Minutes of the 144th Quarterly Meeting
of the
Upper Mississippi River Basin Association

November 7, 2017
St. Paul, Minnesota

UMRBA Chair Tim Hall called the meeting to order at 9:03 a.m. Participants were as follows:

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

Rick Gosch	Illinois Department of Natural Resources
Dan Stephenson	Illinois Department of Natural Resources
Sanjay Sofat	Illinois Environmental Protection Agency
Tim Hall	Iowa Department of Natural Resources
Adam Schnieders	Iowa Department of Natural Resources
Sam Hiscocks	Iowa Department of Transportation
Jake Hansen	Iowa Department of Agriculture and Land Stewardship
Dave Frederickson	Minnesota Department of Agriculture
Barb Naramore	Minnesota Department of Natural Resources
Patrick Phenow	Minnesota Department of Transportation
Rebecca Flood	Minnesota Pollution Control Agency
Dru Buntin	Missouri Department of Natural Resources
Robert Stout	Missouri Department of Natural Resources
Bryan Hopkins	Missouri Department of Natural Resources
Steve Galarneau	Wisconsin Department of Natural Resources
Dan Baumann	Wisconsin Department of Natural Resources
Greg Searle	Wisconsin Department of Natural Resources
John Petty	Wisconsin Department of Agriculture, Trade, and Consumer Protection

Federal UMRBA Liaisons:

Marty Adkins	U.S. Department of Agriculture, NRCS
MG Richard Kaiser	U.S. Army Corps of Engineers, MVD
Ken Westlake	U.S. Environmental Protection Agency (via phone)
Sabrina Chandler	U.S. Fish and Wildlife Service
Scott Morlock	U.S. Geological Survey

Others in Attendance:

Kirk Hansen	Iowa Department of Natural Resources
Mike Griffin	Iowa Department of Natural Resources
Randy Schultz	Iowa Department of Natural Resources
Megan Moore	Minnesota Department of Natural Resources
Heather Johnson	Minnesota Department of Agriculture
Chris Klenklen	Missouri Department of Agriculture
Steve Buan	National Oceanic and Atmospheric Administration, NWS
Dustin Goering	National Oceanic and Atmospheric Administration, NWS
Jim Bodron	U.S. Army Corps of Engineers, MVD
Brian Chewning	U.S. Army Corps of Engineers, MVD
Gabe Harris	U.S. Army Corps of Engineers, MVD

Mike McLaughlin	U.S. Army Corps of Engineers, MVD
Melissa Mullen	U.S. Army Corps of Engineers, MVD (via phone)
Thatch Shepard	U.S. Army Corps of Engineers, MVD
Renee Turner	U.S. Army Corps of Engineers, MVD
Gary Young	U.S. Army Corps of Engineers, MVD
Col. Sam Calkins	U.S. Army Corps of Engineers, MVP
Terry Birkenstock	U.S. Army Corps of Engineers, MVP
Chris Erickson	U.S. Army Corps of Engineers, MVP
Shahin Khazrajafari	U.S. Army Corps of Engineers, MVP
Tom Novak	U.S. Army Corps of Engineers, MVP
Bryan Peterson	U.S. Army Corps of Engineers, MVP
Steve Tapp	U.S. Army Corps of Engineers, MVP
Col. Craig Baumgartner	U.S. Army Corps of Engineers, MVR
Dennis Hamilton	U.S. Army Corps of Engineers, MVR
Marv Hubbell	U.S. Army Corps of Engineers, MVR
Karen Hagerty	U.S. Army Corps of Engineers, MVR
Col. Bryan Sizemore	U.S. Army Corps of Engineers, MVS
Jasen Brown	U.S. Army Corps of Engineers, MVS
Brian Markert	U.S. Army Corps of Engineers, MVS
Jodi Creswell	U.S. Army Corps of Engineers, Regional Planning Division North
Brian Johnson	U.S. Army Corps of Engineers, Regional Planning Division North
Kat McCain	U.S. Army Corps of Engineers, Regional Planning Division North
Aaron Snyder	U.S. Army Corps of Engineers, Regional Planning Division North
Jessica Weis	U.S. Department of Agriculture, NRCS
Mark Gaikowski	U.S. Geological Survey
Olivia Dorothy	American Rivers
Mike Klingner	Upper Mississippi, Illinois, and Missouri Rivers Association
Mark Ellis	Upper Mississippi River Basin Association
Kirsten Mickelsen	Upper Mississippi River Basin Association
Josh Ney	Upper Mississippi River Basin Association

Minutes

Robert Stout moved and Rick Gosch seconded a motion to approve the draft minutes of the August 8, 2017 UMRBA quarterly meeting as drafted. The motion was approved unanimously.

Executive Director's Report

UMRBA Staff — Kirsten Mickelsen announced that UMRBA promoted Mark Ellis to Mapping and Spills Program Director effective October 1, 2017. Mickelsen said Ellis has been staff with the Association since 2007 working primarily on spill response mapping and planning. In his new role, Ellis will lead the Association's activities and projects related to spatial analysis and hazardous spill mapping, response planning, and prevention. This includes facilitating UMRBA's UMR Hazardous Spills Coordination Group and providing mapping support to the Association's other water resources priorities. More recently, this has involved creating an online navigation asset inventory for the UMRS. Mickelsen said she is excited to work with Ellis in this new capacity.

Mickelsen announced that UMRBA has recently hired two new staff that will share the title Policy and Programs Director. Josh Ney's starting date is November 20, 2017 and Lauren Salvato's starting date has yet to be determined, but will likely be in late May or early June. Mickelsen explained that Salvato is currently completing her dual masters program at Indiana University's School of Public and

Environmental Affairs. [Note: Subsequent to the meeting, Salvato's starting date was confirmed for June 4, 2018.]

Mickelsen overviewed UMRBA's hiring process for the two Policy and Programs Director positions. UMRBA received nearly 50 applications and selected eight candidates for interviews. Sam Hiscocks of Iowa DOT, Andrea Vaubel of Minnesota Dept. of Agriculture, and Jim Fischer of Wisconsin DNR served on the interview panel. Mickelsen thanked them for their time and input into the candidate selections. Collectively, Hiscocks, Vaubel, and Fischer represented the multi-facets of UMRBA's work as well as three different state perspectives. Mickelsen said it was extremely helpful to have their input into the final hiring selection. Ultimately, the interview panel agreed that Ney and Salvato will bring unique expertise and abilities to the Association that will make for a strong staff team.

Mickelsen expressed sincere appreciation to Mel Pins from Iowa DNR who provided advice and assistance throughout the hiring process. Mickelsen said Pins was very helpful in ensuring that the hiring process was fair, competitive, and ultimately successful.

Advocacy — Mickelsen reflected on her recent visits with Administration and Congressional staff in Washington D.C. over the past fall, noting major takeaways as including:

- White House staff are indicating strong support for NESP and the Congressional delegation remains strongly committed to implementing NESP as authorized in 2007. NESP has not been budgeted and will remain unfunded unless or until it is in included in a Presidential budget or Congress acts to include it in an appropriations measure.
- Congress is starting to formulate a water resources development act for 2018. Staff of the House Transportation and Infrastructure Committee and the Senate Environmental and Public Works Committee indicated that there may be traction to include a provision for removing the Corps' non-federal cost share requirement to indemnify the federal government.

Mickelsen also met with USFWS's Chief of Refuges Cynthia Martinez. Martinez provided very helpful insights into the Refuge's national priorities and challenges given a limited O&M budget. Mickelsen thanked Sabrina Chandler for her efforts in arranging the meeting.

UMRS Flood Risk and Channel Maintenance Management Study — Mickelsen reported that UMRBA provided the Corps with a reaffirmation email on October 18, 2017 that UMRBA remains interested in serving as the non-federal cost share sponsor of a Section 727 study to design a long term plan for flood risk and channel maintenance management.

UMRBA's 2018-2022 Strategic Plan — The UMRBA Board had its last session yesterday to develop the 2018-2022 UMRBA Strategic Plan. Mickelsen said staff will write a draft plan for the Board's consideration as well as a survey to seek input from state agency staff and external partners. The process will likely be very similar to the survey effort completed in 2012. Mickelsen observed that there are many important and exciting opportunities on the horizon for the UMRS's collective partnership.

Treasurer's Report — Mickelsen said UMRBA Treasurer Jason Tidemann's statement regarding his review of the Association's financial statement for the period of May 2017 to June 2017 is provided on page B-4 of the agenda packet. Dave Frederickson moved and Rick Gosch seconded a motion to approve the Treasurer's statement. The Board unanimously approved the motion by voice vote.

Remarks from MVD Commander

MG Richard Kaiser discussed MVD's role to advance priorities that would ensure the viability and prosperity that is derived from the Mississippi River. MG Kaiser characterized the river system as a

highly valuable ecosystem and economic asset both nationally and internationally. The river uses are not mutually exclusive; innovative, flexible, and thoughtful solutions can improve conditions for both. He encouraged partners to help identify and resolve policy challenges.

Navigation

St. Paul District

Steve Tapp provided an overview of the St. Paul District's FY 2017 $60.3 million operations and maintenance activities. Ongoing work included L&D 7 auxiliary sheet pile installation, L&D 5A embankment strengthening, unloading at Crats Island and Lost Island placement sites, and regional use of the Dredge Goetz. Contracted work includes:

- Lower Pool 2 channel improvement – $3.7 million
- Guidewall crib repairs at L&Ds 5, 6, 8, and 9 – $9.5 million
- Upper St. Anthony Falls tainter gate operating machinery replacement – $4.2 million

Tapp reported that a channel closure occurred in Pool 6 for 57.5 hours on July 27-29, 2017. The dredging contract was delayed at Lost Island due to bald eagle nesting. The Corps is working through real estate policies for disposing of dredged material. In addition, the District is revisiting the Pool 4 Channel Maintenance Management Plan.

Tapp overviewed MVP's FY 2018 planned infrastructure repair pending available funding, including:

- Miter gate replacement at L&Ds 5A and 8 – $10.8 million
- Miter gate replacement installation at L&D 2 – $1.2 million
- Embankment strengthening at L&D 4 – $1.6 million
- Sheet pile installation at L&D 5 Auxiliary – $3.75 million
- Two haulage system repairs at L&Ds 5, 6, 8, and 9 – $3.8 million
- Guidewall crib and tow haulage system repairs at L&D 4 and 5A – $7.2 million
- L&Ds 6 and 8 guidewall crib repairs

Tapp observed that the dredging scheduled is difficult to predict given the environmental factors and changing river conditions. The St. Paul District plans for dredging one million cubic yards over any given season from April to November. Tapp reported that the District moved 1.1 million cubic yards in 2017 at a total cost of $9.1 million. The Corps let a $5.5 million construction contract for phase 2 dredging in Lower Pool 2.

Jim Fischer recognized Tapp for his tremendous efforts to find solutions for managing dredged material in ways that have the least environmental impact. Fischer underscored the need to discover solutions for disposing the dredged material, noting the expense of moving the material outside of the floodplain.

MG Kaiser reflected on the successful dialogue among river partners at the Drysale public meeting. While the Corps cannot change the law regarding the low-cost standard, there are opportunities to discuss innovative solutions within legal abilities. Marty Adkins suggested considering in-river beneficial uses as well as potential demands for the sand – e.g., as mix with road salt for municipality use. MG Kaiser suggested that the UMRBA quarterly meetings include discussions about solutions to disposal of dredged material, including opportunities for beneficial use. Col. Sam Calkins remarked that the Corps took away many lessons learned from the draft Pool 4 DMMP release in summer 2017, particularly in approaching

perceived policy limitations and pursuing solutions. Col. Calkins reflected that communications associated with the draft plan publication should have been more strategic and thoughtfully planned. The District is seeking to learn from the experience to improve future processes.

Olivia Dorothy suggested that the Corps provide more detailed economics information in channel maintenance plans to justify the proposed work. Dorothy said American Rivers is exploring a potential floodplain restoration project on the Zumbro River in Minnesota that would include a levee setback.

Rock Island District

Andy Barnes said that, for FY 2017, the Rock Island District received $85 million for O&M work on the UMRS and $34 million for O&M work on the Illinois Waterway. Ongoing construction efforts included installing bulkhead recesses at multiple sites on the UMR and at La Grange L&D, repairing concrete at L&D 18, and rehabilitating the Marseilles Dam and Starved Rock Guidewall. The District awarded the following construction contracts:

- Lock 11 relief wells – $4.6 million
- Dam 11 gate chains – $1.1 million
- Lock 13 monolith joint repairs – $500,000
- Lock 14 guidewall – $1.0 million
- Lock 18 relief wells - $3.1 million
- Lock 19 service gate – $1.9 million
- Lock 20 machinery repair – $7.3 million
- Dam 22 tainter gates – $6.9 million

Barnes reported that the Rock Island District dredged 276,000 cubic yards of material in the UMR and 177,000 cubic yards of material in the Illinois Waterway. Dredging efforts primarily focused in Pools 19, 20, and 16. The District also constructed regulating structures at Rip Rap Island in Pool 13.

Pending funding, scheduled plans for FY 2018 include repairs at Lock 15 guidewall, the Illinois Waterway Project Office, MRPO service base, and Dam 15 service bridge. In addition, the District is planning to repair bulkhead releases at Starved Rock and Marseilles. Planned dredging includes 400,000 cubic yards of material on the UMR and 250,000 cubic yards of material in the Illinois Waterway. Channel maintenance priorities include dredging in Pool 11 and regulating structures in Pools 22 and 13.

Col. Craig Baumgartner said O&M appropriations to the UMRS have been increasing over recent years, allowing the Corps to advance a major strategic initiative on the Illinois Waterway. These additional appropriations allow for the Corps to minimize more costly major rehabilitations. According to Col. Baumgartner, the Corps is still losing ground in terms of O&M backlog and it will be important to continuously inform Congressional members and our partners of the status and investment needs.

St. Louis District

Col. Bryan Sizemore reported that the St. Louis District received $48.6 million in FY 2017 for O&M work and did not receive funding in its construction or investigations accounts. However, the District had $27 million available in FY 2016 carry-over funds. Col. Sizemore overviewed the District's navigation-related successes in 2017 as including:

- L&D 25 pier contract, including tainter gate chains and sprockets, service bridge rehabilitation, and tainter gate rehabilitation – $23.4 million awarded to date
- Mel Price control system upgrade, including replacement of lockwall control booths and control system and a 60-day scheduled closure at each lock – $1.2 million
- Flood response and recovery
- Rock removal – $16 million

Col. Sizemore discussed the following challenges to the navigation system over the last season:

- Three-day unscheduled closure at Mel Price to employ emergency repairs to the upstream liftgate
- Six-day unscheduled closure of the navigation channel on the Illinois Waterway just south of La Grange due to channel constriction
- Implementation complexities affecting rock removal, including low water conditions, navigation traffic, and various environmental concerns
- 3-day closure at Mel Price due to flooding

The pending FY 2018 navigation schedule outlook for the St. Louis District includes:

- Four piers/spans at Lock 25 – $7.9 million
- Lock 25 roller gate bulkheads – $5 million
- Mel Price control system – $1.2 million
  - Scheduled closure of the main channel from January 3, 2018 to March 8, 2018
- L&D 27 rehabilitation, including liftgate chains and counterweights – $2 million
- L&Ds 24 and 25 bulkhead hoisting cranes – $3 million
- Repairs to protection cells – $500,000
- Repairs to overflow structures – $1.5 million
- Costello Lcok foundation relief repair
  - Scheduled closure for dewatering over 14 days in June 2018

Col. Sizemore said the regulating works efforts will involve continued construction of Dogtooth Bend Phase 6 and Grand Tower Phase 5. The Corps will continue to remove rock in the navigation channel as feasible given river stages. In addition, Col. Sizemore reported that the Supplemental EIS for regulating works was finalized in August 2017.

Col. Sizemore said the St. Louis District annually dredges 3 million to 5 million cubic yards of material on average. The dredging program is very challenging to predict, particularly on the open river reach. In 2017, the Corps moved 3.8 million cubic yards at a total cost of $17.8 million. For comparison, Col. Sizemore noted that the District dredged more than 10 million cubic yards of sediment in two months during the 2012 drought.

In response to a question from Dorothy, Col. Sizemore said the Corps certified the mitigation model in September 2017. The next step involves running the model with projects already completed.

Col. Baumgartner suggested that the February or May 2018 UMRBA quarterly meeting include a discussion about the Corps' plans to implement major rehabilitation simultaneously at several lock sites

on the Illinois Waterway. MG Richard Kaiser observed that the timing of closures is important to consider for minimizing impacts to movement of agriculture products and avoid unnecessary impacts to fish and wildlife habitat or ecological processes. MG Kaiser emphasized the importance of making informed decisions, sharing information and consulting various interdisciplinary experts as well as addressing implementation issues as early as possible.

Kirsten Mickelsen extended appreciation to Corps staff in each of the three Districts for notifying the Association of unscheduled closures and major events to the navigation system this past season. It is helpful to notify the affected states as well as Congressional staff.

Asian Carp

Great Lakes and Mississippi River Interbasin Study (GLMRIS)

Dennis Hamilton recalled that the 2014 Great Lakes and Mississippi River Interbasin Study (GLMRIS) resulted in a follow-on effort to explore potential structural barriers at Brandon Road. Three of the six structural alternatives provided in the 2014 GLMRIS report identified Brandon Road as a strategic location for a variety of reasons. It was also found that managing a single chokepoint (at Brandon Road) was better than managing multiple locations further upstream in the Chicago Area Waterway System (CAWS). The Brandon Road lock has a 34-foot high dam and avoids the flood bypass via the Upper Des Plaines River. According to Hamilton, the Brandon Road location seeks to minimize disruption to existing waterways uses, including commercial navigation. On September 29, 2014, the ASA(CW) Jo-Ellen Darcy directed the Corps to proceed with a formal evaluation of the potential control technologies to reduce the risk of one-way interbasin transfer of aquatic nuisance species at Brandon Road.

Hamilton provided a brief overview of the extensive partnership of federal and state agencies, local governments, Congressional members, nonprofit conservation and industry organizations, engineering firms, and experts in interdisciplinary fields. Hamilton underscored the shared responsibility among all partners in implementing and executing the tentatively selected plan.

Hamilton characterized Brandon Road lock as highly valuable for commercial navigation, with over 11.3 million tons of cargo transiting each year. The lock is estimated to generate $319 million in annual transportation benefits and serves as a critical link between the Great Lakes and the Gulf of Mexico. In addition, the Great Lakes Basin is significantly valuable to the nation. There are about 63 million recreational fishing trips to the Great Lakes generating about $1.3 billion in net economic revenue. Commercial fishing generates about $20 million in annual revenue. The Corps recognizes the tremendous economic and ecological assets of both aquatic systems and has worked hard to ensure that the alternatives safeguard these significant features.

Hamilton reviewed the various alternative scenarios at Brandon Road, including the use of structural and nonstructural measures. Structural measures include water jets, electric barriers, complex noise, an engineered channel, and flushing of the lock chamber. Nonstructural measures include monitoring, public education and outreach, integrated pest management, pesticide application, manual and mechanical removal of fish, and research and development of eradication, control, and prevention technologies and approaches. The Corps evaluated the various scenarios based on effectiveness, life safety, impacts to navigation, costs (construction, O&M, mitigation), flexibility for innovation in the future, number of structural control points in the CAWS, and modes of transportation.

The tentatively selected plan is the "technology alternative – complex noise with electric barrier" that involves modifying Brandon Road to include a flushing lock, complex noise within the lock chamber, water jets, boat launches and a mooring area, and an engineered channel that extends from the existing

walls and includes an electric barrier. The project also includes mitigation to address impacts to connectivity and allows for continued navigation. The Corps is estimating the project construction to cost $275.4 million over 5 years. The estimated annual cost to operate and maintain the structural features is $8.2 million and to implement the nonstructural measures is $11.3 million. Hamilton said the electric barrier would not be in operation when there is a vessel immediately downstream of the barrier or in the engineered channel or lock. The nonstructural measures would begin as soon as the project receives appropriations.

Hamilton said the Brandon Road tentatively selected plan is currently available for public comment, which ends on November 16, 2017. The Corps is planning to issue an agency decision in June 2018 and issuing an associated Chief's report in August 2019. Hamilton pointed to the GLMRIS webpage to find more detailed information (www.glmris.anl.gov).

Col. Baumgartner reflected that the Corps' Brandon Road study process has pursued a multiagency, interdisciplinary approach, including leveraging resources and expertise. The Corps has taken significant time and resources to share information and engage the public early-on and throughout the planning process. An underlying assumption is that implementation will involve a shared responsibility, particularly as it involves nonstructural measures. The Corps has encouraged flexibility throughout the study and in plan implementation – the engineered channel will allow for incorporating technologies and approaches that are not yet known or developed. Col. Baumgartner distinguished the Corps' role in recommending engineered solutions while the public will ultimately decide what is approved and funded. Col. Baumgartner said a non-federal sponsor will be required to construct the structural measures. In response to a question from Ken Westlake, Hamilton said the environmental impact statement would be released in the summer of 2019, just prior to publication of the Chief's report.

MG Kaiser said the Corps is putting a lot of time and energy into outreach to reach various public audiences and ensure that they are well aware of what the tentatively selected plan involves. The Corps is hoping that comments received will be constructive and will lead to the highest quality solution.

Pool 8 Dam Modifications

Col. Sam Calkins explained that the Minnesota DNR funded a study through the University of Minnesota in 2011 to evaluate the movement of Asian carp fish though the locks and dams on the UMRS. The findings included modest recommendations to dam operations that would prevent the carp from expanding north. Col. Calkins said the changes also reduce scouring and erosion effects.

In response to a question from Dorothy, Col. Calkins confirmed that the dam modifications will not affect the navigation system or ecosystem including potential drawdown efforts. Jim Fischer emphasized the importance of maintaining viable migration pathways for native species. Mark Gaikowski said research needs to examine the right flow patterns given the timing of migration for native species and Asian carp – i.e., modify operational parameters to sync with native fish movement.

Col. Calkins also noted the closure of Upper St. Anthony Falls in response to the threat of Asian carp as well as the pending disposition study of Upper and Lower St. Anthony Falls and L&D 1. The study is tentatively scheduled for publication in summer 2018.

Corps Flood Policy Update

National Levee Database

Melissa Mullen explained that the Corps is currently in the process of overhauling its interactive, web-based national levee database. The new website is scheduled for external publication in summer 2018.

As of November 2017, Mullen said there exist 8,900 levee system across the country with a total of 29,000 miles of levees. In MVD, the total is 1,285 levee systems over about 8,469 miles of levees.

The vision for the new National Levee Database is for a centralized, accessible website that includes all Corps inspection and screening data that can be publically reviewed and searched. Mullen explained that each state will have the ability to generate their own respective dashboard within the database by using a series of drop-down menu options. The Corps will maintain the database as a "living" resource by regularly updating it with the most relevant and available information.

In response to a question from Bryan Hopkins, Mullin said publically-viewable data will include general location information, features, size of leveed area, population, general demographics, and number of structures. In response to a question from Mike Klingner, Mullin said the National Levee Database uses data collected from 2016 to 2017. Mullin invited the public to identify any errors, adding that the new database will allow for corrections to be processed much more easily and quickly.

Section 408 Policy

Mullin provided an overview of recent changes to the Corps' Section 408 policy (33 USC 408). The policy provides the Corps with the authority to grant permission to alter one of its civil works projects if it would not 1) impair the usefulness of the project and 2) be injurious to the public interest. The benefits of Section 408 is that it provides a mechanism to alter, repair, or rehabilitate an existing project without reauthorization and to ensure that the project continues to develop its intended benefits to the public. The Section 408 policy also allows for ensuring compatibility of any new infrastructure with existing federal projects and that alterations do not have any unintended negative impacts to the public.

Mullin explained that interim guidance, issued in November 2016, delegated several HQ-level decisions to the Divisions. In June 2017, the Corps issued guidance clarifying Section 408's application to "navigable waters" that reduced the number of activities needing Section 408 permission and also issued guidance to implement the contributed funds authority provided in WRDA 2016. Finally, in August 2017, the Corps decided to provide District Commanders with the authority to delegate their Section 408 decision-making.

Mullin said the Corps is anticipating further draft implementation guidance changes at the end of the calendar year that will be available for public comment. Changes expected include:

- Expanding the type of project sponsor O&M and repair activities that do not require a Section 408 permit
- Reducing internal duplication of effort with other processes (e.g., regulatory, operations, real estate)
- Further reducing HQ-level decision-making
- Creating an option for multi-phased reviews
- Removing 60 percent of the design requirement
- Establishing timelines for reviews per WRDA 2016
- Creating a tracking database

UMRR/NESP Update

Mike Griffin reflected that he has devoted his career with Iowa DNR to the UMR and in particular to the UMRR program. Griffin first started working to develop the UMRR LTRM implementation and now is an HREP specialist. According to Griffin, UMRR is the greatest large aquatic ecosystem program in the world and that the federal-state-nonprofit partnership is its backbone. He observed that UMRR is currently experiencing growing pains as it has received a substantial increase in funding over

the past few years. Griffin encouraged partners to work collaboratively to solve the challenges and to keep UMRR as a priority for the Corps and all partner agencies.

Marv Hubbell reported that UMRR received full federal funding in FY 2017 of $33.17 million. In addition, the President's FY 2018 budget and the Senate and House Appropriations Committees' FY 2018 appropriations measures all have included $33.17 million for UMRR. This is a substantial increase from UMRR's historical average annual funding level of about $20 million. Increased funding allows for more opportunities to do restoration, monitoring, and science. However, there is a lot that goes into planning and deciding how to optimize that investment. Expediting project schedules also highlight policy challenges such as the reluctance of non-federal sponsors to execute the Corps' cost-share agreements.

Hubbell said UMRR will hold a partnership meeting on November 28-30, 2017 in Dubuque, Iowa to identify the most pressing challenges to implementation and determine a path forward for resolving them. Hubbell summarized the four major thematic areas as defining habitat needs for focusing future restoration work, selecting the next generation of UMRR's habitat projects, various hurdles to planning and constructing projects, and policy issues such as the indemnification clause in the Corps project partnership agreements.

In response to a request by Dru Buntin to elaborate on the issues regarding the habitat needs assessment, Hubbell explained that UMRR has invested significantly in packaging all of the LTRM monitoring scientific research into an integrated landscape analysis that will fundamentally shift how the program identifies and formulates habitat projects. Jim Fischer added that UMRR's vision is for a healthier and more resilient ecosystem. Beyond that, the partnership has struggled with what that looks like and how to achieve it. Hubbell said UMRR has been working over the past few years to develop the ecological resilience concepts and define metrics to create targets and assess progress and to better understand how ecological resilience relates to available habitat for fish and wildlife.

Robert Stout observed that the partnership's strength is unique to the country and that the interagency partnership infrastructure works well here. Stout said he believes that the challenges will be addressed.

Buntin discussed the need to increase the availability of non-federal partners that are able to cost-share sponsor UMRR's habitat projects. He acknowledged that each state has its own legal obligations to address and that those issues are outside of the partnership's purview. Buntin also suggested that the Corps review potential flexibility in its project partnership agreements to not conflict with state law.

Nutrient Risk Runoff Model

John Petty overviewed the juxtaposition of Wisconsin's productive agricultural economy and its interest in reducing nutrient runoff. Wisconsin has 69,000 farms with 9 million acres in cropland –nearly one-quarter of the state. About 9,500 dairy farms produce 14 percent of the nation's milk, and the state is first in the nation for cranberry production, snap beans, corn silage, milk goats, mink pelts, and cheese. Wisconsin is also home to 3.5 million head of cattle. Overall, agriculture has an $88 billion annual economic impact in the state that also has direct impacts to soil and water resources.

Petty showed a map of Wisconsin's 2016 303(d) impaired waterways, noting the large spatial extent of degraded water quality. Petty acknowledged that the state has been making substantial progress in managing nutrients by leveraging existing programs and funding. The amount of farmland with nutrient management plans has increased from 900,000 acres in 2006 to 2.96 million acres in 2016.

However, Wisconsin has recognized that weather and soil characteristics are substantial risk drivers. Petty quoted University of Wisconsin Discovery Farms finding that, on average, 47 percent of the

annual surface runoff occurs as snowmelt in February and March. Nutrient loss is directly linked to heavy rainfall events.

To address these loss events, the Wisconsin legislature directed DATCP to "establish and operate an online manure management and advisory system to assist farmers and manure applicators in identifying the least risky fields and times to apply manure." Ultimately, a two-pronged approach was created to 1) show nutrient applicators where sensitive areas exist and 2) inform applicators on a daily basis of the risk for runoff based on more specific landscape and weather conditions. Petty said Wisconsin DATCP teamed with the NWS to create the runoff risk advisory model. DATCP owns the model and associated tools and hosts the information on its website.

Dustin Goering reinforced the notion that the runoff risk advisory tools are meant to reduce acute loss events. Delaying applications at high risk times will reduce overall nutrient loads leaving the fields and entering the waterways. The hope is that, over the long term, voluntary behavior among farmers will change in support of nutrient reduction goals while providing other secondary benefits. While nutrient management has been mostly focused on the right place, amount, and source of application, timing is a critical factor and providing the right information in a timely fashion may alter daily field management decisions.

Goering explained that at least 50 percent of annual runoff can occur on frozen ground in the northern states when vegetation-based practices are not effective. Timing is the major factor during winter conditions and field-management practices could strongly reduce nutrient yields. Goering also explained that the most substantial nutrient loss occurs during the top 10 percent of runoff events.

Goering said the runoff risk advisory model uses NWS's weather, snow, and soil moisture modeling predictions. The University of Wisconsin built and maintains the website and Wisconsin DATCP facilitates the interagency working group and coordinates outreach and training efforts. The model refreshes three times daily, showing the highest risk within a 72-hour timeframe.

Following inquiries from other states to obtain a similar model, NWS partnered through a NRCS Conservation Innovation Grant to investigate potential runoff risk-type tools in other states. Ultimately, a partnership formed with USEPA and the Great Lakes Restoration Initiative (GLRI) to expand the model in a second version that would extend across the Great Lakes, with the purpose of demonstrating the need and desire for runoff risk tools across a larger spatial extent based on a consistent modeling framework. This required all new algorithms and model validation. The regional model was published for Minnesota, Michigan, Ohio, and Wisconsin in 2017 and is planned to be finalized for Illinois, Indiana, and New York in 2018. The regional model is currently producing daily reports, but will be updated later this fall or winter to refresh four times daily.

Goering explained that the runoff risk advisory model is only based on water quantity not quality, with risk stratified based on runoff magnitude. The model incorporates weather uncertainty and recognizes various spatial considerations. Goering clarified that it should be used as one tool among multiple considerations, and said the tool is not intended for regulatory decision making. Next steps include ongoing social science analyses and, in 2018, a transition to the third version of the model. The model will be housed by the NWS's National Water Model with a 1 km or 250 m grid that has several daily runs. The new model will require all new validation that may take 3 to 5 years. Goering said that water quality modeling may be possible in the future.

Heather Johnson presented Minnesota's Runoff Risk Advisory Forecast. Johnson showed a map of the Minnesota Department of Agriculture's pesticide monitoring locations throughout the state, including surface and groundwater sources. While Minnesota PCA is responsible for regulating and managing manure, the Department of Agriculture elected to coordinate on runoff risk advisory tool's development

because of the agency's connection to the agriculture community and interest in protecting water quality. The Minnesota runoff risk advisory tool was paid for by the state's Clean Water Legacy Fund and was developed through a strong collaboration with many local partners. Johnson showcased the web-based interface of the advisory forecast and the various features and available information – e.g., soil temperature. Johnson said the advisory will be made available via the web in 2018.

In response to a question from Chris Erickson, the model does not simulate nutrient filtration into groundwater sources or underground tiles.

Administrative Issues

UMRR Contract Authorization

Kirsten Mickelsen said the UMRR program manager has expressed a desire to contract with UMRBA for staff services under a one-year base agreement for calendar year 2018. The contract would include four additional option years. Robert Stout moved and Steve Galarneau seconded a motion to authorize Mickelsen to execute the support services contract with the Corps. The motion carried unanimously.

Future Meeting Schedule

February 2018 — Moline

- UMRBA quarterly meeting — February 6
- UMRR Coordinating Committee quarterly meeting — February 7

May 2018 — St. Louis

- UMRBA quarterly meeting — May 15
- UMRR Coordinating Committee quarterly meeting — May 16

August 2018 — La Crosse

- UMRBA quarterly meeting — August 14
- UMRR Coordinating Committee quarterly meeting — August 15

With no further business, the meeting adjourned at 12:00 p.m.