

NUTRIENT WORK GROUP TECHNICAL SUBCOMMITTEE

MEETING SUMMARY

AUGUST 10, 2021

1:30 p.m.

Hybrid Meeting: DEQ Room 45 and Zoom

ATTENDANCE: NUTRIENT WORK GROUP TECHNICAL SUBCOMMITTEE MEMBERS

Representative & Affiliation	Representing
Michael Suplee DEQ Water Quality Standards & Modeling	DEQ Co-chair
Rainie DeVaney DEQ Surface Water Discharge Permitting	DEQ Co-chair
Dave Clark HDR	Point Source Discharger: Large Municipal Systems (>1 MGD)
Amy Deitchler (sub. for Rika Lashley) Great West Engineering	Point Source Discharger: Small Municipal Systems with Lagoons
Shane LaCasse CSH	Point Source Discharger: Non-POTW
Kelly Lynch (sub. for Amanda McInnis) Montana League of Cities and Towns	Municipalities
Pete Schade Lewis and Clark Water Quality Protection District	Water Quality Districts / County Planning Departments
Matt Wolf Sibanye Stillwater	Mining
Stephanie Bonucci (sub. for Sarah Zuzulock) GNA Technical Advisor	Conservation Organization: Regional
	Conservation Organization: Statewide
Guy Alsentzer Upper Missouri Waterkeeper	Environmental Advocacy Organization
Guy Alsentzer (sub. for Wade Fellin) Upper Missouri Waterkeeper	Water or Fishing-Based Recreation
Andy Efta U.S. Forest Service	Federal Land Management Agencies
Tina Laidlaw U.S. Environmental Protection Agency	Federal Regulatory Agencies
Coralynn Revis HDR	Wastewater Engineering firms
Julia Altemus MT Wood Products Association	Timber Industry

NOT IN ATTENDANCE: NUTRIENT WORK GROUP TECHNICAL SUBCOMMITTEE MEMBERS

Representative & Affiliation	Representing
Vacant	Point Source Discharger: Middle-Sized Mechanical Systems (<1 MGD)
John Youngberg Montana Farm Bureau	Farming-Oriented Agriculture
Jay Bodner Montana Stockgrowers Association	Livestock-Oriented Agriculture
Kristin Gardner Gallatin River Task Force	Conservation Organization: Local
Jeff Schmalenberg MT Dept. of Natural Resources and Conservation	State land Management Agencies
Samantha Tappenbeck Flathead Conservation District	Soil & Water Conservation Districts – West of the Continental Divide
Dan Rostad Yellowstone River Conservation District Council	Soil & Water Conservation Districts – East of the Continental Divide

ATTENDANCE: OTHER PARTICIPANTS

Aaron Losing, City of Kalispell
 Amelia Flanery, DEQ, Surface Water Discharge Permitting
 Amy Steinmetz, DEQ, Water Quality Division Administrator
 Brian Balmer, U.S. Fish and Wildlife Service
 Brian Heaston, City of Bozeman
 Chace Bell, DEQ, Monitoring and Assessment Section
 Christina Staten, DEQ, Watershed Protection Section
 Christine Weaver, DEQ, Surface Water Discharge Permitting
 Darrin Kron, DEQ, Monitoring and Assessment Section Supervisor
 Dave Galt, Montana Petroleum Association
 Ed Coleman, City of Helena
 Erik Makus, U.S. Environmental Protection Agency, Region 8
 Galen Steffens, DEQ, Water Quality Planning Bureau Chief
 Griffin Nielsen, City of Bozeman
 Hannah New, DEQ, Surface Water Discharge Permitting
 Jeff Dunn, WGM Group
 Jeff May, DEQ, Surface Water Discharge Permitting
 Joanna McLaughlin, DEQ, Surface Water Discharge Permitting
 Joe Lierow, ExxonMobil Billings Refinery
 John Bernard, Meeting Facilitator
 Jon Kenning, Water Protection Bureau Chief
 Katie Makarowski, DEQ QA/QC Officer
 Kayla Glossner, DEQ, Surface Water Discharge Permitting
 Kurt Moser, DEQ, Legal Counsel
 Lauren Sullivan, DEQ, Water Quality Standards and Modeling Section
 Loren Franklin, KC Harvey Environmental

Louis Engels, City of Billings
Maya Rao, DEQ, Surface Water Discharge Permitting
Melinda Horne, DEQ, Surface Water Discharge Permitting
Michael Kasch, HDR
Moirra Davin, DEQ, Public Information Officer
Paul Skubinna, City of Great Falls
Peggy Trenk, Treasure State Resources Association
Rickey Schultz, HDR
Ryan Leland, City of Helena
Ryan Sudbury, City of Missoula
Scott Buecker, AE2S
Susie Turner, City of Kalispell
Tammy Johnson, Montana Mining Association
Vicki Watson, University of Montana Watershed Health Clinic

MEETING OBJECTIVES

- Respond to feedback on proposed response variables and thresholds
- Provide additional details on collection timeframes, frequency, etc. for response variables

MEETING HIGHLIGHTS

- Near field and far field monitoring frequencies proposed
- Relative change proposed as metric to use in permits

A list of meeting action items and discussion topics flagged for future meetings can be found at the end of this summary.

MEETING INITIATION

John Bernard, meeting facilitator, welcomed everyone to the meeting, reviewed the agenda, and took roll call of the technical subcommittee (TSC) members. John then went over the ground rules for the meeting (slide 6 of **Attachment A**).

FEEDBACK RECEIVED ON PROPOSED RESPONSE VARIABLES AND THRESHOLDS

DEQ received feedback from the point source discharger: large municipal systems (>1 MGD) interest group, which can be found in-full on the DEQ Narrative Nutrient Standards Transition MS Teams site. Mike Suplee, DEQ Water Quality Science Specialist, read aloud and responded to each of the major comments received:

Comment 1: What's the allowable spatial and temporal exceedance of target 125 mg/m²? Laterally across the stream transect? Longitudinally along stream reach? Maximum over the summer? Average over the season? Is 30% coverage across stream over entire average area?

DEQ Response 1: More details on this will be provided in today's presentation

Comment 2: Will DEQ allow the permittee to interpret the presented thresholds regarding the questions of spatial and temporal patterns for assessing health and present that to DEQ for review and approval or request improvements or will DEQ provide additional guidance on interpreting the thresholds for assessing health before initiating the AMP? If DEQ will provide additional guidance, when will that be presented to the TSC for review and comment?

DEQ Response 2: Yes, DEQ plans to provide a circular and accompanying guidance document.

Comment 3: Where does DO delta criteria 5.3 mg/L apply? At just any one point in stream? Average over the length of stream?

DEQ Response 3: The criterion applies at the compliance point. DEQ anticipates the permittee would put one instrument out at the mid-point of the reach. DEQ SOPs have this framework laid out, so the process should be pretty straightforward.

Comment 4: What about the perspective of compliance with the combination of thresholds for compliance with the narrative standards? Are we to assess the average of 11 transects again?

DEQ Response 4: DO delta was not assessed at each of 11 transects; instead the instrument is placed at one transect in an appropriate location per SOP.

Comment 5: Are the methods for assessing effects on a waterbody and determining narrative standard achieved the same as in Step 2 or different? If different, when will DEQ present that information to the TSC for review and comment? If these are not met, the flowchart indicates a return loop to Step 5, is that consider full compliance, or will there be other elements within the permit? Will these assessments of health only be within the AMP or will there be separate elements unique to the MPDES?

DEQ Response 5: This goes back to the AMP flowchart. The presumption is the same things that would be looked at to determine if a waterbody is impaired are the same things that would be looked at to conclude that it is not.

Comment 6: Are 2-D continuous simulation models needed to simulate water quality over the summer season and show variability with time and space for all the parameters that DEQ envisions: benthic algae density, algae coverage, DO delta, etc.

DEQ Response 6: Would need a one- or two-dimensional model. A 1-D is like QUAL2K, which assumes mixing both vertically and longitudinally. DEQ is not convinced a 2-D model is needed.

Comment 7: While the proposed response variables and thresholds are supported by DEQ's research and publications for prototypical Wadeable streams in western and eastern Montana, they may not be universally applicable to all streams. Site specific circumstances may vary from waterbody to waterbody. Development of site-specific thresholds to support beneficial uses for a specific waterbody using the adaptive management program may be a more appropriate approach. Benthic algae density and DO delta may be the most appropriate parameters to consider, but macroinvertebrate indices and BOD may be less appropriate because so many other factors may influence the results (e.g., sediment, leaf litter, etc.). Site specific circumstances may suggest the need to reconsider thresholds, consider use attainability, reclassification, etc.

DEQ Response 7: DEQ doesn't disagree; some circumstances might differ a little bit. The Kalispell example on lower Ashley Creek discussed at the last TSC meeting is a good one where we aren't seeing a stream bottom that is typical of the gravel streams of the region.

Comment 8: The proposed response variables and thresholds may be appropriate for use in waterbody assessments, but they may, or may not be useful in terms of discharge permitting, depending upon how the thresholds are translated into permit conditions. The allowable frequency and duration of both spatial and temporal exceedances will need to be defined.

DEQ Response 8: DEQ doesn't disagree and will take into consideration how they're applied, which will be discussed in more detail in today's talk.

Mike then opened this portion of the meeting up to others for additional feedback:

Kelly Lynch, substitute representative for Municipalities, stated that the League of Cities and Towns will be submitting a letter with their concerns, and summarized that their real concern is that the 2016 methodology is based on the numeric nutrient standards and continuous reliance on those will put us back in the same situation where we're being held to strict and unachievable standards, regardless of what's happening in the watershed. Mike responded that the nutrients didn't drive derivation of the response variables. The response variables were developed with a view of the narrative standards and DEQ spent a lot of time looking at harm-to-use. DEQ anticipates that how you convert to a permit limit going forward will look considerably different. Mike also stated that DEQ has been interpreting the state's narrative standard pretty consistently for a very long period of time.

Dave Clark, large municipal systems representative, stated he wanted to explore the large river comment about 2-D models, as 2-D may not be too meaningful for many streams and there are limitations for steady-state models. Mike stated that Dave is referring to a model that operates by making a simulation that informs the process and starting conditions of the next day. Each day builds on the previous day's conditions over the modeled time period. This differs from, for example, the kind of model that QUAL2K is: it just repeats itself under (for example) low-flow simulation type conditions. DEQ has no opposition to using those (2-D) models, as DEQ is using that type of model for Canyon Ferry, but this is getting into data-demanding conditions.

RESPONSE VARIABLES AND THRESHOLDS: NEAR FIELD AND FAR FIELD SITES

Mike Suplee reviewed slide 8 of **Attachment A** showing a watershed with multiple permittees and defined "near field sites" as immediate upstream and downstream monitoring sites around a point source, whereas "far field sites" are set up further upstream and downstream, terminating the jurisdictional AMP part of the watershed (the blue dots shown on the slide).

Mike stated that DEQ conducted a detailed analysis some years ago looking at timing of different things throughout the state and came up with the chart shown on slide 10 showing the starts and ends of growing seasons for the various ecoregions in the state. DEQ does not see a reason to change from these established "growing seasons" at the moment, which contain all of summer and little bit of the fall period. It would take a significant analysis to dig into this again. Mike explained that most, if not all, of the water quality sampling will occur during these growing seasons or "index periods."

Slides 11 through 14 are a review from the previous, August 3, TSC meeting. Slides 15 and 16 show what DEQ considers to be the minimum collection requirements that would be reasonable for wadeable streams and medium rivers in western Montana and the transitional region (rocky mountain front) for the different parameters:

Near Field Sites (bracketing a wastewater facility)

- Benthic Chlorophyll-a, AFDW, TP, and TN: minimum twice annually during the index period (growing season), with at least six weeks between sampling events
- Visual assessment of % bottom cover: minimum monthly during the index period, with two events pairing with the chlorophyll-a and AFDW sampling

Far Field Sites (upstream and downstream ends of the AMP watershed)

- TP, TN Concentrations: minimum twice annually during the index period, with at least six weeks between sampling events
- Flow: at each sampling event
- Benthic chlorophyll-a, AFDW, % cover: DEQ is considering if these response variables should be required or not

Tributaries

- TP, TN Concentrations: minimum twice annually during the index period, with at least six weeks between sampling events
- Flow: at each sampling event

Mike noted that flow will probably have to accompany the monitoring to carry out a total loading calculation. He also noted that tributary monitoring will inform what's coming in from other parts of the watershed, which will help with the development of an AMP, nutrient trading, etc.

Slide 19 shows the index periods for Eastern Montana, which includes the Northwestern Glaciated Plains, Northwestern Great Plains, and Wyoming Basin. Slides 21 and 22 show what DEQ considers to be the minimum collection requirements that would be reasonable for wadeable streams and medium rivers in eastern Montana streams:

Near Field Sites

- Dissolved oxygen, DO delta, temperature: instruments must be deployed annually for a minimum of 30 continuous days with at least 21 days collected in August
- TP, TN Concentrations: minimum twice annually during the index period, with at least 0 days between sampling events

Far Field Sites

- TP, TN Concentrations: minimum twice annually during the index period, with at least 30 days between sampling events
- Dissolved oxygen, DO delta, temperature: DEQ is considering if these response variables should be required

Tributaries

- TP, TN Concentrations: minimum twice annually during the index period, with at least 30 days between sampling events

- Flow

Mike noted that flow would probably have to be collected at all the different types of sites, as well. Slide 23 discusses maintenance of instruments used to monitor DO and temperature. Mike noted that thought needs to be given to this when making a sampling plan. He stated that YSI instruments have wipers that wipe the sensors to keep them clean. DEQ has found that MiniDOT instruments with copper mesh keep algae growth off the sensor, minimizing interference with the data (note that DO delta will increase each day that algae is growing on the sensor). Mike also noted that sometimes there will be flow events where drifting algae will smother the instruments and they must be cleaned regularly (weekly would be ideal). These are the pros and cons of dealing with small instrument deployment.

Mike then discussed a DEQ five-year study that started in 2013 looking at 78 unique sites in eastern Montana (map shown on slide 25). The study measured DO delta and other variables in summer and fall. Slide 26 shows the series of variables outside of water quality that may be affecting DO delta, which includes things such as land use and cover, percent disturbed land, wells, mining activity, and drought. Slide 27 shows the study's major findings, including that average weekly DO delta makes a good decision-making point. Mike explained that if permittees are collecting a month of data, this would contain four compliance points: week 1, week 2, etc. He also stated that DEQ's goal is to have an updated procedure for DO delta later this year.

Discussion

Tina Laidlaw, federal regulatory agencies representative, asked if DEQ is saying it isn't sure if response indicator sampling will be required for far-field sites. Mike responded that DEQ is still on the fence about this, partly because the far field site is the most downstream position in the AMP watershed, which is usually a spill point to another watershed and potentially the upstream extent for another AMP watershed where they would be interested in nitrogen and phosphorus contributions. Mike said the question becomes whether the near-field site is the compliance point for a facility and that's it, or is there some broader point downstream where these response variables should be collected?

Dave Clark asked if benthic algae and ash free dry weight are not collected at more locations in the watershed other than near-field, how do you assess impact of other sources in the watershed using a balanced watershed approach. Mike responded that this is a good point and is an argument to have collection at the downstream extent point. He reiterated that DEQ is still on the fence and wants to hear these comments.

Vicki Watson asked if the visual assessments of percent cover take depth into consideration – is it limited to wadeable/visible depth? She stated that when the water is turbid, you can't see the bottom at depths greater than 30 centimeters, and also that when you revisit a site, water level will probably be shallower than the last visit and now a heavy algae zone may be visible that was not visible during the first visit. Mike responded that DEQ is aware that because it's a visual method carried out from the bank, there are time periods and conditions when it can't be done. For example, when it's too deep, too turbid, too early in the season, etc. At these times, you just can't fill out the form. Under the right conditions (which are common: clear and shallow), however, this is a rapid way to gather useful information over a broad spatial scale.

Stephanie Bonucci, substitute representative for regional and statewide conservation organizations, asked if you see an increase in nutrients and response variables between the index period sampling

events, will there be any trigger if the values remain below the thresholds? Thinking along the lines of nondegradation and monitoring all impact. Mike responded that this question drifts into nondegradation and we don't want to get into that at this time, which has to do with new or increased sources. He said that for the purposes of this conversation, what we're talking about is two sampling events during the summer to measure benthic chlorophyll-a or ash free dry weight (AFDW). Both events would need to be achieving in order to say it's achieving; if one event exceeded the 125 mg/m², would interpret this to say there's a problem. If you have chlorophyll-a or AFDW that exceeds during one event, it would be considered an exceedance.

Dave Clark stated that Mike's publication on stream fertilization studies showed pretty wide swings in diel DO but natural streams exhibit the same behavior. Dave then asked how DEQ selected 5 mg/L as a threshold. He also asked: if you don't monitor throughout the watershed, how do you distinguish impacts on DO delta that are natural, nonpoint source, or point source? Mike responded that the 5.3 mg/L for DO delta was identified before DEQ became aware of the Ohio work. Appendix C of the nutrient assessment methodology made available to the TSC describes how 5.3 mg/L was settled on, which discusses the breakpoint determined from a series of waterbodies ranging from ones DEQ knew had no nutrient impacts to ones with minor amounts of nutrients to ones with major impacts from nutrients. Since that study, DEQ has conducted more work and sees wide swings, but on average, commonly sees values around 5 mg/L. Mike stated that DEQ doesn't see large spatial scale averages like 15 or 20 on prairie streams and feels like this (the 5.3) is a reasonable starting point for this threshold.

Dave then asked if the selection of DO delta threshold essentially sets a standard representing natural headwaters unimpacted by development and apply that threshold to developed areas with urbanization. Mike responded: No, in fact, what we know from analysis is that DO delta in reference, or truly unimpacted, streams is far lower – maybe down around 2 mg/L. 5.3 mg/L represents what you might see in developed watersheds, or statewide in eastern MT. Darrin Kron, Supervisor of the Monitoring and Assessment Section, stated that DO delta is related to the regular dissolved oxygen standard being met in the fall timeframe. Mike also stated it is related to the fact that we see huge DO swings during the day but not correspondingly low DO dropping to 0 at night or violating DO standards during the day. Sometime in the fall, all the algal growth will senesce and that's when DO crashes can occur, which explains why other entities are finding their fisheries are having problems at high DO deltas. Mike further stated that we're not always catching when DO impacts occur, but DO delta captures it for us – not to say that regular DO never has a problem.

Tina Laidlaw asked if the findings of the 2013-2017 DO delta study discussed today suggest a different threshold – will DEQ make adjustments? Mike responded that DEQ is always open to making adjustments. However, the way the study was laid out and ultimately put on the ground, it is unlikely to give us information about a different threshold – it will mostly tell us how our existing threshold is influenced by other factors. Mike reemphasized it won't inform a change in the threshold so much as how the threshold may go up or down depending on what's going on outside of the stream.

Dave Clark asked what the findings about sensitivity of DO delta to seasonal conditions inform the key period for assessment, permitting, and compliance. Mike responded that all the data was collected during the index period (growing season) that's been discussed today. Most data in the DO delta study were in August and September, with a little bit collected in July and October, but that's part of the reason we recommend focusing much of DO delta data collection in August, which is also when it tends to be near its peak. August is usually among the highest and as we go into September, it can begin to diminish as the weather cools. Mike also stated that how all the data will be assembled into a decision

framework and then translated into a permit limit is at the heart of what's going to be discussed and figured out over the next six weeks (the next set of meetings), but this should be resolved by the end of September.

Dave stated that it's difficult to understand what kind of comments representatives ought to make without understanding the overall approach as to how this will fit together for permitting and compliance. He also stated that what is described in the assessment methods seems similar to what led to nutrient criteria and then to variances. Senate Bill 358 was to avoid that sort of thing and we seem to be setting up circumstances of having the same problem: feasible compliance. Mike stated that this comment keeps coming back to implementation and compliance and to keep an eye on the fact that this is what will look different going forward. Mike also stated that nothing in Senate Bill 358 stated we should be allowed to have narrative standards exceeded. DEQ wanted to start with each piece of the puzzle to build step by step and assemble into a process, which is what we have been doing.

RESPONSE VARIABLES AND THRESHOLDS: RELATIVE CHANGE AT NEAR FIELD SITES

Rainie DeVaney, Supervisor of DEQ's Surface Water Discharge Permitting Program, discussed slides 29 and 30 of **Attachment A**, which shows relative change in the near field sites (relative change between the upstream and downstream sampling sites surrounding a point source). Please note these slides are for illustration purposes and aren't representing a specific facility. Slide 30 shows two examples of what DEQ anticipates seeing. The data set demonstrates the frequency discussed (two sampling events during the growing season), shows upstream and downstream results, and the relative change. Scenario one shows mixed results when looking at individual years, but the five-year average is the metric of interest. Scenario two shows a large effect from the point source – upstream is remaining relatively constant, but downstream is showing significant increases when looking at 5-year average relative differences. Rainie summarized that this slide illustrates how DEQ is thinking of looking at the data.

Discussion

Matt Wolfe, mining representative, asked in watersheds where there is already a large database of response variables from permittee monitoring, TMDLs, or other assessments, can the AMPs and permit decisions be based on pre-existing data without a need to collect new data. Rainie responded that DEQ is not going to ignore existing data that's relevant to the conversation. During upcoming renewals or permitting decisions where we have directly applicable, robust datasets, she envisions using this data. However, there would probably still be a need for continued monitoring of response variables to make sure we have a good dataset and not a static one looking backwards.

Louis Engels, City of Billings, stated he's still unclear on the development of the original numeric nutrient criteria and said from what Mike has said, he understands that they were based on a narrative standard. Senate Bill 358 eliminated the numeric criteria, so is it DEQ's take that the instream criteria remain unchanged since they were based on narrative standards? Mike Suplee responded that we have to look at two things: we have science and we have law. We use science to make narrative interpretations (e.g., DO delta, chlorophyll-a levels) and from them, looking at a wide variety of data, we identified nutrient concentration ranges, and from there recommended a single value that was appropriate for each ecoregion (narrative --> impacts to the narrative --> criterion). The law has now changed and said we aren't using that; instead we must use the narrative. Our narratives and the way we interpret the narratives is still functioning. The new law will allow more flexibility in how we comply with the narrative than the old process provided.

ADDITIONAL RESPONSE VARIABLES

Mike Suplee discussed slides 32 through 34 of **Attachment A**. Slide 33 shows what DEQ considers to be the minimum collection requirements for wadeable streams and medium rivers in western Montana and the transitional region (rocky mountain front) for additional response variables:

Near Field Sites Only:

- Macroinvertebrates: minimum of once per annual index period, corresponding to one of the other sampling events

Mike then explained that the Hilsenhoff Biotic Index (HBI) will be applied to the macroinvertebrate results, but no metric threshold will apply; DEQ will consider the relative HBI change upstream versus downstream.

Slide 34 shows what DEQ considers to be the minimum collection requirements for eastern Montana wadeable streams and medium rivers for additional response variables:

Near Field Sites Only:

- Biochemical Oxygen Demand (BOD): minimum once per year during September or October

DEQ proposes that no specific BOD threshold apply; DEQ will instead consider relative change in BOD upstream versus downstream.

Discussion

There was none.

DATA AND MONITORING RESOURCES

Katie Makarowski, DEQ's acting Quality Assurance Officer, gave a presentation on DEQ's ambient water quality monitoring programs, monitoring partnerships, volunteer monitoring support program, and how to access the resulting data. Slides 37 through 44 of **Attachment A** discuss the various monitoring programs and the type of data collected, with slide 44 showing a map of 2021 project locations. Katie noted that project areas vary from year to year depending on data needs, and regardless of the approach used to collect the data (volunteer monitoring, partnerships, etc.), similar data quality requirements are applied so the data can be applied to multiple uses. Similar field methods and analytical methods are used regardless of the collecting entity, as well as a similar data management approach so the data is available publicly. Katie then discussed multiple sites for accessing data including EQulS Enterprise, the National Water Quality Portal, DEQ's Clean Water Act Information Center (CWAIC), EPA's How's My Waterway, and DEQ's Water Quality Library. This information can be found on slides 45 through 51 of **Attachment A**.

PUBLIC COMMENT

Public comment was taken at the end of the meeting. Vicki Watson noted a workshop on the online sources discussed by Katie would be helpful to watershed groups working on AMPs.

CLOSING

Mike Suplee noted it is DEQ's intent to go back to the Nutrient Work Group with a report out on our recommendations for the response variables and thresholds, and DEQ will be taking TSC comments into consideration. Mike requested technical subcommittee comments by around August 17, so DEQ has time to discuss them, make changes, etc.

John Bernard then reminded the group the next technical subcommittee meeting is September 7 at 1:30 p.m., and the next Nutrient Work Group meeting is August 25 at 9:00 a.m. John thanked the group and closed the meeting.

SUMMARY OF MEETING ACTIONS

The tables below include items from all previous meetings. New and updated items are in bold font.

In-Progress Action Items			
#	Action	Who	Status
1	Provide feedback from the TSC about the time component in the flow chart	TSC	In progress
2	Update the flowchart and supporting materials based on TSC feedback	Rainie DeVaney, Mike Suplee	In progress
3	Receive feedback from TSC on time component of each flowchart step.	TSC	In-progress
4	Define what P prioritization means	DEQ and TSC	Pending
5	Define roles and responsibilities of DEQ and permittees for AMP process	DEQ	In-progress
6	Identify and define what is needed to determine how far upstream and downstream monitoring should occur for a point source	TSC	In-progress
7	Put together case study of what DEQ thinks is a reasonable minimum of data collection for large rivers	DEQ	In-Progress

Complete Action Items			
#	Action	Who	Status
1	Distribute the flowchart and supporting materials to the TSC in a format to provide comments/track changes	Rainie DeVaney, Mike Suplee	Complete
2	Consider other measures that may trigger action (Box 7 of flowchart)	TSC	Complete
3	Clarify in the supporting documents that the narrative standards are those referenced in the Administrative Rules of the Montana of the State of Montana.	Rainie DeVaney, Mike Suplee	Complete
4	Define the overall work for the AMP by the June 23 Nutrient Work Group meeting	TSC	Complete
5	Provide information to the TSC on how to get on the agenda for a future meeting	Rainie DeVaney, Mike Suplee	Complete
6	Schedule two TSC meetings between each Nutrient Work Group	Rainie DeVaney, Mike Suplee	Complete
7	Set up Teams TSC collaboration site. Send invite email. Post comments received from TSC members and draft DEQ documents	Moir Davin, Christina Staten	Complete
8	Update AMP definition based on TSC feedback. Share out to TSC.	Rainie DeVaney, Mike Suplee	Complete
9	Decide whether medium sized rivers should be broken out	TSC	Complete
10	Add the draft approach for determining watersheds to Teams for feedback from TSC	Mike Suplee	Complete

Complete Action Items			
#	Action	Who	Status
11	Reorganize technical subcommittee Teams folders so they are more intuitive	DEQ	Complete
12	Receive written comments from League of Cities and Towns	Amanda McInnis	Complete
13	Medium rivers definition	Mike Suplee	Complete
14	Create bibliography of nutrient-related literature	DEQ	Complete

Questions/Topics Flagged for Future Discussions	Meeting Date
Tina asked when will the Monitoring Plan be submitted (is that part of the permitting application)? When will the public get to review what is being proposed for monitoring? Will DEQ have monitoring guidance?	6/10/21
How exactly the public process is incorporated into the different steps in the AMP need to be worked out and flagged that for future discussion.	6/10/21
Consider developing a case study to guide the MT process.	6/10/21
Tina noted, there is talk about doing some downstream analysis, but it could also be that elevated concentrations of nutrients could contribute to an issue that just hasn't yet been manifested, so EPA will be curious how the state plans to address that piece.	6/10/21
Discussion on the nexus between TMDLs and AMPs.	6/10/21
Tina asked where does the NPDES permit application process fit in to this whole process?	6/10/21
Define roles and responsibilities of DEQ and permittees in AMP process	6/21/21
How will DEQ apply existing TMDLs- what is the interplay of AMPs and completed/approved AMPs	6/21/21
Define P prioritization and what is intended as site-specific factors.	6/21/21

ATTACHMENT A: AUGUST 10, 2021 NUTRIENT WORK GROUP TECHNICAL SUBCOMMITTEE MEETING PRESENTATION SLIDES

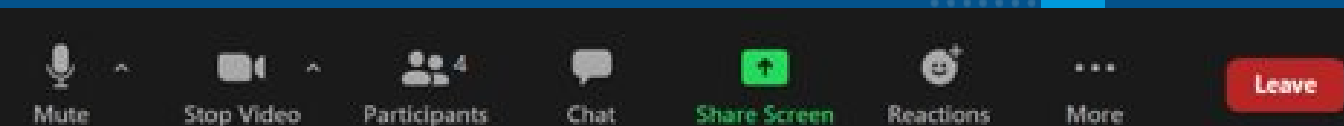
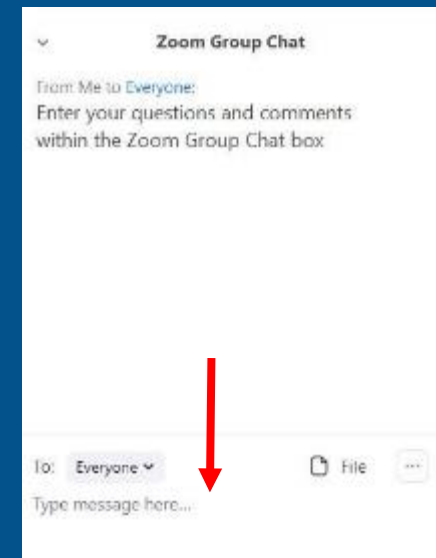
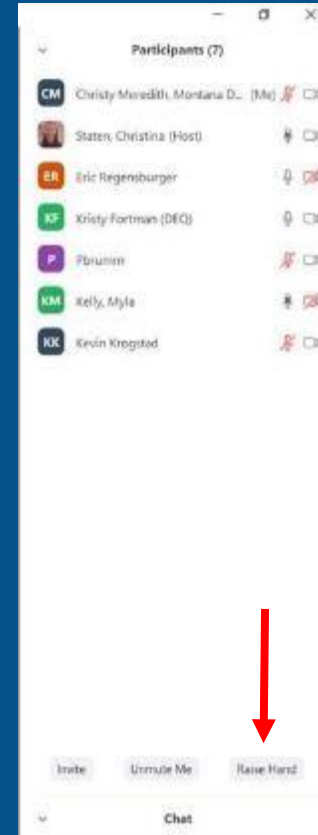
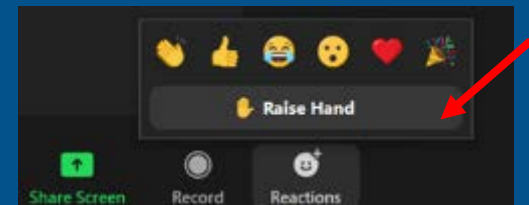


Nutrient Work Group Technical Subcommittee Session Six

August 10, 2021

Welcome!

- Please keep your microphone muted until called on
- TSC Members may participate during discussions
- Please reserve public comment until the end
- *6 unmutes your phone
- State your name and affiliation before providing your comment
- Enter questions in the chat box at any time
- Turning off your video feed provides better bandwidth
- Please sign-in to the chat box with name and affiliation



Agenda

Meeting Goal:

1. Respond to feedback on proposed response variables & thresholds. 2. Continue discussion of response variables & thresholds, with details on collection timeframes, frequency, etc.

1:30 p.m. Welcome

1:35 p.m. Introductions

1:40 p.m. Summary of feedback DEQ received on its proposed response variables & thresholds

2:05 p.m. Western Montana wadeable streams (algal biomass measures)

- Data collection timeframe, frequency of collection

2:25 p.m. Eastern Montana wadeable streams (DO, DO delta)

- Data collection timeframe, instream equipment maintenance needs
- Overview of large-scale factors which influence DO delta (2013-2017 study)

2:45 p.m. Relative change in response variables upstream and downstream of the point source

3:05 p.m. The additional response variables: How they might be used

3:15 p.m. Data and monitoring resources overview

3:25 pm: Public comment

Introductions

Facilitator

- John Bernard

DEQ Staff

- Michael Suplee, Water Quality Science Specialist
- Rainie DeVaney, Discharge Permitting Section Supervisor
- Amy Steinmetz, Water Quality Division Administrator
- Jon Kenning, Water Protection Bureau Chief
- Galen Steffens, Water Quality Planning Bureau Chief
- Myla Kelly, WQ Standards & Modeling Section Supervisor
- Kristy Fortman, Watershed Protection Section Supervisor
- Darrin Kron, WQ Monitoring & Assessment Section Supervisor

Introductions

Nutrient Work Group Technical Subcommittee Members

Interest Group	Representative	Substitute
Point Source Discharger: Large Municipal Systems (>1 MGD)	Dave Clark	
Point Source Discharger: Middle-Sized Mechanical Systems (<1 MGD)	Vacant	
Point Source Discharger: Small Municipal Systems with Lagoons	Rika Lashley	Amy Deitchler
Point Source Discharger: Non-POTW	Shane Lacasse	
Municipalities	Amanda McInnis	Kelly Lynch
Mining	Matt Wolfe	
Farming-Oriented Agriculture	John Youngberg	
Livestock-Oriented Agriculture	Jay Bodner	
Conservation Organization - Local	Kristin Gardner	
Conservation Organization – Regional	Sarah Zuzulock	Stephanie Bonucci
Conservation Organization – Statewide	Sarah Zuzulock	Stephanie Bonucci
Environmental Advocacy Organization	Guy Alsentzer or Sarah Zuzulock	
Water or Fishing-Based Recreation	Guy Alsentzer or Sarah Zuzulock	
Federal Land Management Agencies	Andy Efta	
Federal Regulatory Agencies	Tina Laidlaw or Erik Makus	
State Land Management Agencies	Jeff Schmalenberg	
Water Quality Districts / County Planning Departments	Pete Schade	
Soil & Water Conservation Districts – West of the CD	Samantha Tappenbeck	
Soil & Water Conservation Districts – East of the CD	Dan Rostad	
Wastewater Engineering Firms	Coralynn Revis	
Timber Industry	Julia Altemus	

Ground Rules

- Speak one at a time—refrain from interrupting others.
- Wait to be recognized by the facilitator before speaking.
- Facilitator will call on people who have not yet spoken before calling on someone a second time for a given subject.
- Share the oxygen—ensure that all members who wish to have an opportunity to speak are afforded a chance to do so.
- Be respectful towards all participants.
- Listen to other points of view and try to understand other interests.
- Share information openly, promptly and respectfully.
- If requested to do so, hold questions to the end of each presentation.
- Remain flexible and open-minded, and actively participate in meetings.



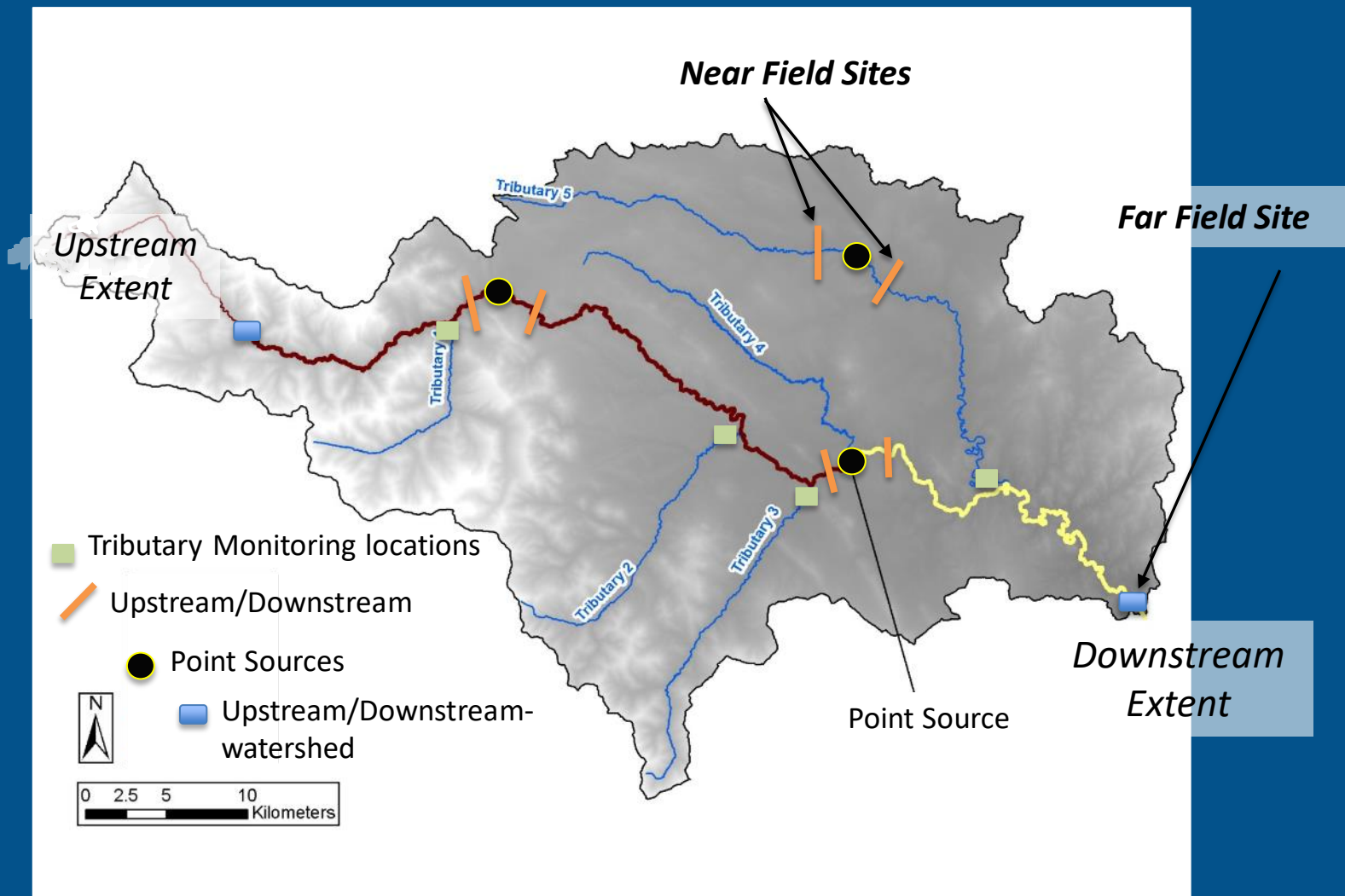
Feedback from TSC on Response Variables and Thresholds: Discussion

For Western and Eastern Montana
Wadeable Streams and Medium Rivers

For Large Rivers

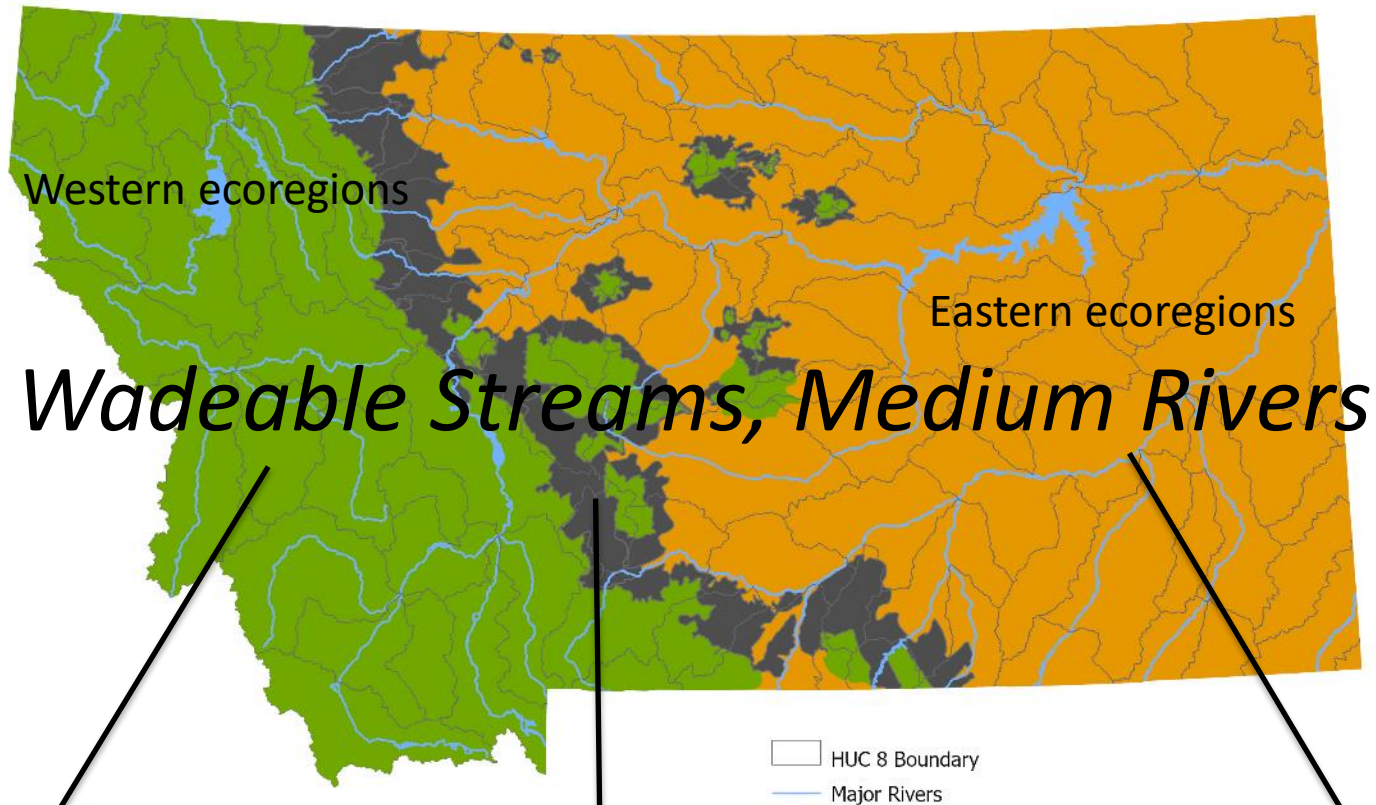


Example Watershed with Multiple MPDES Permittees



Note: This map demonstrates monitoring locations upstream and downstream of point sources. The locations shown are for illustrative purposes only. In addition to upstream and downstream, monitoring downstream of the confluence would be required to demonstrate cumulative effects.

HUC 8 Watersheds and Ecoregions



Data Collection Index Periods ("Growing Season")

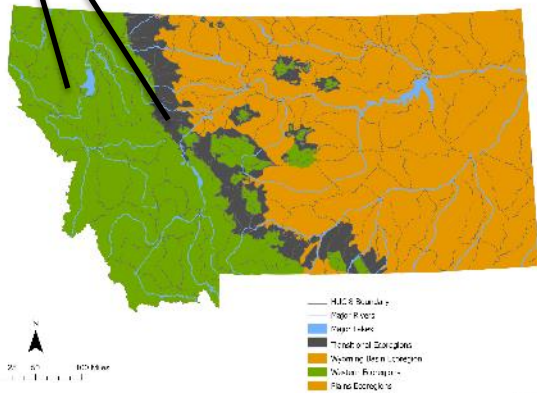
Start and Ending Dates for Three Seasons (Winter, Runoff and Growing), by Level III Ecoregion.

Ecoregion Name	Start of Winter	End of Winter	Start of Runoff	End of Runoff	Start of Growing Season	End of Growing Season
Canadian Rockies	Oct.1	April 14	April 15	June 30	July 1	Sept. 30
Northern Rockies	Oct.1	March 31	April 1	June 30	July 1	Sept. 30
Idaho Batholith	Oct.1	April 14	April 15	June 30	July 1	Sept. 30
Middle Rockies	Oct.1	April 14	April 15	June 30	July 1	Sept. 30
Northwestern Glaciated Plains	Oct.1	March 14	March 15	June 15	June 16	Sept. 30
Northwestern Great Plains	Oct.1	Feb. 29	March 1	June 30	July 1	Sept. 30
Wyoming Basin	Oct.1	April 14	April 15	June 30	July 1	Sept. 30

Chlorophyll *a* Thresholds for Western MT

Entity	Benthic Chla (mg Chla /m ²) Threshold	Use Protected/Instream Value
MT's Clark Fork River (2002)	<100-150	Aquatic Life. Summer mean (100), maximum (150), ARM 17.30.631
MT: Recreational Threshold (2009)	<150	Recreational use
MT: Dissolved oxygen in lower-gradient western streams (2014)	<125	Salmonid fishes and associated aquatic life
Utah DEQ (2019)	<125	Recreational use
Ohio EPA (2015)	<182-320	Trophic Condition Status per Stream Nutrient Assessment Procedure. Chla threshold dependent on other WQ variables.
British Columbia (BCMOE 2001)	50-100	50 (aesthetics/recreation) 100 (undesireable aquatic life changes)
New Zealand Periphyton Guidelines (2000)	<120 filamentous, <200 diatoms	Trout habitat and Angling
New Zealand National Policy Statement (2017)	<200	A maximum value reflecting periodic short-duration blooms from moderate enrichment

HUC 8 Watersheds and Ecoregions



Western Montana Reference Sites (2001-2019)

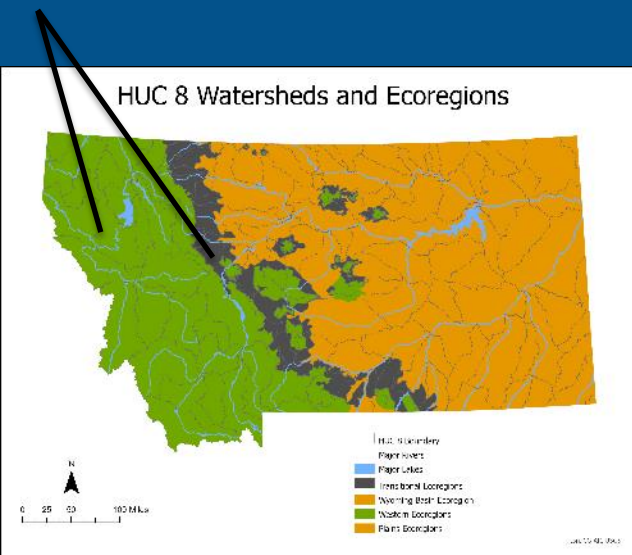
Descriptive Statistic	mg Chla /m ²
25th percentile:	4
50 percentile:	7
75th percentile:	19
90th percentile:	48
Average:	21
Min:	0
Max:	591

DEQ recommendation: 125 mg Chla/m²

Ash Free Dry Weight (AFDW) Thresholds for Western Montana

Entity	AFDW (g/m^2) Threshold	Use Protected/Instream Value
MT: Assessment Method (2016)	35	Recreation, salmonid fishes and associated aquatic life uses
Utah DEQ (2019)	49	Recreational use
New Zealand Periphyton Guidelines (2000)	35	Aesthetics/recreation and trout habitat and angling

Western Montana Reference Sites (2013-2019)	
Descriptive Statistic	grams AFDW/ m^2
25th percentile:	0.4
50 percentile:	2
75th percentile:	5
90th percentile:	11
Average:	7
Min:	0
Max:	262



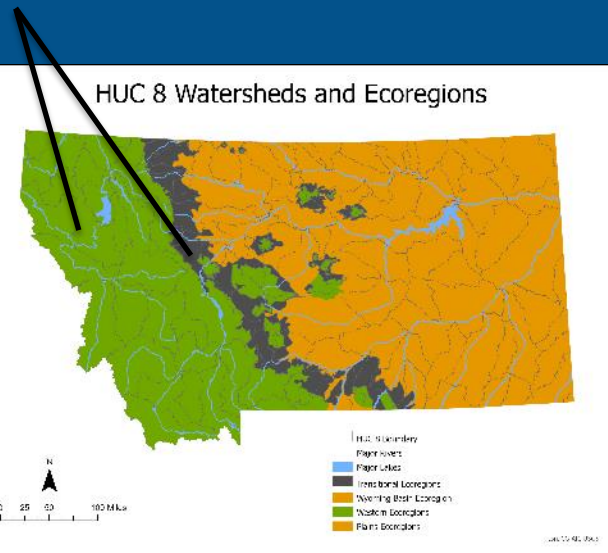
~~DEQ recommendation: 35 mg Cha/ m^2~~

Errata: DEQ recommendation:

35 g AFDW/ m^2

% Bottom Cover Thresholds for Western Montana

Entity	% Bottom Cover	Use Protected/Instream Value
Utah DEQ (2019)	<33%	Aquatic life
Main DEP (2021)	<18-35%	Nuisance algae cover threshold; varies by stream class
West Virginia DEP (2012)	<25%	recreational acceptance
Virginia CBF (2021)	<i>in development</i>	recreational acceptance
New Zealand Periphyton Guidelines (2000)	<60% (microalgae) <30% (filamentous)	Aesthetics/recreation and trout habitat and angling



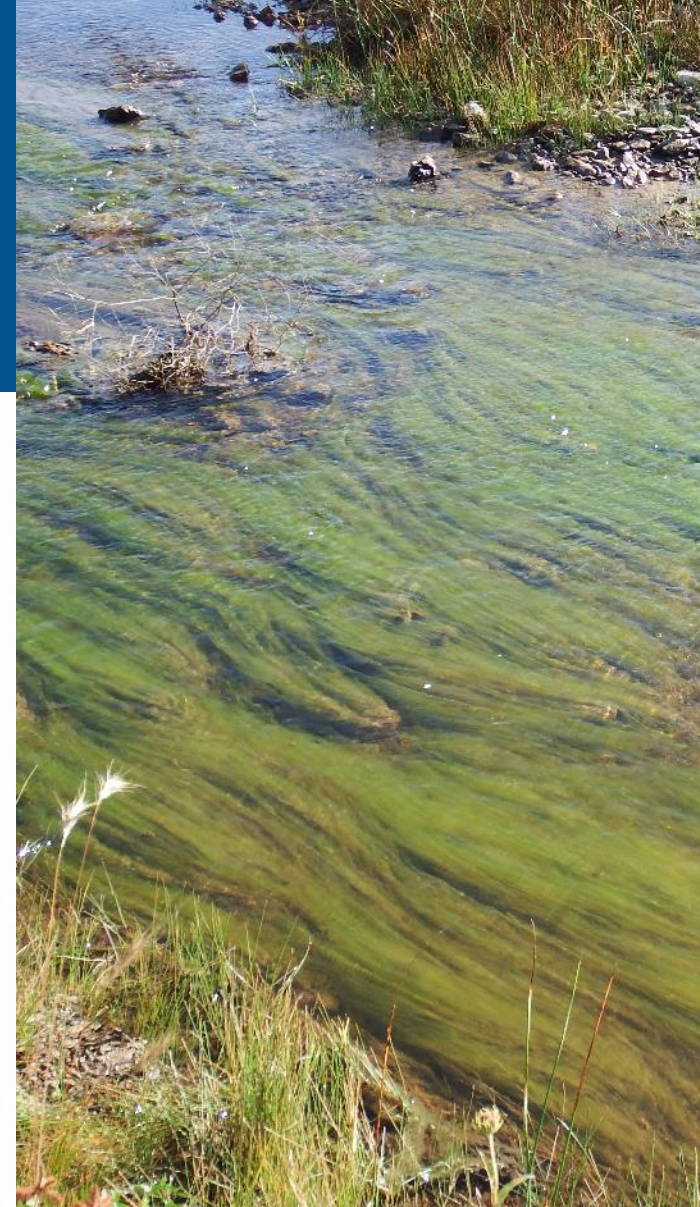
Draft DEQ recommendation: 30% cover
by filamentous algae

Example DEQ Standardized Visual Assessment Form

Categories include % bottom cover, length of filaments

Date: 7/12/2021 Site Visit Code: _____

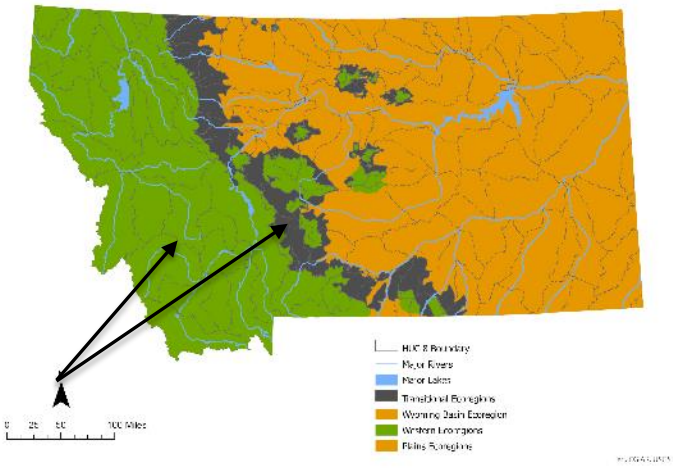
Transect Letter: <u>D</u>		0 = Absent (0%) 1 = Sparse (< 10%) 2 = Moderate (10-40%) 3 = Heavy (40-75%) 4 = Very Heavy (>75%)		G = Green GLB = Green/light brown LB = Light brown BR = Brown/reddish DBB = Dark brown/black	Gr = Growing M = Mature D = Decaying	Thin = < 0.5 mm thick Medium = 0.5-3 mm thick Thick = > 3 mm thick Short = < 2 cm long Long = > 2 cm long
AQUATIC PLANT VISUAL ASSESSMENT FORM		Actual Cover in channel (circle one)	Predominant Color	Condition		
Microalgae	0 (1) 2 3 4	GLB	M	THIN		
Filamentous Algae	0 1 (2) 3 4	GLB	M	LONG		
Chara	0 (1) 2 3 4	GLB	M			
Macrophytes (list below)	0 1 2 3 (4)	G	M			
Moss	0 (1) 2 3 4	DBB G	Gr			
COMMENTS						
Sage pondweed contains very common, water spoutall						
No water willow						
Transect Letter: <u>E</u>		0 = Absent (0%) 1 = Sparse (< 10%) 2 = Moderate (10-40%) 3 = Heavy (40-75%) 4 = Very Heavy (>75%)		G = Green GLB = Green/light brown LB = Light brown BR = Brown/reddish DBB = Dark brown/black	Gr = Growing M = Mature D = Decaying	Thin = < 0.5 mm thick Medium = 0.5-3 mm thick Thick = > 3 mm thick Short = < 2 cm long Long = > 2 cm long
AQUATIC PLANT VISUAL ASSESSMENT FORM		Actual Cover in channel (circle one)	Predominant Color	Condition		
Microalgae	0 (1) 2 3 4	G	Gr	THIN		
Filamentous Algae	0 (1) 2 3 4	GLB	M	LONG		



*Note: photo does not correspond to the form's data.

Western MT: Sample Types and Frequency

HUC 8 Watersheds and Ecoregions

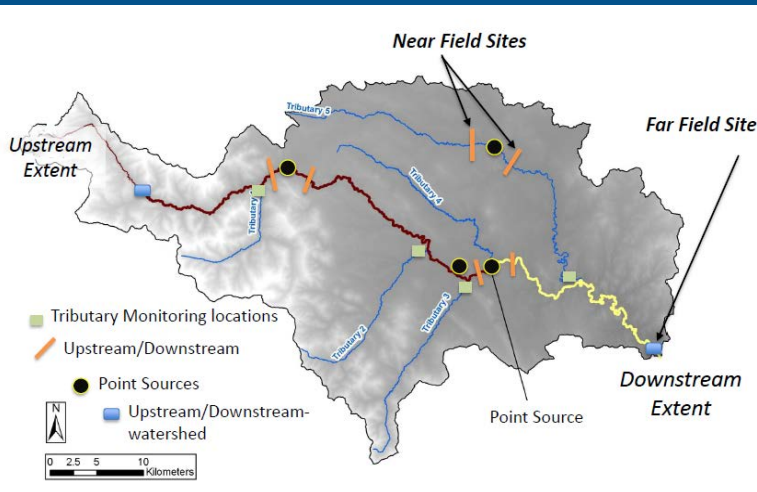


Near Field Sites

- Benthic Chla, AFDW, and TP, TN concentrations: *At least twice annually during the index period, with at least six weeks between each sampling event*
- Visual Assessment of % Bottom Cover: *At least monthly during the index period; two events must pair with the Chla/AFDW sampling.*

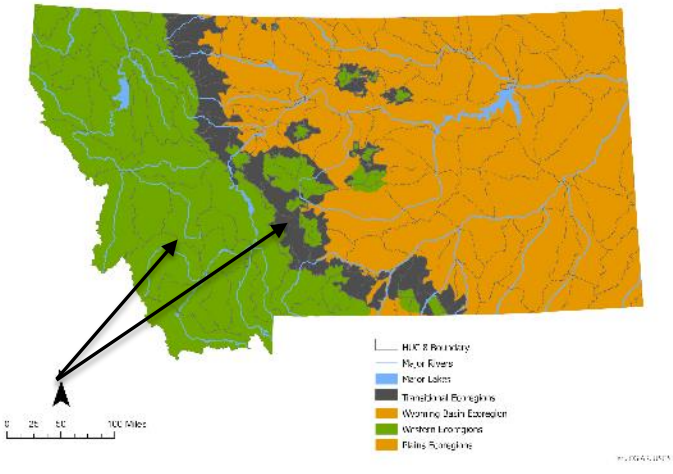
Far Field Sites

- TP, TN Concentrations: *At least twice annually during the index period, with at least six weeks between each sampling event. DEQ is considering if response variables should be required*



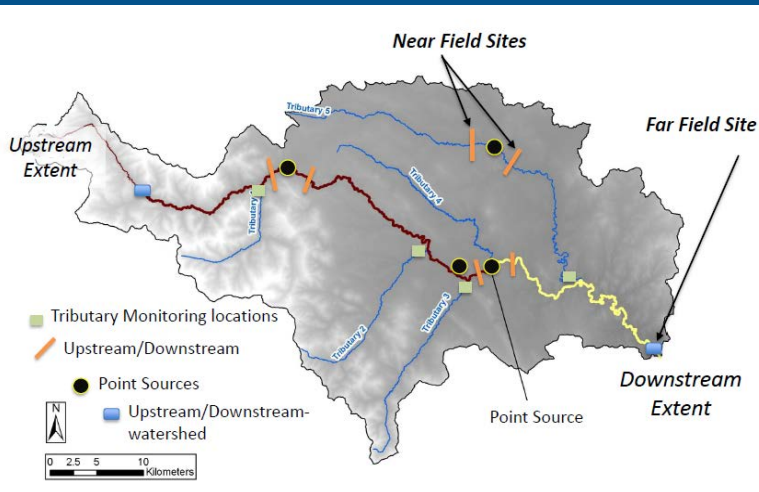
Western MT: Sample Types and Frequency

HUC 8 Watersheds and Ecoregions



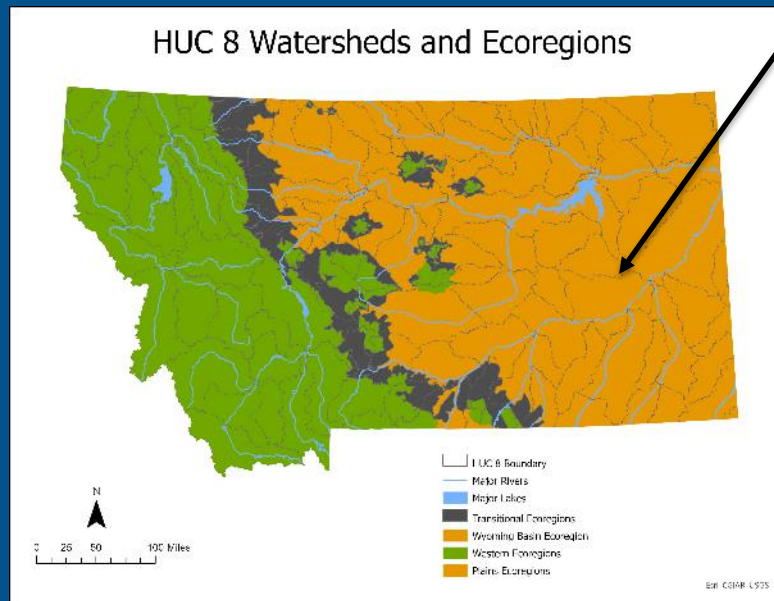
Tributaries

- TP, TN Concentrations: *At least twice annually during the index period, with at least six weeks between each sampling event.*



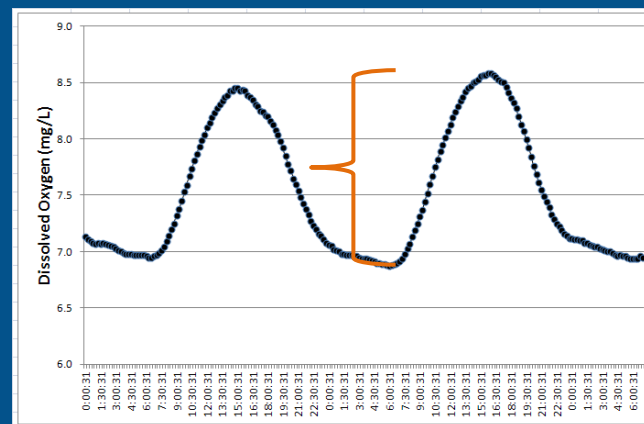
Technical Subcommittee Discussion and Feedback

Eastern Montana Wadeable Streams



Dissolved Oxygen Delta:
Daily High minus Daily Low

(DO standards will also apply, per
DEQ-7, DO assessment SOP)



Data Collection Index Periods ("Growing Season")

Start and Ending Dates for Three Seasons (Winter, Runoff and Growing), by Level III Ecoregion.

Ecoregion Name	Start of Winter	End of Winter	Start of Runoff	End of Runoff	Start of Growing Season	End of Growing Season
Canadian Rockies	Oct.1	April 14	April 15	June 30	July 1	Sept. 30
Northern Rockies	Oct.1	March 31	April 1	June 30	July 1	Sept. 30
Idaho Batholith	Oct.1	April 14	April 15	June 30	July 1	Sept. 30
Middle Rockies	Oct.1	April 14	April 15	June 30	July 1	Sept. 30
Northwestern Glaciated Plains	Oct.1	March 14	March 15	June 15	June 16	Sept. 30
Northwestern Great Plains	Oct.1	Feb. 29	March 1	June 30	July 1	Sept. 30
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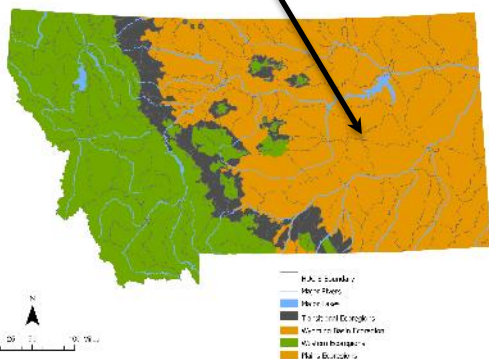
DO Delta Thresholds for Eastern Montana

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

Eastern Montana Reference Sites (2008-2010)

90% of the daily DO deltas <5.3 mg/L. Highest value was 6.6 mg/L in a site with abundant macrophytes

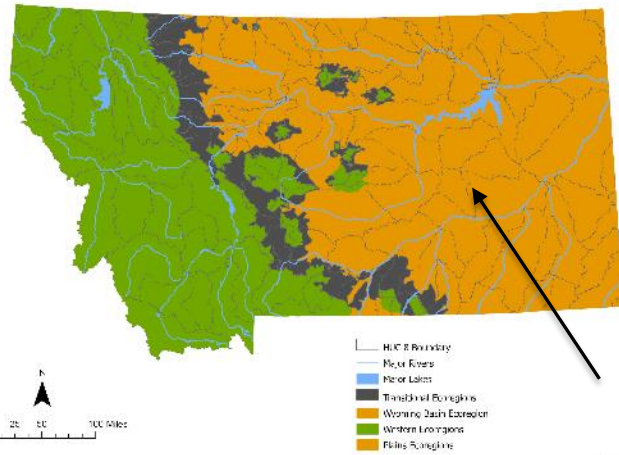
HUC 8 Watersheds and Ecoregions



Draft DEQ recommendation: 5.3 mg/L

Eastern MT: Sample Types and Frequency

HUC 8 Watersheds and Ecoregions

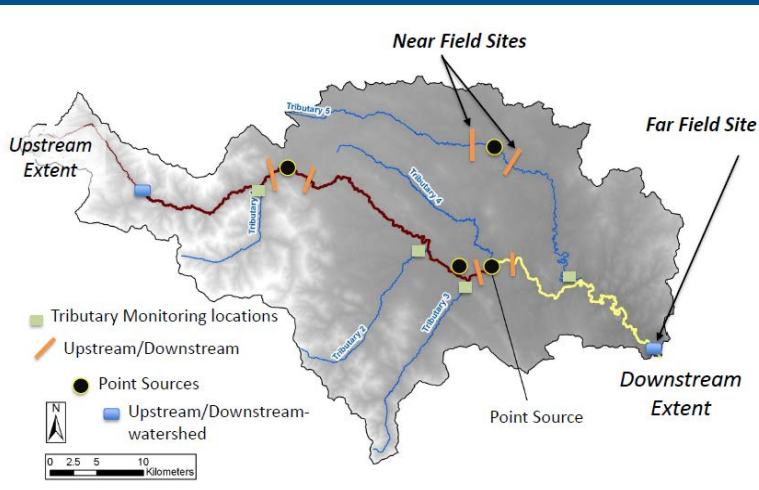


Near Field Sites

- Dissolved Oxygen, DO Delta, Temperature: *Instruments must be deployed annually for a minimum of 30 continuous days with at least 21 days collected in August.*
- TP, TN Concentrations: *At least twice annually during the index period, with at least 30 days between each sampling event.*

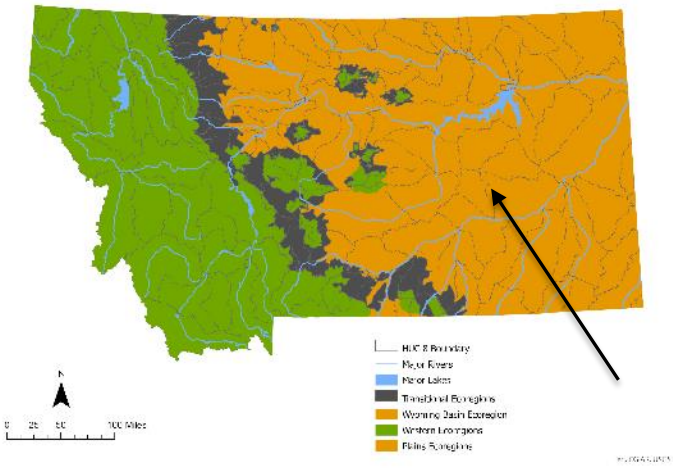
Far Field Sites

- TP, TN Concentrations: *At least twice annually during the index period, with at least 30 days between each sampling event. DEQ is considering if response variable should also be required*



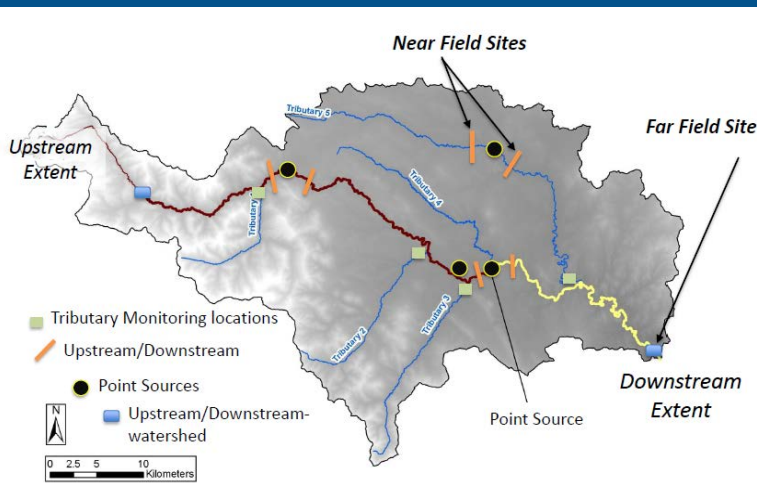
Eastern MT: Sample Types and Frequency

HUC 8 Watersheds and Ecoregions



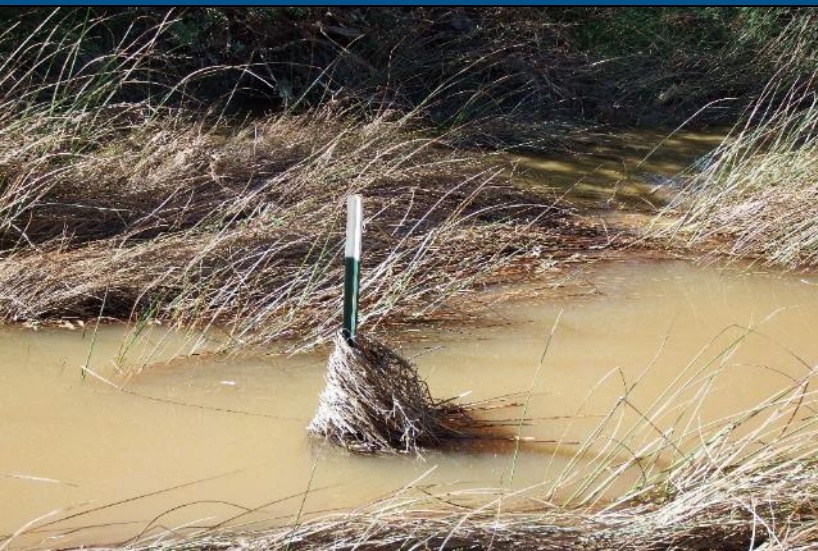
Tributaries

- TP, TN Concentrations: *At least twice annually during the index period, with at least 30 days between each sampling event.*



Instrument Maintenance

- Copper mesh keeps algae growth off the sensor for up to a month
 - Prevents interference with data
- Drifting algae and aquatic plants can smother instruments
 - Should be checked periodically during deployment (weekly ideal)

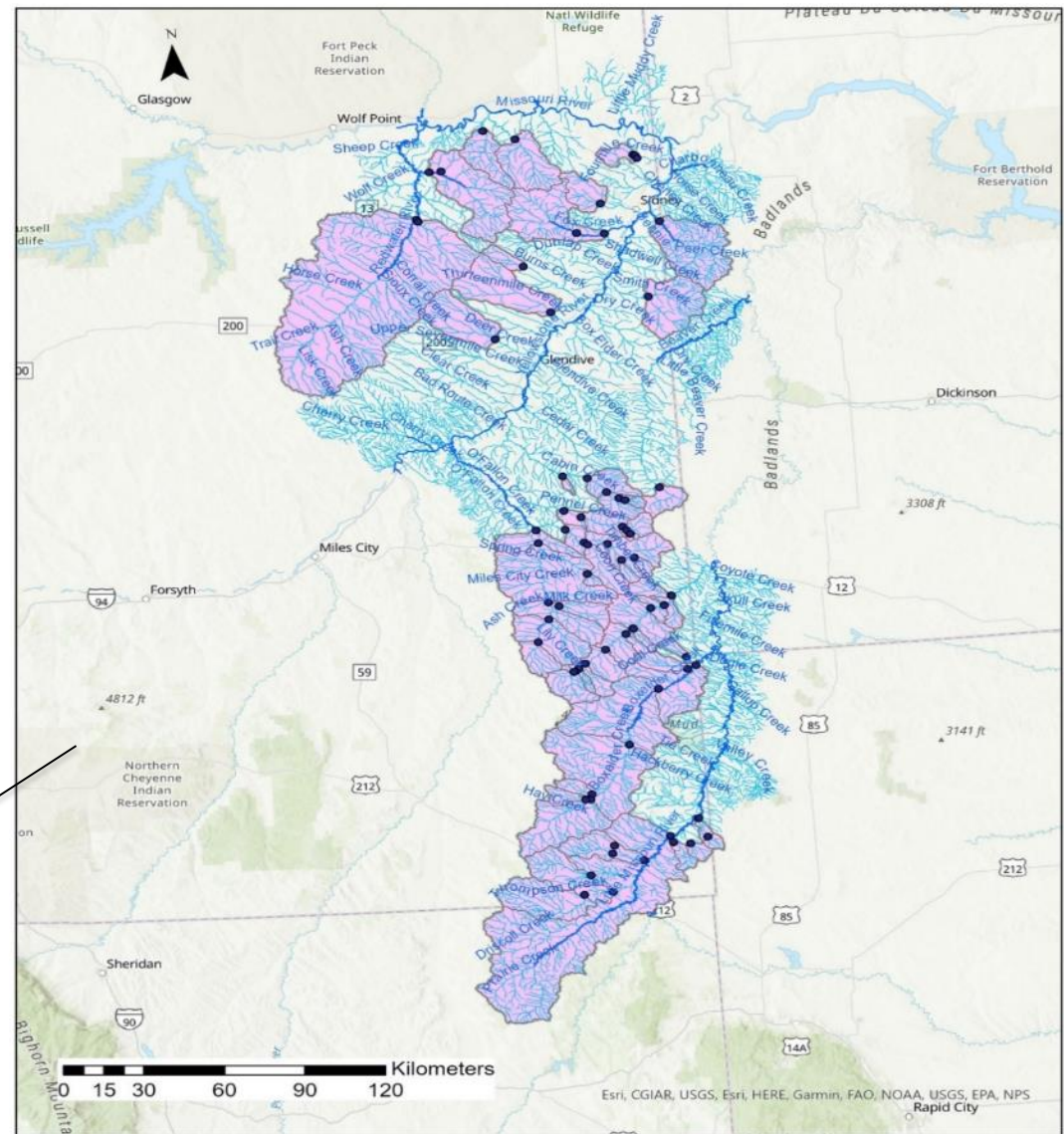
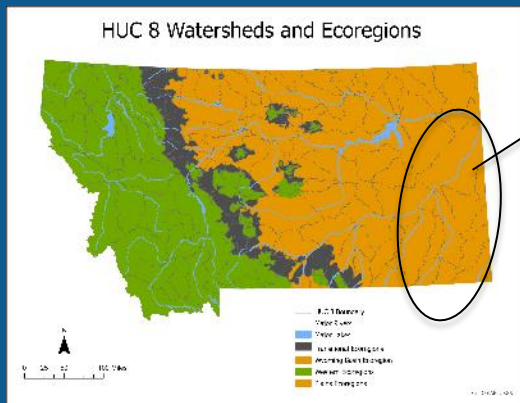


Technical Subcommittee Discussion and Feedback

Factors Affecting DO Delta in Prairie Streams

2013-2017 DEQ Study
GLEC* assisted DEQ with analyses

- 78 unique sites
- DO delta measured from one to five years in summer/fall



*Great Lakes Environmental Center, Inc., Traverse City, MI

We Examined these Variables that Might Affect DO Delta

Land Use/Cover

- % area within watershed by type (19 types)
- Compiled for whole watershed, 5 km radius (from sampling point), 1 km radius

Petroleum-Based Well

- Count by age (actual, before/on-after 1990) or type within watershed
- Type= oil, gas, oil & gas

Topographic Slope

- Median, mean, variance, or maximum value (tangent) by watershed

Drought

- NOAA Palmer Indexes (Z-index, PMDI, PHDI)
 - By month by climate division → integrated to watershed
- National Drought Monitoring Center (% area, consecutive weeks)
 - By week by county → integrated to watershed

Factors

- Stream category (site count)
 - Perennial (25), intermittent (41), ephemeral (1), wetland type (6)
- Drainage area (numeric)
- Comparison (reference) site – yes/no

Water Chemistry

- Nutrients (concentration only)
 - TP, SRP
 - TN (measured), NO23, NH34
 - Conductivity, temp (both instantaneous and continuous), pH
- Events: 2013-2017 (various frequencies by site)
 - 73 sites – every site not sampled each year – some sites have data for 5 years, others 4,3,2,1 year

Aquatic Plants – Periphyton (diatoms)

- % relative abundance, impairment probability (metric)
- End sample result or average begin/end sample
- Events: 2013-2017 (various frequencies by site)
 - 73 sites – same frequency as Water Chemistry – if turbid no sample taken

Aquatic Plants – Aquatic Visual Assessment

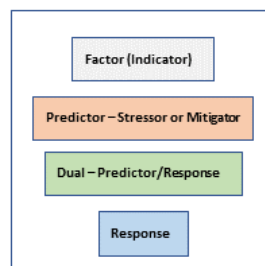
- Microalgae (diatoms and all “short” attached algae), filamentous algae, macrophyte, moss
- Cover (numerical), color, condition, and thickness (numerical)
- Events: 2013-2017 (various frequencies by site)
 - 73 sites – same frequency as Water Chemistry – if turbid no sample taken

Aquatic Plants – Plant Species

- Categorical – presence/absence by species
 - Algae/macrophyte
- Events: 1 time sample only
 - 73 sites – same frequency as Aquatic Visual Assessment – if turbid no sample taken

Dissolved Oxygen

- Multiple week sampling
 - Minimum: average/max
 - Variance of time series
 - Delta:
 - average/max
 - #days delta above threshold (mg/L)
 - 3.5 (Heiskary MN)
 - 5.3 (Suplee MT)
 - 6.5 (Miltner OH)
- Events: 2013-2017 (various frequencies by site)
 - 73 sites – every site not sampled each year – some sites have data for 5 years, others 4,3,2,1 year



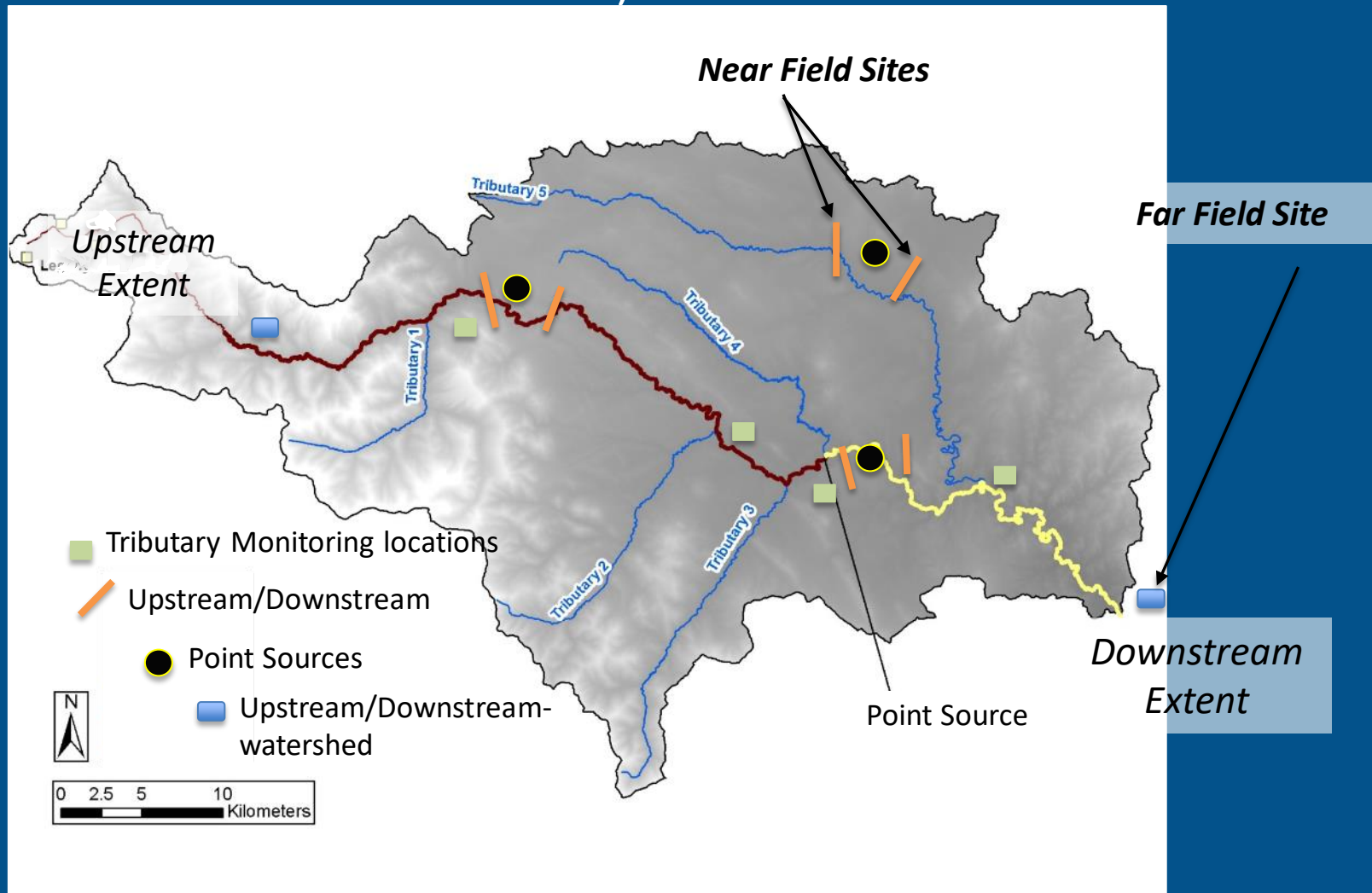
Major Findings and Implications

- Recommended using average weekly DO Delta
- Drought cycles tend to have higher DO Delta, wet cycles lower
- Watersheds with higher % land use have higher DO delta
- Findings allow DO delta thresholds to be considered in light of other environmental factors that co-occur

*Updated procedures regarding use of DO delta
should come later this year*

Technical Subcommittee Discussion and Feedback

Relative Change: Up- and Downstream of Point Source (Near Field Sites)



Note: This map demonstrates monitoring locations upstream and downstream of point sources. The locations shown are for illustrative purposes only. In addition to upstream and downstream, monitoring downstream of the confluence would be required to demonstrate cumulative effects.

Relative Change Data Will Provide New Insights on the Effect of a Point Source

Two Scenarios, for Illustration

Scenario 1: Mixed results, minimal effect from point source.
 Little relative difference, and fairly variable (sometimes algae is lower below the facility, sometimes higher). Both upstream and downstream sites meet threshold of 125 mg Chla/m².

Benthic Chlorophyll <i>a</i> (mg/m ²)			
Sampling Event	Upstream	Downstream	Difference
July 15, 2022	60	115	55
August 15, 2022	55	54	-1
July 15, 2023	90	91	1
August 15, 2023	95	110	15
July 15, 2024	30	75	45
August 15, 2024	35	20	-15
July 15, 2025	49	49	0
August 15, 2025	70	60	-10
July 15, 2026	10	50	40
August 15, 2026	20	20	0
5-Year Average:	51.4	64.4	13

Scenario 2: Large effect from the point source. Algae is high below the facility and routinely exceeds the 125 mg Chla/m² threshold. Upstream, the river consistently meets the threshold. The problem can be clearly linked to the point source.

Benthic Chlorophyll <i>a</i> (mg/m ²)			
Sampling Event	Upstream	Downstream	Difference
July 15, 2022	60	115	55
August 15, 2022	55	300	245
July 15, 2023	30	250	220
August 15, 2023	35	115	80
July 15, 2024	30	125	95
August 15, 2024	35	140	105
July 15, 2025	49	250	201
August 15, 2025	25	275	250
July 15, 2026	10	155	145
August 15, 2026	20	155	135
5-Year Average:	34.9	188	153.1

DEQ is still working out the details of how all the data will be considered and assessed collectively

Technical Subcommittee Discussion and Feedback

Additional Response Variables

For Western and Eastern Montana
Wadeable Streams and Medium Rivers



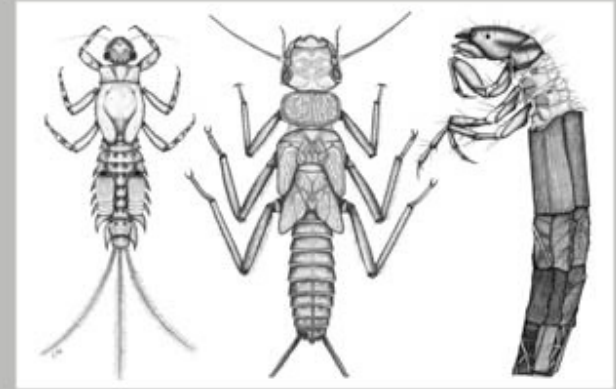
Western MT Wadeable Streams & Medium Rivers: Additional Response Variable

- Macroinvertebrates

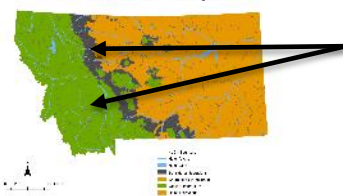
- Hilsenoff Biotic Index (HBI)

At near-field sites, DEQ proposes that no specific metric threshold will apply, because other environmental factors affect insect populations. Instead, DEQ will consider the relative HBI change u/s vs. d/s.

- Data will be used to support algae data results
 - Sampling Frequency: At a minimum, once per annual index period, corresponding to one of the other sampling events



WUC 8 Watersheds and Ecoregions



Eastern MT Wadeable Streams & Medium Rivers: Additional Response Variable

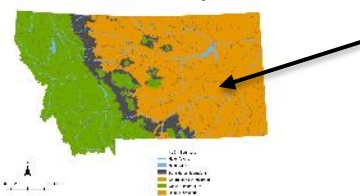
- Biochemical Oxygen Demand (BOD5)

For near-field sites, DEQ proposes that no specific threshold apply, as our knowledge of natural BOD5 levels in prairie streams is limited. Instead, examine relative change in BOD u/s vs. d/s.

- Data will be used to support DO delta results
- Sampling Frequency: At a minimum, once per year during September or October (Note: October is after the index period).



UUC 8 Watersheds and Ecoregions



Technical Subcommittee Discussion and Feedback



As Time Allows

*Data and Monitoring
Resources Overview*

Water Quality Planning Bureau Monitoring

Collect water quality data from state waters

- Ambient data representing current conditions
- Streams, rivers, lakes/reservoirs, wetlands
- Many types of data (chemical, biological, physical)

Implement monitoring projects each field season

- Monitoring objectives vary across programs
- Project areas vary from year to year



Water Quality Planning Bureau Monitoring

Use three main approaches

- Internal
- Partnerships
- Volunteer Monitoring

Apply similar data quality requirements

Data can be applied to multiple uses

- Similar field methods, analytical methods

Apply Similar data management approach

- Data is stored in the same location and format (EQulS)
- Data is publicly available



Internal Monitoring

Each WQPB section monitors for several objectives:

Standards
and
Modeling

Standards Development

Reference Conditions

Monitoring
and
Assessment

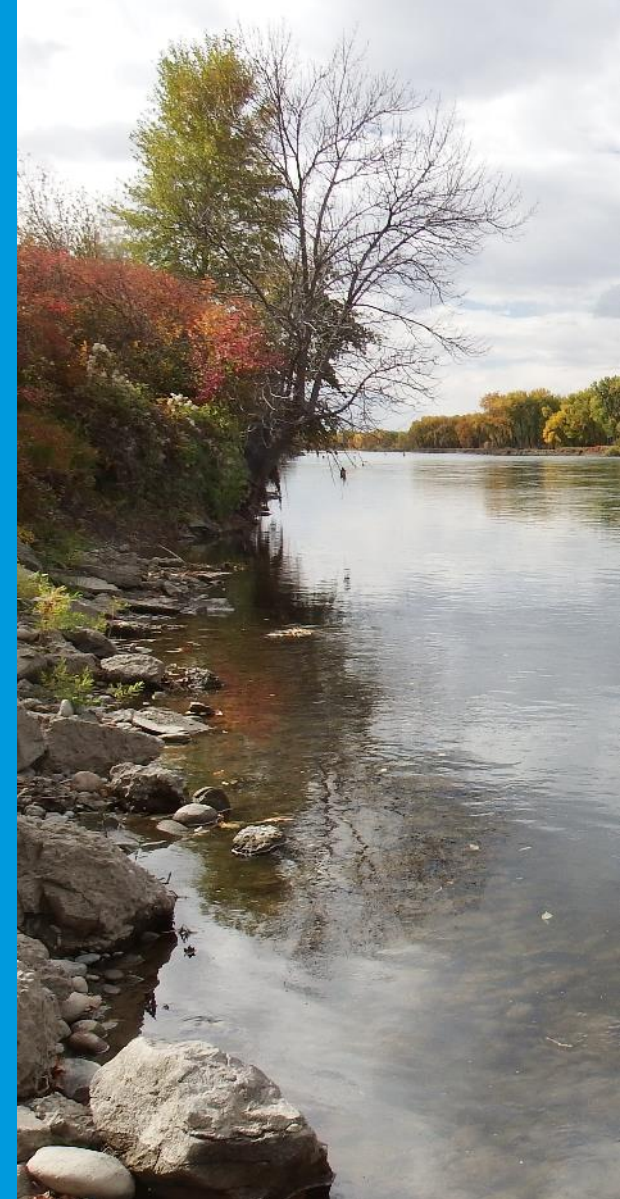
Beneficial Use Assessment

Trend Analysis

Watershed
Protection

TMDL Source Assessment

Restoration Project Effectiveness



Monitoring Partnerships

Opportunities

Similar Objectives

Local

Willing and Able

Benefits

Cost Savings

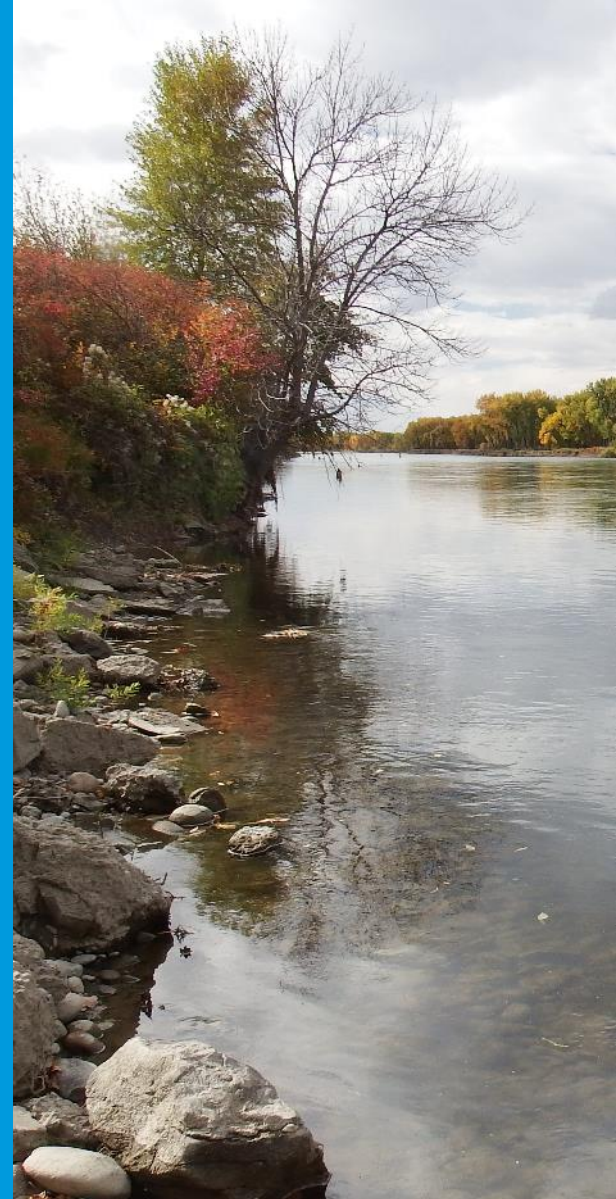
Data Sharing

Approaches

Contracts, Joint Funding Agmts

Cooperative Sampling Planning

Examples: State/federal agencies; water quality districts; municipalities; watershed groups; conservation districts



Volunteer Monitoring Support Program

Financial Support

Lab Analysis Costs

Direct Contracts

Technical Support

Sampling and Analysis Planning

Training

Material Support

Equipment

Supplies



Types of Data

Chemical parameters

- Water and benthic sediment
- Nutrients, metals, organics, other

Biological samples

- Algae (chlorophyll-a, AFDW)
- Periphyton (taxa)
- Macroinvertebrates (taxa)

Field parameters

- Instantaneous or continuous measurements
- Dissolved oxygen, pH, specific conductivity, temperature

Discharge

Physical/sediment



Data Summary

Last 5 years (2016 – 2020)

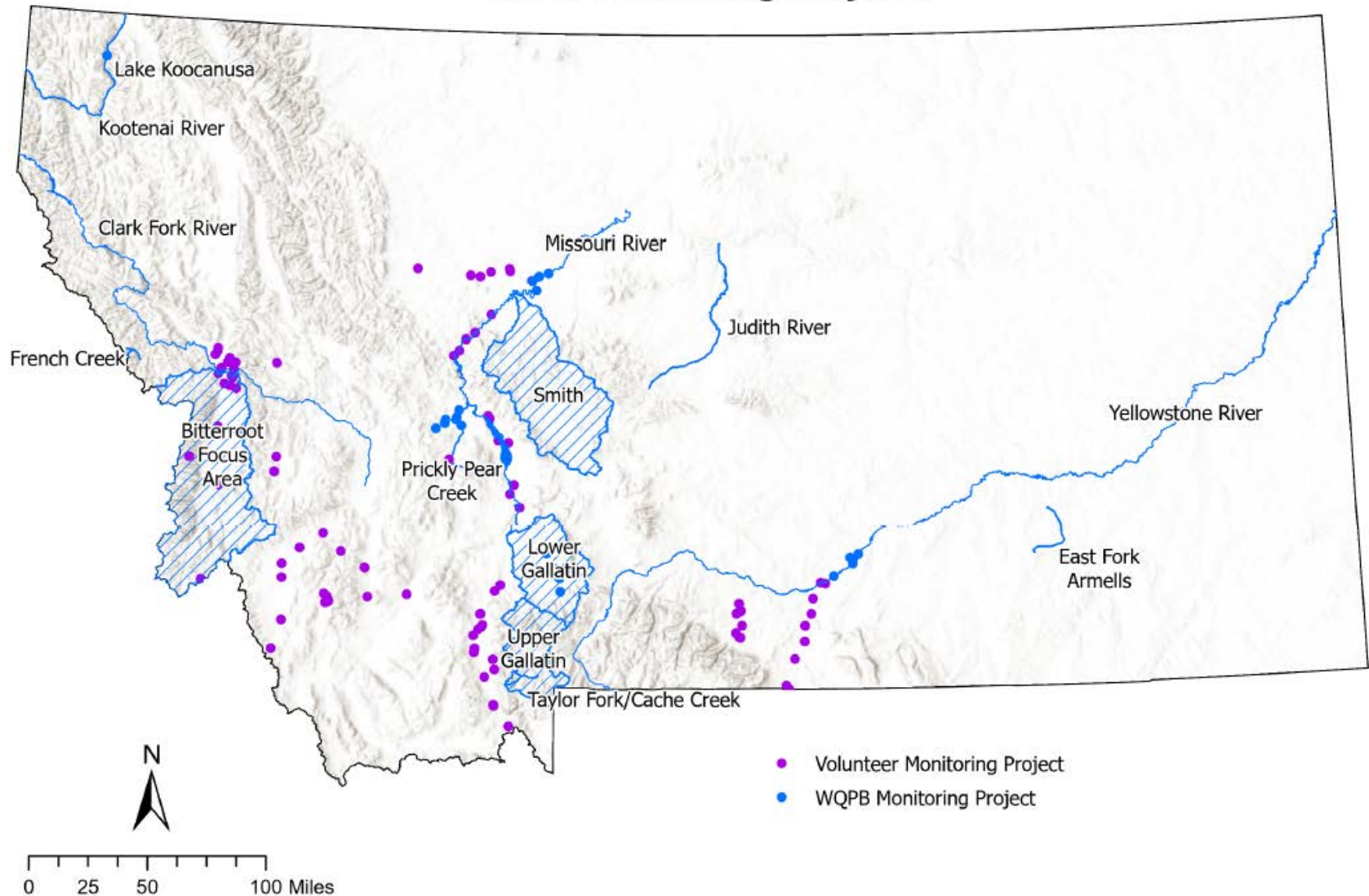
Total number of result values* in database

- Internal monitoring projects: **175,985**
- Volunteer monitoring projects: **32,284**

* includes both analytes and field measurements



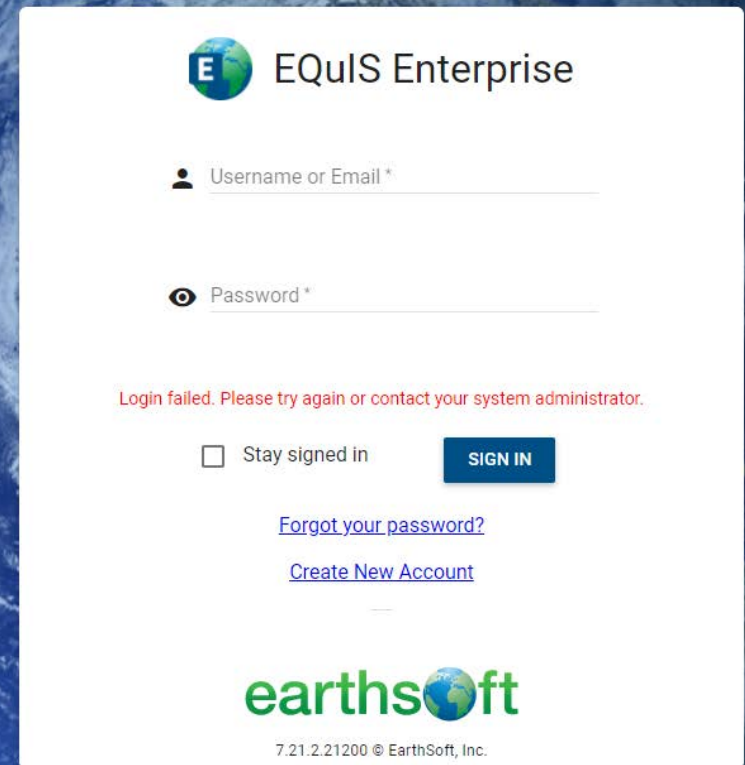
2021 Monitoring Projects



Accessing Data: EQulS

DEQ's primary database for
ambient water quality data

- Result values
- Metadata (e.g., station name, lat/long, method, reporting limit)
- Internal DEQ and external (partners, VM) data submittal
- **Not publicly available via EQulS**
- **Data is uploaded weekly from EQulS to National Water Quality Portal**



EQulS Enterprise

Username or Email *

Password *

Login failed. Please try again or contact your system administrator.

☐ Stay signed in **SIGN IN**

[Forgot your password?](#)

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Accessing Data: National Water Quality Portal

- Combines EPA's STORET and USGS's NWIS databases
- Contains data from EPA, USGS, states, tribes, watershed groups, other federal agencies, volunteer groups, and universities
- Includes most DEQ ambient water quality data
- **Publicly available**

National Water Quality Monitoring Council

Working together for clean water

Water Quality Portal

The Water Quality Portal (WQP) is a cooperative service sponsored by the United States Geological Survey (USGS), the Environmental Protection Agency (EPA), and the National Water Quality Monitoring Council (NWQMC). It serves data collected by over 400 state, federal, tribal, and local agencies.

DOWNLOAD DATA

Download water-quality data in Excel, CSV, TSV, and KML formats.

HOW TO USE THE WQP

User Guide
Web Services Guide
FAQs
Upload Data

NATIONAL RESULTS COVERAGE

Water-quality data in your state.

ABOUT THE WQP

What is the WQP?
Contributing organizations
Other Water Quality Portals
Explore WQP Sites

contact us



Accessing Data: Water Quality Assessments

Clean Water Act Information Center (CWAIC)

Here you will find information about the quality of Montana's rivers, streams, and lakes in relation to Montana's Water Quality assessments. These assessments are derived from available statewide water monitoring data and information. The Clean Water Act Information Center also provides access to Montana's Water Quality Reports and List of Impaired Surface Waters, as well as online search and mapping tools.

Search Water Quality Assessment Information

<https://deq.mt.gov/water/resources>

By Water By Location By Category By Impairment

Search by Water

☒ Waterbody Name

☐ Assessment Unit ID

Optional Filters

ⓘ These filters allow you to reduce the number of results returned from the above search criteria.

☒ County

☒ HUC4

☐ TMDL Planning Area

Search

Accessing Data: Water Quality Assessments

CWAIC,
continued...

Detailed assessment record

Summary of
assessment
findings

Q New Search Detailed Assessment Report

Cycle Year: 2020 View detailed report by cycle year

Water Information

AUID	MT41E002_030	Water Type	RIVER
Waterbody Name	Basin Creek	HUC Name	Boulder
Size (Miles / Acres)	16.70	HUC	10020006
Ecoregion	Middle Rockies	Basin	Upper Missouri
County	Jefferson County	Use Class	A-1
TMDL Planning Area	Boulder - Elkhorn	Trophic Status and Trend	
Location	BASIN CREEK, headwaters to mouth (Boulder River)		
Water Quality Category	4A		

Beneficial Use Support Information

Use Name	Fully Supporting	Not Fully Supporting	Threatened	Insufficient Information	Not Assessed
Drinking Water		✓	No		
Primary Contact Recreation			No		✓
Agricultural			No		✓
Aquatic Life		✓	No		

Impairment Information

Accessing Data: EPA's How's My Waterway?

How's My Waterway?

Informing the conversation about your waters.

Let's get started!

▼ Search by address, zip code, or place...

[» Go](#) OR [📍 Use My Location](#)


Choose a place to learn about your waters:

Community


State

National


Explore Topics:




Swimming




Eating Fish



Aquatic Life

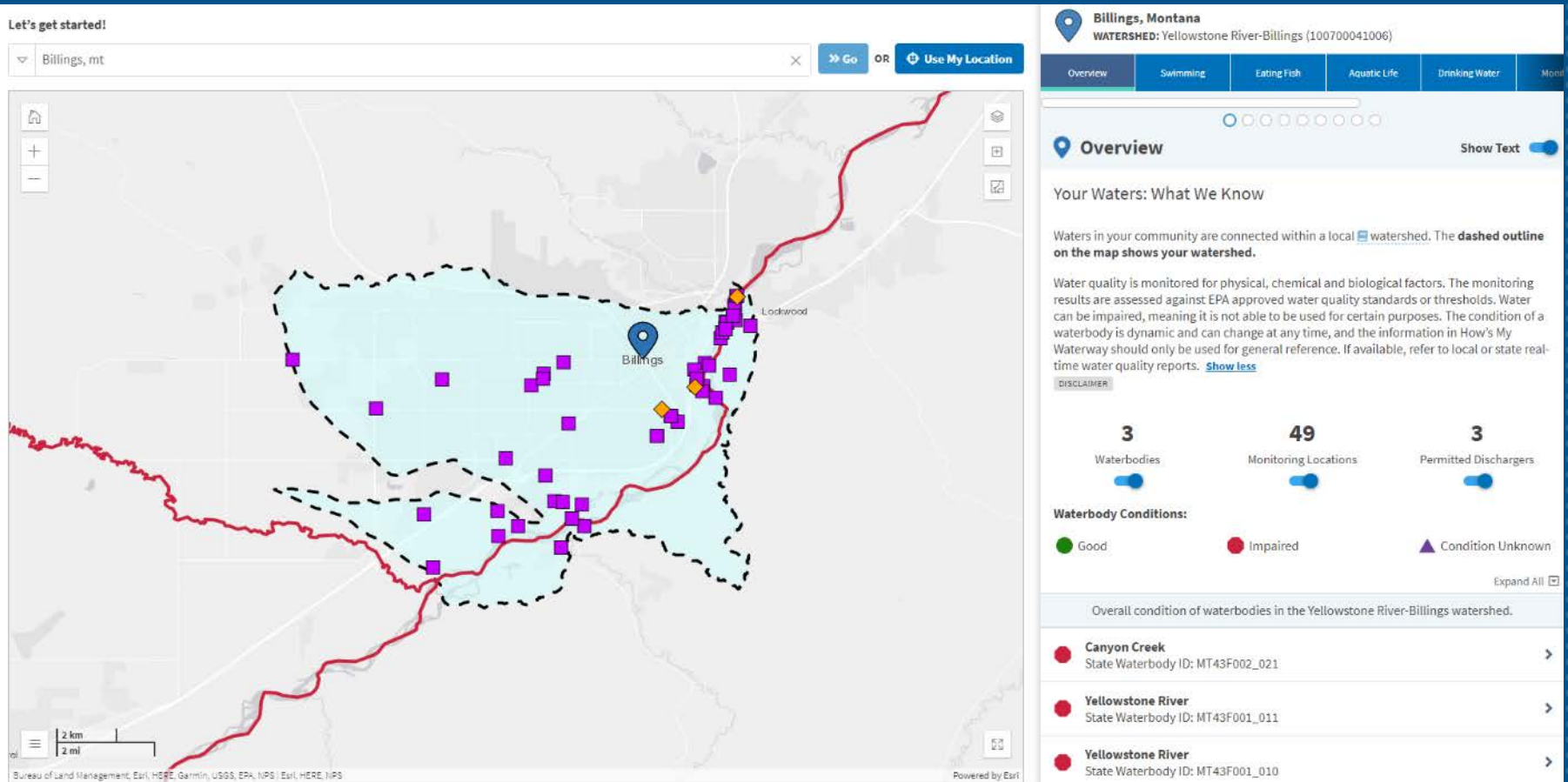


Drinking Water

DEQ
MONTANA 

49

Accessing Data: EPA's How's My Waterway?



Accessing Data: Reports and Information

Water Quality Library

[Return to Water Quality Resources](#)

Search DEQ Database

Keyword: [Library Keyword Thesaurus](#)

Authors Name:

Title: Year: (Format: YYYY)

ISBN/ISSN: (Format: 8 or more characters)

Stream / Lake: Waterbody ID:

Agency By:

Agency For:

HUC 4:

Data Type:

NOTE: Query is NOT case sensitive. You may enter full or partial values for text fields.

Other Monitoring Resources

Other resources that may be available for those developing Adaptive Management Plans:

- Standard Operating Procedures (SOPs) for field methods
- Training
- Equipment Support

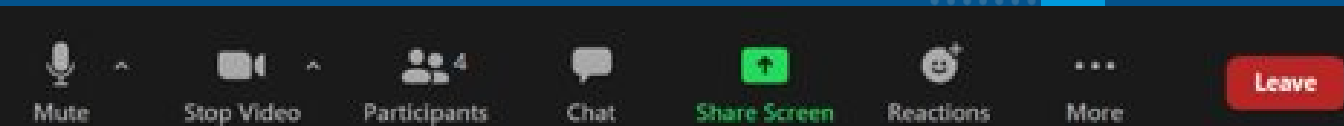
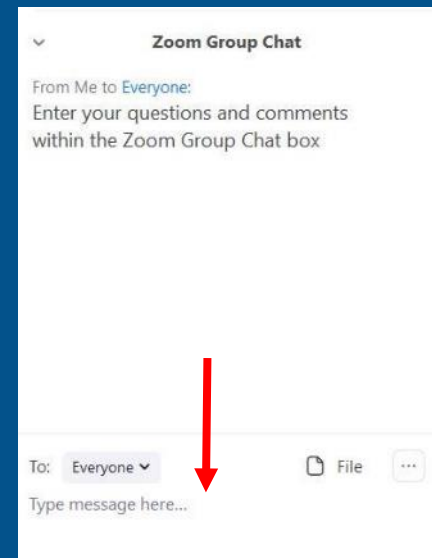
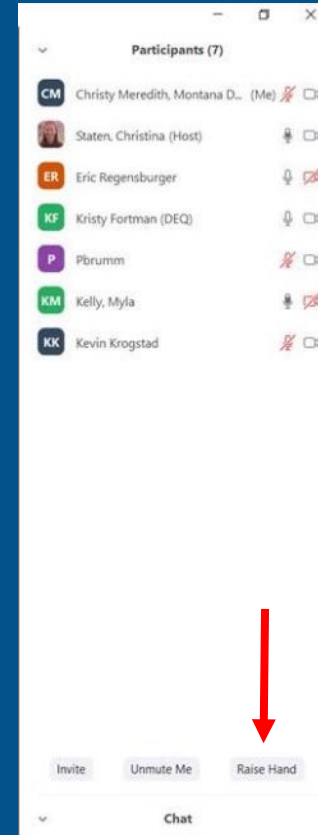
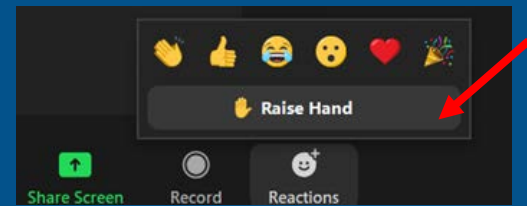




Public Comment & Close of Meeting

Questions/ Comments

- Raise hand or type questions into the chat
- Please keep your microphone muted until called on
- If calling by phone, press*6 to unmute
- State your name and affiliation before providing your comment



Next Meetings

- Next Technical Subcommittee
Sept. 7, 2021, 1:30 – 3:30 PM
Topic: Details for identifying point
source long-term nutrient targets
- Nutrient Work Group Session 4
Aug. 25, 2021, 9-11 AM



Thanks for Joining Us

Contact:

Mike Suplee, MSuplee@mt.gov

Rainie Devaney, RDevaney@mt.gov

To submit comments or questions



» Submit Comments or Questions

<http://deq.mt.gov/water/resources>