

**Upper Mississippi River Basin Association
Water Quality Executive Committee
and Water Quality Task Force
Joint Meeting**

June 7-8, 2017

Meeting Summary

Participants

Gregg Good	Illinois EPA
Amy Walkenbach	Illinois EPA
Dan Kendall	Iowa DNR
Adam Schnieders	Iowa DNR
Matt Lechtenberg	Iowa DALs
Joel Chirhart*	Minnesota PCA
Rebecca Flood	Minnesota PCA
Dana Vanderbosch	Minnesota PCA
Dave Wall*	Minnesota PCA
Kurt Boeckmann	Missouri DNR
Mohsen Dkhili	Missouri DNR
Steve Galarneau	Wisconsin DNR
Shawn Giblin	Wisconsin DNR
Gina LaLiberte*	Wisconsin DNR
Brian Weigel	Wisconsin DNR
Marcia Willhite	Wisconsin DNR
Dawn Perkins	Wisconsin SLH
Karen Hagerty	USACE, Rock Island District
Leo Keller	USACE, Rock Island District
Marty Adkins*	USDA NRCS
Meghan Hemken*	USEPA, Region 5
Kelly Warner	USGS, Illinois-Iowa Water Science Center
KathiJo Jankowski*	USGS, UMESC
Nate Young	University of Iowa, IIHR
Dick Warner	NGRREC
Susan Heathcote	Iowa Environmental Council
Dave Hokanson	UMRBA

**Participated by phone*

Call to Order and Introductions

The meeting was called to order at 1:02 p.m. by Brian Weigel. Introductions of all participants followed.

Approval of Previous Meeting Summary

Two grammatical corrections were identified on page A-3 of the February 21-22, 2017 Water Quality Task Force (WQTF) meeting summary. These including replacing the word “cost” to “costs” and “and” to “in” as part of the section describing Jennifer Terry’s presentation to the WQTF. The summary was approved as drafted with the understanding that these corrections would be incorporated.

Interstate 305(b) and 303(d) Consultation

Minnesota

Dana Vanderbosch noted that the Lake Pepin TMDL should be on public notice by the end of the calendar year. Otherwise, she said the listing of impairments provided in the packet is accurate.

Wisconsin

Weigel said Wisconsin's 2016 listing should be approved by USEPA soon. He noted that work on the 2018 listings are underway and will incorporate data from the recently completed UMR CWA monitoring pilot project. Vanderbosch said Minnesota is still considering whether and how to use pilot project data in its 2018 listings, as some questions remain, particularly for biological monitoring, in regard to sample size and methods, as compared to those used elsewhere in the state.

Iowa

Adam Schnieders reported that Iowa's 2016 proposed list incorporates a number of de-listings throughout the state. Schnieders added that Iowa's 2018 list is under development. However, he said changes for the UMR are not anticipated in either the 2016 or 2018 list.

Illinois

Gregg Good reported that progress on Illinois' 2018 list is slower than in recent cycles partly due to staff departure. Good said Illinois received a large amount of data in response to the routine solicitation for this cycle, particularly for the northeast Illinois area.

Good said Illinois' 2016 list is still awaiting USEPA approval. The table presented in the meeting packet is accurate.

Missouri

Mohsen Dkhili reported that Missouri is preparing its 2018 listings for public review, with the goal of submitting the list to USEPA by April 2018.

TMDLs on the Mainstem UMR and Major Tributaries

Minnesota

Vanderbosch said Minnesota has no further updates in regard to TMDLs beyond the comment on the Lake Pepin TMDL offered previously.

Wisconsin

Weigel said Wisconsin continues to prioritize work on the Wisconsin River TMDL for reducing nutrient loading. Shawn Giblin noted that this TMDL's implementation will also help address phosphorus impairments on the UMR (its tributary confluence is in Pool 10). Weigel reported that Wisconsin also continues TMDL work on the Fox River.

In response to a question from Schnieders, Weigel said Wisconsin is not yet addressing a specific phosphorus TMDL for the segments of the mainstem UMR it has identified as being impaired by it.

Iowa

Kendall said Iowa does not currently have any TMDLs in place or in development for the UMR mainstem.

Illinois

Amy Walkenbach reported that Illinois is developing an atrazine TMDL for the mainstem UMR. In response to a question from Schnieders regarding the TMDL's geographic extent, Walkenbach said the TMDL only affects that HUC-10 watershed in Illinois affiliated with the impaired segment (which is contained within UMR Assessment Reach 8). In response to a question from Dkhili, Walkenbach confirmed that the area has high corn productivity. Schnieders asked how effective the TMDL is anticipated to be if it does not reach beyond the HUC-10. Walkenbach said the impairment affects public water supply use and thus is a priority impairment for Illinois. It is also associated with a feasible, effective solution.

Additionally, Walkenbach said Illinois has in place a TMDL for the middle Illinois River to address a number of pollutants and is partnering with Wisconsin to address the Fox River TMDL.

Missouri

Dkhili said Missouri has a number of TMDLs in place in the St. Louis area, both on the mainstem UMR and on tributaries, in response to impairment of the recreation use due to the presence of *E. coli*.

Roundtable: State Nutrient Loss Reduction Strategies Update

Illinois

Amy Walkenbach described Illinois' interagency committee structure to support the development and implementation of its strategy with work groups focused on point sources, urban/storm water, and the agricultural sector. Illinois is following Iowa's approach of using a logic model application. Walkenbach described activities of the various work group areas as follows:

Urban/Storm Water is a limited contributor to nutrient loss overall; however, efforts are ongoing to bring stakeholders to the table to focus on education. Tracking progress is challenging for a number of reasons, but the nine-year monitoring base is indicating an increase in the implementation of storm water management practices such as grade stabilization and rain gardens. There is enough information becoming available that Illinois will likely compile a progress report sometime soon.

Point Sources is primarily based within Illinois EPA via permitting and regulatory processes. All major dischargers are limited to 1 mg/l for total phosphorus. Additionally, a watershed planning component incorporates both point and nonpoint source efforts with each watershed group adapting its approach to local conditions. Overall, there has been significant progress in this sector over the last two years.

Agricultural Sector is the area of greatest effort in the implementation of Illinois' strategy, with collaboration among commodity groups, NRCS, state agencies, and many others. Overall, the agricultural sector is very motivated to demonstrate all the work accomplished to address nutrient loss. In regard to tracking these efforts, there is a challenge in compiling all of the data available via various sources. So far, the most accessible figure is the amount of expenditure made via government programs to support practice adoption, but this does not capture all of the ongoing activities.

Monitoring Council, in collaboration with USGS, has deployed eight supergages measuring nutrient concentrations statewide. Additional capacities are being added in the Chicago area to help parse out point and nonpoint contributions to nutrient loading.

Nutrient Advisory Committee's recommendations regarding water quality standards for nutrients are likely forthcoming in March 2018, with potentially three different criteria for region and waterbody size.

In response to a question from Rebecca Flood, Walkenbach said Illinois' efforts to develop a nitrogen standard focuses primarily on eutrophication and less so on toxic effects. In response to a question from

Weigel, Walkenbach said Illinois is not yet re-working its ammonia criteria, noting that there are some implementation issues to be worked out – e.g., USEPA guidance. Schnieders and Willhite concurred that many states are in the same position in regard to ammonia criteria.

In response to a question from Dkhili, Warner said six supergages are installed on the mainstem Mississippi River with four located on the UMR. USGS is planning to install an additional supergage in the St. Louis area in the summer of 2017.

Schnieders asked whether there is a specific lead person or staff position(s) dedicated to the implementation of the strategy in Illinois. Walkenbach answered that while many individuals are working on the strategy, there are not individuals specifically assigned only to strategy work. Rather, this is spread out among a variety of individuals as part of their overall job duties.

Schnieders asked how the Illinois strategy's watershed planning component is connected to NPDES permits. Walkenbach explained that the connection is between the point sources and permits and not through a TMDL mechanism. Schnieders asked if there is a forcing mechanism to invest in desired land use practices. Walkenbach said the permits are used to compel action. Many municipalities that hold NPDES permits are already engaged in developing watershed plans and are well aware of the potential partners and reduction opportunities available. Walkenbach added that this approach helps facilitate coordination and consolidate monitoring within and among watersheds. Weigel asked whether there is a formal program name for Illinois' watershed planning activities. Walkenbach said there is not a program *per se*, but rather just a policy approach. Willhite commented that Illinois' approach is a bit unique as it opportunistically took advantage of the permit renewal cycle and ongoing watershed planning activities.

Iowa

Schnieders illustrated Iowa's nutrient reduction strategy by distributing a detailed organization chart of the strategy's main components including point source actions, nonpoint source actions, monitoring and measurement, and educational activities.

Regarding point sources, Schnieders said strategy's primary focus is developing feasibility studies for approximately 100 municipalities and 50 industrial dischargers to implement discharge reductions. As an example, Des Moines is considering installing a nutrient recovery facility similar to Chicago's Stickney wastewater treatment plant. In response to a question from Weigel about nutrient discharge reduction, Schnieders explained that Iowa uses USEPA's guidance for determining utility fees as a percentage of average income (i.e., a limit of two percent of income). Schnieders emphasized Iowa's commitment to monitoring, noting that it is home to one-third of all real-time monitoring installations in the nation.

Matt Lechtenberg provided an overview of Iowa's nonpoint source reduction activities, particularly through the state's Water Quality Initiative. The Initiative was formed following the release of Iowa's Nutrient Reduction Strategy in 2013 and it used as the state's match to other funding sources – e.g., NRCS' Regional Conservation Partnership Program (RCPP). Lechtenberg said strategy activities build on Iowa's historic soil conservation efforts. He reported that Iowa has hired a measurement coordinator to help track the implementation of conservation practices on the landscape.

Lechtenberg noted that the Conservation Reserve Program (CRP) enrollment cap is hitting the limit in Iowa, preventing interested landowners from participating. This challenge is not unique to Iowa. The five UMR states have about five million acres enrolled in CRP and are not able to enroll additional lands. Also the availability of technical assistance from USDA NRCS is declining.

Minnesota

Dave Wall said Minnesota's Nutrient Reduction Strategy is seeking a 45 percent reduction in both nitrogen and phosphorus loss in the Mississippi River Watershed. Minnesota's goal is to reduce 40,000 tons of nitrogen leaving Minnesota via the Mississippi Watershed with an interim goal of a 20,000-ton reduction by 2025. Most of the reduction will likely be achieved via improved management of nitrogen in cropland. This will require that new, desired practices are adopted on millions of acres in each of the state's key BMP categories – i.e., living cover, treatment of tile discharge, and improvements in nitrogen fertilizer and manure use/efficiency.

Minnesota's phosphorus goal is to achieve a 45 percent reduction by 2025. Wall explained that phosphorus sources are more distributed geographically than for nitrogen. Urban areas have made a lot of progress in the past decade and have further to go. Moreover, nonpoint sources and urban storm water will be the focus of continued reduction. Wall added that, while the strategy provides for achieving downstream reductions by 2025, Minnesota understands that additional reductions for numerous in-state lake and river goals will require additional implementation efforts.

In response to a question from Warner about how Minnesota developed its reduction goals, Wall explained that Minnesota consulted with modeling experts to determine the best reduction targets and the timeline for realizing achievements.

Wall said Minnesota's biggest challenge in implementing the strategy is bridging the gap between the amount of acres where nutrient loss reduction practices are already adopted and the overall need for practice adoption. He displayed a graph illustrating that, in order to meet strategy goals, practice adoption will need to more than double for the key categories of soil conservation, living cover, tile discharge treatment, and improved efficiency in fertilizer and manure use.

Weigel offered that management plans may be very helpful in expanding the adoption of nutrient loss reduction practices. Wall concurred, saying that the Minnesota has focused initially on developing such plans in areas of observed nitrate contamination in groundwater. Minnesota is also developing a statewide Nitrogen Fertilizer Rule, recognizing that some tools will be local in nature. Rebecca Flood said the rule is being proposed by the Minnesota Department of Agriculture and will soon be made available for public comment. Wall and Flood explained that if reductions are not ultimately achieved through voluntary mechanisms, the use of regulation to achieve reductions will likely come into play. For now, Flood said she would work with Hokanson to distribute the draft Nitrogen Fertilizer Rule information to the WQEC and WQTF. Currently, the rule only addresses nitrogen as related to fertilizer and does not address manure.

Missouri

Kurt Boeckmann provided an update on Missouri's Nutrient Loss Reduction Strategy. Boeckmann said the strategy was developed via a process involving substantial stakeholder input. The strategy does not include statewide reduction targets but rather focuses on more local, watershed-based reductions. Boeckmann noted that Missouri's 1/10th of 1 percent sales tax dedicated for soil and water conservation supports best management practice implementation. The sales tax generates approximately \$45 million annually, with 70 percent of funds allocated to on-the-ground implementation.

Boeckmann said Missouri's nutrient reduction strategy implementation strongly emphasizes cover crops. Currently, 9 percent of Missouri's row crop agriculture integrates the use of cover crops. Cover crops involves independent voluntary adoption that is supported by a variety of governmental programs. Missouri cost-share alone is responsible for the adoption of 140,000 acres of cover crops last year.

Boeckmann explained that Missouri is also in the third year of an RCPP project focused on practice implementation in targeted watersheds. The project includes \$6 million in NRCS funding that is

matched by over \$16 million from other sources. Boeckmann acknowledged that the RCPP project is central to the success of Missouri's strategy.

In order to help evaluate outcomes, Boeckmann said Missouri is conducting some paired studies on conservation practices and is collecting data on implementation outcomes under a Mississippi River Basin Healthy Watershed Initiative (MRBI) project. He said Missouri would also like to conduct more demonstration projects and incorporate additional edge-of-field monitoring. Boeckmann discussed the variety of projects Missouri has been supporting, including fencing to preclude cattle accessing streams and the establishment of riparian buffers. The utility of bioreactors and saturated buffers is also being investigated. Lastly, Boeckmann noted that Missouri has established a framework to support nutrient trading as a means to support reduction efforts.

Warner asked whether there are needs for nutrient loss reduction in the "bootheel" area of the state. Boeckmann said introducing best management practices there is challenging because of the types of crops produced. But there are opportunities for nutrient loss reduction, with bioreactors potentially providing a useful tool in this context.

Weigel asked Boeckmann to comment on how Missouri prioritizes expenditures of its soil and water conservation tax funds. Boeckmann explained that each county sets its own priorities and the state oversees the allocation of funds, prioritizing projects with the greatest likelihood of fullest execution possible – i.e., funds are allocated to projects where the likelihood of achieving results is greatest.

Steve Galarneau asked about the sustainability of maintaining cover crops as a farming management tool. Boeckmann said a key to success will be gaining a better understanding of the effectiveness of cover crops – in certain geographic areas, on certain soil types, etc.. Learning will only occur if cover crops are implemented on a broad scale. Galarneau noted that Wisconsin has benefitted from demonstration farms. Schnieders said Iowa has observed success when the cover crop can provide an added value such as for grazing or dual cropping.

In response to a question from Schnieders, Boeckmann explained that funds from the state's sales tax was used to provide financial support to install fencing for the purpose of preventing cattle from reaching streambank. Specifically, Missouri paid \$500 per acre of land excluded plus a 75 percent cost-share for the fencing.

Wisconsin

Marcia Willhite said she is currently developing a progress report describing Wisconsin's nutrient reduction strategy implementation. She acknowledged that Wisconsin is making substantial progress both programmatically and in making on-the-ground activities. Wisconsin's approach is based on the goals and structure articulated by the Gulf Hypoxia Task Force and 14 points outlined by USEPA. It also prioritizes local water quality improvements.

In regard to point source reductions, Willhite said Wisconsin is pursuing the integration of water quality-based effluent limits into discharge permits. She said a "multi discharge variance" process was also recently approved to assist facilities where investments in landscape-based nutrient reduction practices (as an alternative approach) are not economically viable.

Willhite explained that Wisconsin's strategy relies on the implementation of existing programs to achieve nonpoint source reductions. She said Wisconsin DNR and DATCP have been collaborating to encourage the adoption of nutrient management plans. About 30 percent of Wisconsin farm acres have a management plan. Willhite added that Discovery Farms are an important mechanism for sharing information and innovative practices with producers.

Willhite said farmer-led watershed groups have also been key to the implementation of Wisconsin's strategy, noting that the first group of this type was formed in the Red Cedar River watershed and the model has now been adopted in a number of watersheds statewide. She explained that support for these groups comes via a cost share from DATCP as well as assistance with modeling, and that DATCP is currently supporting a total of 17 groups.

Willhite noted that a primary challenge in implementing the nonpoint strategies is effectively quantifying progress. Wisconsin has initiated the development of a database for tracking state-funded conservation practices. Willhite explained that Wisconsin will provide a watershed-by-watershed narrative in the progress report. Ultimately, monitoring will measure both practice implementation as well as the resulting nutrient loss reductions.

Kelly Warner asked if Wisconsin has implemented any form of nutrient trading as part of its strategy. Willhite explained that such an approach occurs only within an individual permit. A permitted discharger can implement landscape activities within a localized area to achieve nutrient reductions.

Iowa Watershed Approach

Nate Young of the University of Iowa-IIHR gave an update on the Iowa Watershed Approach (IWA), an interdisciplinary partnership effort which addresses both flood risk reduction and water quality along with other issues in watersheds across the state of Iowa. Specifically, IWA goals are as follows:

- Reduce flood risk
- Improve water quality
- Increase resilience
- Engage stakeholders through collaboration and outreach/education
- Improve quality of life and health, especially for vulnerable populations
- Develop a program that is replicable throughout the Midwest and the United States

Young explained that the IWA is currently being implemented in nine watersheds. Each has an associated Watershed Management Authority (WMA) to aid the implementation of the IWA. The following activities will be pursued in each watershed:

- Developing a hydrologic assessment and watershed plan
- Deploying monitoring equipment
- Working with project coordinators and volunteer landowners to implement projects that reduce the magnitude of downstream flooding and improve water quality
- Assessing project benefits based on monitoring data and modeling

In regard to IWA practice implementation, Young noted the following:

- Practices may include floodplain restoration or easements, farm ponds, terraces, buffer strips, bioreactors, wetlands, saturated buffers, storm water detention basins, and sediment detention basins
- 75 percent cost share assistance available to landowners
- Practices will follow NRCS guidelines and specifications
- The impact of constructed projects will be monitored and feasibility at a larger scale will be evaluated

Young explained Iowa's efforts to map the implementation of best management practices (BMPs) adopted in the state using LiDAR. Purposes of BMP mapping are to establish a baseline against which to compare future progress, estimate nutrient load reductions, estimate conservation investment by farmers, and evaluate the saturation level of BMPs in watersheds. Young detailed approaches to various practices including grassed waterways and nutrient removal wetlands as well as the efficacy of these techniques in nutrient removal.

In response to a question from Walkenbach, Young said WMAs do not actually carry legal or regulatory authorities and function more so as watershed management organizations. Susan Heathcote observed that one key attribute of a WMA is that it is an entity that can receive and distribute funds to support water quality improvement activities.

In response to a question from Warner, Young explained that potential interactions between surface and ground water are being researched but results are not yet available. In response to a question from Schnieders, Young explained that ponds may be recognized as a phosphorus removal practice but not yet for nitrogen removal.

Minnesota Water Quality Initiatives

Rebecca Flood and Dana Vanderbosch described on a number of Minnesota's statewide initiatives related to implementation of its nutrient reduction strategy and overall water quality improvements.

Buffer Initiative

Vanderbosch provided an overview of the buffer initiative started by Minnesota Governor Mark Dayton. Minnesota has longstanding legislation regarding buffers that has historically been implemented at the local level. However, Governor Dayton determined that implementation was inconsistent and incomplete and therefore saw the need for a statewide initiative. Vanderbosch said the new buffer law associated with the initiative was originally enacted in 2015. It was amended in 2016 to ensure that the law only applies to public waters and public ditches. The Minnesota Board of Water and Soil Resources (BWSR) oversees compliance of the law with two upcoming deadlines:

- Nov 1, 2017 – buffers to be installed on public waters (or July 1, 2018 with parcel compliance plan in place). These buffers must have an average width of 50 feet and a minimum width of 30 feet.
- Nov 1, 2018 – buffers to be installed on public ditches. These buffers must have a 16.5-foot minimum width.

Vanderbosch noted that statewide waterway mapping is a critical component of the law. The maps define where buffers must be established. The mapping tool is available online at <http://www.dnr.state.mn.us/buffers/index.html>.

Weigel asked how the term "installation" is viewed under Minnesota's buffer law. Flood said the buffer must follow NRCS standards and be planted with perennially-rooted vegetation. Other uses of the buffer are not excluded as long as it is properly planted and maintained.

25 by 25 Initiative

Vanderbosch described Governor Dayton's recently-launched "25 by 25" initiative, which has a goal of improving water quality in the state 25 percent by the year 2025. She explained that the Governor views this initiative as a grassroots, bottom-up approach where ideas are brought forward by a wide variety of stakeholders. She said ideas will be gathered via a series of town hall meetings in the summer and fall 2017, which the intention for more specific policy discussions in 2018. Vanderbosch said Governor Dayton encourages flexibility and innovative approaches as part of this effort.

Minnesota Agricultural Water Quality Certification Program

Flood provided an overview of Minnesota's Agricultural Water Quality Certification Program. Through the program, certified farms that have implemented BMPs are deemed to be in compliance with any new state water quality rules or laws and are considered to be meeting their contributions to any targeted reductions of pollutants during the period of their certification. She explained that certification is established via a 10-year contract mechanism.

Flood provided these highlights of the status of the program as of April 2017:

- 376 certified farms enrolled
- 221,217 certified acres implementing BMPs
- 646 new BMPs in place that have yielded:
 - 19.9 million pounds of soil saved per year,
 - 14.1 million pounds sediment reduced per year,
 - 8,534 pounds of phosphorus prevented from entering our waters per year, and
 - reduced nitrogen loss
- Additionally, 330 new applications are currently being processed

Walkenbach asked if there is any intersection between the certification program and the buffer initiative. Flood replied that, theoretically, a farm could obtain a score qualifying for certification without buffers in place, but in practical terms farms will need to have buffers in order to reach the certification score. Heathcote asked if there is a renewal cycle associated with the program. Flood responded that renewal is possible following the initial ten year period. Shawn Giblin asked if certification is somehow reflected in the marketing for the farm or its products. Flood said this is possible and permissible, but it is up to the farmer to do so. Weigel asked whether any connection is made between farms being certified and TMDL reduction goals being met in the watershed where the farm is located. Flood said there is no explicit connection made between certification and TMDL goals.

Boeckmann asked whether any other states are taking similar approaches. Schnieders said Michigan has taken some similar steps and Louisiana has a program specific to its rice producers.

NRCS Updates and Perspectives

Mary Adkins provided an overview of USDA NRCS' programs focused on water quality, noting the NRCS provides both technical assistance for planning and implementing conservation systems, as well as financial assistance for work lands and land retirement. Additionally, he noted that NRCS provides soils information and maintains the National Resources Inventory.

Adkins then described a number of NRCS' financial assistance programs in detail, including the Environmental Quality Incentives Program (EQIP), the Conservation Stewardship Program (CSP), the Agricultural Conservation Easements Program (ACEP), the Regional Conservation Partnership Program (RCPP), and the Conservation Reserve Program (CRP). Program highlights are as follows:

EQIP

- Technical and financial assistance to implement conservation practices
- Agricultural land and private non-commercial forestland

CSP

- Rewards current conservation practices
- Provides incentives to further enhance conservation

ACEP

- Wetlands Reserve Easements
 - USDA purchases easements for wetland restoration
 - Wetland restoration planning, design and implementation
- Agricultural Land Easements
 - USDA provides cost share to qualified entities (local governments, land trusts) for easement purchases
 - Easements keep land in agricultural use

RCPP

- Targets critical conservation areas and issues
- Partner engagement
- Leverages non-USDA resources
- Provides for innovation

CRP

- 23.8 million acres enrolled as of March 31, 2106

Adkins presented the following a table summarizing acres engaged in USDA NRCS programs within the UMR states:

Conservation plans written (Acres)	3,425,049
Cropland with conservation applied to improve soil quality (Acres)	2,290,285
Cropland with conservation applied to improve soil health and sustainability (Acres)	418,482
Land with conservation applied to improve water quality (Acres)	2,696,051
Grazing land with conservation applied to protect and improve the resource base (Acres)	234,582
Non-Federal land with conservation applied to improve fish and wildlife habitat quality Acres)	330,670
Wetlands created, restored or enhanced (Acres)	22,085
Conservation Applied to improve Environmental Quality (Acres)	2,884,492

Adkins said NRCS continues to emphasize soil health. Knowledge of the importance of healthy soils continues to evolve substantially including the biological and ecological benefits. He said there are synergistic benefits in that improved soil health also leads to improved water quality.

In response to a question from Karen Hagerty, Adkins said the President’s FY 18 budget reduces NRCS’s appropriation by 20 percent. However, he noted that FY 17 funding ended up being fairly consistent with FY 16 funding. Adkins acknowledged that the uncertain budgeting environment is challenging.

The meeting adjourned for the day at 5:15 p.m. and resumed at 8 a.m. on June 8th.

USGS Updates

Kelly Warner described USGS' work to develop a "roadmap" to articulate a new framework for USGS science in the Mississippi River Basin coordinated across its science centers, regions, and mission areas. The roadmap recognizes the need for USGS to better connect with stakeholders and communicate about science being developed and available via USGS. In particular, USGS signed a memorandum of common purpose with the Mississippi River Cities and Towns Initiative (MRCTI) to jointly realize tangible improvements in water quality, sustainable development, river economy, and environmental protection for the Mississippi River. In meeting partner needs, the goals of the roadmap include: 1) maintaining support for existing key programs, 2) enhancing programs to fill science knowledge and data gaps, 3) leveraging efforts to avoid duplication, and 3) achieving the highest return on investment in science.

Warner said USGS held initial listening sessions regarding the roadmap, including with UMRBA's Board, and is very open to receiving further input as the process of roadmap development continues. Hagerty suggested that the Mississippi River Research Consortium (MRRC) and Upper Mississippi River Conservation Committee (UMRCC) are other groups which could provide valuable input to roadmap development.

Warner discussed USGS's continued development of a continuous monitoring network throughout the Mississippi River Basin. She displayed maps illustrating where continuous monitors are currently deployed along the mainstem UMR and in the UMR Basin as well as locations for planned expansion of the continuous monitors. These monitors could support implementation of the states' nutrient reduction loss strategies.

In response to a question from Vanderbosch, Warner said the continuous monitors are powered by solar panels. Warner said vandalism of the monitoring equipment is a concern. But the continuous monitors are co-located with gaging stations so there a frequently a staff person on site to check the condition of the monitoring equipment.

Warner introduced USGS' new online mapping tool, "Water Quality Changes in the Nation's Streams and Rivers." This interactive map provides a comprehensive, long-term assessment of changes in the nation's rivers and streams health over the last four decades. It includes monitoring data collected by the USGS and 73 other organizations at almost 1,400 sites. Warner demonstrated how the tool's visualization displaying temporal changes in total phosphorus and nitrate.

Great Lakes to Gulf Virtual Observatory

Dick Warner of the National Great Rivers Research and Education Center (NGRREC) shared an update regarding ongoing work on the Great Lakes to Gulf (GLTG) Virtual Observatory. GLTG has now drawn in data from over 8,000 reporting stations. Warner explained that funders of GLTG, including the McKnight and Walton Family Foundations, encouraged NGRREC to work with the states to find ways that GLTG can be supportive of the implementation of the states' nutrient reduction strategies. In particular, GLTG has been working with Illinois in regard to its nutrient reduction strategy.

Dick Warner said GLTG is looking for those common denominators among states differing implementation approaches where GLTG may be most helpful. GLTG is seeking ways to provide decision support systems (DSS) to the states in their nutrient reduction strategies implementation. Warner said DSS development by GLTG may be particularly helpful since USGS will be discontinuing its support for the DSS component of its SPARROW modeling effort. While the SPARROW model and maps will continue to supported, the functionality that allowed external users to run nutrient reduction scenarios for selected waterbodies will no longer be available as of late July 2017. Warner added that another future role of GLTG may be to integrate remotely-sensed data.

Kelly Warner said GLTG's ability to bring in data from both NWIS (USGS-generated data) and STORET (EPA-generated and compiled data) sources is particularly helpful. She asked for a methods comparison in data compilation. Weigel said he would like to see some seasonal analysis of data as that may help point out which times of year are most important in regard to nutrient loading. Dick Warner concurred, saying analysis of seasonal patterns is something GLTG would like to pursue. Shawn Giblin encouraged continued efforts regarding remote sensing, saying it will be key in addressing such issues as harmful algal blooms.

UMR CWA Monitoring Pilot Project (UMR Reaches 0-3)

Overall Project Status/Project Reports

Hokanson reminded the group of the overall project status, indicating that all sampling is complete for all indicator groups (chemistry, fish, macroinvertebrates, and vegetation) and for both types of sampling networks (fixed site and probabilistic). Data compilation and analysis is either completed or in progress across indicator groups as follows:

- Chemistry: All monitoring is complete, and data up through December 2016 is compiled in shared spreadsheet. Hokanson noted that Giblin would be presenting a detailed discussion of probabilistic sampling results later in the meeting.
- Fish: All monitoring is complete and GRFIn (multimetric index) scores have been calculated.
- Macroinvertebrates: All monitoring is complete, Wisconsin IBI (multimetric index) scores have been calculated, and a threshold developed for use with the Wisconsin IBI. Hokanson noted that Joel Chirhart would next be providing a presentation regarding macroinvertebrate data and threshold development.
- Vegetation: All monitoring is complete and SMI (multimetric index) scores have been calculated.

Hokanson gave a brief overview of the preliminary condition assessment results from analysis of the pilot data. He noted that, given the limited time frame of the pilot project and high discharge conditions during much of the sampling, the conclusions that can be drawn in terms of condition are somewhat limited. Nonetheless, he emphasized, the pilot did provide for a complete, multi-indicator, coordinated monitoring effort under Clean Water Act auspices, something that had not previously been achieved.

Hokanson explained that the project would be documented via two separate reports: 1) a "project evaluation" report, which examines the success of the project from a logistical, cost, and replicability perspective, and 2) a "water quality condition" report, which takes the results of the pilot and runs the data through the provisional assessment methodology developed for the UMR. Hokanson explained that initial drafts of both reports have been completed and the goal is to finalize these reports following the end of the 2017 field season.

Macroinvertebrate Data Analysis and Threshold Development

Chirhart said the sampling method and index initially recommended for UMR CWA monitoring was the USEPA-GRE kick sampling method and the associated GRMIn multimetric index for the UMR. However, results from this method and index did not demonstrate the desired sensitivity to stressors. Additionally, Minnesota and Wisconsin had more recently embarked on a methods comparability study examining kick sampling and artificial substrate methods. Chirhart explained that, as a result, the pilot project group had elected to employ an artificial substrate approach. One result of this choice is that a different multimetric index would need to be employed, and the Wisconsin IBI was chosen. Further, a new CWA condition threshold for macroinvertebrate index scores had to be developed. Chirhart explained that his presentation would therefore address data analysis, index calibration, and threshold determination.

Chirhart explained that a biological condition gradient (BCG) process was used to identify a new threshold value. He said this process included a BCG workshop involving staff from both Minnesota and Wisconsin and the development of a BCG model that would allow for automated replication of BCG panel decisions. Chirhart then described the process for the selection of a threshold which would align to BCG category 4. Based on the cumulative results of the analysis, a threshold of 50 was chosen to be used as a draft criterion for the purposes of assessment in the Upper Impounded UMR. Chirhart emphasized that this threshold could be modified in the future based on additional data and information, but in the near term could function as a provisional threshold. He noted that the provisional UMR CWA assessment methodology would need to be updated to reflect the newly identified threshold.

Chirhart discussed the results of fish and macroinvertebrate monitoring under the pilot project. High discharge on the river during the sampling period did not appear to affect outcomes for fish and macroinvertebrate monitoring when compared to the results of similar monitoring conducted in the past. However, the high discharge did result in the loss of approximately 50 percent of the macroinvertebrate samplers. While there did not appear to be impacts on the specific results obtained, the overall density of the data for macroinvertebrates was significantly reduced. Additionally, he noted that macroinvertebrate results from Lake Pepin were demonstrably lower than other results. This is very likely reflects that flows in Lake Pepin do not meet the minimum requirements for the macroinvertebrate method. Thus, it appears to be an ineffective method for Lake Pepin.

Weigel asked if other impounded areas on the river demonstrated similar reductions in scores to Lake Pepin. Chirhart explained that the extent to which this occurred was certainly more pronounced in Lake Pepin than elsewhere in pilot project area.

Probabilistic Monitoring – Chemistry Results

Giblin presented an analysis of chemistry results for the probabilistic monitoring done under the pilot project. He showed results and described spatial trends for a number of parameters including total suspended solids (TSS), total phosphorus, dissolved oxygen (DO), water temperature, total nitrogen, nitrate, chlorophyll-a, *E. coli*, and chloride, as well as several other analytes. He noted that high discharge values during the probabilistic sampling may have impacted results, but that in general the trends observed are consistent with previous monitoring and expectations for this portion of the UMR. Giblin discussed in particular TSS results and their relationships to biologically-relevant threshold values which have been observed on the UMR. Giblin noted that one of TSS thresholds currently incorporated into the UMR CWA provisional assessment methodology, the “lower bound” value for the fair condition class category of 17 mg/l below Lake Pepin, should be adjusted to 16 mg/l based on the most recent research he has completed.

Giblin shared outcomes of comparing chemistry results to provisional assessment methodology thresholds, for those limited number of cases where a chemistry-related parameter is utilized directly in assessment. For TSS evaluation under the aquatic life use, this comparison gave varying results among the reaches, with the “good” condition only be met in Reach 2, while Reaches 1 and 3 displayed “fair” condition, and Reach 0 “poor” condition. For the recreation use, *E. coli* and chlorophyll-a results both indicated a “good” condition, though these parameters may have been impacted, and concentrations diluted, by high discharge conditions.

Giblin suggested that next steps in pilot project chemistry data analysis would be to finalize the fixed-site spreadsheet/database by integrating the remainder of fixed site results (i.e., those from the period of January-April 2017) and then begin the analysis of fixed site data. He suggested that the next several weeks be allocated to continuing to compile data, and then that a discussion be held including staff from all pilot project participant agencies in order to review the results of chemistry monitoring in detail. In the longer term, he suggested that another followup action would be to conduct monitoring similar to the pilot in lower reaches of the UMR.

Harmful Algal Blooms (HABs)

UMR HAB Work Group – Status and Agency Reports

Discussion of HABs began with a roundtable discussion among the groups represented on the UMR HAB work group. Each gave a brief update as follows:

USEPA: Meghan Hemken said the agency continues to work on the finalization of recreational criteria/advisories for microcystins and cylindrospermopsin. She indicated that USEPA hopes to have a final approach in place by the end of the calendar year. Hemken also noted that Regions 5 and 7 are planning additional webinars related to HABs and encouraged work group members to participate in these.

Weigel asked what kind of feedback USEPA has been receiving on its proposal for recreational criteria/advisories. Hemken answered that many comments have focused on the implementation aspect of the proposal. Weigel then asked whether it was likely that the numbers for microcystins and cylindrospermopsin would be finalized as 304(a) criteria. Hemken replied that these would likely be offered as 304(a) criteria, but that a state could adopt them as advisory numbers as an alternative. She emphasized that it would be the states' choice as to which path to follow in implementation, though a justification would need to be provided if the state chose not to adopt the numbers as criteria. Willhite suggested that utilizing a 304(a)(2) criteria might provide an alternative, and asked whether USEPA had been considering this approach. Hemken replied that she was not aware of U EPA Headquarters considering this option.

Wisconsin: Gina LaLiberte said Wisconsin is currently gearing up for recreation season and will soon be issuing a press release and hosting a web-based “ask the experts” session regarding HABs.

Shawn Giblin provided a brief overview presentation of proposed cyanotoxin monitoring in UMR Pools 4 and 8, which will include both main channel and off-channel sites and incorporate a variety of additional chemical and physical parameters. He explained that the analyses would include phytoplankton enumeration, microcystin concentration, and cylindrospermopsin concentration. Giblin described the off-channel sites to be sampled, including an isolated backwater in the Trempealeau National Wildlife Refuge known for algal blooms and the site of suspicious dog death in 2016, and a high-use “bathtub” site where algal blooms have occurred with some frequency. Kendall suggested that phycocyanin be added to the study, given its potential use a corroborating variable for algal blooms. Perkins concurred and said she would be interested in looking at the associated methodology.

Minnesota: Vanderbosch said Minnesota is also beginning its preparations for the recreation season and is considering how it communicates risk most effectively to the public. Specifically, Minnesota is seeking a better sense of whether its press releases are giving the impression that blooms are increasing. Weigel concurred that it is challenge in sharing information to not create a false impression or trigger undue alarm. Along these lines, he noted that Wisconsin has been cautious about releasing advisories based on single reports. LaLiberte commented that another complexity regarding HABs and risk communication is that in some cases toxins can be present even if a bloom is not observed.

Iowa: Kendall said Iowa had simplified its communications regarding HABs at swimming beaches to just “watch” and “warning” categories, though even this may prove challenging in communicating what is meant by the “watch” status. He said to date there have not been a substantial number of blooms in Iowa, but that the season is just beginning and conditions currently would seem to favor bloom formation. Giblin asked whether Iowa has in place any protocols to deal with dog deaths which are suspected to be related to an HAB. Kendall replied that Iowa does have a protocol in place but that dog deaths are difficult to track given the amount of time that typically elapses between exposure, death, and investigation.

USACE: Leo Keller said the Corps' approach to HABs is evolving and the Corps is seeking to synch up its approach with those taken by states and local health departments, rather than creating a separate Corps protocol. The goal here, he explained, is that the Corps' response will be consistent with state and local processes. In terms of monitoring, Keller said the Corps would soon begin its sampling of reservoirs.

Illinois: Gregg Good provided an overview of the large river monitoring conducted by Illinois EPA. He explained that this monitoring generates about 60 samples per year across various sites and provides some level of surveillance for HAB events. Karen Hagerty suggested that USACE UMRR-LTRM field crews could potentially collect additional cyanotoxin samples and ship them to Illinois EPA if desired. Good responded that he would be interested in talking more about this possibility.

Updates and Changes to the UMR HAB Response Resource Manual

Hokanson said he is aware that the UMR HAB Response Resource Manual would benefit from some updates and changes, including any updates needed to contact lists, any recent public communications materials, and the incorporation of information regarding USEPA's proposed criteria/advisories for microcystins and cylindrospermopsin. Kendall agreed that the USEPA proposal should at least be mentioned in the manual. Hokanson said he would send out a reminder requesting any updates needed and then would update the manual as soon as possible.

Winnebago System Cyanotoxin Analysis

Dawn Perkins presented the results of a collaborative study carried out by the Wisconsin State Laboratory of Hygiene (WSLH) and Wisconsin DNR to examine the presence of cyanotoxins, and efficacy of treatment, at four public water systems using Lake Winnebago as a source of water supply (Appleton, Menasha, Neenah, and Oshkosh). She said Lake Winnebago is a large, shallow lake with a history of occurrence of algal blooms.

Perkins explained that an earlier study of cyanotoxins had been conducted in the period of 1988-1989 and as such revisiting this study area would help in evaluating the impacts of changes both in treatment technology and any changes that have taking place in regard to the occurrence of HABs. In particular, the study was intended to provide insight into whether treatment technologies remain effective in inactivating cyanotoxins. Perkins said the study was also particularly timely in light of issues such of the contamination of Toledo's water supply by cyanotoxins. She added that it also was conducted in consideration of USEPA's fourth Unregulated Contaminant Monitoring Rule (UCMR 4), which seeks to evaluate the occurrence of contaminants for which a maximum contaminant level (MCL) has not yet been developed.

Perkins said in both studies raw and treated water samples were collected. During 1988-1989 sampling, microcystin was detected above World Health Organization (WHO) guidelines in some raw water samples, but in all cases treatment resulted in significant toxin reduction to levels below WHO guidelines.

Perkins then described the 2016 effort sampling as follows:

- Water Treatment Plant (Finished Water) Samples
 - 4 facilities sampled 1x/week, July-November 2016 (a total of 14 weeks)
 - 539 samples collected for total microcystins
 - Was originally scheduled to end in October, but October results led to additional November sampling
- Lake (Raw Water) Samples
 - Collected in July, August, and September

- Sampled at 3 long-term sites and at drinking water intakes (surface & at depth)
- Conducted algae identification and measured total microcystins

Perkins noted that DNR and WSLH set up a conference call with each water system and worked together to identify the appropriate sampling locations. In most cases, sampling could be conducted after each major treatment step and locations were also identified where additional water quality information could be gathered.

Perkins then presented the results of monitoring at each of the facilities in detail, and noting the particular treatment processes employed by each of the water systems and the impact on cyanotoxin results at each step in their treatment trains. She noted that, among the raw water samples collected, a total of four samples exceeded USEPA's proposed *recreational use* value of 4.0 µg/L for microcystins (with the highest value being 4.5 µg/L). For treated water samples, there were no detections of microcystins, indicating that removal was effective for the variety of treatment processes employed by the water systems.

Perkins said one key take away from the study is that microcystin remained present through October sampling (and were generally higher in the fall than in the summer), which in this study led to November sampling and more generally indicates it is important to keep monitoring well past the end of the summer. She added that other important observations are that toxins can be present even when a bloom is not visible and that raw water turbidity and pH values are not good indicators of microcystin concentration. As such, predicting the presence of toxins based on other factors can be quite challenging, at least in light of what was observed in this study. Perkins said there is interest in potentially extending the study into the current year, but this has not yet been confirmed.

Weigel thanks Perkins for her presentation, noting that it would likely be something of great interest to UMR public water systems. He also asked whether water systems typically adjust their treatment approach based on the presence of algal blooms. Perkins replied that, yes, water systems will typically adjust to optimize treatment for cyanotoxin inactivation when blooms are present. Willhite asked if raw water sampling for cyanotoxins is frequently conducted. Perkins said she did not believe this is routinely done. Willhite observed this potentially problematic as systems will be limited in knowing conditions under which they should be modifying treatment. Perkins did note that UCMR 4 will require additional cyanotoxin monitoring by public water systems – but that is limited to finished water.

Administrative Items

WQEC and WQTF Chair Transitions

Hokanson explained that for both the WQEC and WQTF, the terms of current chairs have ended and new leadership needed to be selected. He noted that, with Missouri not currently having named a WQEC member (following John Madras' retirement) the Chair position will pass to Iowa. Adam Schnieders agreed to take the Chair position and all were in concurrence. For the WQTF, Hokanson said if the rotation approach is followed, Gregg Good would move into the Chair position and Dan Kendall would become Vice Chair. Good and Kendall agreed to serve in these roles and all concurred.

Next Meeting

Hokanson said the next meeting of the WQTF would be in fall 2017 on a date to be determined. He noted that the next WQEC meeting will be on November 6-7 as a joint session with the UMRBA Board.

With no further business, the meeting adjourned at Noon on June 8, 2017.