Minutes of the 138th Quarterly Meeting
of the
Upper Mississippi River Basin Association

May 24, 2016
St. Louis, Missouri

UMRBA Chair Robert Stout called the meeting to order at 9:30 a.m. Participants were as follows:

UMRBA Representatives, Alternates:

Rick Gosch	Illinois Department of Natural Resources
Dan Stephenson	Illinois Department of Natural Resources
Tim Hall	Iowa Department of Natural Resources
Sam Hiscocks	Iowa Department of Transportation (by phone)
Barb Naramore	Minnesota Department of Natural Resources
Patrick Phenow	Minnesota Department of Transportation (by phone)
Robert Stout	Missouri Department of Natural Resources
Bryan Hopkins	Missouri Department of Natural Resources
Dan Baumann	Wisconsin Department of Natural Resources (by phone)
Jim Fischer	Wisconsin Department of Natural Resources
John Petty	Wisconsin Department of Agriculture, Trade, and Consumer Protection

Federal UMRBA Liaisons:

Michael Scott	Federal Emergency Management Agency
Don Balch	U.S. Army Corps of Engineers, MVD
Col. Anthony Mitchell	U.S. Army Corps of Engineers, MVS
LCDR Susana Lee-Kiddey	U.S. Coast Guard
Ken Westlake	U.S. Environmental Protection Agency, Region 5 (by phone)
Tim Yager	U.S. Fish and Wildlife Service
Leon Carl	U.S. Geological Survey
Scott Morlock	U.S. Geological Survey
Brandon Criman	U.S. Maritime Administration

Others in Attendance:

Lawrence Patterson	Illinois Department of Natural Resources
Mike Griffin	Iowa Department of Natural Resources (by phone)
Megan Moore	Minnesota Department of Natural Resources
Kevin Stauffer	Minnesota Department of Natural Resources
Chris Klenklen	Missouri Department of Agriculture
Janet Sternburg	Missouri Department of Conservation
Andrea Collier	Missouri Department of Natural Resources
Sreedhar Upendram	Missouri Department of Natural Resources
Bryan Ross	Missouri Department of Transportation
Barbara Kleiss	U.S. Army Corps of Engineers, MVD
Chris Erickson	U.S. Army Corps of Engineers, MVP
Zach Kimmel	U.S. Army Corps of Engineers, MVP (by phone)
Ken Barr	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
Jon Klingman	U.S. Army Corps of Engineers, MVR (by phone)
Michael Tarpey	U.S. Army Corps of Engineers, MVR (by phone)
Scott Whitney	U.S. Army Corps of Engineers, MVR
Tim Eagan	U.S. Army Corps of Engineers, MVS
Hal Graef	U.S. Army Corps of Engineers, MVS
John Peukert	U.S. Army Corps of Engineers, MVS
Shawn Sullivan	U.S. Army Corps of Engineers, MVS
Julie Ziino	U.S. Army Corps of Engineers, MVS
Bob Clevenstine	U.S. Fish and Wildlife Service
Sara Schmuecker	U.S. Fish and Wildlife Service
Amy Beussink	U.S. Geological Survey
Courtney Black	NOAA, National Integrated Drought Information System
Jessica Brooks	National Weather Service
Dennis Wilmsmeyer	America's Central Port District
Olivia Dorothy	American Rivers
Thomas Thee	Jacobs Engineering
Brad Walker	Missouri Coalition for the Environment
Ted Kratschmer	National Great Rivers Research and Education Center
Dick Warner	National Great Rivers Research and Education Center
Nancy Guyton	Neighbors of the Mississippi
Mark Harvey	Neighbors of the Mississippi
Paul Rohde	Waterways Council, Inc.
Dru Buntin	Upper Mississippi River Basin Association
Dave Hokanson	Upper Mississippi River Basin Association
Kirsten Mickelsen	Upper Mississippi River Basin Association

Minutes

Jim Fischer moved and Tim Hall seconded a motion to approve the draft minutes of the February 23, 2016 quarterly meeting as written. The motion carried unanimously on a voice vote.

Executive Director's Report

Dru Buntin presented the Executive Director's report, noting the report is organized according to the focus areas in the 2013-17 UMRBA Strategic Plan. Among the items in the report, in the *Commercial Navigation focus area*, Buntin noted that several navigation-related topics would be covered later in the quarterly meeting. Buntin said he attended the March 14-16, 2016 Waterways Council Washington Seminar in Washington, DC. Buntin and Gretchen Benjamin with the Nature Conservancy (TNC) participated in the WCI-led Congressional meetings. Kirsten Mickelsen said she attended the May 3-4, 2016 meeting of the Inland Rivers, Ports, and Terminals (IRPT) Association in Natchez, Mississippi. The meeting included discussion of commodity forecasts, port resilience, public-private partnerships, channel dredging, barge and rail industry coordination, as well as updates from the Corps of Engineers and Coast Guard. Mickelsen expressed appreciation to IRPT Executive Director Aimee Andres for organizing the meeting and inviting UMRBA staff to attend. Mickelsen said UMRBA staff prepared an FY 2017 appropriations summary for UMR-related programs and projects and indicated the summary was available at the back of the meeting room.

In the *Ecosystem Restoration and Monitoring focus area*, Buntin said he and Gretchen Benjamin of TNC participated in advocacy visits with Upper Mississippi Congressional delegation staff on March 16-17, 2016. Discussion topics included support for Upper Mississippi River Restoration (UMRR) program

funding, as well as education regarding the legislative changes being supported by UMRBA and partners such as TNC and Audubon to resolve obstacles to execution of project partnership agreements (PPAs) for UMRR and other projects. Buntin said partners are working with staff of UMR members on the House Transportation and Infrastructure (T&I) Committee as well as staff of Upper Mississippi House and Senate members to secure the inclusion of provisions aimed at addressing challenges with the current PPA template, namely complete indemnification, perpetual OMRR&R, and the value of donated goods. Buntin said the Association's positions were articulated in an April 22, 2016 letter to the chairpersons of the House T&I Committee and the Senate Environment and Public Works (EPW) Committee and directed the Board's attention to pages B-8 to B-11 of the agenda packet for a copy of the letter. In this letter, UMRBA also requested that the water resource authorization legislation also extend the geographic scope of the St. Louis Riverfront Project to allow the Meramec feasibility study to include the entire basin.

Buntin said Rep. Rick Nolan (D-MN) and Rep. Rodney Davis (R-IL) agreed to seek the inclusion of the cost-share agreement provisions in the House T&I Water Resources Development Act (WRDA) measure. UMRBA, TNC, and Audubon collaborated in providing the UMRS delegation with suggested language for provisions related to OMRR&R, indemnification, and the value of donated goods. The Senate EPW's measure does not include the exact provisions sought, and instead offers an approach for limiting OMRR&R obligations to when an ecosystem project has met its intended purpose. The House T&I WRDA bill includes a fifty year limit on nonfederal sponsor's OMRR&R obligations. Buntin said neither the House T&I nor the Senate EPW bills include an indemnification provision. Buntin noted that UMRR program partners are planning an August 8, 2016 event in La Crosse, Wisconsin to highlight the achievements of the UMRR program in its 30th year of existence. Buntin said a save-the-date announcement for the UMRR event is included in page B-12 of the agenda packet.

In the *Spill Response Planning and Mapping focus area*, Buntin said UMRBA Oil Pollution Act (OPA) project staff completed the Minnesota statewide update of the Inland Sensitivity Atlas in March 2016. Buntin said OPA staff have also completed the development of spill response planning tools for UMR Pools 5, 5A, and 6. OPA staff have continued to assemble Atlas data for Illinois, which is the next state to be updated. Buntin said UMRBA staff have begun work under contract with the National Park Service to facilitate development of a spill response plan for the St. Croix National Scenic Riverway.

In the *Water Quality focus area*, Buntin indicated that Hokanson would provide a Water Quality Program update later in the quarterly meeting.

In the *Cross-Cutting Initiatives focus area*, Buntin said he and UMRBA Chair Robert Stout attended the fourth annual capitol meeting of the Mississippi River Cities and Towns Initiative (MRCTI) on March 8-10, 2016 in Washington, D.C. A primary focus of this meeting was the mayors' effort to move forward with a clean water program. On behalf of UMRBA, Stout signed a Memorandum of Common Purpose with MRCTI, describing the shared interests of the states and the mayors in regard to water quality and ecosystem restoration on the Mississippi River. Buntin said a copy of the Memorandum of Common Purpose can be found on pages B-13 and B-14 of the agenda packet.

Buntin said he attended the 2016 Washington Roundtable meeting jointly hosted by the Interstate Council on Water Policy (ICWP) and the Western States Water Council on March 22-24, 2016 in Washington, DC. Buntin said the meeting included a water planning conference focused on water supply as well as the roundtable presentations by and discussion with leaders from the Corps, the National Weather Service, the Natural Resource Conservation Service (NRCS), the U.S. Environmental Protection Agency (USEPA), the Department of Interior, the White House Office of Science and Technology, and staff from Congressional committees dealing with water resource issues. As ICWP Chair, Buntin said he represented the organization at the White House Water Summit on March 22, 2016.

Buntin directed the Board's attention to page B-15 of the agenda packet for a copy of UMRBA Treasurer Jason Tidemann's statement regarding his review of UMRBA's financial statement for the period of February 1, 2016 through April 30, 2016. Jim Fischer offered and Rick Gosch seconded a motion to approve the Treasurer's statement. The Board unanimously adopted the motion by voice vote.

Iowa Watershed Approach to Urban and Rural Resilience

Jessica Turba said the U.S. Department of Housing and Urban Development (HUD), in collaboration with the Rockefeller Foundation, initiated a $1 billion National Disaster Resilience Competition last year. Turba said the State of Iowa, the City of Dubuque, and other partners joined to submit an application for funding. The Iowa Watershed Approach program submitted for funding was developed by the Iowa Flood Center in consultation with many program partners. Turba said the goals of the HUD program include:

- Helping communities recover from prior disasters and improving their ability to withstand and recover more quickly from future disasters, hazards, and shocks.
- Considering future risks and vulnerabilities in planning and decision-making.
- Helping communities better understand their risks and identifying ways in which they can protect the long-term well-being and safety of residents.

Turba said the HUD program justification states that cities and towns face significant economic and social risks from extreme weather events. These risks are expected to increase substantially due to climate and environmental factors beyond the control of vulnerable populations. The justification says communities cannot effectively reduce risks and vulnerabilities without considering future extreme events in planning and decision-making. In order to be eligible for funding, applications were required to be for areas in which a Presidentially Declared Major Disaster had been issued, there are low to moderate income residents, environmental and/or infrastructure had been impacted, and there are unmet recovery needs. Turba shared a map of Iowa counties deemed eligible under these criteria. Turba said Iowa was awarded $96,887,177 in funding from HUD for the Iowa Watershed Approach program to be implemented from 2016 to 2021. Turba said Iowa received the fourth highest grant award of the 13 funded proposals.

Larry Weber said the Iowa Watershed Approach (IWA) project is designed to address multiple needs, but is primarily focused on reducing flood risk in eight targeted watersheds as well as the Bee Branch Creek in the City of Dubuque. He showed the Board a slide with the logos of the various project partner organizations and said he would describe the roles of a few later in the presentation. Weber said the IWA project includes the establishment of Watershed Management Authorities, development of hydrologic assessments and watershed plans, deployment of monitoring equipment, implementation of projects in watersheds to reduce the magnitude of downstream flooding and improve water quality, and assessment of project benefits based on monitoring and modeling data.

Weber said some of the targeted watersheds have already developed Watershed Management Authorities (WMA), while others are in the process of being formed. He said WMAs can foster multi-jurisdictional partnerships and cooperation, assist in development of watershed plans, leverage resources such as funding and technical expertise, and facilitate stakeholder involvement in watershed management. The assessment and modeling envisioned for the project are aimed at improving the understanding of flood hydrology in the watersheds, estimating watershed response to different rainfall events, and quantifying the impact of small-scale flood mitigation practices.

Weber said the IWA project construction and implementation will be based on engagement with volunteer landowners in sub-watersheds. Practices may include floodplain restoration or easements, farm ponds, terraces, buffer strips, bioreactors, wetlands, saturated buffers, stormwater detention basins, or sediment detention basins. Weber said the program includes 75 percent cost share assistance to landowners for practices following Natural Resource Conservation Service (NRCS) guidelines and specifications. Weber said the constructed projects will be monitored and evaluated for feasibility at a larger scale.

Weber said the IWA project also includes a focus on improving community resiliency to flood events. In this context, he defined resiliency as the ability to prepare and plan for, absorb and recover from, and more successfully adapt to adverse events. Weber said the objective is to build back stronger, but build back differently after flood events and support resilient communities with engaged governments, nonprofit and faith-based organizations, businesses, and citizens working together to identify and manage risks. The IWA Flood Resilience Team will engage stakeholders in nine watersheds for three to five years. Weber shared the five-year schedule and the specific watersheds targeted in each year. These watersheds include the Clear Creek, Upper Iowa, English River, Middle Cedar, Upper Wapsi, City of Dubuque, North Raccoon, East Nishnabotna, and West Nishnabotna. Weber said the major activities of the Flood Resilience Team include development of a needs assessment, creation of a flood resilience plan, promotion, promotion of resilience strategies, and tracking progress.

Weber said Iowa State University (ISU) Extension is involved in developing theme-based curriculum, outreach materials, and social media packages, communications plans for the watersheds, and coordination of field days, workshops and events. Weber said John Lawrence, the Director of the Iowa Nutrient Research Center (INRC) at ISU, is the point of contact for the project focus on communicating with landowners. Weber said the INRC is developing a framework to monetize the benefits of nutrient-reducing practices (including primary, secondary, and tertiary benefits), developing alternative scenarios of practices aimed at achieving the goals of Iowa's nutrient reduction strategy, and incorporating changing hydrologic patterns into hydrologic models that predict water quantity and quality.

Weber said the Iowa Water Center (IWC) at ISU is another project partner. He said IWC will work to identify vulnerable watersheds based on slope, soil type, and proximity to water. IWC will also identify appropriate practices to address runoff and erosion vulnerability, and estimate soil erosion and runoff with and without practice implementation.

Weber said the Tallgrass Prairie Center at the University of Northern Iowa is another project partner. The Center will provide technical assistance to each WMA for native vegetation establishment and management, including individual landowner consultation. They will also be involved in coordinating field days and workshops and the creation of demonstration sites for teaching and learning. The Center will also provide print and online technical guides and videos.

Weber said the IWA project was designed to complement the Iowa Watersheds Project implemented from 2010 to 2015. He shared a map showing the watershed targeted in each effort as well as a detailed draft budget for the IWA project. Weber emphasized that the budget was draft as the final agreement with HUD has not yet been executed. Of the $96 million awarded, Weber said roughly $40 million would fund infrastructure and $30 million would fund conservation practices and technical assistance. He also provided information regarding the specific project timeline by quarter from 2016 to 2021. Weber said they expect practice construction to begin in 2018, but indicated sensor deployment for monitoring equipment would begin right away.

Teri Goodman provided the Board information regarding the City of Dubuque's Bee Branch Watershed Flood Mitigation and Disaster Resiliency Project, a portion of which is being funded by the HUD grant. She shared a map depicting Dubuque's "watershed address" and said the challenges the city is

addressing in the Bee Branch project are not unique. Goodman said their goal is to create a replicable model and share information regarding the project with leaders from other river communities. She pointed out that Dubuque Mayor Roy Buol is active in the leadership of the Mississippi River Cities and Towns Initiative (MRCTI) and this has offered an excellent opportunity for Dubuque to connect with other river communities. Goodman said MRCTI community leaders face common challenges related to water quality, flooding and floodplain issues, while also seeing the need to promote river-focused recreation, ecosystem restoration, river culture and history, and sustainable economies. Goodman said the Bee Branch project is primarily designed to address frequent flooding problems related to stormwater in Dubuque. However, she said the project was holistically developed with Dubuque's sustainability goals related to economic, environmental, and social health in mind, while also being structured based on input from local citizens. Goodman said sustainability has become the guide for how Dubuque conducts city planning and analyzes projects. The result is a green infrastructure project for flood mitigation that also seeks to improve neighborhood amenities, water quality, and the ecology.

Goodman showed the Board a series of maps of Dubuque depicting the Bee Branch watershed, its hydrology, and areas that are frequently flooded. She said the Bee Branch had been buried decades ago, and subsequent city development resulted in insufficient stormwater conveyance capacity. She said there have been seven disaster declarations covering these areas of Dubuque in the past 10 years. Based on a 2009 Federal Emergency Management Agency (FEMA) study, 1,373 homes and business in the Bee Branch watershed are prone to flooding. Goodman said this includes 70 businesses that employ over 1,400 people and have over $500 million in annual sales. She showed the Board a series of photographs of flooding and flood damage in Dubuque as a result of inadequate stormwater conveyance capacity. Goodman said estimated damages due to disasters over the past 12 years total nearly $70 million. When analyzing the cost of adding culverts to enhance stormwater conveyance, city planners found that the cost of the culverts would be greater than the cost of "day-lighting" the Bee Branch. The resulting Bee Branch Watershed Flood Mitigation Project includes the following improvements:

- Carter Road Detention Basin
- West 32nd Street Detention Basin
- Lower Bee Branch Creek Restoration
- Historic Millwork District Complete Streets
- Flood Mitigation Gate Replacement
- Upper Bee Branch Creek Restoration
- 22nd Street Storm Sewer Capacity Improvements
- North End Storm Sewer Capacity Improvements
- Kaufmann Avenue Storm Sewer Capacity Improvements
- Flood Mitigation Maintenance Facility
- Bee Branch Creek Railroad Culverts
- Bee Branch Healthy Homes Resiliency Program
- West Locust Storm Sewer Capacity Improvements
- Water Plant Flood Protection
- Impervious Surface Reduction (Green Alleys)

In addition to the HUD funding, Goodman said $98.5 million in state funding is supporting the 12-phase project. Once implemented, she said it is estimated that the project will prevent $582 million in damages over the 100-year design life of the project and create an incentive for individuals and businesses to reinvest in a vital area of the community. Goodman said that, once implemented, the combined project phases will reduce the volume of stormwater, slow the rate and timing of stormwater flow through the upper watershed, increase safe stormwater conveyance through the flood-prone area,

and provide flood proofing for Dubuque's potable water treatment plant. Goodman provided a series of maps and renderings depicting the various project phases as well as photographs of the Lower Bee Branch Creek restoration work already completed. She said work on the Upper Bee Branch Creek restoration is currently underway and she noted the HUD resiliency grant is funding some of the railroad culvert work on this project phase. The Upper Bee Branch Creek restoration will include bio-swales, prairie grass and tree plantings, and a trail system along the creek shore connecting to the 26-mile Heritage bicycle and hiking trail between Dubuque and Dyersville, Iowa.

Goodman said over 50 percent of Dubuque's residents live or work in the Bee Branch watershed. She said 85 percent of the properties in the watershed are historic, with 57 percent being over 100 years old. Goodman said the neighborhoods are largely comprised of affordable, workforce housing. Many residents are low-income and have the least ability to recover from repetitive flood losses. The Bee Branch project includes improvements to community green space and neighborhood mobility. Given the age of the housing stock, Goodman said since 1996 Dubuque has received funding from the HUD Healthy Homes Program to reduce lead hazards in over 1,000 homes. The city has incorporated the lead abatement efforts along with weatherization, public education, and contractor training efforts. Goodman shared a map depicting the occurrence of elevated blood lead levels in children less than six years old based on results collected since 1996. These occurred primarily in the Bee Brand watershed. Goodman said Dubuque conducted a need-based assessment on 191 properties and found the most common hazards in homes included dampness and mold growth, electrical issues, and the presence of lead paint. Goodman said much of this housing stock work aligns with the drainage of the Bee Branch watershed and she showed a map depicting this.

Goodman said the recently awarded HUD resiliency grant will fund 323 lead and healthy homes interventions. The HUD grant also includes funding to assist Bee Branch Watershed residents or property owners in repairing and flood-proofing homes. This will fund:

- Water and sewer service
- Furnace replacement
- Water heater replacement
- Basement window/mold and mildew remediation
- Lead remediation
- Soil modification
- Lateral connection repairs
- Sump pumps
- Downspouts

Goodman said $8.4 million in HUD resiliency funding, $4.2 million from the HUD CHANGE program, and $3.2 million from the HUD Lead and Healthy Homes program will leverage additional private for a total investment of $15.8 million. She said private investment will leverage the HUD funding to generate approximately $30 million toward neighborhood revitalization.

Goodman said the flood mitigation improvements of the project will be completed over a six-year period, with the green alleys completed over a 20-year period. She said the state funding for the project is to be dispersed over a 20-year period. Consequently, the improvements completed in the first few years will be funded through the issuance of debt with the principal and interest to be paid off in large part using the annual state flood mitigation disbursement. By year seven, the annual state funding disbursement will be greater than the amount required to service the debt. Therefore, the city will be able to use the remaining funding to build the green alleys.

In response to a question from Robert Stout, Weber said the governance of the IWA is based on communication among the multiple program partners. He said the partners are sensitive to the needs of local communities and the WMAs are the backbone of program governance. Weber said the WMAs are established in Iowa statute and they have seen a high rate of participation from local government in them. Weber said the WMAs do not have taxing or regulatory authority, but serve as more of a coordination body. Goodman reiterated that local residents have been involved in creating the Bee Branch project in Dubuque. In response to a question from Dan Baumann, Goodman said Dubuque did demolish some homes as a part of the project. In response to a question from Tim Yager, Weber said the IWA project partners have coordinated with watershed groups in some of the adjacent states. Robert Stout pointed out that the Grand River has been a focus in Missouri and is a shared watershed with Iowa. In response to a question from Jim Fischer, Weber said the existing baseline data is limited and, with new continuous monitoring, a new baseline is being established. With the enhancements, Iowa will be monitoring 80 percent of the water exiting the state. Weber said monitoring shows that recent nutrient loading has been high with high flows, but a longer period of record is needed to show changes and trends. In response to a question from Stout, Weber said the watershed included in the IWA project were selected based on past disaster declarations, infrastructure needs, unmet environmental needs (303(d) listing, nutrient data, biological data), and other factors. In response to an additional question from Stout, Weber said the HUD resiliency grant funding will flow through the Iowa Economic Development Authority to the sub-recipients.

National Integrated Drought Information System (NIDIS)

Courtney Black provided an overview of the National Integrated Drought Information System (NIDIS) and the Midwest Drought Early Warning System. NIDIS was authorized in 2006 after a recognition that better informed and more timely drought-related decisions can reduce costs. Black said the goal of NIDIS is to enable the nation to move from a reactive to a more proactive approach to managing drought risks and impacts. She said Congress reauthorized NIDIS in 2014 and part of the charge contained in the reauthorization was a call for the development and expansion of regional drought early warning systems.

Black said NIDIS operates similarly to UMRBA in that it works with many other agencies at the federal, state, and local level. She said NIDIS is a program of the National Oceanic and Atmospheric Administration (NOAA) designed to bring drought information, research, education, policy, and networking together. NIDIS seeks to foster leadership and networking among all sectors of the economy and produce services to monitor, forecast, plan for, and cope with the impacts of drought. Black said NIDIS supports drought research related to indicators, risk assessment, and resilience. They are also developing educational resources, interactive systems, and tools to promote sound decision making, drought awareness, and response. Black said one of the strategies for accomplishing these goals is the development of early warning systems.

Black showed the Board a national map indicating where NIDIS is creating regional drought early warning information systems (DEWS). UMRBA states are in the Midwest DEWS which is being launched in 2016 along with the Pacific Northwest DEWS. NIDIC plans to eventually create DEWS that cover the entire country. Black said a drought early warning system is designed to identify climate and water supply trends and thus to detect the emergence or probability of the occurrence and likely severity of drought. This information can reduce impacts if delivered to decision makers in a timely and appropriate format and if mitigation measures and preparedness plans are in place. She said with careful coordination at local, regional and national levels, stakeholders can monitor various early warning indicators and implement more efficient and effective drought-relief interventions.

Black said the objectives of the Midwest DEWS is to provide a forum for a diverse group of federal, tribal, state, and local stakeholders that represent the water and land resource management communities, to strategize and develop appropriate, relevant, useful, and readily available drought, climate, weather,

and water-related information. The Midwest DEWS will also seek to develop an understanding of the existing observation and monitoring networks, data, tools, research, and other planning and mitigation resources available the system. They will also identify the economic sector-specific and geographic needs for future monitoring, prediction, planning, and information resources. Black said the Midwest DEWS planning process started at the Midwest Climate and Agriculture Workshop in Champaign, Illinois on September 29 through October 1, 2015. There were also Midwest Climate Outlook and DEWS planning workshops in Louisville, Kentucky on November 3, 2015 and in Bloomington, Minnesota on November 5 and 6, 2015. Black said the kick-off workshop for the Midwest DEWS was held in St. Louis, Missouri on February 9 – 11, 2016. She noted that NIDIS is hoping for additional engagement from the navigation sector in future discussions. Black said they are working on the development of a strategic plan for the Midwest DEWS. In the kick-off meeting, Black said four themes emerged from discussion: access to data and information; coordination and relationship development; data delivery; and policy and governmental support. Black said resources currently available include the Midwest Region Quarterly Climate Impacts and Outlook and the Midwest webinars offered through regional climate centers.

Black said NIDIS is also working on the integration of data for drought planning and vulnerability assessments. This work includes the collection of drought impact data from all sectors (including ecosystems), and collection of adaptive capacities or best management practices. The resulting information supports local, regional, state, and sector-specific drought vulnerability assessments and supports development of drought plans, triggers, and consistent messaging at the onset, during, and post drought. Black showed the Board a map of Colorado depicting vulnerability assessment work completed in the state.

Black said NIDIS is also participating in work to better understand the ecological impacts of drought. Ecological impacts include effects on biodiversity, ecosystem function, and ecosystem services. Black said there is a relative lack of planning and preparation for the ecological impacts of drought. She said the current draft definition of an ecological drought is a deficiency in water available that drives ecosystems beyond ecologically significant thresholds and triggers impacts that often have surprising implications for both natural and human systems.

NIDIS is working with organizations involved in operating existing monitoring and observation networks to improve seasonal forecasting and user understanding of data. Soil moisture monitoring was identified as the highest priority need. Research is being conducted on hydrologic processes including the relationship of surface water flows to water quality and groundwater levels and further characterization of groundwater in local areas.

Black shared information regarding NIDIS participation with other federal agencies on forecast-informed reservoir operations and provided the example of adjustments made to operations of Lake Mendocino on the Russian River in California. She said modern observation and prediction technology can reduce risk by supporting decisions of greater reservoir drawdown in advance of storms of improve supply reliability by permitting runoff to be retained for water supply while still meeting flood protection limits. Black said an interagency steering committee of representatives from project partner agencies is studying methods to better balance flood control and water supply needs with a goal of improving water supply reliability downstream while enhancing flood risk reduction.

NIDIS is also working on enhancing drought education and public outreach. Black said this work includes development of messaging prior to the onset of drought, marketing research on how to best convey messages to the public, and utilizing existing media resources including press, television, newspapers, social media, the internet, etc.

USACE MVD Mississippi River Geomorphology and Potamology Program

Barb Kleiss provided an overview of the Mississippi River and Tributaries Project (MR&T) Project's Geomorphology and Potamology Program. She said the program objectives are:

- To support and advance the Mississippi River Commission's potamology agenda
- To investigate a series of geomorphically related questions and problems that developed in the Mississippi River during the 2011 flood
- To support the Mississippi River Flowline Study
- To relocate, archive, and make available historical Mississippi River potamology reports for use in current decision making
- To conduct a series of system-wide investigations that will improve our understanding of the Mississippi River from the watershed perspective
- To involve and mentor a group of younger potamologists and river engineers and scientists and increase their familiarity with historical data and system-wide issues

Kleiss said current program tasks include system-wide efforts to evaluate existing data, create one-dimensional sediment transport modeling, and collection of field data. The potamology program is also involved in district-specific geomorphic projects, ecohydrology, geomorphic assessment (Lower and Middle Mississippi geomorphic assessment, Middle and Lower Mississippi River sediment budget, and next generation geomorphic assessment tool development), assessment of channel improvement features, and development of the Mississippi Valley Division geomorphic projects.

Kleiss shared with the Board a graphical depiction of the difference in perceived societal priorities in the different areas of the Mississippi River as it relates to navigation, flood risk management, and environmental issues. As an example, she said in the north there is a general concern about habitat flooded within the active channel, while in the south they are concerned about habitat being isolated from the active channel through channel incision. Kleiss showed a chart depicting the distance between the Mississippi River floodplain and levees, showing a much greater distance in the southern portion of the river. She also described a study including the collection of bed sediment samples from Grafton, Illinois south and highlighted the importance of sediment particle size and roughness in determining sediment transport. The Corps used the same collection pipe used in an 80-year old study and found a decrease in sediment particle size as compared to historic data.

Kleiss highlighted the Corps efforts related to ecohydrology in the lower Mississippi River. They have used a small unmanned aircraft to conduct remote, high resolution classification of batture vegetation and secondary channel connectivity. Kleiss said the potamology program is also evaluating the ecological value of sandbars in the lower river, identifying endangered pallid sturgeon origin using stable isotope chemistry, applying telemetry to evaluate movement and habitat use of pallid sturgeon, and conducting an Island 62 multidisciplinary study. Kleiss showed the Board a map with the deployment location of 34 new isotope water sensors. She showed a picture of new receivers deployed at the Old River Control Structure in Louisiana.

Kleiss provided additional detail on the Island 63 ecohydrology study. The study purpose is to better understand how river regulation influences patterns of water flow, sediment transport, and habitat complexity. Kleiss said the study objectives and deliverables include to:

- Identify ecotones, which are those areas of hydrologic connectivity transferring water and its constituents between the river channel and floodplain.

- Evaluate seasonal relationships between hydrogeomorphic process and biodiversity of fish and other aquatic organisms at representative reaches in the lower Mississippi River.
- Identify environmental and geomorphic variables that can be used to predict biotic responses of threatened and endangered species, commercial, and recreational species to changes in habitat complexity.
- Determine the relative importance of allochthonous versus autochthonous organic matter along a connectivity gradient in the lower Mississippi River.
- Monitor cycling of nutrients between the floodplain and channel.
- Recommend ecosystem restoration measures to mitigate adverse impacts of river regulation.

Kleiss shared a topographic map of the Island 63 reach depicting the depths of the river channel as well as the depth of a chute with a notched dike in the reach.

Kleiss showed the Board a series of graphic depictions of the connectivity of a few example sites at different river stages. She said a significant portion of the potamology program's budget is devoted to geomorphic assessment to identify areas of aggradation and degradation. This work is important in understanding what impacts restoration projects might have in a given area.

Kleiss said the potamology program is also involved in work to assess the major causes of land loss in coastal Louisiana. The range of causes includes subsidence, sea level rise, barrier island degradation, storms, herbivory, oil and gas development, canals, levee systems, saltwater intrusion, sediment reduction, and cypress harvesting. Some of these factors combine to result in most sediment being distributed before entering the Gulf of Mexico.

Kleiss said that the Corps' creation of a sediment budget for the lower Mississippi River has turned out to be an extremely valuable exercise. She said they are now working to set this effort up for the middle Mississippi River and the lower Missouri River. By working with a team of interagency experts and some new data sources, Kleiss said it is now known that for the period from 2008 to 2012, only 46 percent of the water, 19 percent of the total suspended load and 1.4 percent of the suspended sand that are in the river at Tarbert Landing at river mile 493 reach Head of Passes at the Gulf. Much of this material is "lost" downstream from Baton Rouge by either exiting the river through numerous small distributaries or being stored in the channel. Kleiss said this tells us that there is not as much material in the river as we previously thought. She said this also shows that we need to study the wetland areas in the lower river which are receiving river water and river-borne sediment, because they are not building wetlands nearly as fast as we might anticipate, as the lower Mississippi Delta is one of the areas losing land at a very high rate. Kleiss said this is likely due to high subsidence rates in the lower river, and the fact that most of the sediment is very fine and easily re-suspended by coastal processes.

Kleiss said this work has highlighted many uses for suspended sediment measurements. The data is important for numerical model calibration, validation, and interpretation. It can also be used in the development of broad scale sediment budgets for the Mississippi River system, particularly with respect to the delivery of fine sediments. Kleiss said long-term changes in sediment loads would also be beneficial to better understanding climate change impacts. The suspended sediment measurements can provide additional information about potential inputs such as nutrients in the basin as well as the impacts of changes in land use. Sediment measurements are also important in the characterization of dam capacity and can be valuable in environmental studies, particularly those related to water quality and nutrients. Kleiss said the Corps' work to date has yielded some preliminary recommendations, including:

- Suspended sediment samples on the Mississippi River should be depth integrated samples.

- Gradations for the sand component of measurements of suspended sediment will be analyzed.
- Bed material samples will be collected at each vertical whenever suspended sediment measurements are collected.
- Suspended sediment measurement data should be collected as frequently as funding allows. The nation-wide USGS collection program includes collecting samples 14 times per year. Sampling established under the potamology program provides for sampling 18 times per year, which equates to once a month plus six additional sampling efforts during high water events.
- All the recommended field and laboratory techniques should follow USGS standard operating procedures.

Kleiss showed the Board a map of suspended sediment sampling locations on the middle and lower Mississippi River. She said no consistent suspended sediment collection currently exists on the lower Mississippi River. In response to a question from Bryan Hopkins, Kleiss said the consistency of very limited datasets is a challenge.

In response to a question from Mike Klingner related to the Mississippi River Flow Line Study, Kleiss said MVD is currently obtaining hydrology data from the National Weather Service. She said MVD will provide an update to the Mississippi River Commission in August, and expects to complete the study in March 2017.

Water Resources Development Act

Robert Stout said the House Transportation and Infrastructure (T&I) Committee and the Senate Environment and Public Works (EPW) Committee are both advancing 2016 Water Resources Development Acts (WRDA) measures. Stout noted that UMRBA has been providing input regarding provisions of the respective WRDA bills and he asked Kirsten Mickelsen to provide an update. Mickelsen said the Senate EPW Committee passed S. 2848 on April 28, 2016 and the House T&I Committee passed H.R. 5303 on May 23, 2016. Mickelsen said the anticipated schedule for advancing the WRDA bills in not entirely clear, but Congressional staff expect full House and Senate consideration this summer, with a potential conference committee in the lame duck session after the November elections.

Mickelsen said the Senate EPW WRDA bill contains provisions related to the Corps' project partnership agreements (PPA) requirements, limiting the operations, maintenance, repair, replacement and rehabilitation (OMRR&R) obligations of nonfederal project sponsors and allowing for the value of donated goods to be accounted in the total cost share match. The Senate EPW bill limits OMRR&R obligations to 10 years following the Corps' determination that a project's physical features are successful. The House T&I measure includes the OMRR&R language supported by UMRBA, TNC, and Audubon. Neither the House T&I nor Senate EPW WRDA measures include a provision for resolving the indemnification requirement. Mickelsen noted that the navigation industry through the Waterways Council, Inc. (WCI) has strongly opposed authorization of a public-private partnership (P3) project including lockage fees on the Illinois Waterway. She said neither the House nor Senate bill contain provisions authorizing such a P3.

Mickelsen said the Senate EPW bill (S. 2848) contains the following provisions of note:

- Section 1028 – would expand the authorization of the Corps' Planning Assistance to States (PAS) program to include regional and national consortia of states.
- Section 1037 – would modify some reporting requirements in WRDA 2014 for studies exceeding 3 years or $3 million.

- Section 2002 – would allow nonfederal interests to receive credit or reimbursement for carrying out the federal operations and maintenance responsibility for structures associated with authorized hurricane and storm damage risk reduction projects that bisect an inland or intracoastal waterway.
- Section 2004 – would reaffirm requirements that dredged material disposal meets applicable state water quality standards.
- Section 2015 – would establish a pilot program authorizing a nonfederal interest to maintain a federal navigation project with its own equipment and personnel and be eligible for reimbursement.
- Section 2017 – would authorize placement of dredged material in a location that does not meet the federal least cost standard if any additional upfront costs would be offset by the resulting environmental, flood protection, and resiliency benefits.
- Section 3001 – would authorize the Secretary of the Army to increase the level of protection when rebuilding a levee under P.L. 84-99 if the additional costs are paid by the nonfederal interest and the Chief of Engineers determines it is in the public interest, including consideration of whether the same levee has been rebuilt multiple times, whether there is an opportunity to reduce risk of loss of life and property, and whether there is an opportunity to reduce the life cycle rehabilitation costs.
- Section 4010 – would authorize a study of levees along the Upper Mississippi and Illinois Rivers to evaluate the flood damage risks on a system-wide basis (rather than local basis) to justify projects. The purpose of the study is to address the fact that rehabilitation of a levee at a single location often cannot be cost-justified, but each location is an integral part of a levee system that provides essential flood protection benefits.
- Section 6001 – would authorize a feasibility study for the Upper Des Plaines River and Tributaries project in Illinois and Wisconsin.
- Title VII – deals with safe drinking water and clean water infrastructure.

Mickelsen said the current House T&I water resources authorization measure (H.R. 5303) contains the following notable provisions:

- Section 109 – would authorize a pilot program to carry out projects for the beneficial use of dredged material, including projects to reduce storm damage to property and infrastructure; promote public safety; protect, restore, and create aquatic ecosystem habitats; stabilize stream systems and enhance shorelines; promote recreation; and support risk management adaptation strategies.
- Section 114 – would authorize the strengthening, raising, extending, or other modification of flood control work threatened or destroyed by flooding after consultation with the nonfederal sponsor and if requested and agree to.
- Section 119 – would authorize the Comptroller General of the United States to conduct a study of the cost and benefits of expanding, reducing, or maintaining the current configuration with respect to the size and makeup of the federally owned hopper dredge fleet.
- Section 125 – would authorize credit or reimbursement for a discrete segment of a flood damage reduction project before final completion of the project if it is determined that the discrete segment meets certain requirements, is technically feasible, and environmentally acceptable.
- Section 126 – would authorize regional organizations of states to participate in water resource planning programs.
- Section 127 – would authorize regional districts of state government to participate in levee safety programs.
- Section 134 – would require the establishment, maintenance, and availability of a database on maintenance dredging carried out by federal and nonfederal vessels.

- Section 136 – would require the Secretary of the Army to make publicly available all data related to the planning, design, construction, operations and maintenance of water resources development projects as well as water quality and water management of projects owned, operated, or managed by the Corps.
- Section 137 – would establish a process for de-authorizing water resource development projects that have not received construction funding in seven years.
- Section 201 – would authorize a feasibility study for a flood damage reduction project in the City of Dubuque, Iowa.
- Section 202 – would authorize an expedited feasibility study for a flood risk management project on the Des Moines and Raccoon Rivers in Iowa.
- Section 401 – would authorize a flood risk management and ecosystem restoration project on the Upper Des Plaines River and Tributaries.

Stout invited any partners in attendance to provide their perspectives on the water resources authorization legislation. Mike Klingner said the Upper Mississippi, Illinois, and Missouri Rivers Association (UMIMRA) is appreciative of UMRBA's leadership on basin issues and in particular the Association's support of the Navigation and Ecosystem Sustainability Program (NESP). He said UMIMRA continues to support implementation of the Upper Mississippi River Comprehensive Plan and is closely following the WRDA legislation flood risk/control provisions given the importance of the issue. Klingner said UMIMRA also continues to support the implementation of NESP without additional study. He said UMIMRA members have strong interest and support for the Iowa Watershed Approach and how it is attempting to address flood risk/control issues with other benefits. Klingner said UMIMRA is also interested in whether public-private partnerships might be possible on levees. He said UMIMRA is supportive of efforts to store more water in upland areas in order to reduce peak flows in the tributaries.

Mark Harvey said the Neighbors of the Mississippi (Neighbors) support the development of a hydraulic model for the Upper Mississippi River System. He said the Neighbors have concerns with some of the provisions of Section 4010 of the Senate Environment and Public Works Committee WRDA bill, particularly the reference to the use of data from the Upper Mississippi River Comprehensive Plan. He asked that the states consider this concern. Harvey said the Neighbors support a flood risk study on the Upper Mississippi River and think such a study should include the major tributaries and address the Mississippi River from the Twin Cities to Cairo, Illinois. Harvey said the Neighbors believe such a study should embrace transparency and the involvement of all interests. He said the Neighbors appreciate the opportunity for open communication among basin partners.

Olivia Dorothy said American Rivers and the Nicolet Island Coalition have developed broad goals related to the WRDA bills. She noted that a fact sheet containing these goals was available at the back of the meeting room. Dorothy said the groups have been working with members of Congress to get some of these goals incorporated in the WRDA bills. She noted that portions of their flood risk goal related to improvements to the P.L. 84-99 program are included in Section 114 of the House bill. She said the intent was to facilitate levee setbacks, but she said a drafting error has resulted in an unintended consequence they will be working with members to fix. Dorothy said Section 136 of the House bill includes some of their transparency goals related to availability of Corps' data. Dorothy said the groups' proposal to better coordinate in states through the Fish and Wildlife Coordination Act by developing criteria and metrics for the Corps to use is also included in the House bill. She said they are supportive of the provisions supported by basin partners to resolve challenges with nonfederal partner project partnership agreements and said they would be interested in discussing whether the House or Senate provisions related to OMRR&R are preferable. Dorothy said American Rivers opposes Section 4010 of

the Senate bill related to a flood risk study on the UMRS due to the cost-benefit provision in subsection D as well as the reference to the Upper Mississippi River Comprehensive Plan.

Jim Fischer noted that both the House and Senate bills contain provisions related to the least cost option for placement of dredged material. Given the states' interest in channel maintenance, he suggested that UMRBA track these provisions.

USGS Update

Leon Carl informed the Board that, while it was not included in the Administration's budget summary, the President's budget includes funding for a Climate Science Center for the Midwest with a proposed jurisdiction covering Illinois, Iowa, Minnesota, Missouri and Wisconsin. Carl said USGS is also reorganizing in the Midwest Region, and this includes combining the Water Science Centers in Illinois and Iowa as well as the centers in North and South Dakota. He said USGS believes this reorganization will improve service to the agency's customers. He said the Water Science Centers will initially retain their state liaisons, sites, and staff. However, the combination of administrative functions will provide efficiencies.

FEMA Update

Michael Scott said FEMA is accepting applications for the Pre-Disaster Mitigation Grant program through June 15, 2016 and each state has an allocation of approximately $500,000. Scott said the base allocations are at the state level, but there is additional funding available on a competitive basis and targeted to green infrastructure and climate change. He said applications for the competitive pool of grant funding are submitted through state emergency management agencies. Scott noted that FEMA was still operating a joint field office to assist with claim processing and other response efforts focused on the December 2015 flooding. Robert Stout expressed Missouri's appreciation for FEMA's efforts in response to the flooding. Stout said Missouri state agency staff is participating in a meeting today with FEMA representatives to discuss lessons learned from the winter flooding.

USFWS Update

Tim Yager informed the Board of the U.S. Fish and Wildlife Service's Monarch Butterfly Conservation Initiative that entails protecting the habitat of the species in Canada, Mexico, and the United States. Yager noted that the USFWS Midwest Regional Director Tom Melius traveled to Mexico this past winter for coordination meetings with the Mexican government focusing on conservation efforts. He said the agency is optimistic about future efforts and funding.

St. Louis District Update

Shawn Sullivan provided an update from MVS on the Corps' implementation guidance for the 2014 Water Resources Reform and Development Act (WRRDA) and the status of recovery efforts in response to winter flooding. Sullivan said the WRRDA implementation guidance determines how the Administration and agency will proceed under the new law in light of current policies and procedures. He indicated that the majority of the implementation guidance for the 2014 WRRDA has been completed and can be found at:
http://www.usace.army.mil/Missions/CivilWorks/ProjectPlanning/LegislativeLinks/wrrda2014.aspx

Sullivan said the 2014 WRRDA contains 22 provisions that are regionally significant for the Upper Mississippi River System and he provided information regarding these provisions and the status of implementation guidance for each, including:

WRRDA Section	Section Title	Status
1002	Consolidation of Studies	9 APR 2015
1006	Expediting the Evaluation and Processing of Permits	2 SEP 2015
1008	Expediting Hydropower at Corps of Engineers Facilities	9 NOV 2015
1013	Evaluation of Project Partnership Agreements	Pending
1014	Study and Construction of Water Resources Development Projects by Non-Federal Interests	4 FEB 2016
1015	Contributions by Non-Federal Interests	11 FEB 2015
1017	Acceptance of Contributed Funds to Increase Lock Operations	Pending
1018	Credit for In-Kind Contributions	16 DEC 2015
1020	Transfer of Excess Credit	4 NOV 2015
1036	Non-Federal Plans to Provide Additional Flood Risk Reduction	17 JUN 2015
1039c	Invasive Species	8 FEB 2016
1043	Non-Federal Implementation Pilot Program	Pending
2002	Project Delivery Process Reforms	Pending
2010	Upper Mississippi River Protection	6 OCT 2014
2013	Operation and Maintenance of Fuel Taxed Inland Waterways	24 NOV 2014
3012	Management of Flood Risk Reduction Projects	4 NOV 2015
3014	Levee Certifications	Pending
4002 b	Middle Mississippi River Pilot Program	4 NOV 2015
4002 c	Greater Mississippi River Basin Severe Flooding and Drought Management	6 APR 2015
5014	Water Infrastructure Public-Private Partnership Pilot Program	30 SEP 2015
6004 a(6)	Lucan Berg Pit, Illinois	6 APR 2015
7001	Annual Report to Congress	18 SEP 2015

Sullivan highlighted a few of these sections in greater detail. He said Section 4002b authorizes the ability to address navigation and aquatic ecosystem restoration projects using the continuing authorities program (CAP) or feasibility study, while Section 4002c authorizes a study to identify federal actions on new or existing projects to manage flood risk and minimize effects of drought and floods on navigation. Sullivan said 2014 WRRDA also includes provisions related to alternative financing. Section 2015 authorizes contributions by nonfederal interests, as some have expressed interest in contributing funds to enable work to occur more quickly that it would with only federal funds. As an example, Sullivan highlighted the Miami Harbor Deepening Project where the nonfederal sponsor is providing all of the funding required to implement new construction work for the project. Section 5014 authorizes a water infrastructure public-private partnership pilot program. Sullivan said Section 7001 of WRRDA creates a new process for the recommendation of projects for potential Congressional authorization. This includes projects with completed feasibility studies, proposed feasibility studies, as well as proposed modifications to projects or studies currently authorized. He said this section was largely in response to the rules limiting Congressionally directed spending. Sullivan noted that there is an opportunity for partners to submit projects for consideration through September 2016.

Sullivan provided an overview of the magnitude of the December 2015 flooding and said record levels on the Mississippi River were reached at Cape Girardeau, Thebes, and Thompson Landing. The second highest flood of record was reached at Carlyle Lake and Jerry F. Costello Lock and Dam and record levels were reached on the Meramec River. Sullivan said 41 levee districts have requested rehabilitation assistance, with seven levees sustaining breaches (six nonfederal and one federal levee). He said ten levee systems were previously damaged in summer 2015 flooding and nine of those reported additional

damages due to the winter flood. Sullivan said there were impacts to the Mississippi River bankline and damages to components of the locks and dams.

Sullivan said the damage assessments for the winter flooding have been completed. The Corps continues to conduct channel surveys to monitor for shoaling. Sullivan said project information reports for P.L. 84-99 rehabilitation projects are pending approval. He said bankline repairs at three locations were the Corps' first priority and are complete and an interim level of protection has been established. Given the lack of supplemental appropriations, the Corps has prioritized appropriated funding to conduct critical repairs. Sullivan said the federally constructed levees prevented more than $2.4 billion in damages. He showed the Board a map depicting the location of impacted levees and bankline repair projects

Sullivan said flood recovery needs exceed the existing FY 2016 appropriations. Consequently, the Corps is funding the highest priority projects with operation and maintenance (O&M) appropriations. He said the Corps is confirming that projects selected can be executed in fiscal 2016 as they are seeking to reduce risk as soon as possible with available funds. Sullivan said it is possible that, if the capability exists to reprogram funds, additional projects may receive resources as long as they are confirmed to be able to be executed in FY 2016.

In response to a question from Rick Gosch, Sullivan said the Corps is still looking at alternatives for addressing the Len Small levee breach that will meet required benefit-to-cost ratios. Col. Anthony Mitchell said, while progress has been made in flood recovery, MVS is limited by available funding. Mitchell said MVS has been aggressive in pursuing recovery projects in preparation for increased potential of spring flooding. In response to an additional question from Gosch, Don Balch said he would check to see if the Corps could share the project information reports (PIRs) for recovery projects. Col. Mitchell said it might not be possible to restore the previous level of protection for the Len Small levee, and indicated the recovery may require some give-and-take.

Water Quality

Great Lakes to Gulf Virtual Observatory

Dick Warner said the National Great Rivers Research and Education Center (NGRREC) looks for opportunities to add value to existing work of partner organizations. Warner said NGRREC saw such an opportunity around the issue of water quality monitoring and assessment given the silos that exist with organizations providing water quality information. He said NGRREC, the Illinois-Indiana Sea Grant, and the National Center for Supercomputing (NCSA) partnered in the development of the Great Lakes to Gulf Virtual Observatory (GLTG) to provide access to water resource information from the Mississippi River and featured watershed in the Mississippi River Basin. Warner said NGRREC has coordinated with state agencies in the UMR states in creating the GLTG. He said the GLTG is addressing data frontiers by integrating data from multiple sources into a platform allowing users to effectively query available data.

Ted Kratschmer said the initial focus of GLTG has been on nitrate monitoring in areas with long term records or continuous monitoring. He provided the Board with a demonstration of the functionality of the GLTG website at: http://gltg.ncsa.illinois.edu/ Kratschmer said the GLTG home page gives users access to all of the Observatory's available data points. The available data is organized by data source and river reaches. Kratschmer showed a series of examples of the various data sources and data layers. He demonstrated the search page where users are able to create unique data sets for the specific sites, sources, and parameters of interest. Users can then download their selected data sets in common file formats such as CSV and JSON.

Warner said after launching with a focus on nutrients and water quality, GLTG will expand to include additional types of environmental monitoring data. He acknowledged the Walton Family Foundation and McKnight Foundation for providing funding and said GLTG is charged to work at three different spatial scales. The first is in support of state nutrient reduction strategies and they have worked extensively with the State of Illinois to address data gaps identified in the state strategy. Secondly, Warner said efforts looking at where GLTG can be helpful at the watershed scale are underway. The third spatial scale is main channel and Warner said UMRBA partners can provide helpful input here given the different focus, capacities, and needs of various states. In response to a question from Bryan Hopkins, Warner said GLTG is beginning to do some estimations of nutrient loading.

UMRBA Water Quality Projects Update

Dave Hokanson provided an update regarding the UMR Harmful Algal Bloom (HAB) Work Group established by the Board in November 2015 to explore the issue of HABs on the UMR and evaluate whether additional steps are needed to appropriately address the issue. Hokanson said approximately 30 individuals have participated in the HAB Work Group representing state Clean Water Act and Safe Drinking Water Act programs, USEPA, USGS, the Corps, USFWS, drinking water systems, NGGREC, and UMRBA. Hokanson said the Work Group has held three conference call meetings so far. The group has developed a draft compilation of capacities such as program scope, staffing, monitoring, analysis methods, laboratory, data, etc. They have also exchanged press releases and communication materials related to HABs and are developing a call list and communications plan. Hokanson said the HAB Work Group will meet on June 2, 2016 to refine objectives and products as a part of the Water Quality Executive Committee (WQEC) and Water Quality Task Force (WQTF) joint meeting. He said the group is continuing to exchange information and identify data sharing opportunities. He said they are also expecting to soon review a HAB response plan from the Ohio River Valley Water Sanitation Commission (ORSANCO), which was revised in response to the HAB event last year on the Ohio River.

Hokanson briefed the Board regarding the pilot implementation in Minnesota and Wisconsin of the *Upper Mississippi River Clean Water Act Recommended Monitoring Plan*. He said this pilot is being conducted on UMR reaches 0-3 in collaboration with the Minnesota Pollution Control Agency, the Minnesota Department of Natural Resources, the Minnesota Department of Health the (Twin Cities) Metropolitan Council, the Wisconsin Department of Natural Resources, the Wisconsin State Laboratory of Hygiene, and UMRBA. Hokanson noted that the Plan has been slightly modified for the purposes of the pilot. Chemistry sampling began in May 2016 and work on the water quality viewer and field operations manual has continued. Hokanson said biological sampling begins in July 2016. He said upcoming work included documenting the outcomes both in terms of water quality results and the mechanics of implementing the coordinated monitoring approach. Hokanson provided an example of the online water quality viewer primarily intended to support pilot implementation. He said UMRBA staff has also facilitated development of a SharePoint site to support this and other work groups by allowing participants access to working documents, background information, and links to key resources. In response to a question from Tim Yager, Hokanson said biological sampling includes fish, macroinvertebrate, and vegetation assemblages.

Navigation and Ecosystem Sustainability Program (NESP)

Scott Whitney presented information regarding the scope of an update of the navigation economics and program cost estimate for the Navigation and Ecosystem Sustainability Program (NESP). Whitney noted a number of major changes that have occurred since the 2008 economics re-evaluation, including:

- United States and world recovery from severe recession
- Shale oil boom resulting in rail and waterway movement of oil

- Panama Canal expansion nearing completion (Institute for Water Resources estimates this will significantly lower the delivery cost of agricultural exports to Asia and other foreign markets)
- USDA corn forecasts estimate Chinese imports will increase at average annual rate of 7.4 percent through 2024 and the United States' share of the world corn market will grow from 37.5 percent to 44.6 percent in 2024.
- Maritime Administration M-35 and M-55 Marine Highway Corridor designations and focus on container shipping
- Increasing congestion on highways and railroads
- Aging infrastructure and decreasing reliability

Whitney provided details from the proposed Level 3 economic re-evaluation report (ERR) that the Assistant Secretary of the Army for Civil Works Jo Ellen Darcy provided to Congress. This report included no scope changes, no reformulation, and no additional National Environmental Policy Act (NEPA) work. The report would include a recommendation based on a central scenario, but would include high, low, and central scenarios. Whitney said the economic system model will not explicitly model other modes of transports. He said the anticipated schedule for the report's development was 36 months with an estimated cost of $6.9 million.

Whitney said the report would use a modeling approach to update the economics inputs such as the traffic demand forecast, global grain model and non-grain forecasts, and the transportation rates and demand forecasts. If the effort was funded, the Corps would also update engineering reliability analysis of existing locks and estimate reliability of new locks. Whitney said cost estimates would also be updated for ecosystem restoration and monitoring projects as well as for the seven locks, mooring cells, and switchboats authorized under NESP. He said the engineering reliability could be extremely important as it will likely increase the benefit-to-cost ratio for the program due to decreasing reliability.

Whitney said the purpose of the report is to ensure NESP is eligible for inclusion in the President's budget. In response to a question from Dru Buntin, Whitney said he was not aware of any potential for reprogrammed funding for the report unless it was included in the 2017 work plan. In response to a question from Ken Westlake, Ken Barr said no additional NEPA work was included due to no significant changes in conditions have occurred.

Olivia Dorothy shared some concerns from the perspective of the Nicollet Island Coalition. She said the group said an integrated implementation plan should be developed focusing first on small scale navigation efficiency improvements before other NESP components should be considered for implementation. Dorothy said they are also concerned that the effort will focus too much on the mid- and high-level traffic forecasts, thus rejecting the entire range and existing cost-benefit requirements. Dorothy noted that the existing cost-benefit ratio for NESP is below the required thresholds.

Brad Walker shared comments regarding NESP on behalf of the Missouri Coalition for the Environment (Coalition). He said we are approaching the ten-year anniversary of NESP's authorization in the Water Resources Development Act of 2007. Walker said this authorization was completed without the benefit of the 2008 economic re-evaluation report that showed the 1,200 foot locks would not provide sufficient benefit for the cost. Walker said little has changed over the past decade and no new studies have been completed by the Corps. He added that the Assistant Secretary of the Army for Civil Works did not approve a Chief's report for NESP or the 2008 economic re-evaluation report. He said that, from the perspective of the Coalition, proponents of NESP omit facts from their narrative and elected officials are largely uninformed about NESP. Walker said the Coalition is opposed to any additional funding being devoted to NESP as they do not believe that an update of the 2008 economic re-evaluation would be adequate and they believe that expanding the lock system would be a waste of public funds.

Navigation

Improving Channel Maintenance Management

Kirsten Mickelsen provided background information regarding UMRBA's focus on channel maintenance planning. She said state resource agency staff identified the need to proactively and strategically reengage in long term planning for channel maintenance activities after channel closures resulted in emergency measures in 2014. UMRBA quarterly meetings in 2015 included discussion of the topic and the Association sent an April 21, 2015 letter to Corps leadership highlighting the need to reengage long term channel maintenance planning. The Corps' October 2, 2015 response and discussion at the February 23, 2016 meeting led UMRBA staff to work with the On Site Inspection Team (OSIT) members to identify the most pressing challenges. Mickelsen directed the Board's attention to pages J-1 to J-8 of the agenda packet for a copy of these. Mickelsen noted that information was raw and reflected input submitted by staff, and therefore did not necessarily reflect the position of agencies. She said that, while UMRBA staff did not prioritize the information, there was agreement on the need for long-term planning. She said the purpose of today's discussion is to get input from the Board regarding which recommendations were priorities for addressing in the near and long term.

Mickelsen said state and federal restrictions on placement of dredged material in the floodplain were common issues highlighted. A number of issues regarding beneficial use of dredged materials were identified, including the federal low cost standard, the potential for in-water placement, and the need to promote market opportunities. Mickelsen said the OSIT members also recommended streamlining the real estate acquisition process so the Corps is able to take advantage of opportunities to acquire needed placement sites. She said some recommended the creation of a sediment budget in order to better understand tributary inputs as well as the impact of federal and state watershed efforts as they relate to sediment. Understanding the impacts of increased flooding frequency on channel maintenance was identified as a need.

Mickelson said a number of information needs were identified, such as improving the real-time availability of information regarding placement site capacity, developing a sediment transport model, creating a HEC-RAS model for the UMRS, and conducting an ecological assessment regarding removal of sediment from the floodplain. Mickelsen said the OSIT recommendations also addressed interagency coordination. Their recommendations included using the OSITs for facilitating communication on priorities and lessons learned, and enhancing coordination of multiple Corps programs impacting channel maintenance.

Jim Fischer expressed his appreciation to UMRBA staff, Mike Griffin, and OSIT members for putting together the recommendations. Fischer said Wisconsin supports focusing initially on addressing the challenges to real estate acquisition, renewing long-term planning documents, further identification of information needs, and additional attention on facilitating beneficial use by looking at the federal Section 204 low-cost standard. Fischer noted that Wisconsin's memorandum of understanding (MOU) with the Corps regarding channel maintenance has expired and planning documents are over ten years old in some cases.

Mike Griffin said the restrictions on floodplain placement limit opportunities to use dredged material in ecosystem restoration projects such as island creation. Tim Yager said better understanding sediment sources and how to manage them is also important. Janet Sternburg said the agencies involved in soil conservation and other sediment management have not been involved in the discussion to date. She suggested including these agencies in future discussions. Fischer said the challenge related to using dredged material in ecosystem restoration projects will be determining when placing sediment in the channel has ecological benefit. Sternburg agreed that evaluating this would be important. In response to a question from Robert Stout, Brian Johnson said the Corps has evaluated this on at least one project.

Inland Waterway Users Board/Industry Update

Paul Rohde said the Inland Marine Transportation System Capital Projects Business Model from 2010 recommended the prioritization of navigation projects across the entire system, improvements in project delivery processes to insure on-time and on-budget completions, and the development of a funding mechanism to increase revenue. Rohde said many of the first two recommendations were included in the 2014 Water Resources Reform and Development Act. He noted some irony in the fact that, after years of industry support, Congress approved a 45 percent increase in the diesel fuel tax to 29 cents per gallon in the 2014 lame duck session as a part of the "Tax Increase Prevention Act of 2014." Rohde noted that the diesel fuel tax increase, the change in the Inland Waterways Trust Fund (IWTF) share to complete the Olmsted project, the 20-Year Capital Development Plan developed with support from the Inland Waterway Users Board (IWUB), and the completion of the Panama Canal expansion all offer opportunities for NESP. Rohde said challenges include the Congressional rules on "earmarks," competition for project funding, and proposals for lockage fees.

Rohde said the FY 2017 recommendations from the IWUB include spending down the IWTF given the anticipated revenue from the nine-cent fuel tax increase and investing $10 million in planning, engineering, and design (PED) for NESP. He said the IWUB 28th Annual Report from December 2015 recommended PED funding for LaGrange Lock and Dam and Lock and Dam 25 and further recommended expediting PED to move these project to construction-ready status so that NESP is queued up for Olmsted's completion or for when IWTF dollars become available. The IWUB also work with Corps staff to include these recommendations in the larger draft capital investment strategy. According to Rohde, the Corps leadership subsequently changed much of the strategy in its March 2016 version, which moves away from the prioritization strategy in the 2010 plan to focus more on completion of projects on the books as opposed to starting new projects. He said the 2016 plan is consistent in that it calls for the IWUB to collaborate with the Corps, but he noted that the IWUB was not afforded the opportunity to comment on the final plan submitted by the Administration to Congress.

Rohde said the Waterways Council, Inc. (WCI) is providing input to Congressional members as the 2016 Water Resources Development Act is developed. He said WCI is supporting changing the major rehabilitation threshold for IWTF cost-shared projects from $20 million to $50 million. WCI is opposing authorization of lockage fees in support of public-private partnership (P3) projects. Rohde said WCI supports authorization of two projects with completed Chief's Reports, the Calcasieu Lock in Louisiana and the Upper Ohio River Project. Rohde compared some of the provisions contained in the Senate and House WRDA bills. The Senate bill authorizes 25 projects and includes authorization of $6 billion for Safe Drinking Water Act projects. The House bill authorizes 28 projects and contains no municipal water provisions.

Rohde shared with the Board a map depicting the number of jobs depending on inland river transportation in the Pacific Northwest, Upper Mississippi, Ohio River, Lower Mississippi, and Gulf Intercoastal Waterway. These totaled over a half a million jobs, and Rohde said additional jobs would be created if we invest in infrastructure. Rohde said WCI remains firmly in support of NESP. They are pursuing Congressional outreach, media and public education, and grassroots activism in support of the program.

M-35 Route Action Plan

Kirsten Mickelsen said the U.S. Department of Transportation (USDOT) has increasingly recognized the value of the inland waterways in the national surface transportation network. She said congestion is an impediment of USDOT's goal of a seamless, interconnected transportation system of multiple modes. Mickelson said the agency is seeking to improve freight planning and coordination, target policies and investments to resolve freight congestion, and encourage innovative strategies for addressing first and

last mile connection issues. Mickelsen said the USDOT Maritime Administration vision for the America's Marine Highway Program is full integration of marine highway vessels and ports into the surface transportation system – including rivers, bays, channels, the Great Lakes, St. Lawrence Seaway, coastal, and open-ocean routes. She said the marine highway corridors are long, multistate routes that parallel major national highway routes. While there is flexibility in implementing a marine highway project, MARAD's intent is to fund projects specifically tied to service development.

Mickelsen said a copy of a brochure containing additional details regarding the M-35 Marine Highway Corridor Route is available at the back of the meeting room and on pages J-25 to J-27 of the agenda packet. She noted that the M-35 and M-55 Marine Highway Corridor Routes are inherently integrated by the states, UMRBA, Mississippi River Cities and Towns Initiative (MRCTI), the Inland Rivers, Ports, and Terminals Association (IRPT), and other partners as they view the Mississippi and Illinois River as a part of an integrated system. Mickelsen noted that the UMRS states are the corridor sponsors and responsible for implementation, but UMRBA is assisting with facilitating the effort. The M-35 corridor runs from the Twin Cities to Grafton, Illinois.

Mickelsen said the Upper System is a unique corridor that produces tremendous ecological and economic value, but lock and dam infrastructure and channel maintenance are challenges. She noted the dual purpose nature of the system as most of the M-35 passes through a National Fish and Wildlife Refuge and the system has been designated by Congress as a "nationally significant ecosystem and a nationally significant commercial navigation system." Mickelsen said that, while insufficient funding to address aging locks and dams and to support needed channel maintenance are challenges, great potential for enhancing economic activity exists and there is a strongly rooted history of interagency collaboration and public support.

Mickelsen said the states have developed governance architecture for the M-35 route, conducted initial outreach, created a vision, mission, and implementation strategies, established an Advisory Committee and initiated an action plan. The action plan includes actions related to infrastructure, planning and organization, marketing and service development, and advocacy and awareness. The M-35 action plan goals for infrastructure are maintaining the locks and the 9-foot navigation channel, implementing NESP by finalizing modernization plans for the LaGrange Lock and Dam and Lock and Dam 25, creating an asset inventory of ports terminals, and intermodal connectors including public and private assets, and encouraging innovation in project delivery. The M-35 action plan planning and organization goals include conducting a meta study to gather information already available and identify information needs, addressing data and analysis concerns such as constraints in current cost-benefit analyses, finalizing engineering work for NESP, and consulting basin stakeholders in planning.

Mickelsen said the M-35 action plan goals for marketing and service development include developing a marketing plan, conducting a market competitive analysis, pursuing a container-on-barge feasibility analysis, marketing the river's ability to support commerce, and incentivizing shipper using the M-35 route. The action plan advocacy and awareness goals include educating elected and Administration officials, communicating the economic importance and risk of failure of the navigation system, and using a variety of communication tools and venues.

Mickelsen said next steps for the M-35 initiative include engaging a broader array of stakeholders to get input on the action plan as well as involvement in implementation. She said the M-35 Policy Group, Advisory Committee, and Work Groups will continue to refine the plan based on this input.

<u>M-55 Marine Highway Route: Illinois Intrastate Shuttle Project</u>

Dennis Wilmsmeyer commended MARAD for creating and implementing the Marine Highway Program. He said efforts to pursue container-on-barge to date have shown that what works in one area

might not work in others. Shuttling containers from areas such as Memphis (which has an overabundance of containers) to areas such as St. Louis (which has a container deficit), is a major component. Wilmsmeyer said America's Central Port is partnering with the Illinois Soybean Association and other organizations to apply for funding for the Illinois Intrastate Shuttle Project under the M-55 Marine Highway Corridor designation. He said the proposed project entails moving empty containers from Chicago or Joliet to St. Louis for shipping identity-preserved commodities.

Wilmsmeyer said the deadline for submitting applications to MARAD is May 27, 2016 and the agency has indicated plans to award funding later in 2016. He indicated awareness of four potential project applications being considered for submission in the M-35 and M-55 corridors: the Illinois Intrastate Shuttle, a planning grant related to container-on-barge service development, a project in Baton Rouge, Louisiana, and a project in New Orleans, Louisiana. Wilmsmeyer indicated that inland navigation partners are sharing information regarding potential applications as they realize that any success benefits the whole system.

Administrative Issues

UMRBA FY 2017 Budget

Tim Hall offered and John Petty seconded a motion to adopt the draft FY 2017 budget for UMRBA. Dru Buntin indicated copies of the draft FY 2017 UMRBA budget were available at the back of the meeting room. The motion was approved unanimously on voice vote.

Future Meeting Schedule

Stout said the next meeting series will be held August 8-9, 2016 in La Crosse, Wisconsin with the UMRR 30th Anniversary event on August 8, and the UMRBA quarterly meeting and the UMRR Coordinating Committee quarterly meeting on the 9th. The November meetings will be held November 14-16, 2016 in St. Paul, Minnesota with the UMRBA Board and Water Quality Executive Committee joint meeting on the 14th, the UMRBA quarterly meeting on the 15th, and UMRR Coordinating Committee quarterly meeting on the 16th. The February quarterly meetings will be held February 7-8, 2017 in the Quad Cities with the UMRBA quarterly meeting on the 7th, and the UMRR Coordinating Committee quarterly meeting on the 8th.

With no further business, Jim Fischer offered and Tim Hall seconded a motion to adjourn. The motion passed unanimously, and the meeting adjourned at 3:59 p.m.