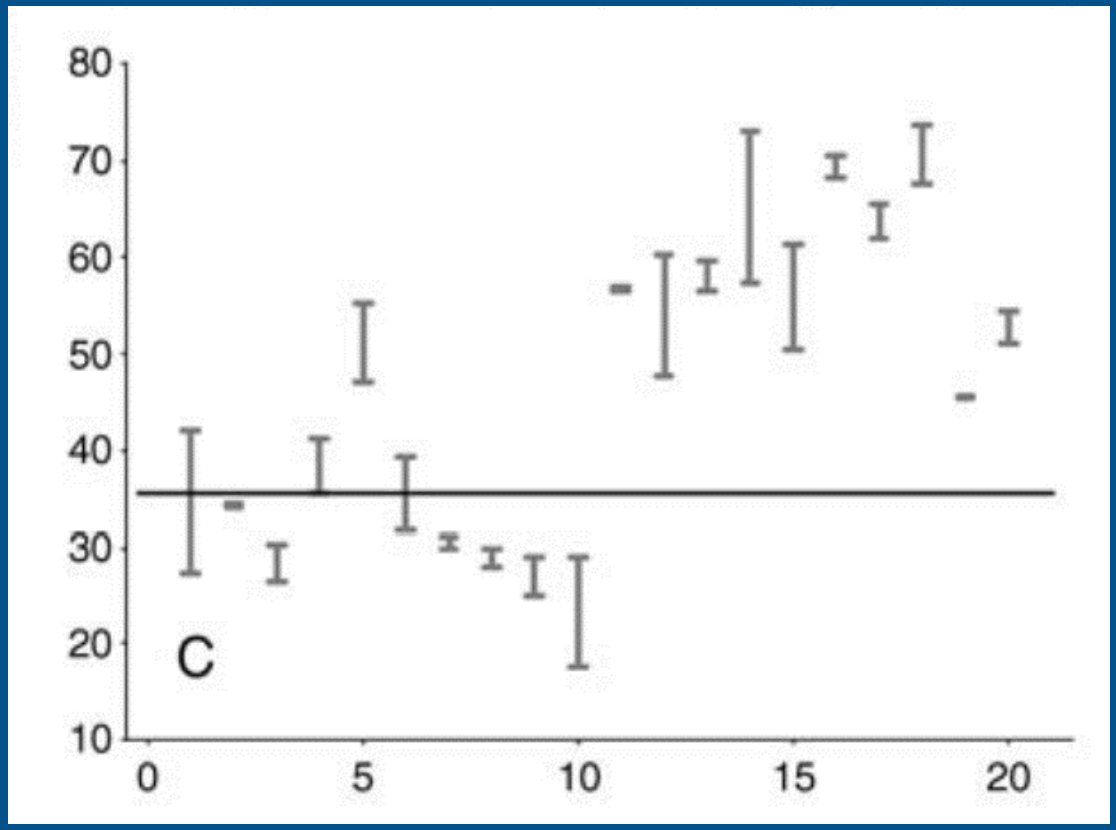
Macroinvertebrates can provide consistent assessment results (example: Plains MMI)



From Stribling *et al.* (2006). Precision of benthic macroinvertebrate Indicators of stream condition in Montana. J. N. Am. Benthol. Soc. 27: 58-67

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In the translator, if nutrient concentrations are high but the response variables are acceptable, then the standard is met

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Some combinations of results will be harder to interpret (e.g., low nutrient concentrations, acceptable DO delta, but poor macroinvertebrates score).
-A decision framework will be needed to address these situations

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Translation of the Narrative for CWA Programs

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Updating the Nutrient Assessment Method

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PUBLIC COMMENT

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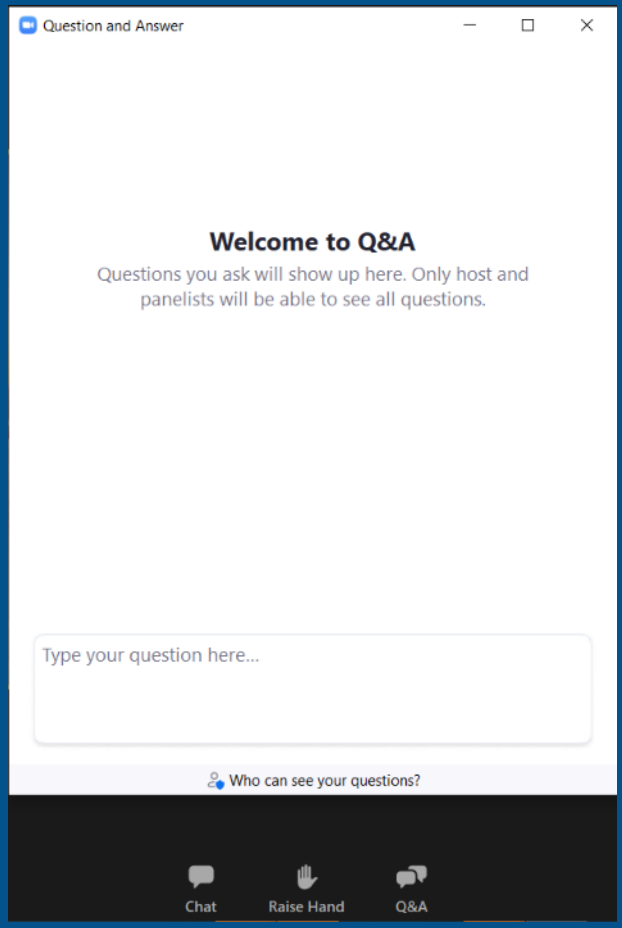
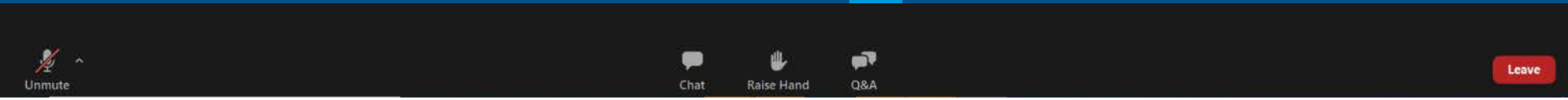
Questions/ Comments

- Raise hand (*9 if on the phone) or type questions into the Q&A
- DEQ will unmute you if you wish to provide your comment orally
- If calling by phone, press*6 to unmute
- State your name and affiliation before providing your comment





Next Meetings

Next Meeting

- Wednesday, September 28, 2022, 9 – 11 a.m.

November Meeting Changes

- Wednesday, November 9 – Still scheduled
- Wednesday, November 16 – NEW
- Wednesday, November 23 – Cancelled due to holiday

Thanks for Joining Us

Contact:
Christina Staten
CStaten@mt.gov

To submit comments or questions

Submit Comments or Questions

https://deq.mt.gov/water/Councils

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