

**Minutes of the 156th Quarterly Meeting
of the
Upper Mississippi River Basin Association**

**October 27, 2020
Web-Based Conference Meeting**

Steve Galarneau called the meeting to order at 8:30 a.m. Participants were as follows:

UMRBA Representatives and Alternates and State Members of the Water Quality Executive Committee:

Rick Pohlman	Illinois Department of Natural Resources
Chad Craycraft	Illinois Department of Natural Resources
Dave Glover	Illinois Department of Natural Resources
Loren Wobig	Illinois Department of Natural Resources
Tim Hall	Iowa Department of Natural Resources
Adam Schnieders	Iowa Department of Natural Resources
Jake Hansen	Iowa Department of Agriculture and Land Stewardship
Barb Naramore	Minnesota Department of Natural Resources
Katrina Kessler	Minnesota Pollution Control Agency
Dru Buntin	Missouri Department of Natural Resource
Chris Wieberg	Missouri Department of Natural Resource
Jennifer Hoggatt	Missouri Department of Natural Resource
Chris Klenklen	Missouri Department of Agriculture
Matt Vitello	Missouri Department of Conservation
Steve Galarneau	Wisconsin Department of Natural Resources
Jim Fischer	Wisconsin Department of Natural Resources
Greg Searle	Wisconsin Department of Natural Resources

Federal UMRBA Liaisons:

Brian Chewning	U.S. Army Corps of Engineers, MVD
Ken Westlake	U.S. Environmental Protection Agency, Region 5
Sabrina Chandler	U.S. Fish and Wildlife Service, UMR Refuges
Scott Morlock	U.S. Geological Survey, Midcontinent Region
Verlon Barnes	Natural Resources Conservation Services

Others in Attendance:

Ryan Benefield	Arkansas Department of Natural Resources
Wes Cattor	Illinois Department of Natural Resources
Kirk Hansen	Iowa Department of Natural Resources
Katie Pratt	Minnesota Environmental Quality Board
Erik Dahl	Minnesota Environmental Quality Board
Suzanne Rhees	Minnesota Environmental Quality Board
Megan Moore	Minnesota Department of Natural Resources

Patrick Phenow	Minnesota Department of Transportation
Dave Wall	Minnesota Pollution Control Agency
Bryan Hopkins	Missouri Department of Natural Resources
Dan Baumann	Wisconsin Department of Natural Resources
Mike Halstad	Wisconsin Department of Transportation
Ryan Fischer	U.S. Army Corps of Engineers, ASA(CW)
Sharon Sartor	U.S. Army Corps of Engineers, Headquarters
Jim Cole	U.S. Army Corps of Engineers, MVD
Leanne Riggs	U.S. Army Corps of Engineers, MVD
Ben Robinson	U.S. Army Corps of Engineers, MVD
Thatch Shepard	U.S. Army Corps of Engineers, MVD
Bryan Taylor	U.S. Army Corps of Engineers, MVD
Kevin Wilson	U.S. Army Corps of Engineers, MVP
Chris Erickson	U.S. Army Corps of Engineers, MVP
Terry Birkenstock	U.S. Army Corps of Engineers, MVP
Ann Banitt	U.S. Army Corps of Engineers, MVP
Jill Bathke	U.S. Army Corps of Engineers, MVP
Angela Deen	U.S. Army Corps of Engineers, MVP
Jon Hendrickson	U.S. Army Corps of Engineers, MVP
Steve Tapp	U.S. Army Corps of Engineers, MVP
Col. Steve Sattinger	U.S. Army Corps of Engineers, MVR
Kim Thomas	U.S. Army Corps of Engineers, MVR
Andy Barnes	U.S. Army Corps of Engineers, MVR
Roger Perk	U.S. Army Corps of Engineers, MVR
Jodi Creswell	U.S. Army Corps of Engineers, MVR
Karen Hagerty	U.S. Army Corps of Engineers, MVR
Rachel Hawes	U.S. Army Corps of Engineers, MVR
Davi Michl	U.S. Army Corps of Engineers, MVR
Paul St. Louis	U.S. Army Corps of Engineers, MVR
Scott Whitney	U.S. Army Corps of Engineers, MVR
Col. Kevin Golinghorst	U.S. Army Corps of Engineers, MVS
Susan Wilson	U.S. Army Corps of Engineers, MVS
Michael Feldmann	U.S. Army Corps of Engineers, MVS
Jasen Brown	U.S. Army Corps of Engineers, MVS
Hal Graef	U.S. Army Corps of Engineers, MVS
Gregory Kohler	U.S. Army Corps of Engineers, MVS
Brian Markert	U.S. Army Corps of Engineers, MVS
Ben McGuire	U.S. Army Corps of Engineers, MVS
Shawn Sullivan	U.S. Army Corps of Engineers, MVS
Brian Johnson	U.S. Army Corps of Engineers, Regional Planning Division North
Nate Richards	U.S. Army Corps of Engineers, Regional Planning Division North
Chuck Theiling	U.S. Army Corps of Engineers, ERDC
Anna Wildeman	U.S. Environmental Protection Agency, Office of Water
Amy Shields	U.S. Environmental Protection Agency, Region 7
Jason Daniels	U.S. Environmental Protection Agency, Region 7
Tim Yager	U.S. Fish and Wildlife Service, UMR Refuges
Neal Jackson	U.S. Fish and Wildlife Service, UMRCC
Sara Schmuecker	U.S. Fish and Wildlife Service, Illinois-Iowa Field Office
JC Nelson	U.S. Geological Survey, Midcontinent Region

Kristen Bouska	U.S. Geological Survey, UMESC
Jennifer Dieck	U.S. Geological Survey, UMESC
John Delaney	U.S. Geological Survey, UMESC
Jeff Houser	U.S. Geological Survey, UMESC
Jennie Sauer	U.S. Geological Survey, UMESC
Molly Van Appledorn	U.S. Geological Survey, UMESC
Molly Woloszyn	National Oceanic and Atmospheric Administration, NIDIS
Mark Glaudemans	National Oceanic and Atmospheric Administration, NWS
Steve Buan	National Oceanic and Atmospheric Administration, NWS
Jessica Brooks	National Oceanic and Atmospheric Administration, NWS
Sandra Pavlovic	National Oceanic and Atmospheric Administration, NWS
Olivia Dorothy	American Rivers
Janet Buchanan	Heartlands Conservancy
Momcilo Markus	Illinois State Water Survey, Prairie Research Institute
Jill Crafton	League of Women Voters
John Howard	League of Women Voters
Doug Daigle	Lower Mississippi River Sub-Basin Committee (Hypoxia Task Force)
Christine Favilla	Sierra Club
Gretchen Benjamin	The Nature Conservancy
Doug Blodgett	The Nature Conservancy
John Chick	University of Illinois
Marian Muste	University of Iowa
Daniel Wright	University of Wisconsin
John Wetenkamp	Wisconsin Public Radio
Douglas Massie	[Affiliation Unknown]
Kirsten Wallace	Upper Mississippi River Basin Association
Mark Ellis	Upper Mississippi River Basin Association
Lauren Salvato	Upper Mississippi River Basin Association
Andrew Stephenson	Upper Mississippi River Basin Association

Minutes

Tim Hall moved and Dru Buntin seconded a motion to approve the draft minutes of the August 11, 2020 UMRBA quarterly meeting as written. The motion was approved unanimously.

Executive Director's Report

Kirsten Wallace mentioned that UMRBA and the Corps are finalizing the draft Keys to the River 2020 report. The report recommends a suite of high leverage actions and a framework for developing long term, integrated management strategies for the Upper Mississippi River. Wallace said today's meeting agenda reflects the need for regional information sharing and dialogue about precipitation forecasting, watershed planning, and status and trends analysis. UMRBA will continue to facilitate these types of conversations and foster collaboration to advance the actions. This includes integrating state and local water planning, such as the states' nutrient reduction strategies.

Members of Congress submitted an October 26, 2020 letter to the Corps requesting a new construction start for the Navigation and Ecosystem Sustainability Program (NESP). The letter was signed by 49 members of Congress, including 11 Senators and 38 Representatives from 10 states.

Wallace announced that the America's Watershed Initiative is planning for a December 3, 2020 publication of its second report card of the watershed's primary uses. Specifically, the report card measures goals related to ecosystems, flood control and risk reduction, transportation, water supply, economy, and recreation. AWI will be hosting a pre-release for its close partners in the afternoon of November 30, 2020. Wallace said she will distribute the invitation to UMRBA Board members. Wallace explained that most of the indicators are consistent from the 2015, with improvements to data analysis related to flood frequency and water quality.

UMRBA sent a September 11, 2020 letter to USGS, supporting its selection of the Upper Illinois River for its next Integrated Water Science (IWS) monitoring basin. The letter is provided on pages B-5 to B-8 of the agenda packet. USGS's objective for its IWS basins is to "develop and apply advanced water availability models for resource assessment in the basin, supported by high density innovative monitoring and cutting-edge research, in ways that can be used to improve larger regional and national models and predictive products." Wallace said USGS had indicated the possibility of the geographic scope being expanded to also include the Lower Illinois River. USGS is seeking a basin in the Midwest to understand how nutrients, sediment, and HAB formation and toxicity affect water availability. It is anticipated that USGS will announce the selection by the end of October 2020.

Wallace referred to Executive Director's report in the agenda packet for a summary of the Association's other work load efforts since the August 2020 quarterly meeting.

Wallace pointed to UMRBA's financial statements on pages B-10 to B-12 of the agenda packet. Dru Buntin moved and Tim Hall seconded a motion to approve the Association's budget report and balance sheet as included in the agenda packet. The motion was approved unanimously.

Keys to the River Report Overview

As a means for providing background, Paul St. Louis reminded that UMRBA and the Corps entered a two-year Planning Assistance to the States (PAS) agreement in November 2018 to:

- Solve the more straightforward problems for which federal, state, local, and private partners can take immediate action
- Develop a more detailed proposal for exploring complex issues through a longer-term planning effort – i.e., Section 729
- Create a stronger collaboration through an engagement strategy with river users that allows for the first two items to be regionally accepted

The PAS involved a unique process for stakeholder engagement, using the methods of systemic development of informed consent (SDIC). The process was very different than typical federal and state public meetings and document review. It is predicated on the recognition that the public is directly affected by the work and will be integral part of the solutions.

St. Louis explained that UMRBA and the Corps are finalizing a draft report describing the stakeholder engagement, high leverage actions, and long term planning solutions. St. Louis expressed his appreciation for the tremendous input received in the 2019 local listening sessions and throughout the development of the ideas. While report writing teams were organized around subject matter chapters (i.e., sediment, drought, and flood), the Keys to the River Report takes on an integrated approach by focusing chapters on stakeholder engagement, high leverage actions, and UMRBA's Section 729 long

term planning proposal. St. Louis emphasized that the purpose for the PAS, and the focus of the report, is organizing around action we can take now to improve management – i.e., formulating solutions within a watershed context.

St. Louis provided a summary of the report’s high leverage items, including the following:

- Flood: HEC-RAS, flow frequency profiles, and an economic vulnerability assessment
- Drought: Defining drought, interstate cooperation regarding out-of-basin water transfers, and an economic vulnerability assessment
- Sediment: Plans, agreements, and permits; marketing dredged material, and beneficial use of dredged material
- Watershed: Precipitation prediction capabilities, watershed actions, and information exchange

Kirsten Wallace said the longer term planning needs are organized via the Corps’ Section 729 process – i.e., vision, objectives, and planning scenario formulation. There is a resounding agreement among the region that the status quo is not acceptable and that change in management and land use is needed. The overall objective is to answer how to increase the resilience of the Upper Mississippi River to major flood events, prolonged drought, and excessive sediment for the purposes of maintaining a safe and reliable 9-foot navigation channel. This will include evaluating:

- Where and how should existing land uses be protected and sustained into the foreseeable future?
- Where should land use be different?
- What does resilient and sustainable flood, drought, and sediment look like?

An assessment of tributary influences to the river system will be used to develop a comprehensive, collective understanding of how various actions are acting in tandem with, or against, other actions. And, how these cumulative actions as well as weather-related effects are driving the events that are manifesting in the river. This will add clarity about the many stakeholders and their various contributions, which are often disconnected. A thorough examination of existing conditions will be used as a baseline to justify investment and evaluate the influence of any recommended actions. Longer term planning will include an evaluation of what contributes to flood conveyance issues, the triggers that cause the demand for water to exceed its availability, the problems that are affecting sediment management, and the economic and social vulnerabilities to flood and drought. A detailed explanation of how the existing system of flood protection infrastructure and storage areas (including backwaters and floodplain forests) performed during major flood events occurring between 2000 and 2020 will help us answer questions about where the existing system provides adequate protection and where it does not provide adequate protection. Additionally, it will be important to evaluate the current barriers to implementing new approaches to managing the river. That may include policy and funding constraints, the current governance framework, and politics, among other issues. For example, how does the multi-jurisdictional nature of governance on the Upper Mississippi River contribute to the challenges?

Scenario planning will focus on building solutions to flood, drought, and sediment management to stimulate economic growth, minimize economic and social vulnerabilities, and foster ecological health. While the focus for solutions will primarily be in the river-floodplain, the analysis will also illuminate where and how actions in the watershed would be most effective for improving the river’s resilience. We will focus on answering questions such as:

- How should and can the floodplain be altered to allow for effective conveyance of floods and deposition of sediment?
- Where should current land uses be protected and sustained, or changed to another form in the foreseeable future?
- How can sediment be removed from the river channel and backwaters at the rate needed to maintain an open and reliable navigation system under high and low water conditions and improve flood conveyance? This will include an analysis of how the problems affecting sediment management can be resolved.
- Collectively, how can management actions minimize the economic and social vulnerabilities to flood and drought? For example, what are general criteria that may inform water use in a low flow situation?

Wallace acknowledged that the ideas embedded in the report were developed in a transparent manner with stakeholders able to participate as they were able and as they wanted. She expressed optimism that people would see their input in the report. UMRBA and the Corps are planning for a targeted review of the report with a three week review period. To accommodate stakeholder preferences, Wallace said written and/or verbal input would be encouraged.

Wallace said UMRBA's next steps will involve building a scope of work for the UMRBA staff and states to advance the ideas provided in the report. UMRBA will advocate for the funding and policies to advance the report's ideas, convene discussions around climate science and other related planning efforts, and develop an assessment of tributary influences. UMRBA is also planning to develop branding around this work to enhance overall communications and participation among stakeholders.

Olivia Dorothy noted that other watershed studies have linked floodplain connectivity and wetlands to important aquifer recharge. For example, the Yazoo River backwater is important for the recharge of the Mississippi Alluvial River Valley Aquifer, which supports cotton production. Similar studies in the west have examined recharge for the purposes of mitigating long term drought. Dorothy asked if, for the purposes of this study, USGS would consider mapping potentially important areas for groundwater recharge. Kirsten Wallace said those types of questions and potential analyses would be explored in the more detailed scoping process. Mark Gaikowski said he does not have specific knowledge of that work, but offered to follow up with water science centers to share any of that work with the UMRBA Board.

Future Precipitation Analysis and Projections

NOAA Atlas-14

Mark Glaudemans explained that the Atlas-14 precipitation frequency analyses provide quantifiable estimates of point precipitation amounts for a given duration and annual exceedance probability (or average recurrence interval) – e.g., precipitation over a 24-hour period with a one percent (1/100) probability to occur in a given year. The statistical analyses are based on historical observations. Atlas-14 was updated in 2013 covering Iowa, Minnesota, Wisconsin, and Missouri and in 2004 for Illinois and Indiana.

Atlas-14 work is performed at the request and sponsorship of a stakeholder(s). It is not funded by Congressional appropriations, but rather by the affected states and other users on a cost reimbursable

basis. Individual volumes are supported by a pooled fund approach managed by USDOT, with contributions from partners at the local, county, state, and federal levels.

Atlas-14 has several important applications, including infrastructure design and planning, small basin-scale modeling, flood threat potential assessments, and post-event analysis. FEMA uses Atlas-14 in its National Flood Insurance Program. Glaudemans provided an example of the city of Austin, Texas' evaluating renewed Atlas-14 projections to revise its floodplain definitions. Glaudemans provided an overview of the various products available on NOAA's precipitation frequency data server: <https://hdsc.nws.noaa.gov/hdsc/pfds/index.html>.

More immediately, NOAA is completing Atlas-14 for Idaho, Montana, Oregon, Washington, and Wyoming and is scheduled to initiate a new two-state study for Idaho and Wyoming in early 2021. NOAA's strategic priorities for Atlas-14 include:

- Updating estimates for the contiguous United States with regular updates every five or 10 years
- Incorporating a methodology to account for non-stationary climate
- Developing supporting products to compliment engineering and modeling use
- Advancing the Advisory Committee on Water Information's 2018 recommendations, which can be found at this link: https://acwi.gov/hydrology/extreme-storm/product_needs_proposal_20181010.pdf

Glaudemans explained that new, available technologies would strengthen Atlas-14 by integrating future climate projections into the precipitation frequency analysis. NOAA has recently developed a non-stationary Atlas-14 process that has the ability to integrate future climate projections into precipitation frequency analysis, allowing for different levels of complexity. New tools also allow for a wider range of inputs. For example, current areal reduction factor curves from the 1950s are assumed to be applicable for any location. Proposed areal reduction factors would include a range of durations, areal sizes and frequencies, and on-the-fly calculations of areal estimates for any selected location.

Katrina Kessler pointed to the difference between NOAA's goal of a five- to 10-year national update cycle and the 16-year-old Atlas-14 coverage for most Upper Mississippi River basin states. Kessler asked whether it would be efficient and realistic to seek a national update and how UMRBA might be helpful in achieving that, and if not, how the Upper Mississippi River basin states might receive priority for an update. Glaudemans said a nationwide update is realistic, assuming appropriate sponsorship at the federal level. NOAA is preparing for this possible scenario, and Glaudemans acknowledged that it would be challenging to simultaneously issue regional volumes.

Illinois Bulletin 75

The Illinois State Water Survey published a statewide precipitation frequency study, referred to as Bulletin 75. Illinois Department of Commerce and Economic Opportunity and U.S. Department of Housing and Urban Development provided grants to support the project, which was coordinated with the Illinois Department of Natural Resources. Momcilo Markus, a lead author of Bulletin 75, reported that it provides expected rainfall amounts for selected storm durations and return periods and can be used for mapping, planning, design, research, and other applications.

Markus provided an overview of the data and processes used to determine the analyses. Recent studies suggest that 70 years is the maximum timeframe to best reflect current conditions.

Markus described the observed trends in annual maximum daily precipitation and frequency of heavy storms in Illinois. It aligns with the observed 42 percent increase in the top one percent of extreme precipitation (the 99th percentile) in the Midwest. All of Illinois' top 10 highest precipitation days occurred since 1950.

Markus explained that average annual rainfall has increased 11 percent over the past century. There is a high confidence that annual rainfall amounts will continue to grow at an increasing rate, with heavy precipitation events increasing in frequency and amounts. This expectation of continued increases in precipitation will require more frequent assessments of precipitation frequency using both observed and projected precipitation.

Wisconsin Rainfall Project

The Wisconsin Initiative on Climate Change Impacts (WICCI) is a statewide collaboration of scientists and stakeholders. The University of Wisconsin's Nelson Institute for Environmental Studies and Wisconsin DNR partnered to create WICCI, which has established working groups to conduct science-based assessments of climate change impacts on specific regions, ecosystems, communities, and industries in Wisconsin as well as to foster solutions and adaptation strategies. Dan Wright explained that, as an outgrowth of WICCI, the Wisconsin Rainfall Project was created to update extreme rainfall statistics, develop future rainfall statistics reflecting predicted climate conditions in Wisconsin, and provide that information in ways that would be usable among various practitioners.

Following the project's initial focus on outreach, Wright said the Wisconsin Rainfall Project developed up-to-date rainfall statistics using recent storms and alternative methods. The analysis utilized the RainyDay stochastic storm transposition (SST) software. Future plans include updating the analysis at regular intervals. It provides greater weight to more recent storms that are not captured in the existing Atlas-14 version available for Wisconsin.

Wright compared the RainyDay and NOAA Atlas-14 analyses for rainfall estimates for three-hour, 24-hour, and 96-hour (or 4-day) durations throughout Wisconsin. The two methods produce generally similar spatial gradients in rainfall depths for all durations. The RainyDay results showed substantially higher rainfall estimates throughout the state for a three-hour duration than Atlas-14. The results are more geographically mixed for the two longer durations; however, there is a strong regional consistency between 24-hour and 96-hour results.

With funding provided by NOAA, the University of Wisconsin's Nelson Institute for Climate Research and the University of Illinois' Prairie Research Institute are preparing to publish the results of their comparative analysis of the historical accuracy of point precipitation frequency estimates. The key finding is that today's 100-year storm is likely to be a 20-year storm by the late 21st century.

The Wisconsin Rainfall Project is also developing a web-based portal to access these extreme rainfall scenarios, allowing users to focus on specific geographic regions of Wisconsin or to utilize for a hazard model.

Wright acknowledged that the RainyDay model is an innovative tool that is still limited by historical data. It helps to augment to Atlas-14 by confirming and comparing projections. The RainyDay model also serves as a relatively inexpensive tool that was quick to develop and has more direct connections to flooding. Like Atlas-14, it is most relevant for small-scale infrastructure and flood-related planning. Problems and solutions remain for medium to large watersheds, which are more complicated. Wright

concluded that updating extreme rainfall information in a changing climate is essential for communities and infrastructure, and requires an inclusive, science-driven process.

In response to a question from Kirsten Wallace, Glaudemans explained that fundamental issues remain with estimating a storm covering 10 square miles to 20 square miles. Scientific advancements have focused on non-stationary capabilities and less so on the spatial distribution of extreme events.

Katrina Kessler asked how the Wisconsin and Illinois state regulatory agencies are using the Wisconsin Rainfall Project estimates and Illinois Bulletin 75. Wright said the Wisconsin Rainfall Project is in its early days and so its utilization remains to be seen. Markus explained that Illinois DNR's Office of Water Resources and the Illinois DOT's District 1 began requiring that Bulletin 75 be utilized for newly initiated projects. FEMA has agreed to accept Illinois Bulletin 75 rainfall data for projects and map revisions. Illinois counties and communities are expected to update ordinances to adopt the Bulletin 75 standards for building adequate structures based on a predefined magnitude and duration of storms.

UMRBA Water Quality Executive Committee

Strategic Planning

Chris Wieberg reported that UMRBA's Water Quality Executive Committee (WQEC) agreed to employ a strategic planning effort aimed at answering how UMRBA can more effectively serve as an interstate water quality program of the five basin states. This includes an evaluation of the WQEC members' roles and responsibilities and how the Committee can be more influential and better integrated with the UMRBA Water Quality Task Force (WQTF).

As a first step, the WQEC reviewed the history of UMRBA's water quality program since its inception. A summary of that history is provided in the agenda packet, which describes a deliberate trajectory of assessing water quality problems and designing an approach for interstate assessments. The WQEC convened its first strategic planning session virtually on July 22-23, 2020 and, generally, shared similar conclusions as the 2006 report – i.e., that there are critical unmet needs that can be best addressed by the UMR states working together. Constrained resources are limiting the states' ability to implement their Clean Water Act responsibilities and nutrient reduction strategies as well as the potential for UMRBA to fully function as the states' interstate water quality program. States can maximize their limited resources by pooling them, thereby avoiding unnecessary duplication of effort, adding value through consolidation or collaboration, and leveraging outside funding sources to advance water quality research and management efforts on the UMR. However, the strategic plan will also attempt to clarify their desired services for UMRBA that it can then use to secure the necessary resources.

Conversations during this first session made it clearly evident that the scope of the states' needs for an interstate water quality organization are primarily related to their CWA responsibilities and nutrient reduction strategies. The WQEC focused on the question of "what business should UMRBA be in and why" and the accomplishments the states hope to realize in three to five years as well as over a longer timeframe. This discussion led to the following vision and mission statements:

- Vision: Water quality conditions in the UMRS watershed, floodplain, and mainstem that provide the foundation for a healthy ecosystem and that exceed public expectations
- Mission: To achieve our collective vision for water quality, we advocate for investments in a shared resource, catalyze change in the mainstem and watershed, convene and coordinate dialogue around water quality issues, communicate the value of clean water,

and develop tools and products that enhance our collaborative efforts to protect and improve water quality

Wieberg explained that the WQEC voiced its strong preference for UMRBA to remain an association of states, with the states providing direction to UMRBA and working with each other through the interstate forum. Therefore, the ongoing planning assumption is that UMRBA's formal structure will be unchanged – i.e., the strategic planning effort will not result in a recommendation for UMRBA to become an interstate compact with governing powers. Consideration of any new structure would follow recommendations of goals and objectives.

The WQEC held two subsequent strategic planning sessions to develop a purpose statement for UMRBA's work and assign recommended roles and responsibilities for UMRBA, the individual states, and USEPA. The WQEC agreed that the states should be striving to manage the Upper Mississippi River as "one river" by working through UMRBA. And that UMRBA should be a venue for the states to come together and decide together how we are going to use the river and protect its resources, and to work together to align designated uses and standards. The WQEC has talked about a range of potential actions, including the following:

- Issuing 305(b) reports and/or point and nonpoint source loading reports
- Building a shared assessment by implementing the interstate water quality monitoring plan and developing a common set of designated uses
- Assisting the states in progress tracking
- Adding capacity to the states' nutrient runoff reduction efforts
- Providing communications and advocacy

The discussions also clearly pointed to the UMRBA-proposed WQ Improvement Act as the necessary next step. The resources and partnership with USEPA and NRCS are required to sufficiently implement the CWA and nutrient reduction strategy programs.

Wieberg thanked Wisconsin DNR for providing facilitation support through Dan Hesel. This has allowed UMRBA staff to effectively participate in the conversations.

Interstate Water Quality Monitoring: Reaches 8-9 Pilot

Wieberg reported that the Interstate Water Quality Monitoring Reaches 8-9 Pilot was suspended on April 2020 due to covid-related monitoring restrictions and restarted October 1, 2020. Partners were able to develop field and laboratory protocols to ensure safety during the health pandemic.

Wieberg reported that the drinking water use assessment had depended upon voluntary participation from public water suppliers. Participation was lost following the pandemic due to lack of resources. However, the planning committee agreed to combine the drinking water use assessment with fixed site monitoring. Also, the planning committee added PFAS sampling, which is currently on hold while USEPA Region 5 resolves an equipment contamination issue.

Wieberg reported that Illinois EPA was recently awarded additional Section 106 funds to recuperate the losses from the first three months of sampling (pre-pandemic). On behalf of the WQEC, he expressed appreciation to Gregg Good for his work in securing that additional funding.

Other

Wieberg reported that the WQEC also continues to coordinate through UMRBA on HABs, chloride, and emerging contaminants. UMRBA as well as WQEC and WQTF members participate on various regional and national forums. This includes the Hypoxia Task Force, with state agency and UMRBA staff actively involved in its working groups.

Minnesota Water Planning

2020 Water Action Plan

Katie Pratt is the Executive Director of the Minnesota Environmental Quality Board, which was established in 1973 to foster coordination of resources and planning among the heads of the nine state agencies as well as public members from around the state. The Environmental Quality Board focuses on environmental review, interagency projects and planning, and public engagement. Minnesota statute requires the Board to develop a 10-year plan for coordinating comprehensive long-range water resource plans. In accordance, the Board recently published the 2020 State Water Plan. The plan focuses on climate change and emphasizes the social aspects of climate and water, including equity, tribal nations, and quality of life.

Pratt explained the following five themes that surfaced from the planning effort's stakeholder engagement:

1. Minnesotans are concerned about the effects of climate change on water in their communities
2. Top concerns include flooding, infrastructure damage, and effects on local ecosystems
3. Practitioners feel somewhat informed to make decisions on preparing for climate change
4. [Practitioners recommend] it is important for the state to implement and guide action
5. The state should support collaboration, communication, education, and outreach

Minnesota's 2020 State Water Plan underscores that our climate shapes our water. Precipitation influences the quantity and quality of surface and ground water; temperature controls snow melt, ice cover, and growing seasons; and extreme variations are normal but can mask significant, ongoing climatic changes. The Plan acknowledges the scientific conclusions that Minnesota is warmer and wetter than historical averages. There is some variation spatially in annual precipitation departure experienced between 2000 and 2019 compared with historical averages. The southeast corner of Minnesota has experienced between 5 inches and 6 inches in increased precipitation over the past 20 years. Average temperature has increased in all portions of the state, including winter lows and summer highs. The winter low average has increased 5.7 degrees in the middle third of the state and 4.7 degrees in the southern third of the state, examining records from 1895 to 2019. Climate projections estimate shorter winters with about one month less of snow cover, and more "very hot" days, resulting in warmer lake conditions that may trigger a change in fish species.

Pratt provided an overview of the goals and strategies included in the Minnesota 2020 State Water Plan as follows:

1. Ensure drinking water is safe and sufficient

- Accelerate source water protection for community water systems
 - Emphasize source water protection in watershed management
 - Prevent nitrate contamination of drinking water and groundwater
2. Manage landscapes to protect and improve water quality
 - Increase soil health
 - Expand opportunities to participate in ecosystem services markets
 3. Manage built environment and infrastructure for greater resiliency
 - Improve data sources and modeling
 - Support communities with asset management and resilience planning for wastewater, stormwater, and drinking water infrastructure
 - Develop new and updated resiliency financing mechanisms
 - Design transportation infrastructure in floodplains for long term resiliency
 4. Manage landscapes to hold water and reduce runoff
 - Identify opportunities to retain and store water and manage drainage
 - Develop multipurpose drainage water management standards, guidelines, and incentives
 - Incorporate drainage water management into local water planning
 5. Promote resiliency in quality of life
 - Adapt and mitigate infrastructure planning, design, and development for recreational needs
 - Improve monitoring and public communication regarding water quality and safety of beaches
 - Manage fish and aquatic habitat for resilience
 - Conduct research and engagement to address impacts of changing water resources and ecosystems on mental health and well-being

In response to a question from Patrick Phenow, Pratt confirmed that the Water Action Plan does not include recommendations related to navigation infrastructure. While navigation considerations were raised during initial planning discussions, navigation infrastructure did not ultimately elevate to a focal area.

Nutrient Reduction Strategy

Katrina Kessler characterized Minnesota’s approach to nutrient management by acknowledging that large-scale state programs provide leadership for local watershed planning that result in rural and urban land use changes with then subsequently changes in water conditions. In August 2020, Minnesota published a five-year progress report on its nutrient reduction strategies. The report includes appendices detailing state-level nutrient reduction program advancements, external factors affecting nutrients in water, and river nutrient trends in Minnesota.

Kessler reported on increasing federal, state, local, and private resources being invested in best management practices, acknowledging that Minnesota’s Clean Water Fund has substantially boosted the state’s financial contributions. Improvements to wastewater treatment has resulted in

a 70 percent reduction in phosphorus discharge since 2000; while estimated statewide nitrogen loads from wastewater have generally remained steady, increasing slightly with population and precipitation.

A primary goal for Minnesota's watershed approach is to meet local and downstream needs. Kessler discussed the state's watershed load reduction targets needed to collectively achieve milestone/interim and final downstream goals. Kessler underscored the promise of new private-private collaborative watershed partnerships, as exemplified in the Cannon River and Cedar River watersheds as well as in central Minnesota.

Minnesota PCA recently finalized a new online best management practice tracking portal with information offered at multiple scales. The state uses multiple indices to track and assess progress, including censuses and surveys, satellite imagery, fertilizer sales, nutrient-use efficiency trends, and permitting. Overall, the adoption of agricultural best management practices are not keeping pace with scenarios outlined in Minnesota's nutrient reduction strategy.

Kessler reported that long term trend analyses show that phosphorus concentrations are decreasing over the past 10 years and 20 years while nitrogen concentrations are increasing or steady on the Mississippi and Minnesota Rivers. The only decreasing trend in nitrogen concentration was observed at Fort Snelling on the Minnesota River, near its confluence with the Mississippi River. Increasing precipitation in southern Minnesota over the past two decades has been offsetting the benefits of phosphorus-reducing activities. As a result, phosphorus load reductions are showing no significant trend in most southern Minnesota rivers unless adjusted for river flow variability. Similarly, nitrate loads have been increasing since the late 1990s, suggesting that reduction efforts are either insufficient and/or there has not yet been enough time to realize the full effects of those efforts.

Chris Erickson asked about the status of Minnesota's riparian buffer law regulatory program. Kessler said compliance is very high with participation regularly above 90 percent. People are taking it seriously. Naramore added that there are a few instances in which landowner concerns and reluctance to comply with the law are causing significant issues both in terms of enforcement of the buffer law and a legal challenge to its underlying public water determination. As a result, Minnesota DNR is investing significant resources to work with those few landowners on specific cases.

Jim Fischer applauded the increase utilization of cover crops and asked if there is any understanding of why the adoption is not more widespread. Kessler said Minnesota is exploring that question, but in part, Minnesota farmers are suggesting that the state's climate is not conducive to growing cover crops later in the fall.

Federal Interagency Subwater Cabinet

Ryan Fischer, ASA(CW) Deputy Director, reported that President Trump signed an executive order on October 12, 2020 formalizing the Federal Interagency Subwater Cabinet, as provided in Attachment E in the meeting agenda packet. The Subwater Cabinet includes the Secretaries of Interior, Agriculture, Commerce, and Energy; the Assistant Secretary of the Army for Civil Works; and the Administrator of the Environmental Protection Agency. The primary purposes are to improve and integrate water resources management and reduce inefficiencies and duplication. Fischer explained that senior officials recognized their similar and, oftentimes, competing mandates and began informally meeting early on in the Trump Administration. They had wanted time and space to talk and coordinate together outside of the standard Congressional hearings where they would often have their only chances of connecting.

Anna Wildeman, USEPA Principal Deputy Assistant Administrator for the Office of Water, said water quality is a major connection point among the Water Subcabinet members with specific roles for all participating agencies. Early on in the Trump Administration, USEPA sent a letter to NRCS Undersecretary Bill Northey seeking assistance in nutrient reduction in waterways by focusing on market-based opportunities. Wildeman noted that not enough investment has occurred to make substantial reductions in nonpoint contributions to nutrient loading, so water quality trading seemed like a productive partnership. That initial focus is included in the Executive Order with a specific direction to support the Mississippi River states' nutrient reduction strategies. Wildeman said she is encouraged by the formalization of the Water Subcabinet and expressed her hope that it will foster federal agencies to make real progress, and that integration among federal agencies will become the new normal.

Carrie Castille, USDA Farm Production and Conservation Mid-South Regional Coordinator, explained that NRCS works with private landholders and stakeholders to implement best management practices. NRCS has recently expanded by providing support for improving rural municipal drinking water programs. The water quality work has created direct connections between NRCS and USEPA.

Federal agencies will work together to determine possible collaboration, particularly when available resources are limiting work towards mutual goals. Technology is an important area for collaboration. It is important that datasets are comprehensive, compatible with one another, and provide utility to stakeholders. We are better when we work together and view our individual roles and responsibilities in a more synergistic approach, all working towards a common vision and purpose. Castille extended appreciation to the UMRBA Board for recognizing the value of the Water Subcabinet.

In addition to working across federal agencies, Jim Fischer said the Water Subcabinet is also interested in creating better relationships with, and connections among stakeholders and interstate organizations. Referencing an earlier dialogue with UMRBA, Fischer said FEMA could play an important role in the Water Subcabinet and encouraged partners to reach out to FEMA leadership to recommend its involvement in the group.

Dru Buntin said prescriptive, rigid policies for spending federal program dollars sometimes preclude important water resources projects, citing an example of a community on the Missouri River wanting to do a levee setback and improve flood resilience. Buntin underscored the value of flexible policies that allow for smart investment. Buntin called for NRCS and USEPA to work with the states in planning and coordinating nutrient reduction strategies and targeting resources to help the states meet water quality goals. Wildeman said the Hypoxia Task Force serves as an important federal-state coordinating body for advancing the states' nutrient reduction strategies. As an example, she noted that USEPA, NRCS, and the Corps all have different values and mitigation approaches for wetlands. Siloed federal agencies can create a complicated interagency puzzle for stakeholders. The Water Subcabinet provides a convening body for addressing these issues and finding solutions.

Wildeman encouraged UMRBA to submit feedback on the Water Subcabinet including ideas for its five-year action plan. Building from the wetland example, a deliverable might be an MOU on evaluating wetland functions. Wildeman pointed to Great Lakes provisions within the Executive Order as potential opportunities for UMRBA.

Buntin emphasized the need for federal investment to help address priorities issues of the states, UMRBA, Hypoxia Task Force, and federal agencies. Wildeman said the EO includes a priority to help the states implement their respective nutrient reduction strategies, but said the agencies will require

Congressional appropriations to implement the actions. The EO will serve as a guide for the federal agencies' budget development going forward, but Wildeman reiterated that the agencies have to react to appropriated dollars.

Katrina Kessler asked if the Water Subcabinet is considering coordinating on climate forecasting capabilities – i.e., an Atlas-14 for the entire country. Fischer said the Water Subcabinet is evaluating this action, and acknowledged the lack of communication across federal agencies when one agency is leading a model development. Fischer said modeling should be a shared effort among federal agencies to avoid duplication and make them more powerful. Wildeman agreed with Fischer's response and added that it is important to integrate priorities – e.g., adding water quality layers to a hydraulic model.

Noting UMRBA's recent flood, drought, and sediment planning, Kirsten Wallace suggested that all Water Subcabinet members would be involved in efforts to slow the water and sediment moving through the watershed. Wallace recommended that the Subcabinet consider ways in which the states can work with the federal agencies to leverage expertise, planning, and resources. Wallace said the Water Subcabinet meetings have been incredibly helpful convenings. They allowed for robust conversations of issues in a multi-purpose context. Wallace offered that UMRBA formulate questions and solutions for integrated water planning and ideas for roles and responsibilities among the states and federal agencies. Fischer and Wildeman expressed support for that idea and said they would appreciate the input.

UMR Ecosystem Status and Trends

The purpose of the Upper Mississippi River Restoration program's long term resource monitoring is to comprehensively assess the status and trends of the river's ecological characteristics – i.e., the factors affecting river habitat along the corridor within the floodplain. Jeff Houser credited the program's many partners and accomplishments since its authorization in 1986. The culmination of the long term data (from 1993 to 2019) will be described in a forthcoming third Status and Trends Report. Given the datasets longevity, this report will provide statistical insights into the river's ecological condition and how factors in the river (i.e., sedimentation, invasive species) and in the watershed (e.g., nutrient loading from tributaries) are affecting its condition.

Houser said the purpose of the Status and Trends Report is a) to provide a broadly accessible and concise description of our working knowledge of the river ecosystem, including the most important changes observed, and b) to illustrate the fundamental role of long term monitoring in the science and management of large floodplain river systems. The report will discuss management and restoration implications of the known ecological trends over time and, where possible, the implications for future changes in the river.

Houser acknowledged the lack of consensus among river practitioners for a "desired future condition" of the river ecosystem or a reasonable "reference system" or consensus "reference condition." Therefore, the Status and Trends Report assesses the status of ecological indicators by utilizing externally developed criteria (e.g., water quality standards) and internal spatial and temporal comparisons for everything else – e.g., reaches with the greatest or least prevalence of aquatic vegetation. A variety of statistical methods are used to assess linear trends, non-linear trends, and other changes as appropriate.

Houser summarized the Status and Trends Report findings as follows:

- Hydrology
 - All hydrologic indicators had significantly increasing trends over time – e.g., discharge
 - High flow conditions are occurring over longer durations
 - Seasonally, peak flows are shifting from April to May or June
- Geomorphic
 - About 718.5 hectares have been gained in landform surface area; similar gains occurred from 1989 to 2000 and from 2000 to 2010
 - Increase in bed elevation overall at the pool-scale from 1997 to 2017, with both sedimentation and erosion detected and varied within and among transects
- Land cover/land use
 - Leveed areas are relatively stable across the system; there is a persistently strong gradient in area behind levees across the system
 - Forest area continues to decline in all reaches except for the unimpounded reach (south of St. Louis), where some areas along the river channel showed increases
- Water Quality
 - Generally, total phosphorus has declined while total nitrogen remained steady; with nutrient levels exceeding Clean Water Act criteria
 - Suspended solids declined in most study reaches
 - Algae (chlorophyll a) has remained stable with declines in some areas in Pools 4 and 8 and the La Grange reach
 - Backwater hypoxia has occurred more frequently in summer than winter; there has been a small long-term increase in Pool 4
- Aquatic vegetation
 - The prevalence of submersed aquatic vegetation has increased in Pools 4, 8, and 13 and remains scarce in other reaches of the river
 - The prevalence has occurred at more than 80 percent in Pools 4 and 8 over the last decade, and has possibly declined recently in Pool 13
 - Emergent vegetation has increased in Pools 4 and 8 but not in Pool 13
- Fisheries
 - Non-native bigheaded carp now equal the mass of the native fish community in Pool 26 and La Grange; while, total fish community productivity has increased in Pool 26 and decreased in La Grange
 - Forage fishes are less abundant in Pools 4, 8, and 13 and more abundant in Pool 26, La Grange, and the open river reach; however, significant declines occurred in those southern areas
 - Lentic fishes have increased in Pools 4, 8, and the open river reach and have decreased in La Grange.

The change in hydrologic conditions has significant implications for the river ecosystem, including related to sediment dynamics, hydraulic connectivity, backwater hypoxia, aquatic habitat, nutrient

transport and cycling, and floodplain forest mortality. The geomorphic changes are important because they can result in further hydrologic connectivity changes, modify flows within backwaters, reduce backwater lake volumes, reduce water surface area (terrestrial encroachment), and reduce potential sediment storage in the floodplain. From an ecological standpoint, new landforms can create sandy habitat areas for shorebirds, waterbirds, and early-successional tree species (e.g., willows and cottonwoods). Subsurface sedimentation and erosion processes change the amount and location of aquatic habitats.

Houser explained that higher water levels led to increased contiguous forest lake areas in the upper impounded reach and increased side channel areas in the unimpounded reach. Even with all of these changes, Houser noted that the basic structure of aquatic areas has not changed much since 1989.

Houser explained that long term data from Pools 4, 8, and 13 have provided important insights regarding the interactions among hydrology, water quality, vegetation, and fish. Those areas experienced ecological shifts during a period of low discharge from 2006 through 2009. It allowed suspended sediment to settle and consolidate leading to increased water clarity, stimulating vegetation to establish and grow and providing needed habitat for native fish species. The rebounding of native fish species also correlated with a decline in common carp.

Houser reviewed UMRR's important role in providing unique insights into the bigheaded carp invasion. These insights have included the carp's influence on native filter feeding species, sport fisheries, native fish communities. UMRR partners have provided expertise to federal-state coordinating bodies, research on potential control methods, and understandings of the carp's effects on local limnology, trophic levels, and shifting ecological conditions. Long term data has provided scientific evidence of non-random trajectories in functional fish community attributes.

Administrative Issues

Future Meeting Schedule

February 2021 — Remote

- UMRBA quarterly meeting — February 23
- UMRR Coordinating Committee quarterly meeting — February 24

May 2021 — Location TBD

- UMRBA quarterly meeting — May 25
- UMRR Coordinating Committee quarterly meeting — May 26

August 2021 — Location TBD

- UMRBA quarterly meeting — August 10
- UMRR Coordinating Committee quarterly meeting — August 11

With no further business, the meeting adjourned at 2:20 p.m.