**Upper Mississippi River Basin Association**

**Water Quality Executive Committee and**

**Water Quality Task Force Hybrid Meeting**

**June 13-14, 2023**

**Draft Highlights and Action Items Summary**

**Approval of the WQTF January 25, 2023 Meeting Summary**

The UMRBA Water Quality Executive Committee (WQEC) and Water Quality Task Force (WQTF) approved the January 25, 2023 draft highlights and action items summary.

**UMRBA Updates**

*UMR Interstate Water Quality Monitoring in 2025-2026*

Lauren Salvato said the WQTF is planning to implement the fixed site network, a portion of the Upper Mississippi River (UMR) Interstate Water Quality Monitoring Plan during October 2025 to September 2026. This would include all five states as well as Metropolitan Council (regional government in Minnesota) to sample a suite of parameters at 11 fixed sites from L&D 2 to Thebes, Illinois. The five states are coordinating multiple funding sources to be able to implement the fixed site network monitoring. The WQTF met earlier on June 13 for a working session and used that time to refine its list of parameters and discuss analytical laboratory options.

*USEPA Exchange Network Grant*

In preparation for the next phase of implementing the UMR Interstate Water Quality Monitoring Plan, the WQTF agreed that UMRBA should centrally house a database and develop functionality to upload the data to USEPA’s Water Quality Exchange (WQX). In researching potential funding sources, UMRBA staff found that the USEPA Exchange Network (EN) would support UMRBA’s development of a database in alignment with the WQTF’s objectives for the database.

During spring 2023, UMRBA staff confirmed with the EN Program Coordinator that UMRBA can partner with a state agency from one of its member states as long as that organization applies as the lead organization. Illinois EPA agreed to partner with UMRBA and an application was submitted for $150,000 to support UMRBA staff time and the costs of a database development contractor. This amount would include space to house UMRBA’s water quantity data to support the out of basin diversion charter and conducting a cumulative impacts assessment.

Following submission, USEPA staff notified Illinois EPA that two applications were submitted from the agency. Since the agency cannot be awarded more than one application per cycle, UMRBA’s application was withdrawn.

Salvato asked the WQEC and WQTF for input on additional options to fund a database for UMRBA. Glenn Skuta suggested a follow-up discussion with USEPA staff. From Minnesota PCA’s standpoint the structure of the grant program is problematic as PCA was also planning to pursue a grant in fiscal year (FY) 2023. He assumes USEPA’s rule is related to spreading the funding around, but UMRBA’s proposal and one put forth by PCA are very distinct proposals with greatly different scopes. Kirsten Wallace asked for a more specific action item. Is a letter appropriate in this case, a meeting with USEPA HQs staff? What would be the most effective way to communicate this. Skuta suggested and other WQEC representatives agreed to start with a call to USEPA staff and determine if a letter is helpful. The message can be about the implementation challenge and suggest that UMRBA should be eligible as its own entity to apply for EN grants.

*USEPA Regions 5 and 7 Science Liaison Meetings*

UMRBA staff met with USEPA Regions 5 and 7 science liaisons to understand how the Upper Mississippi River can be incorporated into USEPA’s research initiatives. There are several options. Regional ORD Applied Research Program (ROAR; formerly called RARE grants): the annual proposal process is internal through the regions - i.e., a partner cannot write the proposal in collaboration with USEPA regions. The science liaisons are program neutral and the true advocacy for a particular proposal comes from the water division level. There is not a large sum of funding for research projects and the funding is competed for across multiple divisions. Research ideas can be discussed with Amy Shields in Region 7 or her equivalent in Region 5, Dave Pfeifer. ROAR proposals must align with the Strategic Research Action Plans (STRAPs) priorities.

STRAPs are national level research priorities that guide four years of USEPA research. The next survey cycle will occur in 2025. Some of the ways that USEPA incorporates priorities are: 1) USEPA HQ Lisa Matthews consults with the Environmental Council of the States, 2) the regions are consulted, and 3) the Region 7 science liaison convenes a committee of the states and tribes, so the WQEC and WQTF could also submit priorities through Angela Falls (Missouri DNR) and Kathy Lee (Iowa DNR).

UMRBA staff would like direction on how to engage USEPA in future STRAP and ROAR cycles and are suggesting a brainstorm of research ideas during calendar year 2023. If the WQEC and WQTF agree to the idea, staff can utilize the following schedule:

* Summer 2023: UMRBA staff initial brainstorm
* Fall 2023: WQTF develop detailed list (in conjunction with WQTF meeting):
* Winter 2023-2024: Coordinate research questions with partner organizations – e.g., UMRCC WQ Tech Section.

The WQEC and WQTF expressed interest in this exercise. Nicole Vidales said a lot of good can come from having research questions ready. Robert Voss suggested topics such as the impact to mussels from aluminum and selenium exposure. Daniel Kendall suggested emerging contaminants research topics. Voss wondered how to prioritize the ideas and cost. Salvato replied she is open to different formats. The Upper Mississippi River Restoration (UMRR) Long Term Resource Monitoring (LTRM) recently created a set of information needs to be able to quickly respond to increased authorization. That was done using structured decision making and the expected value of information.

Micah Bennett added that a constraint of the ROAR process is that USEPA cannot directly collaborate with outside partners in developing the proposal. Laying out research priorities for the UMR and trying to get those related to regional and ORD priorities will allow USEPA staff to create projects that can meet those needs. Steve Schaff said he would check with Region 7’s science liaison but there may be opportunities to do research using existing water quality data as well – i.e., if the states have data but no time to analyze it, Region 7 could potentially contribute resources or expertise to analyze it and draw conclusions.

*UMRBA Multi-Benefit Conservation Practice Workshops*

UMRBA received a USEPA Office of Wetlands, Oceans, and Watersheds grant to convene partners across the basin to discuss how to further accelerate the adoption of conservation practices with multiple benefits. The first workshop occurred in St. Louis, Missouri in November 2022 and the second is planned for October 3-4, 2023 in St. Paul, Minnesota. The theme of this workshop is leverage points of change. Identifying leverage points for the Upper Mississippi River Basin requires a whole system evaluation of the roots causes that, when addressed, can increase the implementation of conservation practices with multiple benefits. UMRBA and the workshop participants will work together to plan strategic efforts to address root causes: policy, financial, technical, leadership, and partnership. Examples of leverage points include improved and coordination technical assistance, innovative and streamlined funding mechanisms, peer to peer networks, and new partnerships/collaborations.

UMRBA staff have scheduled two pre workshop webinars on June 29, 2023 and September 13, 2023 to provide baseline information for workshop participants, while the October workshop is by invitation only. The pre-workshop webinars are open to everyone. Salvato added that the planning committee has been integral in shaping the workshop and is grateful for their participation.

*How Clean is the River? Report*

Salvato said that the report is 99 percent complete. Staff are reworking the conclusions section to ensure it is impactful and have a set of actions to address water quality issues. Staff will be presenting the report at the upcoming August 9, 2023 Missouri Water Protection Forum meeting. Wallace added that UMRBA wants to have a strategic message for UMRBA’s water quality program.

*Midwest CASC Proposal for Floodplain Reconnection*

Wallace said UMRBA is receiving funding from USGS’s Midwest Climate Adaptation and Science Center to create learning questions to inform a broader adaptive management framework and develop a suite of criteria to identify and prioritize the location of floodplain reconnection opportunities. The project will additionally illuminate the willingness of some landowners to implement floodplain reconnectivity on their respective lands.

Shawn Giblin shared his interest in this project, and asked if the proposal is meant to reconnect isolated backwaters or do levee setbacks. In response, Wallace said the proposal does not prescribe either. The proposal will be used to articulate the need for learning criteria and investment in reconnecting the floodplain. The funding is small and partners like Joint Ventures have offered to help develop social metrics. As this proposal was submitted, USFWS received $10 million to identify projects focused on climate resilience and economic and social justice. Separately, UMRR and the Navigation Ecosystem Sustainability Program (NESP) will be undergoing a project selection process. Feel free to reach out to Wallace with questions and insights.

**Nutrients**

*Gulf Hypoxia Program Sub-Basin Committee Work Plan*

Salvato reviewed that the Gulf Hypoxia Program authorized in the Bipartisan Infrastructure Law allowed for sub basin committees (SBCs) to each receive $400,000 for a three-to-five-year period. The guidance was published on June 1, 2023, and SBCs are asked to submit their workplan by July 31, 2023. USEPA wants the workplan to follow the following specific strategic outcomes to advance multi-state collaboration in the Mississippi River Basin:

1. Convene regional, state, and other stakeholders not represented on the Task Force, including additional basin states, basin tribes, agencies, and interested parties and organizations to gather input, facilitate peer-to-peer learning opportunities, and encourage collaboration across boundaries.
2. Help the states engage disadvantaged communities in nutrient reduction planning and activities within their boundaries.
3. Support states in the respective sub-basins as they implement and coordinate comprehensive nutrient reduction strategies across boundaries. For example, where states are looking to adopt programs or practices of other sub-basin states, provide coordination and assistance where possible to ensure data generated across state programs will provide a regional picture of progress.
4. Coordinate, consolidate, and improve access to data and present regional progress towards the Action Plan goals.

Salvato asked for initial feedback from the WQEC and WQTF: 1) how does the sub basin committee role relate to your state workplan? Which of the four goals do you prefer the Association work on? Do you have any guidance for UMRBA while developing the workplan? Participants shared their preference is for UMRBA staff to focus is on strategic outcome three, as listed above.

Potential examples of workplan tasks include better linking nutrient data in tributaries to what is occurring in the UMR mainstem. This would help create a storyline of what the problem and solution are. This would formally include the high-quality data of LTRM. The 2022-2035 UMRBA Water Quality Program plan also discusses work around climate change research, an adaptive management framework. Albert Ettinger suggested that UMRBA could help identify sources of nutrients in various watersheds. The science has been challenging in Illinois to parse out whether nutrient contribution is from streambank erosion, CAFOs, or other nonpoint sources. An isotopic analysis would help separate out the contributions of nutrient loading.

*Nutrient Reduction Strategy Updates*

*Missouri –* John Hoke said Missouri’s Nutrient Loss Reduction Strategy (NLRS) is 10 years old. Missouri is going to gather stakeholders to reflect on what has been achieved and what the next 10 years will look like for nutrient reduction. In response to Adam Schnieders about the most exciting work that has happened in Missouri, John Hoke said the 1.0 mg/L total phosphorus statewide rule. The rule goes before the commission for vote in July 2023. Missouri DNR has gained support of industrial and municipal discharges statewide. The rule will get Missouri closer to the point source reduction goal for the Hypoxia Task Force (HTF) states.

Robert Voss said that Missouri DNR is expanding its contract with USGS and plans to have continuous nitrate sensors on the Missouri River at St. Joseph, Napoleon, and Herman, as well as on the UMR near Keokuk and Alton. There is also a nitrate sensor on the UMR near Thebes. This will give the state a better idea of nitrogen flux to do better flow weighted regression for the next three to five years. Hoke added that when Missouri DNR updated its monitoring strategy, USEPA Region 7 noted the lack of continuous sensors was one of the bigger monitoring gaps.

*Illinois –* Nicole Vidales said that Illinois EPA’s Trevor Sample is working on the biennial report with an anticipated release in December 2023.

*Iowa –* Adam Schnieders said May 2023 marked the 10-year anniversary of the Iowa Nutrient Reduction Strategy (NRS). At the time, Iowa released a comprehensive data dashboard with coordination from Iowa State University. The dashboard can be found linked here: <https://nrstracking.cals.iastate.edu/tracking-iowa-nutrient-reduction-strategy>. Iowa has been able to invest hundreds of millions of dollars towards conservation projects. In order to see a change in the water, changes need to occur in the land and in people. Agriculture-urban partnerships and the batch and build model are good examples of partnerships and leveraging multiple benefits. A lot of new facilities are coming online with the latest nutrient removal technologies that are further reducing point source pollution.

Communication with the public, however, is challenging. The size of the Gulf of Mexico Hypoxic Zone is three million acres. Salvato emphasized the point and shared that she was interviewed by the Mississippi Ag and Water Desk when the Dead Zone size prediction came out. The reporter wanted to know what was different about previous years, and Salvato communicated the challenges of legacy nutrients and lags in water quality, but also the federal investments that have come through the Gulf Hypoxia Program Funding.

Ettinger suggested a presentation from Dr. Castellano whose research created a weather forecast for the best nitrogen rate to apply on a specific field using hundreds of different factors. Ettinger added that it is well proven in Ohio that tile drains are not helping to stop nutrients. In response to a question from Ettinger about point source limits, Schnieders responded that limits have been in Iowa’s strategy since 2013 as a 10:1 shorthand. For 75% reduction you achieve 1 mg/L phosphorus. This applies to major municipalities and wastewater treatment. Forty-seven facilities are meeting nitrogen goals and 23 facilities are meeting phosphorus goals. There has been good steady progress, including in the industrial sector. Ettinger asked if phosphorus is being converted from sewage and fertilizer. Schnieders said that Ostara, a proprietary name, became too expensive. Des Moines has figured out different ways to patent a few pending technologies for the phosphorus recovery process.

*Wisconsin –* Adrian Stocks said through the Gulf Hypoxia Program grants, Wisconsin is working to provide administrative support to producer-led watershed groups. There are currently more than 40 in the state. The real advantage of these groups is to get conservation practices implemented with peer-to-peer knowledge sharing. A challenge is for busy farmers to set up meetings. UW Extension is a partner to provide capacity to set up events, create meetings, and focus on watershed areas and counties that could use support. The grant funding is also being used for a dedicated NRS coordinator to work solely on tracking, reporting and outreach. Wisconsin DNR is supporting county land conservation districts to develop nine key element plants. Wisconsin is continuing to develop data visualization capacity with interactive web-based maps and tracking the progress of projects. Satellite imagery will help Wisconsin better assess nonpoint source projects and implementation.

In response to a question from Ettinger about where Milwaukee Mixing Zone Study stands, Stocks said he would reach out to DNR’s wastewater manager.

*Minnesota –* Skuta said Minnesota’s NRS is 10 years old and is in active revision. Since the strategy was produced, Minnesota published a five-year progress report. The revised strategy will include documentation of efforts and programs that have launched in the previous decades. But there is more work to do and hopefully conservation implementation can be accelerated. Farmers can access funding to gain water quality certification and access certain sources of funding. MN Department of Agriculture has the groundwater protection rule where there are impacts to drinking water. The University of Minnesota’s Forever Green has a host of continuous living cover that it is trying to promote. The Clean Water Fund has millions of dollars for water quality. Unfortunately, nitrogen is not reducing, it is either flat or going up.

Gulf Hypoxia Program dollars will be used for a NRS coordinator. The candidate should be announced soon. Having a dedicated person to write the NRS will allow Dave Wall to support the research. The University of Minnesota has been contracted to tell us the most cost efficient BMPs. While two-thirds of the drainage in Minnesota goes to the Gulf of Mexico, the NRS will pay more attention to the nutrient loading in the Red River Basin.

Ettinger asked about Minnesota’s plan for a nitrate standard. Skuta replied that Minnesota wants to take a more holistic approach. A standard has the biggest impact of point sources in terms of implementation. Minnesota wants to use the NRS to address nitrogen pollution.

*A Partnership to De-Risk Regenerative Agriculture Practices*

Becca Clay, Conservation Agronomist with Practical Farmers of Iowa (PFI) described the partnership with PepsiCo to put $216 million towards regenerative agriculture. By 2030, PFI and PepsiCo estimate implementing practices like cover crops on 1.5 million acres. This partnership is aligned with PRI’s vision of “healthy soil, healthy food, clean air, clean water, resilient farms and vibrant communities.”

Clay reminded the audience that as of 2021, 64% of Iowa was planted in corn and soybeans in 2021. Within the shoulder seasons there are additional opportunities for biomass production which can reduce nitrate leaching. In fact, a study in the Van Zante Creek showed that nitrate loads from cover cropped fields were 32% lower than nitrate loads from non cover cropped fields.

Responding to member requests, in 2015 PFI began providing cost share of more than $10 per acre for cover crops. There is a role for large corporations like ADM and Unilever, purchasers of soybeans, and Cargill and PepsiCo, purchasers of corn, to make positive impacts on the supply chain and put more conservation requirements on the producers that grow these commodity crops. In 2023, PFI continues to offer $10 per acre cover crop cost share, which can be used in concert with publicly funded cost share programs.

PFI works directly with producers interested in regenerative agriculture and also provides farmer-to-farmer education, connecting members to the press and direct story sharing. The partnership coaches farmers on conservation practice adoption and conducts on-farm research through a cooperators program. PFI also works on market development and business support through a cover crop business accelerator program, including business support and marketing tips.

In response to a question from Salvato about the geography covered by PFI and the Soil and Water Outcomes Fund, Clay said that she believes both organizations are working in similar areas. Salvato asked Clay to share how regenerative agriculture is defined by PFI. Clay said that the term is broad and includes actions like reducing nitrogen fertilizer, conversion of granules, extending rotation, and use of cover crops. PepsiCo is purchasing a lot of grain in the Midwest and is focused on working land conservation and less on taking it out of production. Skuta asked if the shorter growing season in the Upper Midwest is a barrier to implementing cover crops. Clay replied that cover crops work in states like Minnesota, though the species that can overwinter are more limited. She knows that cereal rye is consistently used in Canada. In response to Salvato’s question about continuous living cover like Kerna™, Clay said PFI is still waiting for the market to respond and for improved breeding before putting a big investment in it.

Clay responded to Salvato’s initial question about how UMRBA can be helpful to PFI. She suggested engaging with policy makers, making it easier for cover crop adoption and providing flexibility to farmers as much as possible. Skuta added the data make cover crop adoption seem compelling and asked if there is more that can be done with the reauthorization of the Farm Bill, policies and specific types of funding to really advance cover crops more than they have been thus far. Clay said that there is a bill on the floor that is trying to get $5 per acre cover crop premium insurance to be formally institutionalized. The program came out during the COVID-19 pandemic as relief funding and farmers really like it and have found the program easy to use.

*What’s Eating the Trempealeau Lakes: The Case for Controlling Nutrient Loading*

Giblin described the Trempealeau Terrace as an area with economic diversity, unique culture, homes on stilts, a mix of seasonal to year-round residents, and a lot of recreational interests such as fishing. The study area is about 30 square miles on the sand wash terrace bordering the Trempealeau National Wildlife Refuge, with permeable soils and intensive cash cropping. Because of the underlying substrate, the area is susceptible to high levels of nitrate in groundwater.

The public and recreational users of the area have complained about the changing water quality conditions and reduced recreational and ecological value. That was the driver of forming the nonprofit Friends of Trempealeau Lakes.

In 2021, Giblin and collaborators conducted sampling at six sites monthly from May to September. Parameters sampled included basic field measurements as well as nutrients, chlorophyll-a (chl-a), phycocyanin (meter measured), rooted veg cover, filamentous algae cover, and duckweed cover. The results for each of the six sites when compared to the lower limit eutrophic range, only one site was below. The backwater areas were likely nitrogen-limited for many years and now are receiving nitrogen which is causing eutrophication problems. Chl-a results were well in exceedance of the threshold for >60 µg/L for severe nuisance algal bloom and >20 µg/L the levels viewed as a problem according to public perception studies.

Giblin et al., 2022 looked at backwater residence times and the big takeaway was that as nitrogen increases, backwaters tend to have increased filamentous algae mats. Giblin suggested that eutrophication issues cannot be addressed without reducing nitrogen and phosphorus loading. Therefore, nitrogen criteria can be developed to help reach nitrogen reduction goals. Nitrogen reduction pilot programs are manageable and can help reduce nutrient loading on smaller scales.

In response to a question from Schnieders, Giblin said the backwater lakes are six to eight feet deep and the residence times range from one to 150 days. Schnieders asked Giblin what nitrogen criteria numbers would be suggested. Giblin replied the numbers are in the 1-2 mg/L range based on dissolved oxygen and biomass cover. In response to a question from Salvato about desired future conditions and nitrogen criteria development being a complimentary effort, Giblin said he recommends criteria for everything, including addressing water quality issues, as humans are a goal-oriented species.

Schnieders asked Giblin what sources of nitrogen loading there are – e.g., wastewater. Giblin said areas of the Trempealeau terrace has center pivot irrigation. Center pivot irrigated areas result in a huge loss of nutrients to groundwater. Giblin added that a forthcoming paper is working on management targets for habitat restoration that can alleviate mats with certain residence times.

**Upper Mississippi River Restoration**

*Long Term Resource Monitoring Information Needs*

Andrew Stephenson discussed the Upper Mississippi River Restoration (UMRR) Long Term Resource Monitoring’s (LTRM) recent implementation planning effort. This effort is to prepare for potential increased funding resulting from increased UMRR authorization under WRDA 2020 and to develop a set of portfolios of actions that best address UMRR management and restoration information needs. In addition to identifying information needs not currently being addressed by the ongoing LTRM, the planning team developed criteria for expected benefits, estimated costs of each information need and through a ranking process, reduced the list of information needs down to 11. ​

Some of the list of includes:

* System-scale assessments of changes in floodplain vegetation
* Spatial and temporal distribution of higher trophic levels on the UMRS floodplain (reptiles, amphibians)
* Where and how the geomorphology of the river and floodplain is changing and can be expected to change over planning horizons of decades to centuries
* Learning from restoration and management actions
	+ Floodplain vegetation change at restoration project scales
	+ Effects of restoration on habitat conditions
* Ecological condition of the transitional portion of the UMRS between Navigation Pools 13 and 26.
* Aquatic plant distribution
* Community composition, abundance, and distribution of native and non-native macroinvertebrates in the UMRS
* Abundance, distribution, and status of zooplankton and phytoplankton
* Status and trends of mussel species within the Upper Mississippi River and Illinois Rivers

Stephenson elaborated on the information need “ecological condition between pools 13 and 26” which is likely an interest to the WQEC and WQTF. UMR Pools 14 to 25 are unmonitored by LTRM. The proposal includes hiring scientists to evaluate current data needs and design sampling plans for fish, aquatic vegetation, water quality, and macroinvertebrates.

Another information need, “status and zooplankton and phytoplankton,” involves evaluating the abundance, distribution, and status of zooplankton and phytoplankton. The cost of evaluating the phytoplankton data in storage is $3 to 4 million. The proposal includes adding specialists and technicians at each of the LTRM study reaches to collect and analyze zooplankton data.

Next steps for the information needs team are to develop a detailed implementation plan for FY 24-26 and present the final plan to the UMRR Coordinating Committee at its fall 2023 quarterly meeting.

Kendall asked whether the team looked at a flowcam to process the phytoplankton samples instead of the traditional way of identifying the data. Jeff Houser said there is ongoing work to test out the flowcam system to see what can be gained from the results. Salvato commented that for river gradient monitoring needs, she has had discussions about incorporating UMRBA’s monitoring plan design into LTRM’s expansion into Pools 14-25. There is benefit to making the two sampling programs more complimentary.

Voss asked if the increased LTRM funding is over the long or short term. Wallace replied that the hope is the increase will remain unless Congress decides to revert to 2022 levels due to the debt ceiling. Karen Hagerty said typically appropriations are $55 million and the increase is up to $90 million. Wallace added that UMRR has been capped for the past several years but now with the authorization increase, the program may not go to its new cap, but the suggestion is that appropriations will be at a higher level. Stephenson also noted that UMRR’s execution rate has been above 97% for the last seven to eight years, and is the highest execution rate of Corps programs. In response to a question from Skuta on what may be needed from the WQEC and WQTF, Stephenson said his update is informational for now.

**UMRBA Water Quality Program**

Salvato reminded participants of UMRBA’s ambitious 2022-2035 Water Quality Program plan. The feedback she is hoping for is how to focus efforts in the next two fiscal years to ensure the tasks are reflective of the WQEC and WQTF’s top priorities.

Before posing questions to the WQEC and WQTF, Salvato shared select FY 2023 accomplishments:

* UMRBA adopted a chloride resolution: <https://umrba.org/chloride>
* The Reaches 8-9 Pilot final reports were published: <https://umrba.org/document/reaches8-9pilot>
* UMRBA and the WQEC hosted USEPA Region 5 and 7 leadership to discuss shared priorities for the UMR
* UMRBA hosted the first of two Multi-Benefit Conservation Practice workshops in November 2022
* UMRBA staff applied for a USEPA EN grant in partnership with Illinois EPA

In the immediate short term, the following action items are on anticipated to be complete:

* Host the second Multi-Benefit Conservation Practice workshop in October 2023 and summer pre-workshop webinars
* Update the WQEC Charter
* Plan for fixed site monitoring of the UMR in fall 2025
* Collaborate with USEPA Office of Research and Development to update the UMR Interstate Water Quality Monitoring Plan and other documents
* Publish the *How Clean is the River?* Report
* Develop a workplan for Gulf Hypoxia Program funding

Wallace added that Salvato has presented at various meetings and conferences as part of the outreach goal (goal 4). Salvato asked the WQEC and WQTF to write down three water quality priorities for the Association to focus on in FY 24-25 and what success looks like in two years. She requested three successes for each priority.

*Iowa –* Schnieders said his top priorities are nutrients, PFAS, and total suspended solids (TSS). TSS are generally reduced through the Upper Mississippi River but during meetings with the Corps, he hears about sediment problems. In addition, Schneiders added water quality standards for aluminum. Iowa is waiting for USEPA to change its 304a criteria. Once a standard is approved, it is conditional, but the laboratory method still must be approved. Kendall anticipates the need for collaboration down the road as new aluminum methods come in, such as opportunistic sampling for aluminum at Illinois EPA’s fixed site network. Salvato noted that the *How Clean is the River?* Report suggested aluminum trends are decreasing and wondered why there is a discrepancy. Schnieders replied that aluminum is super stringent. Skuta asked about sources of aluminum and Schnieders replied that there are aluminum manufacturers and fabricators in Iowa. Hoke added that Missouri has abundant clay soils and aluminum salts are added to remove phosphorus from water. It becomes a balance between eutrophication versus aluminum toxicity. In response to a question from Schnieders, Hoke said there is some discussion of ferrous salts, but Missouri has iron standards to consider too. Like with PFAS, Schnieders anticipates surveillance to get a grasp of where hot spots are occurring.

Schnieders has heard that the USDA Risk Management Agency is looking at the crop insurance industry to change insurability if PFAS is detected on a farm. Farmers may be more reluctant to accept biosolids, and all of this is driven by insurance agencies. Schnieders has observed that Wisconsin has been the most aggressive of the basin states regarding PFAS monitoring and developing standards for PFAS. For Iowa, the purpose of some of its PFAS monitoring is to understand impacts to facilities. Once we know more, we can target practical actions, for example if PFAS is found in a well to switch to a different one.

*Minnesota -* Skuta said his top three items to focus on in the next two fiscal years are 1) the UMR Interstate Water Quality Monitoring plan: securing full funding for operationalization and having a data management system in place; 2) nitrogen: best practices for reducing nitrogen loading, sharing success stories, and promoting perennial crops; and 3) mussels: propagation of mussels and reintroduction to the Upper Mississippi River.

Laing said her priorities are 1) shared standards and assessments. She emphasized getting shared standards within the constraints of the state. Each state needs to adopt standards individually, yet through UMRBA the states function as an association of states. The second priority is full operationalization of the UMR Interstate Water Quality Monitoring plan, and finally data structure and availability to share the story of water quality on the UMR. While condition assessments and evaluation reports have been developed, the data should be digestible for non-technical audiences.

*Missouri -* Hoke shared that his priorities for UMRBA are data management and displaying the data to the public. He is also interested in nitrogen, but Missouri is not actively working on standards. Communication is important, including presentations at the Missouri Water Protection Forum. Not many of Missouri’s stakeholders hear what is going on in the other states. There are many common threads - e.g., PFAS in biosolids. For PFAS, Missouri is working on MCLs, policies, and permit language.

Voss said he is interested in sediment in the lower portion of the UMR. Sturgeon need pulses of sediment, so what would sediment management look like? He would also prioritize understanding why people recreate in some areas and not others. Salvato said that the WQTF is interested in developing a UMR recreational survey to understand where and how people recreate and their feelings about water quality. This would inform the chl-a criteria as part of the UMR Provisional Assessment. Giblin added that the lake survey for Wisconsin was successful, which yielded qualitative and quantitative data about perceptions of water quality and recreation potential. Schnieders has observed that stakeholders have very different perceptions about water quality. The public generally believes water quality is declining, while barge operators generally feel that water quality has never been better.

Regarding Voss’s comment about sediment, Hagerty said it is critical to recognize regional differences in water quality. Examining pre-lock and dam conditions may be helpful. Some portions of the Mississippi River are sediment starved. Wallace said that the UMRBA Board wants to move forward with longer-term sediment planning. The UMRR program evaluated 30 years of monitoring data and we have five flyers to communicate what is going on. There is one flyer focused on sediment. Wallace added that there is more sediment going into the system than what is coming out of the system. The challenge for the channel is that there are not enough placement sites for the materials. That is why there is an emphasis on beneficial reuse. Wallace suggested a focused conversation about what is happening with sediments in the channel. Giblin emphasized the public’s concern about sedimentation in the backwaters. Once those backwaters are gone, we lose a lot of biodiversity.

Skuta, Wallace, and Giblin said communication is important. Even if the messages are not simple, the UMR is an integrator of everything happening in the watershed. Wallace suggested that in UMRBA’s role as a subbasin committee to the HTF, staff can better connect LTRM with the states’ monitoring programs. For example, results from Minnesota’s buffer law can highlight how policy can impact water quality. Skuta said Minnesota has not made the quantification of nutrient reduction. This is again where PCA gets paralyzed in communication, if it is too complicated to show causality, the agency will not say anything.

*Wisconsin –* Giblin said that the chloride resolution has been impactful in Wisconsin and was the impetus for forming a chloride workgroup. The resolution can be utilized to increase awareness about the harm of overapplying road salt on pavements and roadways. Giblin would like a nitrogen resolution to be developed, similar to the chloride resolution, that would emphasize living cover and BMPs specific to nitrogen reduction. He suggested that focusing on geographic hotspots like the Trempealeau terrace would enable further learning. Giblin would also like the development of an emerging contaminants resolution. It is important to have the emerging contaminants monitoring plan to investigate the decline of burrowing mayflies. They are an important food source in the UMR ecosystem and understanding drivers of the decline is important.

*Illinois –* Vidales said her priorities are conducting fixed site sampling on the UMR in 2025. In line with Minnesota and Missouri, having a data management system in place for UMRBA data is important. Vidales shared that having a common set of designated uses is important and having this outlined before sampling begins in 2025 would make this effort even more successful.

Wallace observed that advocacy was not discussed. She asked if the WQEC and WQTF would like UMRBA staff to educate Congress about the Gulf Hypoxia Program? That is a greater amount of work for staff. There is also a need to advocate for the UMR Interstate Water Quality Monitoring plan. Skuta suggested both would be important if resources allow. Schnieders asked about the expenditure of time and money to conduct advocacy relative to the success of the efforts. Wallace replied it takes about a week to fill out appropriations requests. Staff can develop a factsheet, do Capitol Hill visits, and coordinate letters. Altogether, it would be about three weeks of staff time. In its subbasin role, UMRBA can figure out what would be the right amount of funding to request. In the February and March 2023 congressional cycle, Salvato filled out appropriations requests for an additional capacity of $25 million for the HTF.

Steve Schaff asked for clarification if the Gulf Hypoxia Program is a "Geographic Program" dedicated to the Mississippi River and the Missouri River? US EPA has geographic programs focused on place-based efforts to protect or restore specific ecosystems of national significance. Salvato responded that the Gulf Hypoxia Program includes the 12 HTF states and would not include the Missouri River in this case. Wallace added that she believes the Gulf Hypoxia Program was authorized as an individual program, not a geographic program.

**Examining Biological Indicators of the Upper Mississippi River**

*Review of 2009 Workshop Conclusions*

Salvato provided an overview of the 2009 Biological Indicators workshop hosted by UMRBA with funding from the Corps and USEPA. The goals of the workshop were to frame the needs for and potential uses of indicators in the ecosystem restoration and Clean Water Act (CWA) programs on the UMR; identify key issues, evaluate opportunities for cross-program coordination, and identify next steps in the development and application of biological indicators on the UMR; learn from the experiences with indicator development and use in other large aquatic ecosystems; and evaluate current research efforts.

The workshop sought to answer the following questions about biological indicators:

* What are the potential benefits and obstacles of incorporating biological indicators into CWA and ecosystem restoration programs on the UMR?
* What biological indicator approaches from outside the UMRB can inform approaches in the UMRB?
* How should ongoing collaboration regarding indicators be sustained?
* What are the potential connections between CWA and ecosystem restoration programs in applying biological indicators on the UMR? Are there approaches to indicators for the UMR that can apply effectively in both CWA and ecosystem restoration contexts?
* How should each program area proceed in applying biological indicators on the UMR?

The workshop participants identified possible next steps:

* Establishing an ad hoc Ecosystem Restoration-CWA Interagency committee
* Engagement of CWA staff in ecosystem objective-setting for UMR reaches
* Hold a biological condition gradient workshop
* Engagement of CWA staff in LTRM analysis team refinement of indicators
* UMRBA WQTF development of biological assessment guidance for the UMR
* Inventory and comparison of sampling methods and data sets
* Examine the use of LTRM infrastructure to support enhanced monitoring
* Monitoring progress of the Lake Pepin TMDL and Mississippi Makeover effort
* Enhancing outreach and communication

Salvato was unaware that the next steps had been explicitly carried out, but she invited USGS Upper Midwest Environmental Science Center (UMESC) staff that carry out the science for the LTRM program to contribute to the discussion. She explained that she believes the workshop’s conclusions are incredibly relevant given the following ongoing initiatives:

* UMRR Desired Future Conditions and UMR Interstate Water Quality Monitoring biological endpoints
* UMRR LTRM effort to piloting macroinvertebrate collection for three years
* UMRR LTRM information needs, including river gradients for UMR Pools 14-25 and Fast Limological Automated Measurements (FLAMe) proposal
* UMR Interstate WQ Monitoring completion for two pilot projects

Houser, who participated in the 2009 workshop, observed that Giblin had a number of suggestions regarding water quality indicators that were incorporated into the 2022 Status and Trends report, specifically the use of WRTDS analysis of fixed sites to better understand changes in nutrient and total suspended sediment fluxes into the system. Houser appreciates Salvato’s interest and involvement in the FLAMe project. At this time, Houser does not have specific recommendations.

Hagerty noted that her career has been almost exclusively on the ecosystem, but she has been struck where the CWA and ecosystem areas diverge in some areas. For example, in the lower confluence of the Mississippi and Missouri River there is not enough sediment, so restoration efforts are not favoring native species. Hypoxia is a normal part of the ecosystem but within certain limits. The idea that we need to educate the public on what is natural for water quality to be in different reaches makes the messaging extensive. We cannot have an open bluegill fishery in the open river because it never existed. The lower impounded reach is a huge transitional area. The FLAMe project will generate data to improve understanding of the various complexities in the river. There is a lot we do not know about those areas that are more degraded and how to restore those from both an ecosystem and CWA perspective. Wallace said the desired future conditions question is a huge undertaking. When we talk about floodplain reconnection through the UMRR Coordinating committee, UMRBA staff can extend the invitation to join or have more report outs on projects/progress.

Houser recalled that the summary included the idea of more CWA connections to projects to restore the ecosystem. It does not mean there cannot be awareness of possible connections. If that is something of interest, river team meetings may be a good venue. Schnieders is unsure of a chemical response with ecosystem restoration. Biology is typically the first to respond. The public likes those types of success stories. It is harder to think about these connections within a complex large river system.

Schaff said that USEPA Region 7 hired three new staff with expertise in fish and macroinvertebrate sampling and identification. These staff will assist with finalizing Biological Condition Gradient work for the two predominant ecoregions within USEPA Region 7. Schaff is interested in the decline of burrowing mayflies and suggested UMRBA could reach out for assistance. Houser suggested Schaff contact Manish Pant with Illinois Natural History Survey's Illinois Biological Station. She is leading the LTRM macroinvertebrate work, which has funding for three years to pilot and potentially bring back the element to LTRM.

Danelle Larson provided links to the following literature that is relevant to this discussion:

* Windmuller-Campion et al., 2022 - What is a stand? Assessing the variability of composition and structure in floodplain forest ecosystems across spatial scales in the Upper Mississippi River

<https://www.sciencedirect.com/science/article/abs/pii/S0378112722003796?via%3Dihub>

* De Jager et al., 2018 - Indicators of Ecosystem Structure and Function for the Upper Mississippi River System

<https://pubs.usgs.gov/publication/ofr20181143>

* McCain et al., 2018 - Habitat Needs Assessment‐II for the Upper Mississippi River Restoration Program: Linking Science to Management Perspectives

<https://usace.contentdm.oclc.org/utils/getfile/collection/p266001coll1/id/8323>

* Houser et al., 2022 – Ecological status and trends of the Upper Mississippi and Illinois Rivers

<https://pubs.usgs.gov/publication/ofr20221039>

* Larson et al., 2023 - Aquatic vegetation types identified during early and late phases of vegetation recovery in the Upper Mississippi River

<https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/ecs2.4468>

* Larson et al., 2023 - Data to quantify ecosystem states and state transitions of the Upper Mississippi River using topological data analysis

<https://www.sciencebase.gov/catalog/item/641097cad34e254fd35301c0>

**Legacy Pesticides**

*Analyzing Legacy Data from Illinois Rivers to Improve Pesticide Monitoring*

Sparks shared that Illinois EPA’s pesticide monitoring network includes 21 sites, 18 of which are long-term sites. The sites cover 11 major river basins, monitored nine times per year. Data on over forty pesticides are collected.

Sparks analyzed herbicide data collected from 1999 to 2021. Atrazine was detected 72% of the time and metolachlor 65% of the time. Comparing the 1999 to 2021 dataset to the one Matt Short analyzed from 1985 to 1998, Sparks noted that the percent difference increased in detections for metribuzin (41%), whereas atrazine’s detection rate was about the same.

Data from Illinois EPA’s ambient lakes monitoring program were also collected and hits for atrazine and simazine were detected more widely across the state. Sparks used the data overlain with land use to determine where to add seven additional pesticide monitoring sites.

There is seasonality to detections in acetochlor, atrazine, metolachlor, metribuzin in the May through July timeframe. Monthly averages increase in both finished and raw water samples. Sparks noted this trend increased in 2013 and his online research confirmed that the use of metolachlor and metribuzin increased during this time.

There are also relationships where herbicides groups are detected in watersheds. For example, simazine, 2,4-D, and dicamba are detected consistently in the Vermilion watershed, whereas atrazine, metolachlor, metribuzin, and acetochlor are more commonly detected in the Kaskaskia, Mississippi, and Sangamon watersheds.

For the insecticide data, most of the detections are for organochlorines as opposed to the organophosphates. Comparing the 1991 to 2021 data with the 1985 to 1998 dataset showed that insecticides like dieldrin and lindane are increasing in usage. Imidacloprid usage increased in urban areas of NE Illinois during a 2015-2016 study. The vast majority of the sites also indicated toxic conditions for invertebrates.

Another study that is occurring in 2023 will characterize insecticide use in the major tributaries of the Illinois and Wabash Rivers. Voss asked how results will be interpreted. Voss is aware that imidacloprid is used for leaf eating insects like Japanese beetles, and permethrin is used on pets. Sparks is unsure about the interpretation. Voss also suggested it would be useful to know what pest control companies are applying to better understand potential urban sources.

Laing noticed the DDT results and yet it has been banned since 1972. Does Sparks have any idea of what is happening? Sparks said that the area is outside Chicago, near Starved Rock, and it hasn’t been detected since 2014. But prior to that the pattern was a spike of DDT once per year. Salvato asked if Sparks had ideas on why atrazine hot spots are occurring in particular watersheds. Sparks speculated that the watersheds that are both agricultural dominated and in rural settings, there could be differences in conservation perspectives - e.g., no-till versus tillage.

**WQEC Charter**

Salvato said UMRBA staff revisited the charter and made some suggested changes for the WQEC and WQTF’s reflection. The main changes include adding more formal meetings, a new proposed structure of committees, and a change of roles and responsibilities in priority order. Given the significant workload in the 2022-2035 UMRBA Water Quality Program plan, staff are suggesting a more formal tie to the WQEC’s charter and the program plan. The reshuffle of committees would enable a response to the increased workload of interstate water quality responsibilities. The WQEC could become the Water Quality Executive Council and oversee the work of five different committees on emerging contaminants, monitoring, nutrients, cyanotoxins, and chloride.

Salvato posed the following questions:

* What are your thoughts on the language changes?
* Does the overall package reflect UMRBA’s Water Quality Program Plan?
* Do the roles and responsibilities support your goal for interstate water quality coordination?
* How will the HTF sub-basin committee function within this proposed structure? Can they reside under the WQEC?
* Do you have any additional ideas to strengthen the WQEC’s role and ability to accomplish the work in the 2022-2035 UMRBA Water Quality Program plan?

Wallace added that UMRBA staff have a large portfolio. For UMRBA’s work as a subbasin committee to the HTF, staff needed a delegated authority. A group of NRS coordinators has been formed and is functioning like an ad hoc group. Do they report to the WQEC or the UMRBA Board? How do we ensure there is an efficient line of communication to provide direction? UMRBA is not a compact or commission; staff need direction from the states.

Wallace also suggested formal memberships. Wisconsin, for example, has two representatives per committee. Should DATCAP be specified as a non-voting member? The UMRBA Board is structured to have a primary member that can delegate to an alternate.

Laing asked for clarification that CWA would be equally emphasized along with emerging contaminants and cyanotoxins. Wallace replied that the suggestion to keep nutrients and CWA separate was for the focus on nonpoint source pollution (NPS) and point source pollution, respectively. Participants all emphasized that while not regulated, NPS is part of the CWA and states are required to characterize the extent of the NPS through actions like NPS management plans and programming. Recent memos from USEPA have also emphasized the connection between CWA programs and NRSs.

Wallace reminded participants that some WQTF have expertise in some topic areas but not necessarily all of them. If you are not the chloride person, you are coordinating with the chloride person.

She added that UMRBA’s HAB work is not very active and asked if having a formalized group could help advance the interstate work around HABs in a more strategic and efficient manner. The committees would not necessarily need to meet on a regular basis.

Laing posed her concern about state agency staff having the capacity to serve on the committees and potential duplication with USEPA Region 5 workgroups. The new committee structure would eliminate a WQTF representative to funnel and coordinate work. Schnieders views nutrients as unique as there is specific funding available through the Gulf Hypoxia Program. Staff are already stretched too thin and additional meetings would be challenging to join. Giblin likes the current layout of bringing in subject matter experts as needed. He is reticent to bring on new committees. Kendall agreed and shared his concern over increasing silos. Hoke emphasized that staff turnover is a frequent issue. Distribution lists would be outdated in a month. Wallace suggested starting with an additional spring meeting for the WQEC as the meeting calendar does not currently have a formal meeting just for the WQEC. Participants agreed with the suggestion.

Schnieders said that the WQTF is a proven model. Nutrients are different because there is federal funding coming down. Hoke agreed. Laing said that in her current role her responsibilities are broadly spread. If additional committees were added, Laing would be handing off responsibilities to someone she supervises and there would not be someone to connect the dots. That is the role that the WQTF is currently playing. Voss agreed that the WQTF is doing a better job of identifying the action items, resolutions, and leaving it to the states to coordinate internally.

Skuta reflected that the two questions are 1) should additional committees be created, and 2) what is the WQTF moving forward? Next steps include additional discussion on WQEC and WQTF structure.

**Administrative Items**

*Chairs*

Salvato thanked Glenn Skuta and Dana Vanderbosch for their time chairing the WQEC and thanked Robert Voss and Heather Peters for their time chairing the WQTF. The next chairs for the WQEC and WQTF are Nicole Vidales and Kim Laing, respectively.

*Future Meetings*

The next WQTF hybrid meeting will be scheduled for September 20-21, 2023 in Muscatine, Iowa.

**Participants**

|  |  |
| --- | --- |
| Ryan Sparks  | Illinois Environmental Protection Agency  |
| Nicole Vidales | Illinois Environmental Protection Agency  |
| Dan Kendall | Iowa Department of Natural Resources  |
| Adam Schnieders | Iowa Department of Natural Resources  |
| Kim Laing  | Minnesota Pollution Control Agency  |
| Glenn Skuta | Minnesota Pollution Control Agency |
| John Hoke | Missouri Department of Natural Resources |
| Robert Voss | Missouri Department of Natural Resources |
| Micah Bennett | U.S. Environmental Protection Agency, Region 5  |
| Ed Hammer | U.S. Environmental Protection Agency, Region 5  |
| Donna Keclik | U.S. Environmental Protection Agency, Region 5  |
| Zachary Leibowitz | U.S. Environmental Protection Agency, Region 7  |
| David Pratt | U.S. Environmental Protection Agency, Region 7 |
| Steve Schaff | U.S. Environmental Protection Agency, Region 7 |
| Amy Shields | U.S. Environmental Protection Agency, Region 7 |
| Heather Golden | U.S. Environmental Protection Agency, ORD |
| Anna Hess | U.S. Environmental Protection Agency, ORD |
| Terri Jicha | U.S. Environmental Protection Agency, ORD  |
| Erin Spry  | Upper Mississippi River Basin Association |
| Lauren Salvato  | Upper Mississippi River Basin Association |
| Brian Stenquist | Upper Mississippi River Basin Association |
| Kirsten Wallace | Upper Mississippi River Basin Association |
| Ashley Beranek | Wisconsin Department of Natural Resources  |
| Shawn Giblin | Wisconsin Department of Natural Resources  |
| Kevin Kirsch | Wisconsin Department of Natural Resources  |
| Mike Shupryt | Wisconsin Department of Natural Resources  |
| Adrian Stocks | Wisconsin Department of Natural Resources  |
| Jeff Houser | U.S. Geological Survey, Upper Midwest Environmental Science Center |
| Danelle Larson | U.S. Geological Survey, Upper Midwest Environmental Science Center |
| Charles Brown | City of Moline Utilities  |
| Albert Ettinger | Mississippi River Collaborative |
| Becca Clay | Practical Farmers of Iowa  |
| Becca Trueman | Quantified Ventures |