

**Upper Mississippi River Basin Association
Water Quality Task Force Meeting
June 10-11, 2014
Moline, 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 Rielly	Missouri DNR
Jim Fischer	Wisconsin DNR
Brian Weigel	Wisconsin DNR
Aaron Larson*	Wisconsin DNR
Linda Holst	US EPA, Region 5
Roger Viadero	Western Illinois University
Michael Reisner	Augustana College
Dru Buntin*	UMRBA
Dave Hokanson	UMRBA
Matt Jacobson*	UMRBA

* *Joined the meeting by phone.*

Call to Order and Introductions

The meeting of the UMRBA Water Quality Task Force (WQTF) was called to order at 1:00 p.m. on June 10, 2014 by Chair Mohsen Dkhili. Introductions by all participants followed.

Approval of Previous Meeting Summary

Dave Hokanson asked if there were any additions or corrections to the draft summary of the February 5-6, 2014 WQTF meeting. Dkhili identified two typographical errors, on pages A-3 and A-4 to be corrected. John Olson asked that, on page A-14, language be clarified to indicate that the Minnesota River is a primary source of sediment to the UMR within Minnesota. Hokanson said these changes would be made in the final version of the meeting summary. Gregg Good then motioned and Glenn Skuta seconded that the summary be adopted with the changes incorporated as noted. The WQTF then approved the meeting summary.

Interstate 305(b) Assessment and 303(d) Impairment Listing Consultation

Hokanson displayed the current comparison chart of the states' UMR impairment listings. Each state provided comments on its assessment and listings as follows:

Minnesota

Skuta reported that Minnesota's 2014 303(d) list has been transmitted to US EPA Region 5 and is awaiting approval.

Wisconsin

Brian Weigel said Wisconsin's 2014 list also been submitted to US EPA Region 5 and approval is pending. He noted that, in the UMRBA summary table, listings for UMR Reach 4 had been broken out at the pool level in 2012, but this had not been done for 2014. Aaron Larson said Wisconsin typically does portray listings down to the pool level if applicable. He explained that Wisconsin DNR is currently considering whether to describe fish consumption-related listings at the pool or reach level. Larson said he would follow up with Hokanson regarding Wisconsin's preferred characterization for the summary table. (Note: Larson subsequently communicated that Wisconsin prefers to keep the pool-level characterization on the summary table. An updated table reflecting this preference was distributed to the WQTF on June 25, 2014.)

Noting the listing of total phosphorus-related impairments for Wisconsin in UMR Reaches 1-4, Dkhili asked how Wisconsin makes a determination of exceedance for its phosphorus criteria. Weigel replied that this is based on a 90th percentile value among results that is greater than Wisconsin's total phosphorus criterion of 100 micrograms per liter. Dkhili asked whether this value applies to the entirety of the UMR in Wisconsin. Weigel replied that the criterion does apply to all the UMR in Wisconsin. In response to a question from John Olson, Weigel said the criterion is a "stand alone" value, meaning it does not necessarily incorporate biology into the impairment determination. However, he added, Wisconsin is interested in incorporating biological condition into its attainment determinations.

Dkhili asked whether Wisconsin is developing a nitrate criterion in addition to its total phosphorus criterion. Weigel replied that Wisconsin is focused primarily on phosphorus at the current time, but also has concerns regarding nitrogen. He noted that some of the conservation practices which are effective in controlling phosphorus may not be effective for nitrogen.

Iowa

Olson said the summary table is accurate in its portrayal of Iowa's 2012 and 2014 listings. He did note that Iowa's metals listings in UMR Reach 5 for aluminum and cadmium are presenting challenges for permit renewal in this portion of the river. Skuta asked if a total maximum daily load (TMDL) is in place for these metals as a result of the impairment. Olson replied that a TMDL is not in place due to difficulties in establishing a background concentration for cadmium. He explained that, elsewhere on the UMR, sampling for cadmium has produced only largely "non detects" and the number of samples with detectable levels has not been sufficient to determine a background level. As such, Iowa has not been able use background concentrations in developing a wasteload allocation (WLA) for a TMDL. Olson clarified that this is problem for cadmium, but not for aluminum.

Linda Holst asked Olson what creates the disparity in mercury and PCB listings across the river for Iowa, Wisconsin, and Illinois (i.e., Wisconsin and Illinois have mercury and PCB listings while Iowa does not). Olson explained that this is due to differing fish consumption advisory processes among the states, and that the states' impairment listings rely at least in part on their state-specific fish consumption advisories. Additionally, he said Iowa does not monitor for the presence of PCBs in water and has not monitored for the presence of mercury in water recently. Matt Short commented that Illinois does not measure mercury in water either, but rather looks to fish consumption advisories/fish tissue concentrations. Dkhili indicated that, based on this discussion, Missouri may reconsider its listings related to fish consumption as it also does not currently match mercury and PCB listings present on the Illinois side of the river.

In light of Illinois' listing for atrazine in UMR Reach 8, Olson said he would look at Illinois' atrazine data to determine if Iowa should have a similar listing in place, noting that Iowa's 2014 list is not final and could still be modified if needed.

Illinois

Good said the summary table appears accurate for Illinois, adding that Illinois has submitted its 2014 listings to US EPA Region 5 for approval.

Missouri

Dkhili said the summary table is accurate for Missouri noting that, per earlier discussion, Missouri may revisit its fish consumption-related listings. He added that Missouri has submitted its 2014 list to US EPA Region 7 for approval.

Other Agency/Partner Reports

Illinois

Good said Illinois EPA is in the process of writing its next five year monitoring strategy, and that this strategy is currently out for public comment. He said the agency plans to finalize the strategy by September 30, 2014.

Wisconsin

Jim Fischer noted that John Sullivan, Wisconsin DNR staff person and long-time member of the WQTF had retired on April 4, 2014. He indicated that DNR hopes to fill Sullivan's position by July 2014. He added that Wisconsin DNR has also been consulting with Minnesota PCA regarding the pilot implementation of the UMR CWA monitoring plan.

Weigel said Wisconsin DNR has also been working with Chris Yoder of the Midwest Biodiversity Institute on a review of Wisconsin's bioassessment program. Weigel noted that Wisconsin is moving forward three important rule packages – addressing aquatic life designated uses, bioassessment, and site-specific phosphorus criteria – which have implications for the UMR.

US EPA Region 5

Linda Holst commented that Susan Hedman, Region 5 Administrator, had recently been appointed to ORSANCO's board, along with George Elmaraghy, formerly of Ohio EPA and now with Stantec Consulting. Holst said the Region 5 Water Program is prioritizing work with states to update their *E. coli* monitoring protocols, in light of BEACH Act grant requirements. She said another priority for Region 5 is ammonia criteria and, specifically, determining how this criterion is to be applied to smaller lagoons and receiving waters.

Minnesota

Skuta reported that Minnesota's Legislature has moved to ban triclosan in personal care products, effective January 1, 2017. He noted that a ban on triclosan use had previously been in place for Minnesota state government agencies and that, in both cases, the *State of the River Report* produced by Friends of the Mississippi River and the National Park Service had been an important driver for these actions. Good commented that Illinois' legislature had also recently moved to ban the use of microbeads in personal care products, and that this decision proceeded fairly rapidly. Skuta replied that Minnesota' legislature is also considering a microbead ban, as are New York and California.

Skuta also noted that the closure of Upper St. Anthony Lock was included in the recently-passed Water Resources Reform and Development Act (WRRDA). Buntin said the WRRDA had just been signed into law by President Obama.

Other Updates

Hokanson provided brief updates on a number of initiatives relevant to UMR water quality work as follows:

- America's Watershed Initiative (AWI): AWI is holding a summit in Louisville, Kentucky on September 30 to October 2, 2014. This summit will include both a water quality-focused session and presentation of AWI's basin report cards.
- Mississippi River Cities and Towns Initiative (MRCTI): MRCTI has released its 2014 policy platform which includes support for conservation and state revolving loan fund programs. MRCTI's next meeting will take place in New Orleans on September 16-18, 2014.
- National Research Council (NRC) Report on Mississippi River Water Quality Science and Interstate Collaboration: The NRC recently released this report, which was based on the workshop held in St. Louis in November 2013 in which several WQTF members participated.
- National Great Rivers Research and Education Center (NGRREC), Great Rivers Ecological Observation Network (GREON): The GREON project is expanding, with a plan to move from two currently deployed buoys to a total of seven by the end of summer 2014.

Fischer asked Hokanson and Buntin if they had yet seen recommendations forthcoming from the Big River Works effort. Buntin replied that these are to be released at upcoming Big River Works meeting in Washington, DC and that these recommendations are of interest to the AWI effort as well.

Western Illinois University Mississippi River Programs

Roger Viadero provided an overview of the Western Illinois University (WIU) Institute for Environmental Studies, describing in particular its work on the Mississippi River. Viadero explained that WIU has campuses in Macomb and Moline, Illinois, as well as a biological research station at Warsaw, Illinois. He said the WIU Institute for Environmental Studies offers both undergraduate and graduate programs, with its PhD. program focused on large river ecosystem science. Overall, the Institute addresses aquatic natural resources, including the areas of water quality, environmental restoration, aquatic biology, fluvial geomorphology, and spatial analysis. Viadero added that the new WIU Riverfront Campus will soon include laboratory facilities which can conduct a variety of water quality analyses.

Turning to WIU's applied research on the UMR, Viadero described WIU's Alice L. Kibbe Life Science Research Station located in Warsaw, Illinois on UMR Pool 20, just below Lock & Dam 19. He said researchers based at this station have been collecting data in UMR Pools 19 and 20 for over 30 years, building long-term data sets including information for mussel, fish, and turtle communities. Viadero explained that this data collection effort has been modernized to include 60 geo-referenced data collection sites for submerged aquatic vegetation & floodplain forests; native and invasive fish, freshwater mussels, floodplain reptiles, and water quality. He said WIU's research and data collection helps "fill in the gap" between pools monitored under the UMR-EMP Long Term Resource Monitoring Program.

Lastly, Viadero noted that WIU regularly teams with regional stakeholders to help broaden collective education, research, and outreach capabilities.

Dkhili asked whether WIU is able to share its data from the research done on Pools 19 and 20. Viadero said WIU is happy to share this data, noting that some of the older data may be challenging to use, but that overall there is no problem in data sharing. Dkhili asked how many sites data is present for, and Viadero replied that there are six to eight sites with data available in Pools 19 and 20. Dkhili asked whether any trends have been observed in the data collected in Pools 19 and 20. Viadero replied that

the impacts of flooding, as well as lock and dam structures, are apparent in the data. Dkhili asked how the data informs the overall state of the river's condition. Viadero said it appears that the overall health of the river is good and has improved, but that there will certainly be significant impacts from invasive carp.

Skuta asked whether WIU has done any work regarding endocrine disruptors. Viadero replied that this has not been a focus of WIU's work to date. Rather, he said, a current area of emphasis is in regard to invasive carp and developing a better understanding of their genetics.

Nutrient-Related Developments and Activities

Missouri

In reviewing the summary table of states' nutrient reduction strategies, Dkhili noted that Missouri's draft strategy would likely not be available by July 30, 2014 as indicated on the table. Rather, it is more likely that the draft would be completed by September 2014, and that this timeline would be clearer after strategy-related meetings scheduled for June and July 2014. Dkhili noted that numerous committees are involved in developing component topical areas of the strategy and that it is Missouri's intent to implement the strategy first in smaller watershed areas and then adaptively manage its implementation on a statewide basis.

Minnesota

Skuta said Minnesota hopes to have its nutrient reduction strategy finalized this summer. He noted that there have been several complimentary activities emerging alongside the strategy *per se*, including the development of nutrient-related water quality standards. More broadly, Skuta said that there has been good participation from a variety of stakeholders in nutrient work and, rather than opposition, there seems to be a general understanding of the need to address nutrients' impact on water quality.

Wisconsin

Weigel said one of Wisconsin's primary conclusions in developing its nutrient reduction strategy is that existing programs and regulations can be utilized to meet nutrient reduction goals. However, he added, this will require using existing resources more efficiently. Weigel noted that Wisconsin is approximately halfway to meeting its strategy-established goal for phosphorus reduction (using 1995 as a base year for comparison).

Illinois

Good said the information in the overview table accurately reflects Illinois' nutrient reduction strategy work, adding that Mark David of the University of Illinois has utilized Illinois EPA's data in putting together the science assessment associated with the strategy.

Good noted that Illinois EPA has been working with USGS at Illinois EPA's Florence, Illinois monitoring station to develop a method of calculating total phosphorus and total nitrogen loads. He explained that this work has been funded in part by a CWA Section 106 monitoring grant and that a goal is to establish an eight station, statewide network. Holst asked what the cost of this monitoring network is anticipated to be. Good replied that the cost could vary from \$0.9 million with fewer sites and parameters to \$2.4 million with more sites and more parameters analyzed. He added that some questions also remain to be settled in regard to whether the network would be monitored continuously and how long it would be maintained.

Iowa

Olson said Iowa's nutrient reduction strategy has been in place for approximately one year. On the point source side of the strategy, Olson said the focus has been on major dischargers and that some of these entities have moved forward to enact the reductions called for by the strategy. On the nonpoint side, Olson said one of the major challenges will be how to measure success of nutrient reduction practices. Skuta commented that Minnesota is now asking point sources to initiate voluntary monitoring for nutrients, and that eventually this will be a requirement. Weigel said he is interested in seeing the monitoring frequencies that Minnesota is using. Skuta replied that this varies by facility and that he can send a copy of the rule to Weigel. Dkhili said Missouri is also planning to have some facilities collect additional ambient water quality data for total nitrogen and total phosphorus, but that currently the focus is on facilities located on lakes and smaller streams (i.e., not on large rivers such as the UMR).

Holst asked Olson whether Iowa is being asked to implement narrative requirements for permits, as there has been some push to do this at the national level. Olson said Iowa DNR has had some initial meetings on this subject, but it has been challenging to determine how exactly this process would work.

Regarding nutrient standards development, Olson noted that Iowa does have a report forthcoming in regard to wadeable streams, but nothing is currently underway that would impact large rivers.

UMR CWA Monitoring Strategy Implementation

Status Update and Implementation Plan

Dave Hokanson gave a brief update on the WQTF's monitoring strategy project, highlighting the implementation plan included in the meeting packet. He noted that this implementation plan includes partner outreach, mapping monitoring locations, compiling data/virtual pilots, field pilots, seeking long term support, and the affiliated UMR CWA assessment feasibility project. Hokanson commented that many of these action areas are addressed in agenda items for the remainder of the meeting.

Minnesota-Wisconsin Monitoring Implementation Pilot

Skuta said Minnesota has been working closely with Wisconsin in formulating plans for pilot implementation. He said the focus of the pilot has been on UMR Reach 0 (Twin Cities) through Reach 3 (Root River), with the states splitting up the work geographically (i.e., Minnesota focused on Reaches 0-1 and Wisconsin on Reaches 2-3) and targeting field work for 2016. Skuta said Minnesota is currently scoping the cost of implementing the monitoring plan, but is estimating approximately \$0.25M will be needed for monitoring on Reaches 0-1. He said he is pursuing a budget initiative to support this monitoring and that Rebecca Flood (Minnesota's member of the Water Quality Executive Committee) is supportive of the effort. However, he noted it is important to recognize that there is pressure to invest more in implementation (e.g., conservation practices) as opposed to expanding monitoring programs.

Good asked how staff costs are considered in expense estimates. Weigel said the current estimates have not included sample interpretation and assessment, so that these costs would likely be in addition to the expenses associated with monitoring *per se*. Fischer noted that until the vacancy created by John Sullivan's retirement is filled, it will be challenging for Wisconsin to staff river monitoring efforts, adding that Wisconsin likely faces a greater challenge in budgeting for the project than Minnesota. That said, he noted that Wisconsin's budget initiative to implement this monitoring has made it through the first internal step.

Good suggested it may be helpful to have a letter of support from the five states specific to pilot project implementation. Skuta said this could be beneficial to Minnesota and Wisconsin's efforts. Buntin indicated that UMRBA staff could work on drafting such as letter.

Holst suggested that the states could potentially use CWA Section 106 supplemental monitoring funding to support the project in 2016. Specifically, she said the states could ask for FY 2015 funds to support work in 2016 and, as such, there is still time for the states to apply for funding in this way (i.e., would be part of 106 funding proposal submitted in April 2015). Good asked whether states would potentially all seek funding to go into a common pool or if states would request and administer funds individually. Skuta said he thought states would do this individually. Dkhili and Trish Rielly said Missouri's 106 supplemental funding is typically committed in advance to cooperative monitoring with USGS and as such it is unlikely to be available for UMR monitoring. Skuta said Minnesota also typically plans out in advance how this funding will be dedicated and recognizes that each state likely takes a differing approach on this.

Buntin asked for clarification on the source of 106 supplemental monitoring funding and its intended use. Holst replied that it is part of the national probabilistic monitoring survey funding and is intended as "gap-filling" for needs not otherwise addressed via the national survey. Buntin asked Holst to describe the application process. She replied that this can differ among Regions, but that at Region 5 individual states work with Mari Nord of the Water Program staff to negotiate their plans for use of 106 supplemental monitoring funding. Buntin suggested that this be a topic of discussion at the fall joint meeting of the WQEC and WQTF.

Mapping and Data Compilation

Matt Jacobson and Hokanson demonstrated the water quality viewer developed by Jacobson and available at <http://umrba.org/umr-wqtf-viewer.htm>. They noted that the viewer is currently in a draft state and includes only sample location information, as well as ancillary geographic information (e.g., river miles).

Hokanson also described initial efforts by UMRBA staff to extract data from the Water Quality Portal (<http://www.waterqualitydata.us/>) which combines data from US EPA and USGS databases. He said efforts thus far have focused on identifying what data is available for the fixed sites identified within the *UMR CWA Recommended Monitoring Plan*. In general, Hokanson observed, there is data available via the portal for the fixed sites, though data from Metropolitan Council Environmental Services (MCES) does not appear to have been added, and this impacts a few of the fixed sites within Minnesota. Additionally, UMRR-EMP LTRMP data is not included in the portal.

Buntin asked why LTRMP data would not have been integrated. Matt Short replied that LTRMP data is housed in its own database and given the amount of data, compatibility challenges, and potential for error/duplication, it is probably better than LTRMP data be directly accessed as needed from its own database. Fischer noted that one lesson learned from LTRMP is the importance of consistency in methodology and data management, and that perhaps LTRMP's procedures could be adapted to the UMR CWA effort in the hopes of maintaining greater consistency.

Viadero said he sees value in building on the water quality viewer to incorporate the ability to bring in data, whether this is by means of creating a new, shared data set or linking directly to external data sources. Jacobson said in either case it would be important to document what the original data sources are and how they are incorporated in the viewer.

Sampling of Metals and Related Parameters under the Recommended Monitoring Plan

Skuta noted that, as Minnesota is considering monitoring implementation, questions have come up as to the value of sampling for all the metals listed in the *Recommended Monitoring Plan* and the need to sample for metals at all the probabilistic sites. He said Minnesota is inclined, for the purposes of the pilot, to forgo metals sampling at the probabilistic sites and focus this monitoring on the fixed sites. Fischer observed that many of the metals may be most relevant for the drinking water use and, as such, may not need to be sampled in all locations/in areas where the use is not assigned. Weigel asked whether data exists that could help inform whether sampling is indeed needed at all the probabilistic locations. He said he'd like to pursue the full monitoring approach as described in the *Recommended Plan*, but recognized there may be a need to reduce down from the original plan due to budget and other constraints and as such it may be beneficial to identify areas/habitats less critical for metals sampling. Dkhili suggested that existing data be reviewed in order to help determine whether the full suite of metals parameters should be sampled at all locations under the Plan.

The meeting adjourned for the day at 5:30 p.m. and resumed at 8:00 a.m. on June 11, 2014.

Wrap Up and Review of Day 1

Sampling of Metals and Related Parameters under the Recommended Monitoring Plan (continued)

Skuta commented that it seems worthwhile to take a look at existing metals data, adding that it is important to keep in mind that some adjustments to monitoring may be done just for the purposes of the pilot (such as reduction in metals monitoring), but that the underlying plan may remain unchanged. Good asked what the budgetary savings might be of reducing the metals down to just the fixed sites. Skuta replied that, of the \$250,000 cost estimate for Reaches 1 and 2, perhaps \$40,000 could be saved by reducing the extent of metals monitoring.

Weigel suggested that the WQTF look at existing data to help scope metals monitoring, at least for the purposes of the pilot. Skuta agreed, saying one important piece of this would be to identify metals for which there has been monitoring, but not detection. Olson said he could potentially suggest a list of metals likely to be detected, based on data he has reviewed in the past. Dkhili commented that, in addition to occurrence, it would be helpful to look at seasonal variations.

Olson said the WQTF needs to decide if it will focus its monitoring on dissolved or total metals, further suggesting that dissolved metals would seem to be a preferable approach. Hokanson said he could send a request out to the WQTF that they provide readily available metals data for review, which would be compiled by UMRBA staff. The WQTF could then review this compilation to determine whether additional information is needed to support decision-making regarding metals sampling. Skuta suggested that, if metals sampling is to be pared back, Minnesota would plan to drop it from probabilistic sites, but keep at fixed sites.

Probabilistic Sampling Design

Building off the metals discussion, the WQTF briefly revisited the function of the probabilistic design, noting that while it supports the characterization of the condition of the reach, it may not capture localized conditions or bank-to-bank variability. Olson said he views the probabilistic monitoring as providing a signal regarding condition, but that impairment listing may require additional monitoring to better define the scope and origin of water quality problems. Weigel suggested that the probabilistic site assignment be stratified to ensure that both flowing and pooled areas are incorporated and that results from these areas could be examined independently if needed.

Augustana Upper Mississippi Center

Michael Reisner gave an overview of Augustana College's Upper Mississippi Center, noting that the vision of the Center is to "mobilize Augustana's resources to help communities solve sustainability challenges facing urban & rural working landscapes." He explained that in pursuing this vision the Center seeks to help address community-identified problems in a collaborative, inter-disciplinary manner.

Reisner next described the Center's pilot Sustainable Urban Watersheds Project, and in particular work done in Rock Island and Moline. He said this effort seeks to examine how to simultaneously build more resilient urban watersheds and revitalize surrounding neighborhoods. Reisner described how this project used both mapping and water sampling to examine relationships between land use and water quality, and in particular identify driving factors for water quality. He said next steps for the project include issuing a final report, making recommendations for restoration of urban ecosystems, identifying watersheds for potential restoration, and targeting senior inquiry projects towards related research. Reisner also briefly described the Center's emerald ash borer project, which has focused on the sustainability of urban forests.

Reisner suggested the following as areas of possible collaboration between the Center and the WQTF:

- Internships-conducting monitoring & collecting data, etc.
- Problem-based experiential learning opportunities for capstone environmental studies & other courses (e.g., statistical analyses)
- Senior inquiry research projects; especially those lend themselves to interdisciplinary approaches

Good asked if the Center could assist with questions such as that discussed by the WQTF previously in the meeting – e.g., the occurrence of metals on the UMR. Reisner replied that this could be a possibility if the data could be provided to the Center, and that it might be something for their applied statistics students to work on. Fischer asked what kind of lead time the center would need to work on a project such as this, to which Reisner replied that two or three months of advanced notice would be needed.

Hokanson asked how the Center defines the geographic scope of its work. Reisner said that while the Center considers the entire Upper Mississippi River as being in its area of work, it is primarily focused on Illinois and Iowa, as well as areas upstream of these states.

Olson asked if the Center could be part of an Upper Mississippi River monitoring network. Reisner said the Center could potentially participate in summer sampling and could also perhaps partner with Western Illinois University to engage in such an effort. Skuta suggested that one potentially helpful role for universities may be in regard to data management. Reisner said this could be a possible role, as well as examining the QA/QC component of monitoring.

UMR CWA Assessment Feasibility Project

Missouri's Approach to Mississippi River Water Quality and Designated Use Assessment Methodology

Trish Rielly presented an overview of how Missouri approaches the assessment of designated uses on the Mississippi River. She began by describing the uses assigned by Missouri to the UMR, which include aquatic life, whole body contact recreation, human health (fish consumption) and drinking water. Rielly then described some overarching components of Missouri's assessment approach, including data quality (e.g., preference for most recent data, up to 7 years in age), use of null hypothesis (e.g., that water quality does not exceed criterion or threshold), balancing Type I and Type II errors, and approach to non-detects (i.e., use ½ of detection limit as value for non-detects). She also described the

variety of data sources, from various agencies, that are used by Missouri and noted that Missouri does not have a biological assessment program in place on the Mississippi River. Rielly then described Missouri's approach to the assessment of specific uses as follows:

Aquatic Life Use

- Where applied, biological assessments are based upon a weight of evidence approach which takes into consideration biological monitoring, sediment toxicity and water chemistry toxicity.
- For sediment toxicity, Missouri utilizes a comparison of geometric mean to the probable effect concentration (PEC) value or calculation of a probable effect concentration quotient value (PECQ) (n= 3+). In identifying an impairment, Missouri looks for a certainty of injury as indicated by a value 150% of the PEC threshold or 0.75 of the PECQ threshold.
- Regarding water chemistry, an impairment is identified when >10% of values exceed a water quality criterion for conventional pollutants. Also, for toxics, there must not be more than one toxic event or kill during a period of three years.
- Additionally, Missouri has specific temperature criteria for the Mississippi used in aquatic life use attainment determination. These criteria are defined in three separate zones and supersede what is otherwise present in the statewide listing methodology.

Recreation Use (Whole Body Contact and Secondary Contact)

- Five *E. coli* samples are taken during the recreational season and a geometric mean is calculated.
- Different *E. coli* criteria are utilized for various use categories (i.e., whole body contact A: 126 cfu/100 ml; whole body contact B: 206 cfu/100 ml; secondary contact: 1134 cfu/100ml).
- The use is attained if there are no geometric mean exceedances of the criteria within the past three years.

Drinking Water Use

- Must have a minimum of eight samples; then the mean is compared to water quality criterion.
- A hypothesis test with a 1-sided confidence limit is utilized to determine attainment.
- Parameters assessed include: metals, organics, pesticides, PAHs, phthalates, bioaccumulative anthropogenic toxics & carcinogens, sulfate, chloride, and fluoride.

Human Health/Fish Consumption Use

- Both fish tissue and water chemistry are considered in human health/fish consumption use assessment.
- Fish tissue samples come from species in higher trophic levels (e.g. walleye, sauger, trout, black/white/striped bass, northern pike, flathead and blue catfish). A minimum of three samples are needed and the sample mean is then compared to the criteria using a hypothesis test with a 1-sided confidence level. Parameters assessed include: chlordane, mercury, and PCBs.
- For toxic chemicals in water, similar to the drinking water use, must have a minimum of eight samples; then mean is compared to water quality criterion utilizing a hypothesis test with a 1-sided confidence limit. Parameters assessed include: metals, organic chemicals, pesticides, PAHs, phthalates, bioaccumulative anthropogenic toxics & carcinogens.

Rielly noted that, while Missouri has typically utilized fillet samples, US EPA is moving toward plug samples for mercury. Additionally, US EPA Region 7 only does sampling and analysis for mercury,

having dropped chlordane and PCBs. As such, Rielly explained, chlordane and PCB information must come from other sources.

Rielly explained that Missouri's assessment methodology goes through a stakeholder review process and the state's Clean Water Commission. Skuta asked whether the entire methodology is re-opened every time it goes through and updating process. Rielly said this is the case, that essentially the entire methodology is open for review whenever updates are proposed.

Good asked how US EPA Region 7 has reacted to Missouri's weight of evidence approach in assessing aquatic life use where biological information is available. Rielly said Region 7 has recently sought clarification from Missouri on this approach.

Good asked for confirmation regarding the number of *E. coli* samples needed to determine attainment. Dkhili replied that it is a minimum of five samples per year over the course of three years, so essentially 15 samples in total.

Wisconsin's Approach to Mississippi River Water Quality and Designated Use Assessment Methodology

Aaron Larson began his discussion of Wisconsin's approach by reviewing the current impairment listings as displayed on UMRBA's chart. He noted that the phosphorus listing in UMR Reach 1 is considered to be linked to biological condition, but that the phosphorus listings in Reaches 2-4 are not currently linked to biology. As such, the listings in Reach 2-4 are referred to as having an "unknown" impairment and Wisconsin DNR is currently considering how best to categorize these impairments. Larson said he would share Wisconsin's documentation regarding the biological component of the impairment determination for Reach 1 with the group.

Larson said Wisconsin shares use designations in common with other states (e.g., aquatic life, recreation), but also has unique use assignments such as human health/public welfare and wildlife. He noted that the UMR is classified by Wisconsin as a "warm water sport fishery" and the criteria associated with this classification are therefore used in assessing the River. He explained that Mississippi River data has typically resided outside the Wisconsin DNR central database and in the past John Sullivan had compiled river data from a number of sources for assessment purposes.

Larson explained that, for conventional pollutants, Wisconsin applies a "10% rule" in determining attainment, while applying a single exceedance approach for acute effects of toxics and a four day maximum over a three year window for chronic effects. Larson observed that, in regard to the UMR, one sample per stratum might be acceptable for general assessment purposes, but more samples (e.g., more than one sample over five years) would likely be needed for impairment determination.

Joel Chirhart asked whether the states would want to see more than one sample for biological assessment purposes or if one sample is sufficient. Larson replied that one sample may be sufficient for assessment, but that followup samples would be needed if issues are identified. Olson said Iowa needs to have two biological samples in order to declare that an impairment exists. Skuta and Good said Minnesota and Illinois, respectively, only need to have one biological sample to identify an impairment.

UMR CWA Recreation Use Assessment

John Olson said the UMR CWA Assessment Methodology Work Group had explored the possibilities for a shared UMR recreation use assessment and identified a number of questions to raise with the WQTF in order for decisions to be made. He then led the WQTF through a discussion of these issues. The first question raised by Olson was the goal of the recreation use assessment, asking the WQTF whether it viewed the purpose of the shared UMR recreation assessment as: 1) characterizing bacteria

levels (e.g., reporting geometric mean levels and/or percentage of time the SSM/STV is exceeded and letting states use these data within their programs), 2) identifying impairments (which UMRBA has no authority to do at this point), and/or 3) functioning as a swimming (beach) monitoring network (for example, in urban areas)? The WQTF members agreed that the goal of the shared assessment is solely to characterize bacteria levels and any further use of the data would be done by the individual states.

Olson next asked the group to consider whether both fixed site and probabilistic *E. coli* monitoring should be maintained as part of the *UMR CWA Recommended Monitoring Plan*, particularly in light of the potential challenges in dealing with probabilistic data in conducting an assessment. Good suggested that there is still value in collecting the probabilistic data as it would add to the overall information available for the River, suggesting that a shared UMR assessment might look at a sliding five-year data window. However, he said he did not see the urban area sampling sites fitting into the general reach-based assessment, as they would not produce enough data to be meaningful in an assessment context.

Overall, the WQTF agreed that the fixed site and probabilistic *E. coli* monitoring should be maintained as part of the *Recommended Plan*, but that the urban area sites should be dropped. The value of the probabilistic monitoring could be revisited following the initial/pilot rounds of monitoring. In terms of sampling frequency, the group agreed that fixed sites and probabilistic sites should be sampled as specified in the *Plan*. Additionally, the WQTF agreed that a five year data window should be used in recreation use assessment, as well as in the assessment of other uses.

The next question posed by Olson to the group was the bacteria criteria to be applied under a potential shared UMR CWA methodology. He suggested three possibilities as follows:

- The existing criteria for *E. coli* used by most states (i.e., a geometric mean of 126 cfu/100 ml and a single sample maximum of 235 cfu/100 ml).
- US EPA's 2012 recommendations for *E. coli* (i.e., a geometric mean 126 cfu/100 ml & statistical threshold value of 410 cfu/100 ml).
- A different approach entirely, such as that used by ORSANCO (e.g., 130 cfu/100 ml & 240 single sample maximum).

The group was in agreement that US EPA's 2012 recommendation should be utilized.

Olson next discussed the issue of "significantly greater than 10% violation frequency" to identify impairment. Essentially, this is the concept that, in order to provide greater statistical confidence that 10% of samples exceed a criterion, it may be necessary for more than 10% of samples to actually exceed, depending on the sample size. The WQTF was in agreement to apply this "significantly greater" approach in the draft UMR CWA methodology for cases where a "10% rule" is applicable.

Hokanson summarized the decisions of the WQTF regarding recreation use monitoring and assessment as follows:

- The purpose of *E. coli* monitoring is to support characterization of bacteria levels (e.g., reporting geometric mean and STV), with the states then using this data further within their own CWA programs.
- Both fixed site and probabilistic monitoring will be pursued as described in the *UMR CWA Recommended Monitoring Plan*. However, the "urban area" sites will be dropped as they would not produce enough data to be meaningful in an assessment context.
- US EPA's recommendations for *E. coli* criteria will be incorporated into the draft UMR CWA assessment methodology. Further, a "significantly greater than 10%" approach will be utilized to identify excursions from the criteria.

Weigel said he sees the approach outlined by the WQTF as workable in a condition assessment context, but asked if there would be a potential for moving toward impairment determination. Good replied that this is a phased approach to initially improve monitoring and determine whether shared assessment feasible, with further potential applications depending on these first steps.

UMR CWA Recreation Use Assessment

Joel Chirhart reviewed the draft aquatic life assessment text he had prepared for the WQTF's consideration. He said this is largely based on the work done by MBI on behalf of the WQTF in 2011 and specifically utilizes three aquatic assemblages – fish, macroinvertebrates, and submersed vegetation – as the primary drivers of aquatic use assessment outcomes. Under this approach, he explained, the results of chemical/physical water quality and habitat monitoring are used only to diagnose causes of identified biological impairments.

Chirhart said one of the challenges in using this approach is deciding how to characterize condition when biological assemblages do not agree in their outcomes. He suggested that it could be possible, as MBI suggested, to use the vegetation assemblage as a “tie breaker” – to help clarify a potential impairment situation – when fish and macroinvertebrate assemblages do not agree (for the reaches where vegetation is sampled).

Weigel noted that, in Wisconsin's application of biological information, they have observed differences in the response of assemblages to various stressors. In particular, they have observed a greater sensitivity of fish to habitat stressors and macroinvertebrates to water chemistry. As such, Weigel, said use of multiple assemblages provides for a more robust assessment and it is important to collect physical/chemical/habitat information alongside biological data.

The WQTF discussed the application of the biological assemblages as essentially independent indicators of condition. In general, the group expressed comfort with the use of the assemblages as independent indicators within the draft UMR CWA assessment methodology.

Continuation of the UMR CWA Assessment Work Group

Hokanson asked the WQTF members and participants in the UMR CWA assessment work group if they saw value in continuing to have assessment work group meet and further refine the draft methodology. All were in agreement that the work group should continue, at least through the next meeting of the WQTF.

Next Water Quality Task Force Meeting

The group agreed that the next WQTF meeting should take place in September 2014 and, if possible, should be a joint meeting with the WQEC. Hokanson said he would be in contact with both groups to set a meeting date.

With no further business, the meeting adjourned at 12:30 p.m. on June 11, 2014.