

# Upper Mississippi River Basin Association Water Quality Task Force

February 3-4, 2015  
East Alton, Illinois

## Meeting Summary

### Participants

Gregg Good	Illinois EPA
Matt Short	Illinois EPA
John Olson	Iowa DNR
Glenn Skuta	Minnesota PCA
Joel Chirhart	Minnesota PCA
Mohsen Dkhili	Missouri DNR
Trish Reilly*	Missouri DNR
Brian Weigel	Wisconsin DNR
Shawn Giblin	Wisconsin DNR
Linda Holst*	US EPA, Region 5
Paul Proto*	US EPA, Region 5
Michael Brennan	National Great Rivers Research and Education Center
John Sloan	National Great Rivers Research and Education Center
Lori Stenzel	Illinois American Water Company
Albert Ettinger	Mississippi River Collaborative
Pat McGinnis	The Horinko Group
Christine Favilla	Sierra Club
Jimmy Greene	Sierra Club
Dru Buntin*	UMRBA
Dave Hokanson	UMRBA
Matt Jacobson*	UMRBA

\*Joined the meeting by phone.

### Call to Order and Introductions

The Water Quality Task Force (WQTF) was called to order at 1:05 p.m. on February 3, 2015 by Chair Mohsen Dkhili. Introductions by all participants followed.

### Approval of Previous Meeting Summary

Dave Hokanson reminded the WQTF that the previous meeting summary had already been approved via email due to the need for it to be included in the November 2014 UMRBA Board-Water Quality Executive Committee (WQEC) meeting packet. As such, approval action is not needed in this meeting.

### Meeting Overview and Background

Hokanson provided a brief overview of the current areas of emphasis in interagency water quality coordination via UMRBA, including monitoring, assessment/reporting, data/information management, nutrients, and outreach/partnerships. He said these areas of emphasis would all be addressed during the course of this meeting and in particular the draft UMR CWA assessment methodology and implementation of the CWA recommended monitoring plan would be primary topics of discussion. Hokanson added that there are several workgroups engaged in these efforts – including the WQTF,

WQEC, assessment workgroup, and the Minnesota-Wisconsin pilot monitoring group – and that these groups have a need to stay informed regarding the others' work.

### **Agency and Partner Reports**

#### *Iowa*

Olson said Iowa has continued work on updating its water quality monitoring strategy. At this time, the strategy does not include any specific discussion of the UMR CWA monitoring plan. Additionally, Olson said he is aware of a list of UMR fishes being developed by Hal Schramm of Mississippi State University, suggesting that, once completed, this may be a resource for use in potentially refining a biological condition gradient (BCG) for the UMR, as well as in fish tissue monitoring discussions.

Olson also noted the proposed lawsuit by the Des Moines Water Works against three northwestern Iowa counties that manage drainage districts where nitrate levels in surface waters are elevated. Weigel asked who the defendants in the lawsuit would be. Olson responded that there are ten drainage districts within these counties that operate as quasi-public agencies under the governance of the counties. As such, the counties are named for their role in overseeing the drainage districts.

#### *Illinois*

Gregg Good said Illinois EPA's 2015-2020 monitoring strategy is now available online (see <http://www.epa.illinois.gov/topics/water-quality/monitoring/strategy/index>). He thanked US EPA for their assistance in helping Illinois complete this strategy. Good noted that Illinois has 11 monitoring sites on the mainstem UMR and intends to keep monitoring these locations as long as funding and staffing can support. He said, so far, there have not been any cuts to Illinois EPA's UMR monitoring presence.

Albert Ettinger asked whether Illinois EPA included any continuous monitoring at its UMR sites. Good replied that there is not continuous monitoring at the UMR mainstem sites, but that this is done at intensive wadeable stream sites. Shawn Giblin said there is some continuous UMR monitoring in Wisconsin and Glenn Skuta added that MCES may also be doing some continuous monitoring in the Twin Cities metro area UMR as well as on the Minnesota River. Giblin asked how often Illinois EPA is monitoring at its Lock and Dam 11 site. Matt Short replied that this is done on a quarterly basis. Giblin then asked how far upstream Illinois EPA conducts monthly monitoring. Short answered that monthly monitoring is done up to Lock and Dam 15, though it is just for a total of nine months during a single year.

Good said Illinois is also working on IBIs for their interior lakes and streams, including indices for both fish and macroinvertebrates. Additionally, he said the public comment period for Illinois' new nutrient loss reduction strategy has been completed, with the draft strategy available on Illinois EPA's website (see <http://www.epa.illinois.gov/topics/water-quality/watershed-management/excess-nutrients/nutrient-loss-reduction-strategy/index>).

Good noted that the application deadline for the next round of CWA Section 106 supplemental monitoring funding is upcoming in April. As such, if the states are planning to use this round of supplemental 106 funding to support UMR monitoring work, this meeting is the time to discuss any such plans.

#### *Minnesota*

Skuta said Governor Dayton had recently announced an initiative to require 50 foot buffers for all watercourses in the state. He said this announcement came at the annual Minnesota DNR roundtable held January 16, and that agencies are now examining how to proceed. Skuta noted that the

Environmental Working Group had recently completed an analysis of the potential impacts of buffer implementation in five Iowa counties (see <http://www.ewg.org/research/iowas-low-hanging-fruit>), but had not looked at Minnesota to date. Olson asked if the waterbodies in Minnesota to which the buffer requirement would apply have been identified. Skuta replied that the Governor had simply said “all watercourses,” so that is one of the questions that will need to be sorted out. He added that much of the existing authority lies at the local level, so it is not yet clear how a statewide initiative, which the Governor has tasked DNR to implement, would play out. Olson asked whether a habitat component is incorporated into this initiative. Skuta said the initiative is primarily water quality focused, but that there has certainly been support for buffers among pheasant hunting groups. Sloan asked what the status of LiDAR coverage is in Minnesota, noting that there may be some GIS tools that could then be employed in regard to the buffer initiative. Joel Chirhart replied that complete LiDAR coverage exists for Minnesota.

Ettinger asked Skuta to summarize Minnesota’s actions in regard to triclosan. Skuta said Minnesota agencies had ceased using products containing triclosan two years ago and a statewide ban was passed in 2014, which will take effect in January 2017. He noted that the Minnesota Department of Health had studied triclosan as part of this process, and found that it was ineffective as an antimicrobial agent when used in personal care products.

Skuta said Minnesota is also starting to look at the microbead issue, with Minnesota PCA having been mandated by the state Legislature to produce a report on the topic (the MPCA report is available at: <http://www.pca.state.mn.us/index.php/about-mpca/mpca-news/featured-stories/plastic-microbeads-in-our-waters.html>). Mohsen Dkhili noted that plastic microfibers have also been recently highlighted as an issue for the Great Lakes. Skuta concurred, saying that microbeads are just one component of the presence of plastic in the environment, and that microfibers are potentially a more challenging issue, due to their diverse sources (e.g., lost from clothes products during washing).

Skuta said MPCA’s overall request for water quality monitoring assessment (a total of \$17 million) did make it into the Governor’s budget request, and that this request includes the UMR pilot monitoring project. He said the next stop for the budget is the state Legislature, so it remains to be seen what the final budget will look like.

Additionally, Skuta commented that MPCA is working on an IBI for lakes, including both fish and vegetation.

### *Wisconsin*

Brian Weigel said Governor Walker’s budget is due out today and that, while details are not yet available, it is expected that overall spending will either be flat or down somewhat as compared to the previous budget. Regarding microbeads, he said there is at least one state legislator considering the introduction of legislation on this topic. Weigel said a review of Wisconsin’s bioassessment program had recently been completed by Chris Yoder and that Wisconsin has been working on a new bioassessment approach which emphasizes collaboration with the state’s 319 nonpoint source program. More broadly, he said, Wisconsin DNR is pursuing greater coordination between its surface water and ground water/drinking water programs. One aspect of this has been enhanced flow monitoring to determine ground water-surface water connections and the impact of high capacity wells specifically. Weigel said both high capacity wells and frac sand mining have been emerging issues for the Wisconsin DNR.

Ettinger asked whether the frac sand issue relates to water quantity or water quality. Weigel replied that it is really both and relates to both the periodic and ongoing discharges of wash water from sand mining sites. Ettinger asked whether there are any specific contaminants that are driving water quality concerns related to frac sand mining. Weigel answered that is primarily a total solids issue, rather than specific

contaminants per se, though there are some polymers that may end up in the wash water. Dkhili said Missouri is now also seeing some frac sand mining activity in the Cape Girardeau area.

Weigel said Wisconsin is also working on its triennial standards review, and is seeking to incorporate harmful algal blooms (HABs) into this process. He noted that the WisCALM methodology document has also been updated (see <http://dnr.wi.gov/topic/SurfaceWater/assessments.html>) and thanked US EPA for their assistance with the update. Weigel said the WisCALM update with regard to drinking water drew on Ohio's approach and incorporates cryptosporidium and microcystin as contaminants of interest. He commented that, overall, the process of updating the document was very smooth.

In other standards work, Weigel said Wisconsin DNR has been working on rule packages addressing site specific criteria, tiered aquatic life uses, and biocriteria. He said these packages are part of work being done by Wisconsin DNR to address a list of water program deficiencies that had been identified by US EPA.

Giblin noted that some unusual fish kills had recently been observed on the UMR, which appear to result from oxygen super-saturation in areas where ice cover is present, sunlight penetrates, and submersed vegetation is photosynthesizing. He asked whether other states had observed this phenomena this winter, but none indicated reports of this type of fish kill. Giblin also noted that he is seeking to conduct an algal toxin monitoring study on the UMR. Additionally, he said two new staff have been hired – John Kalas (Water Quality Specialist) and Deanne Drake (Vegetation Specialist) – to work at the Wisconsin Field Station, which conducts monitoring under the Upper Mississippi River Restoration Program-Long Term Resource Monitoring Program (LTRMP).

Giblin said Wisconsin DNR is also assembling a work group to examine connections between biology and total suspended solids (TSS). Ettinger asked if there has been an inflection point observed in the relationship between TSS and biology. Giblin replied that there is nothing firmly established, though it appears there may be a critical point around 17 mg/l for TSS in Wisconsin's reach of the UMR. This is something the work group will examine further.

### *Missouri*

Dkhili said Missouri has continued its work to develop nutrient criteria for lakes greater than 10 acres in size. He said criteria development effort has incorporated multiple "lines of evidence," including nutrient concentrations and clarity measurements, in determining the support of aquatic life, recreation, and drinking water uses. Dkhili emphasized that this work is limited only to lakes at the present time and does not address stream and rivers. He also noted that Missouri, like other states, is in the process of updating its monitoring strategy.

Trish Reilly noted that, in the context of Missouri's monitoring strategy, UMR monitoring remains very limited. She said UMR monitoring, along with Missouri River monitoring, remains a gap in Missouri's monitoring approach.

Dkhili reported that Missouri's nutrient loss reduction strategy was completed in December 2014 (see <http://dnr.mo.gov/env/wpp/mnrsc/docs/nlrs-strategy-2014.pdf>) and focuses on specific HUC 8 watersheds as priorities for action.

Ettinger asked whether any states have taken action to incorporate new US EPA ammonia standards. Olson said he believes Iowa will be doing so and Dkhili said Missouri has had one stakeholder meeting on the topic to date. Skuta said this in on MPCA's list of standards to incorporate. Olson noted that Iowa's preliminary review has indicated that there will not likely be a significant change in the number of violations due to the new criteria.

## *US EPA Region 5*

Linda Holst said US EPA Region 5 had recently approved Minnesota's river eutrophication standards and is working with Wisconsin on a potential statewide variance mechanism for its phosphorus criterion. Per Good's earlier comment, Holst confirmed that the application deadline for supplemental 106 funding is upcoming in April and that states should be considering what project(s) they wish to submit for consideration. She said that, while final numbers are yet to be determined, it appears that approximately \$160,000 per state will be available. Holst encouraged Region 5 states to contact Mari Nord ([nord.mari@epa.gov](mailto:nord.mari@epa.gov), 312-886-3017) to discuss their plans for FY 15 supplemental 106 funding.

Paul Proto said Region 5 is still working on its review of Minnesota's proposed 2014 303(d) listing and that Illinois' and Wisconsin's 2014 listings are in process.

## *Other Updates*

Hokanson noted that the next Gulf Hypoxia Task Force meeting is scheduled to be held in Columbus, Ohio in May 2015. Dru Buntin noted that America's Watershed Initiative (AWI) held a summit in October in Louisville, Kentucky and shared draft report cards for the Mississippi River Basin at that meeting. He said AWI is now working on revising those report cards in consultation with stakeholders in each of the sub-basins. Additionally, Buntin noted that the next meeting of the Mississippi River Cities and Towns Initiative (MRCTI) will take place in Washington, DC in March 2015 and that MRCTI will then be meeting in Dubuque in September 2015. He also said multiple partners are collaborating to produce an economic profile for the UMR, a draft of which should be available by June 2015.

## **National Great Rivers Research and Education Center (NGRREC) Programs**

### *Great Rivers Ecological Observation Network (GREON)*

John Sloan described the mission of the GREON program as advancing understanding of the ecology of large-floodplain rivers, and their connections to coastal waters, by collecting and sharing high resolution data on key water quality parameters with scientists, managers, and the general public. He said this is accomplished by working with partners from academic institutions, government agencies, and NGOs to create a network of water quality monitoring platforms based on equivalent technologies.

Sloan explained that there are now seven monitoring units included in the GREON effort with planned deployment in spring 2015 at locations spread throughout the Upper Mississippi River basin. He said the units are now using upgraded sensors which should allow for easier calibration. Additionally, Sloan added, earlier tests of two types of nitrate sensors have led to the identification of sensor technology that provided more accurate results (i.e., is consistent with results from "traditional" water quality sampling in the same area). He then described the process by which data from the GREON sensors is transmitted via cellular communications and then becomes available via the Great Lakes to Gulf (GLTG) Observatory. Information transmitted would include system diagnostics, meteorological information, and water quality data.

Sloan said the GREON 1 unit had been tested on the UMR in 2013 by deploying it into Ellis Bay just upstream from Melvin Price Locks & Dam 26. As turned out, he explained, this deployment in May 2013 came just before the fifth highest ever recorded flood crest at Alton, Illinois, which occurred on June 4, 2013. Sloan said the unit was very easy to deploy and sensors generally held calibration for a significant length of time (4-6 weeks). However, potential damage by river debris is a major concern, particularly if future deployments are made in flowing main channel areas (the Ellis Bay test took place in a lower-flowing, off-main channel location). Other possible concerns for extended/main channel deployments include collisions with boats or barges and vandalism. The unit's operation can also be impacted by low sunlight conditions, as it is solar powered (though no collected data will be lost).

Sloan next displayed a variety of data outputs from the GREON 1 deployment, noting that in general the results display good agreement with UMRR-LTRMP data collected nearby. He noted that there is some interference between turbidity and nitrate, though in general the SUNA nitrate sensor produced good results that are comparable with LTRMP data. Ettinger asked whether Ellis Bay is considered a backwater area. Sloan confirmed that this is a backwater, which protected the unit from hazards, such as driftwood, that are associated with floodwaters. He did note, however, that some change in water quality condition was observed associated with the flood event.

For Phase II of the GREON deployment, Sloan said goals include adding more sensors to the unit, including an orthophosphate sensor, and tying the data into the GLTG Observatory. He noted that this Phase has already begun with the deployment of additional sensors on a unit in Ellis Bay – including temperature, dissolved oxygen, conductivity, turbidity, chlorophyll-a, blue-green algae, dissolved organic matter, and nitrate. He said this test also affirmed the quality of results provided by the SUNA nitrate sensor and confirmed the decision to continue using this sensor. Sloan clarified that the units are not left in deployment over the winter, and said the deployment of all seven units is expected this spring, with locations including UMR Pool 8 (main channel and backwater), UMR Pool 26 (main channel and backwater), Missouri River, Lake Decatur (Illinois) and the Lower Sangamon (Illinois). For the Mississippi River, he said goals of the 2015 deployment include gathering information on how water quality changes with latitude in the main channel Pool (8 versus Pool 26) and regarding water quality differences between the main channel and backwaters, as well as the interchange of water, nutrients, and sediment between the main channel and backwaters.

Ettinger asked if there are any planned deployments to the Illinois River as part of this phase. Sloan responded that there are not Illinois River deployments in this phase, but noted that USGS and IL EPA have collaborated in setting up a water monitoring “super site” at Florence on the Illinois River. Good asked the depth at which samples are collected for analysis in the GREON unit. Sloan responded that samples are pulled at a depth of one meter. Good also asked the approximate cost of one buoy, including all instrumentation. Sloan replied that the approximate cost is \$70,000, noting that this includes all instrumentation across a number of parameters. Giblin asked whether the GREON buoys include a sensor for photosynthetically active radiation (PAR), which is a measure of the light energy available to submersed plants for photosynthesis. Sloan answered that all the GREON buoys include a PAR sensor.

#### *Great Lakes to Gulf (GLTG) Observatory*

Michael Brennan explained that the GLTG Observatory has been set up to pull in data from a number of sources in order to provide information along the length of the Mississippi River. He said the project has begun by focusing on nitrogen-related compounds, including nitrate, ammonia nitrogen, and total nitrogen. Brennan said the Observatory has selected out sites with at least five years of monitoring data and then color-coded them according to data source to facilitate viewing and use. He explained that data can be graphed using the application and eventually a polygon-based query tools should be available. Additionally, work is ongoing to calculate and display nitrogen loads. Overall, Brennan said, the current goal is to “go live” with the GLTG Observatory site near the end of February.

Good asked if there are plans to include other parameters beyond the nitrogen-related measurements, such as measurements associate with phosphorus. Brennan replied that, initially, the focus on nitrogen was chosen as it is well-measured by the GREON sensors, relevant for Gulf hypoxia needs, and tied to concerns regarding the loss of nitrogen via tile drainage. Good noted that the monitoring “superstation” at Florence will provide information regarding phosphorus. Hokanson asked how the project has dealt with the numerous forms of nitrogen measures (e.g., total nitrogen, nitrate, nitrite, ammonia, etc.) as well as varying analytical methods. Brennan said for now that similar results have been grouped together regardless of analytical methods and that an emphasis has been placed on nitrate data, as his understanding is that nitrate typically makes up about 70% of total nitrogen in the system.

Good asked what funding source(s) are supporting the GLTG project. Brennan replied that it is a partnership among NGRREC, Illinois-Iowa Sea Grant, the University of Illinois, and the National Center for Supercomputing Applications, with financial support from the Walton Family Foundation.

*Following these presentations, the WQTF took a brief tour of the NGRREC Confluence Field Station.*

### **UMR CWA Assessment Feasibility Project**

John Olson and Joel Chirhart provided an overview of the draft UMR CWA assessment methodology.

#### *Aquatic Life Use Assessment*

Olson provided a general background on the scope and purpose of the assessment feasibility project and then described the details of the aquatic life use assessment methodology. He and Chirhart noted that a new addition to the aquatic life use methodology is a discussion of uncertainty related to biological condition scores, particularly in cases where the score is very close to the threshold level. In particular, Chirhart explained, since only one biological sampling event is prescribed in the monitoring protocol, there is a need to address situations of uncertainty in biological results and therefore the methodology proposes – in cases where an index score is within  $\pm 5\%$  of a threshold value – that other information such as water quality values, flow, habitat, and vegetation index scores be considered in making an attainment determination. He noted that MPCA employs a similar approach in performing its assessments of intra-state waters.

Olson asked whether an adjustment in assessment outcome would function in “both directions” – i.e., in both cases of moving from support to non-support as well as non-support to support. Chirhart said this would function in “both directions,” though it may be applied most frequently in cases of moving from non-support to support – as these are situations where the other information all indicates support but the biological score is just below the threshold.

Weigel asked whether this type of situation might trigger follow up monitoring. Chirhart replied that this could be done. Hokanson observed that the monitoring plan discusses follow up monitoring, but had never defined exactly when this occurs. As such, the  $\pm 5\%$  score variation could potentially be used to define when follow up monitoring is triggered. Chirhart and Weigel both observed that the  $\pm 5\%$  approach is actually a fairly “tight” approach, with Weigel noting that Wisconsin has used up to  $\pm 15\%$  band to trigger follow up monitoring.

Hokanson asked whether, if water chemistry information is to be reviewed in addressing uncertainty in biological results, this would require the establishment of de facto water quality criteria, noting that agreement on shared water chemistry criteria has been one of the ongoing challenges to interstate water quality work. Olson said that existent water quality criteria could be considered in making a determination, but there is not a need to establish new criteria or be tied to a single set. Chirhart agreed, saying that in these cases a consultation process would occur that brings a variety of available information, including water quality data as well as existing criteria and other comparison points.

Chirhart asked the group whether any weighting of sampling sites should be considered. Skuta suggested this question could be posed to Tony Olsen of US EPA, though in general the WQTF agreed that weighting would not be employed, at least for the initial round of monitoring, and that a “simple” probabilistic approach be taken.

Olson asked the group if they are comfortable with breakdowns of good, fair, and poor proposed for reach level characterization of aquatic life use condition, where these categories are determined by the

percentage of river miles in a reach meeting aquatic life use condition thresholds. The WQTF members expressed comfort with this approach.

Chirhart next explained that the methodology now treats submersed vegetation-based assessment as a separate, supplemental assessment, rather than being integrated into the primary aquatic life use assessment *per se*. He said this approach has been proposed due to the greater spatial intensity involved in vegetation monitoring which precludes a site-level assessment congruent with those developed for fish and macroinvertebrate indicators. Giblin said he was not completely comfortable with vegetation being placed in a “supplemental” role, suggesting that the vegetation assessment can still be performed at the reach level and could therefore be equivalent to the other assemblage assessments. Chirhart responded that a separate, parallel assessment could potentially be developed in this way. Weigel emphasized that, regardless of the particulars of the assessment, submersed vegetation sampling should definitely be included in UMR CWA monitoring.

#### *Recreation Use Assessment*

Olson next reviewed the approach to recreation use assessment outlined in the methodology. He noted that there is not a site-specific assessment included as part of the recreation determination, but rather just a reach-level assessment. Olson described how *E. coli* data from both fixed and probabilistic sites would be incorporated in making a determination of reach-level condition class.

Ettinger asked whether any other information – such as algal presence, visual appearance, chlorophyll-a, or microcystin levels – would be incorporated into recreation use support determination. Olson responded that, as currently drafted, only *E. coli* data is considered – as is typically done by states in making their use determinations for other waterbodies. Good commented that there is increasing interest generally in incorporating factors such as algal toxins into recreation use assessments.

Giblin asked whether the approach proposed in the UMR assessment methodology is the same as that used by ORSANCO. Olson replied that ORSANCO is using an older criterion, while the UMR methodology incorporates 2012 US EPA recommendations. Holst said she is not comfortable with the concept of “significantly greater than 10%” applied in the methodology. Olson explained that, particularly when such small sample sizes are being used, it is important to be confident that results truly represent an exceedance of criteria value. As such, the “significantly greater” approach provides this level of confidence. Dkhili concurred, saying this approach does change the criterion itself, but rather speaks to how the criterion is applied. Weigel emphasized that the outcome of this methodology is a general assessment of condition over a five year period of time, rather than a very specific beach-type assessment.

#### *“State of the River” Presentation of Assessment Outcome*

Hokanson presented a conceptual draft of how the results of a shared UMR CWA assessment could be presented in a non-regulatory, public-friendly “State of the River” format, as this has been discussed by the WQTF and WQEC as a vehicle by which to share assessment outcomes. He noted that the draft includes both a color-coded condition for each reach and text description of what is included in the assessment, how the assessment was performed, any known trends in condition, any limitations or caveats, and where more information may be obtained.

Ettinger cautioned that the characterization of the recreation use attainment would have to be presented very carefully as it would be based on a very limited amount of data, and would not be appropriate for the public to view this as a statement on the short-term suitability of particular areas for swimming. Good said the presentation would definitely need to be accompanied by an explanation of the limitations of the assessment, and emphasizing its long-term view, rather than short term applicability. Weigel acknowledged that there would be limitations and caveats associated with such a presentation, but



overall there is value in bringing information to a broader audience. Giblin concurred, noting that this type of format will likely draw the public's attention and help respond to typical questions the public has about the general condition of the river.

Dkhili emphasized the importance, when portraying results, that this reflects an assessment of condition developed using multiple years' worth of data – i.e., a longer term condition assessment. As such, he said, this provides the proper context and conveys the limitations of the assessment. Skuta said the goal of this type of report is to be able to convey, briefly and in a public-friendly manner, the condition of the river to support its major uses. Ettinger said he agrees with the goal, but has simply been urging caution about how messages are conveyed to the public, without relying on individuals to read the “fine print” in order to develop an understanding of the information presented.

*The WQTF meeting adjourned for the day at 5:30 p.m. on February 3, 2015 and reconvened at 8:00 a.m. on February 4, 2015.*

### **UMR CWA Assessment Feasibility Project (continued from Day 1)**

#### *Drinking Water Use Assessment*

Olson continued the discussion regarding the draft assessment methodology by introducing its approach to drinking water use assessment, explaining that this use would only be assessed in reaches that included a drinking water intake and that maximum contaminant levels (MCLs) and other established benchmarks would be used as “thresholds” in completing the assessment. He walked through the process by which both site and reach level condition would be determined.

Ettinger said he has concerns about the use of 10% exceedance cutoff being applied when using an MCL value. Skuta observed that, perhaps, what we are really trying to detect in this assessment is conditions where an extra-ordinary level of treatment would need to be employed in order for a public water system to provide water meeting MCL values. Ettinger concurred, saying perhaps the most important criteria to apply in assessing this use is indeed whether extraordinary treatment is required. Skuta and Hokanson agreed, suggesting that perhaps this condition could be added to the assessment methodology.

Ettinger asked whether total organic carbon (TOC) levels were explicitly included in the assessment. Olson and Hokanson acknowledged that TOC is known to be a parameter important to public water system, but it is not clear how this would be assessed as a stand-alone parameter. Lori Stenzel concurred, saying that this could not really be assessed as sole parameter, as there is no regulatory threshold for TOC *per se*, rather it impacts a utility's ability to meet treatment targets.

Holst suggested that, rather than a 10% rule, perhaps a running annual average could be applied in comparing results to the MCL value, as this is closer to what is actually done to determine Safe Drinking Water Act (SDWA) compliance. Hokanson agreed that this is closer to typical SDWA usage and it may be worth looking at this as an approach. Good said it may be possible to evaluate using more than one approach – for example using “or” statements – as this is what Illinois does in some cases. Weigel reminded the group that the intent here is simply to create a condition assessment, not a 303(d) listing, and to keep that in mind when making choices in designing the assessment. He also noted that, in Wisconsin's recently completed methodology update that the drinking water use is defined as a subcategory under the public health and welfare designated use to provide water quality such that public water systems can meet SDWA standards using only conventional treatment technologies. Assessment indicators in this methodology include microcystin, nitrate, cryptosporidium and other pollutants with human health-based water quality criteria. Holst asked whether this approach is a result of recent Wisconsin workshop recommendations and Weigel confirmed that this is the case.

Olson said Greg Swanson of Moline water had provided input on a “top ten” list of parameters of importance to public systems. He displayed Swanson’s list as follows:

1. Ammonia
2. Chlorophyll-a
3. *Cryptosporidium*
4. Dissolved oxygen
5. *E. coli*
6. Microcystin (although utilities believe that blue-green algal count or Geosmin/MIB would be more beneficial algal parameter)
7. Nitrate+Nitrite
8. Total organic carbon
9. Total phosphorus
10. Turbidity (routinely monitored at water plant, but additional monitoring would be beneficial)

Ettinger asked for a description of both geosmin and MIB (2-methylisoborneol), and how they relate to algal occurrence. Sloan explained that both geosmin and MIB are produced by cyanobacteria, as well as other bacteria, and that these metabolites can lead to taste and odor problems in drinking water systems. In regard to cryptosporidium, Stenzel noted that large systems – those serving greater than 100,000 customers – are required to conduct their own cryptosporidium monitoring.

Hokanson asked the group how the preceding discussion, and the information provided by Swanson, affects their choices of: 1) what parameters to monitor in the UMR CWA plan, and 2) what parameters to include in a UMR CWA assessment. He also observed that in some scans, such as those for VOCs, results will be available for a variety of contaminants as a result of the method used, even if we are only “looking for” a few of the contaminants. Stenzel confirmed that is the case, that VOC and SOC scans often will include results for numerous contaminants.

Olson and Dkhili suggested that perhaps existing data could be reviewed to determine which contaminants to target for monitoring and assessment. However, Short noted, in many locations on the UMR, this data is lacking, so may not provide an effective screening mechanism. Stenzel and Hokanson noted that, given what we generally know about pollutant occurrence on the UMR, likely regulated contaminants to be detected include atrazine, simazine, and nitrate – though it is unlikely any of these would exceed MCL values.

Weigel said, from a big picture perspective, a choice to be made here is whether to take screening or targeted approach. He suggested that things seem to be at more of a screening level at this time. Weigel added that, if cost reduction is a goal, this could also be achieved by reducing spatial intensity, rather than breadth of parameters. Short offered that, at least at the current time, it would seem to make sense to include cryptosporidium and MIB in the monitoring and assessment framework. Good and Short noted that, in terms of microcystin monitoring, much of this is done in a responsive mode. Good added that much of the monitoring, analysis, and assessment related to algal blooms, toxins, and metabolites is still emerging. As such, the states may be using different measures at this time. Ettinger asked whether US EPA is proposing any criteria that may help clarify/standardize states’ approaches. Holst said there is work ongoing and that she would send an update to Hokanson for distribution to the WQTF. (Note that Holst subsequently provided the following update: *Per US EPA Headquarters, EPA will issue health advisories for microcystins and cylindrospermopsin in the spring of 2015. EPA is also considering development of recreational criteria for microcystin and cylindrospermopsin and human health water quality criteria for microcystins, anatoxin-a, and cylindrospermopsin. The recreational criteria will address recreational exposure while the human health criteria will identify levels of cyanotoxins at which adverse health effects are not expected to occur from drinking water or eating contaminated fish and shellfish. EPA expects to have draft recreational criteria by spring/early summer 2015 and is currently evaluating the data for the human health criteria.*)

Olson observed that it would make sense to incorporate microcystin into both recreation and drinking water use assessment. Skuta said it would then be appropriate to include all fixed sites in microcystin monitoring.

Dkhili said it will be important to communicate that the results of the drinking water assessment are based on a long-term analysis of data from raw water (i.e., not finished water) and that potential cost considerations are not incorporated into the assessment.

#### *Fish Consumption Use Assessment*

Olson next presented the approach to fish consumption use assessment described in the draft methodology, noting that it is based on levels of mercury and PCBs in predator & bottom-feeding species, where both trophic levels are sampled at the 15 probabilistic sites per assessment reach. He said three condition class assessments are then developed as follows:

- Separate (trophic level) site-level condition classes for predator and bottom feeding species
- Overall site level: whichever trophic level shows lowest condition class.
- Overall reach-level condition class.

Olson then walked through an example of condition class calculations using the methodology.

Ettinger asked whether water column values are considered in this use assessment. Olson and Hokanson replied that the assessment focuses on fish tissue values as being the most direct indicator of fish consumption suitability.

Reilly said Missouri has typically used a plug, rather than fillet, approach and her understanding is that the methods give comparable results. Olson said a fillet approach is recommended in the UMR CWA monitoring plan, noting that this is the method utilized by three UMR states (Illinois, Minnesota, and Wisconsin) under the Great Lakes Protocol. Skuta said it may be worth looking into the comparability of these methods. Short asked for a further description of the plug method. Olson said it involves taking a small sample of tissue from the fish, rather than a fillet or entire fish. Advantages associated with the plug method include lower processing costs as well as potential survivability for the fish.

Good asked if a decision had been made in regard to the selection of a predator species. Olson replied that common carp appears to be the choice for bottom-feeding species, but that the predator species question has not yet been resolved, in part because there does not appear to be a single species that is present river-wide in populations larger enough for sampling to be successful. Giblin suggested flathead catfish as potential species that could be used in this monitoring and assessment. Olson said it is also important to consider what species people will actually be catching and consuming. Chirhart suggested a tiered system could be used where a list of species is employed and if the species at the top of the list is not available, then the sampler would move to the next species on the list.

Ettinger asked whether there is variation in contaminant levels among species. Olson said yes, this is the case, though in general species would track trends similarly, which may make differences less important for a condition assessment such as this. Christine Favilla asked how fish consumption information is typically distributed to the public. Olson said each state has its own fish consumption advisory program which is charged with providing this information to the public, and that their advisories come out much more frequently than would the longer-term shared CWA assessment the WQTF is considering.

Skuta thanked Olson and Chirhart for their work on the methodology document. He said, given the number of comments made today, it may be important to identify which issues can be resolved in the

near term (i.e., before an initial assessment document is completed this year) and which issue may need to be left for future resolution and/or addressed during a consultation process. Good said he is comfortable with such an approach, as long as the content of the robust discussions, such as those had today, is not lost.

Hokanson proposed a target date of the end of June 2015 for completion of the initial assessment methodology document, noting that it would then be the “game plan” heading into the assessment of actual data, but recognizing that further adjustments may need to be made later on. There was general agreement with this timeline for completion.

### **Macroinvertebrate Methods Comparison Study**

Chirhart provided background on the study’s origin and purpose, including the issue identified in the WQTF biological assessment guidance project where the GRMIn macroinvertebrate index was found to have limited responsiveness to stressors on the UMR. As such, one of the primary goals of the study is to determine the applicability of an artificial substrate (aka Hester-Dendy) method on the UMR.

Ettinger asked what went into the stressor gradient developed under the EMAP-GRE project. Chirhart answered that the EMAP-GRE stressor gradient is relatively complex and includes factors such as urbanization, point source, agricultural land use, and habitat. He added that the Wisconsin macroinvertebrate IBI, used with the artificial substrate sampling method, is much less complex.

Chirhart explained that the artificial substrate sampling method utilized in the study is a combination of Wisconsin DNR and ORSANCO techniques. He said artificial substrate samplers were deployed at the same locations where EMAP-GRE type kick samples were collected and that the artificial substrate samplers were left in place for six to seven weeks. Hokanson asked whether the kick samples were taken at the time of artificial substrate deployment or collection. Chirhart replied that kick samples were collected at the same time that samplers were retrieved and that water chemistry samples were collected at various times throughout sampler deployment.

Chirhart said overall recovery of the samplers themselves was very successful, with nearly all samplers being retrieved. He said analysis of the data is ongoing, with the calculation of IBI scores having just been completed. While further analysis is to be conducted this spring, Chirhart displayed some of the initial results, noting that scores for the two macroinvertebrate indices (ad hoc GRMIn and Wisconsin IBI) are not in agreement. As such, Chirhart said there needs to be additional investigation of what might be causing this disagreement in results. He added that small changes in autecology can lead to large differences in macroinvertebrate IBI scores and therefore the degree of taxonomic resolution employed in analyzing samples can influence outcomes significantly. Good asked Chirhart to explain this a bit further. Chirhart replied that different methods call for the examination of macroinvertebrate species to different levels of detail, with Wisconsin’s method being one that “drills down” further into speciation. Weigel and Chirhart also noted that the underlying stressor gradient can impact results and, as previously discussed, the Wisconsin and EMAP-GRE approaches rely on differing stressor gradients. As such, they said, part of the further analysis will be to explore the impact of the stressor gradients on results.

Skuta observed that there may also have been changes in underlying physical/ecological quality since the EMAP-GRE indices were developed. Giblin acknowledged that this could be a possibility, but that he did not think it likely that substantial change has occurred in the roughly ten years since the EMAP-GRE project. Chirhart pointed out that one challenge in creating a river-wide stressor gradient, such as EMAP-GRE’s, is that there really aren’t reference streams that can be used as a comparison point with the UMR. Weigel said the rapid condition changes indicated by the EMAP-GRE stressor gradient may not reflect actual conditions and, as such, he has some concerns about this gradient. Chirhart emphasized that, despite some of the challenges posed by early analysis of results, he is confident that

a functional macroinvertebrate IBI can be identified for the UMR. He explained that, given the differences in the Wisconsin IBI and the EMAP-GRE GRMIn, it is not surprising they work in different ways, with the challenge now being to understand how exactly they may be working differently.

Skuta asked if part of the appeal of the artificial substrate approach is its relative ease of implementation as compared to kick sampling. Chirhart replied that the two methods require differing investments of time and effort – with artificial substrate requiring two trips while kick sampling being perhaps more difficult to execute and not providing for a consistent sampling habitat.

Good also asked what the index period for artificial substrate sampling is. Chirhart replied that this is a late July through early September index period. Weigel asked whether any artificial substrate sampler results appeared to be impacted by low flow conditions. Chirhart answered that while a couple sites may have been impacted, this did not appear to be a major issue. Sloan asked what causes might be for cases where a sampler is lost. Chirhart said this is most often a result of high flow. Weigel added that public curiosity/vandalism could also be a cause of lost samplers.

Chirhart said he is hopeful that more information from the study will be available by the time of the UMRCC-Water Quality Tech Section in late March, where MPCA's Will Bouchard will be presenting. Matt Short observed that a decision on a preferred method would ideally be made before starting pilot monitoring, though it is possible that both methods could be implemented if necessary.

## **UMR CWA Monitoring Strategy Implementation**

### *Overall Status*

Hokanson said implementation is proceeding both through planning for field pilot implementation by Minnesota and Wisconsin and through “virtual pilot” data mining efforts by UMRBA staff. In addition, he noted that a field operations manual will also be developed to help guide pilot monitoring implementation. Hokanson also highlighted a simplified display of parameters to be monitored both under the *UMR CWA Monitoring Plan* in general and specific to the Minnesota-Wisconsin pilot.

### *Minnesota-Wisconsin Pilot Monitoring*

Weigel said planning continues among Minnesota and Wisconsin staff to prepare for pilot monitoring in 2016. He said Wisconsin is seeking to use CWA Section 106 supplemental monitoring funds to support its portion of the effort, and the extent to which these funds are secured will have a significant impact on Wisconsin's investment in the pilot monitoring effort. Giblin said that without the 106 funding, it would be necessary to scale back Wisconsin's efforts. Weigel added that, in such an event, Wisconsin DNR would need to examine workloads and determine how much could be accomplished using existing staff and resources. Good said Illinois could potentially direct some of its 106 supplemental funds to aid the effort if that would be constructive. Weigel asked if guidance for 106 supplemental funding is yet available. Good commented that, in general, if a monitoring gap has been identified by a state, then addressing that gap is typically seen as a legitimate use of 106 supplemental funding.

Skuta said Minnesota is not seeking to use 106 funds and rather has included its pilot monitoring work in a broader proposed package that is to be supported with Legacy Act funds. He said this package is included in the Governor's budget, but action by the Legislature is still pending.

### *Virtual Pilot*

Matt Jacobson said he has started virtual pilot work by examining data in CWA assessment reach 13 in the Open River section of the UMR. He said he has initially focused on nutrient parameters and in mining data from the Water Quality Portal (<http://www.waterqualitydata.us/>) and the UMR-LTRMP (<http://www.umesc.usgs.gov/ltrmp.html>). Ettinger asked whether selenium is one of the parameters

being pulled in so far via the virtual pilot effort. Hokanson and Jacobson said this has not been among the parameters included to date, but could potentially be included in upcoming work. Hokanson added that the virtual pilot will likely focus on chemical and physical parameters in the near future, given the potential complexity of biological data. However, he said, the goal is to include biology and specifically fish assemblage information from LTRMP. Chirhart and Giblin offered to assist in working on the conversion of LTRMP fish data to multimetric index scores when needed.

## **Nutrients and Water Quality**

### *Regional Conservation Partnership Program (RCPP)*

Hokanson said the multi-state RCPP proposal submitted by the five UMR states and numerous other partners was *not* selected for funding by USDA-NRCS during the current round of awards. However, a total of 17 RCPP projects were selected to be implemented in all or part of the UMR states. More information about projects selected is available on the NRCS website at: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/farmbill/rcpp/>.

Hokanson said, based on conversations with members of the multi-state proposal group, it did not appear that the states will be submitting another multi-state proposal in the next RCPP funding round. Nonetheless, UMRBA plans to continue to engage in nutrient-related work, seeking to find the most helpful role(s) the Association can play in supporting the states' ongoing work.

### *State Updates: Nutrient Reduction Strategies and Other Nutrient-Related Work*

Missouri – Dkhili said Missouri continues its work on numeric nutrient criteria for lakes. Following lakes, Missouri plans to address criteria for streams, but this is not expected to include large rivers such as the UMR. Dkhili also noted that Missouri's nutrient loss reduction strategy was finalized on December 16, 2014 and is now available at <http://dnr.mo.gov/env/wpp/mnrsc/docs/nlrs-strategy-2014.pdf>. He said a committee will be meeting later in February to explore implementation of the strategy in three pilot watershed areas, two of which are in the UMR basin.

Iowa – Olson said there has been some criticism of Iowa's nutrient reduction strategy from those concerned that it is not resulting in substantial reductions in the near term, citing the previously-discussed lawsuit by the Des Moines Water Works as evidence of this type of concern. He noted, however, that Iowa DNR has been moving forward with point source reductions at permitted facilities identified in the strategy. Ettinger asked for a further explanation of how these point source reductions will be achieved. Olson explained that when a permit comes up for renewal at one of the major facilities (as identified in the strategy), a process is initiated to determine how that facility can meet the reduction goals outlined in the strategy (i.e., 1 mg/l total phosphorus, 10 mg/l total nitrogen). Olson said several facilities have already been through this process. Regarding criteria development, Olson said he does not anticipate any rule development in this area within the next two years.

Illinois – Matt Short said public comment on Illinois' draft nutrient reduction strategy had just closed in the preceding week. Good said the draft strategy calls for a number of new working groups and emphasizes stakeholder engagement, monitoring, standards development, and engagement of the agricultural sector. He added that the Illinois Water Resources Center, part of University of Illinois-Extension, has been quite engaged in strategy development.

Minnesota – Skuta reminded the WQTF that Minnesota's nutrient reduction strategy had been approved in September 2014. He also reported that Minnesota's new eutrophication standards for rivers were recently approved by US EPA (see <http://www.pca.state.mn.us/index.php/water/water-permits-and-rules/water-rulemaking/new-water-quality-standards-for-river-eutrophication-and-total-suspended-solids.html>) and that these standards would be utilized as part of the upcoming assessment cycle

In terms of research needs, Skuta noted that Minnesota is awaiting the outcomes of studies by US EPA in regard to nitrogen in flowing waters, and the development of nitrogen-related aquatic life use criteria. Holst said this research is ongoing, emphasizing that it addresses direct aquatic life use toxicity (i.e., not eutrophication) and is strictly lab-based toxicity testing to support the development of acute and chronic criteria. (Note that Holst subsequently provided the following update regarding this research: *US EPA-sponsored toxicity testing for nitrate and nitrite has been completed and US EPA is awaiting the publication of studies based on this work. Please contact US EPA's Ed Hammer (312-886-3019 or [hammer.edward@epa.gov](mailto:hammer.edward@epa.gov)) for more information.*)

Wisconsin –Weigel said one important advancement in Wisconsin has been the implementation of more point source monitoring in order to develop a better understanding of baseline conditions and statewide loading. He said one gap identified is the lack of a gage on the Grant River, and placing a gage here will be one of the proposed uses of CWA 106 funds. Overall, Weigel said, he sees a lot of the ongoing projects coming together, particularly in terms of targeting and tracking with respect to nutrient loads.

Ettinger asked Weigel to explain the statewide variance component of Wisconsin's phosphorus standard. Weigel explained that a state law was passed directing Wisconsin DNR to work with Wisconsin's Departments of Administration and Agriculture, Trade, and Consumer Protection to develop a statewide variance for its recently-established phosphorus criteria. He said part of this effort involves identifying which facilities will be eligible for a variance based on social and economic factors. Under the variance approach, there would be a stepwise approach to meeting newly established limits, allowing a facility a number of years to reach the reduction target, while paying \$50 per pound per year for any gap between current effluent and the goal. Weigel noted that under this approach, a facility with a variance would still ultimately reach the reduction goal, but might do so on a different timeline than facilities which do not have a variance.

Ettinger said he is interested in the relationship between dissolved oxygen and nutrients, asking whether there is any ongoing work addressing this connection. Sloan said the GREON effort, as it produces side-by-side nutrient and dissolved oxygen data, will likely be helpful in illustrating any connections. Ettinger said he is also interested in GREON's ability to measure chlorophyll-a in the field, as it was his understanding that this is typically a lab analysis. Sloan replied that the field measurement of chlorophyll-a is spectroscopy-based and the project will definitely plan to track the correlation between such field-based measurement and traditional, laboratory-based measurements. Ettinger said he would suggest a focus on the relationship between nutrients and dissolved oxygen as a priority area for investigation.

#### *Nutrient-Related Research Needs*

Hokanson commented that at the September 2014 meeting of the WQTF and WQEC, the suggestion was made that UMRBA develop a list of nutrient-related research needs identified by the states. He said Minnesota had shared some initial ideas that could perhaps provide a starting point for such a list and that, so far, the scope of research needs is fairly broadly defined (e.g., potentially including measurement, criteria, conservation practices, social factors, etc.). Weigel said Wisconsin has a research list that could potentially be referenced or incorporated into a combined list across states. Giblin said he is proposing work to examine light limitation effects on nutrient-related conditions, using chlorophyll-a as a response variable, something that could be identified in a research needs list. Hokanson and Skuta suggested that, while there is merit in compiling a research needs list, other ongoing work of the WQTF may need to take precedence in the near term. The WQTF concurred, and agreed to revisit the research need list in more detail at a future call or meeting.

**Next Meeting**

The WQTF agreed that its next meeting should take place in early June 2015, though there may be a need for conference call(s) prior to that time. Hokanson said he would follow up with a scheduling email to the group.

*With no further business, the meeting adjourned at 12:15 p.m. on February 4, 2015.*