

**Fall 2012 Meeting of the
UMRCC Water Quality Technical Section
October 24-25, 2012**

Lucille A. Carver Mississippi River Environmental Research Station

The fall meeting was held on the afternoon of October 24 and the morning of October 25 at the Lucille A. Carver Mississippi River Environmental Research Station (LACMRERS) in Fairport, Iowa. Seventeen people attended in Fairport with two more participating remotely on Thursday morning. Attendees represented federal, state, regional and academic water resource organizations, including offices in each of the five Upper Mississippi States. Attendees are listed at the end of this summary.

This summary is compiled by Louise Hotka, serving as Water Quality Technical Section Chair in 2012, from written notes provided by Section members.

State/Agency Reports

Wisconsin– John Sullivan, WDNR-La Crosse.

Our Department has rescinded its 303d listing guidance as a result of disagreements with USEPA Region 5 over the 2012 Impaired Waters List. This centered on the Department procedures for listing waters impaired by phosphorus. A Department workgroup has been formed to expedite a revised listing guidance report over the next several weeks. This may delay the approval of a 2012 list or result in a need to combine the 2012 listings with our 2014 listing cycle. Wisconsin DNR collected zebra mussel veliger samples at Lock and Dams 2, 7 and 9 and the St. Croix, Chippewa and Wisconsin River mouths in July, August and September. July and August samples are being analyzed by a US Corps of Engineers lab. September results were analyzed by a WDNR lab and revealed low veliger concentrations (<15 per liter) in samples from the Mississippi River. Veligers were not detected in September samples collected from the three tributaries. As a result of the relatively low river flows, discharge measurements have been conducted in some side channels receiving wastewater discharges to verify mixing zone evaluations for wastewater permits. Our Department is working with MPCA, MCES and other states in evaluating Hester-Dendy vs. kick sampling for macroinvertebrate assessments on the Mississippi River and major tributaries. This is related to Clean Water Act Monitoring Strategy that is currently being developed for the Mississippi River. The Wisconsin DNR is also updating its Monitoring Strategy and a monitoring work group has been formed to complete this task.

Illinois – Matt Short, Illinois EPA.

Illinois EPA continues to operate the ambient network (n=146) with the assistance of contract help from the USGS and ISWS. Eleven Mississippi River sites are currently sampled 4x a year. IEPA began sampling at the furthest downstream site, Thebes, in 2012. Missouri USGS continues to sample Thebes as well.

Table 1. Illinois EPA ambient stream program monitoring sites on the Mississippi River and non-routine parameters.

IEPA Station	Site Description	Pesticides	Chlorophyll
I-84	RM 44 at Thebes, IL		
I-05	RM 111 near Chester, IL 1 mi ups US 150/51 bridge	X	X
J-36	RM 162.2 ups Meramec River confluence		
J-98	RM 200.8 Mel Price L&D 26, near Alton	X	X
K-21	RM 273.5 at L&D 24 Clarksville, MO		X
K-17	RM 325 at L&D 21, 0.75 MI SW Quincy, IL	X	
K-22	RM 364.6 at L&D 19 at Keokuk, IA	X	X
L-04	RM 437 L&D 17, 15 miles W of Aledo		
M-02	RM 482.9 at L&D 15 Arsenal Island	X	
M-12	RM 522.5 at L&D 13, 1.5 miles NE of Fulton, IL		X
M-13	RM 583 at L&D 11, 2 miles NE of Dubuque, IA		X

Routine parameters include field readings (water temperature, dissolved oxygen, pH, specific conductance, turbidity), nutrients (ammonia, nitrate+nitrite, TKN, total and dissolved phosphorus), chlorides, sulfate, phenol, TOC, TSS, VSS, along with total and dissolved metals.

Iowa – John Olson, IDNR.

Iowa’s 2012 Section 303(d) list: Iowa’s 2012 Integrated Report and impaired waters list is in preparation. A draft impaired waters list has been forwarded to EPA for review.

Existing & new UMR impairments for Iowa’s 2012 303(d) list:

- Between Wisconsin River and L&D 11 at Dubuque (UMRBA Assessment Reach 5): new cadmium aquatic life impairment; existing impairment for aluminum.
- L&D 11 down to L&D 13 (Assessment Reach 6): existing mercury/fish consumption impairment. This advisory has been rescinded; thus, this impairment will be proposed for de-listing for the 2012 cycle.
- L&D 13 to Iowa River (Assessment Reach 7): existing impairments for cadmium/aquatic life; existing impairments for aluminum (aquatic life), and arsenic (drinking water). TMDL for bacterial slime problem at Clinton was prepared & approved by EPA in January 2010.
- Iowa River to Des Moines River (Assessment Reach 8): existing impairment for cadmium/aquatic life; existing aquatic life impairment for aluminum, and existing drinking water impairment for arsenic.
- Bacteria impairments, as identified by Illinois EPA, have been proposed for de-listing for the 2012 cycle.

Fish Tissue Monitoring: As part of the U.S. EPA’s Regional Ambient Fish Tissue (RAFT) monitoring program, fish samples were taken from three locations on the Iowa reach of the UMR in 2011: Harpers Ferry (Clayton Co.), near Princeton (Scott County), and Huron

Slough (Des Moines County). Levels of mercury ranged from 0.10 to 0.12 mg/kg; PCBs (sum of Aroclors 1248, 1254 & 1260) were less than detection (<0.09 mg/kg). Iowa's only current advisory for the UMR (a one-meal/week advisory for Pool 12 due to high levels of mercury in predator fish was rescinded in 2011 - see http://www.iowadnr.gov/portals/idnr/uploads/fish/fish_consumption_advisories.pdf for current Iowa advisories). For 2012, four Iowa UMR sites were sampled: Beaver Slough at Clinton, downstream from Dubuque, downstream from Davenport, and downstream from Muscatine. Iowa's 2012 fish tissue sampling was the second year of use of tissue plugs from predator fish species for mercury analysis. Analysis of snapping turtle tissue continues with four interior Iowa lakes sampled in 2012. Data from these samples should be available by summer 2013.

Nutrient Criteria Development: Iowa DNR continues to work toward development of nutrient criteria for lakes and rivers/streams.

- Stream/river criteria: Iowa DNR is continuing the process of developing river/stream nutrient criteria to protect aquatic life. The approach is to base numeric nutrient criteria on response variables (e.g., chlorophyll-a and dissolved oxygen) as they impact biological integrity (IBI values). The tentative plan is to have recommendations by late-2012 with rulemaking to follow.
- Nutrient strategy development: Iowa has prepared a draft nutrient reduction strategy for point sources and nonpoint sources based on meeting Gulf Hypoxia reduction targets for nitrogen and phosphorus. The draft strategy relies heavily on collaborative/partnership approaches as encouraged by EPA's March 2011 (Stoner) memo. Iowa DNR prepared the PS reduction strategy; Iowa Dept. of Agriculture & Land Stewardship prepared the NPS reduction strategy. Technology-based nutrient reduction goals have been identified for major point source dischargers independent of numeric nutrient targets. The draft strategy is currently under review.

Law suit over EPA failure to set nutrient "limits": In mid-March 2012, a suit brought by a number of environmental groups, including Iowa Environmental Council, Minnesota Center for Environmental Advocacy, and Environmental Law & Policy Center, was filed in U.S. District Court in New Orleans. The basis of the suit is the failure of EPA and states to set "limits" on nitrogen and phosphorus that are causing environmental damage in the Gulf of Mexico. Part of the suit involves requiring EPA to set nutrient limits for discharges from wastewater treatment plants. The suit follows from EPA's July 2011 rejection of a NRDC petition to establish numeric criteria for N and P to protect water quality in the Gulf of Mexico. In their rejection of the suit, EPA claimed that they needed to stay with the plan of having states adopt nutrient standards because federal rulemaking would be time consuming, costly, and complex. NRDC says this rejection was a violation of federal administrative rules and was arbitrary.

The only update on this law suit that I could find was the filing of an EPA response to this law suit on May 21, 2012. Although this filing is considered a "formality within U.S. District Court civil lawsuit proceedings", EPA's response to the suit included the

admission that *nutrient pollution in the Mississippi River Basin and northern Gulf of Mexico causes or contributes to a low-oxygen “dead zone” in the Gulf of Mexico; that such pollution degrades and impairs water quality; and that such pollution harms aquatic life, human health, and the economic, aesthetic, and recreational values of rivers, lakes, streams, estuaries, and coastal waters.*

US Army Corps of Engineers – Dave Bierl, Rock Island WQ and Sedimentation Section.

This past summer we performed baseline monitoring at three HREPs (Pool 12 Overwintering, Beaver Island in Pool 14 and Huron Island in Pool 18) and performance evaluation monitoring at six HREPs (Brown's Lake, Spring Lake and Potter's Marsh in Pool 13; Lake Odessa in Pools 17/18; and Cottonwood Island and Gardner Division in Pool 21. In general, low water levels and high water temperatures were seen at all HREPS for much of the summer. Continuous monitors deployed in Lake Odessa recorded water temperatures approaching 100°F and diel DO swings of nearly 25 mg/L.

Sediment samples will be collected in November from sites in the upper Illinois Waterway for ERDC (Corps research lab) as part of the effort to determine if sediment is serving as a vector for Asian carp eDNA.

(In his written notes, Dave also shared that he is now the supervisor of the section since the retirement of Clint Beckert.)

Minnesota – Louise Hotka, Minnesota Pollution Control Agency.

MPCA managers and staff experts continue to participate in the development of the UMR CWA Monitoring Strategy (see John Olson's presentation) and on addressing other UMR issues with the facilitation of the UMRBA.

Basin Alliance for the Lower Mississippi in Minnesota (BALMM) is a group of local, state and federal agencies formed in 1999 to address WQ issues in the Minnesota watersheds that drain directly to the Mississippi border waters. Posted on the [BALMM page on MPCA Web site](#) is a PDF of a presentation by Tony Runkel of the Minnesota Geological Survey, which gives a nice overview of frac sand mining in Minnesota.

UMRCC Coordinators's Report – Scott Yess, USFWS Accomplishments since the 2012 Annual Meeting

1. Completed the UMRCC Video – This 17 minute video highlights the history, accomplishments and future of the UMRCC. We purchased 100 copies and the rights to the video from Dan Krumholz.
2. Approved and paid five Field Trip Grants this fall. Eight have been submitted, two were turned down and one is pending. So far this fall over 300 students have benefitted from the grants.
3. Vegetation Sampling was conducted in Pools 7 and 14 this year with Lisa Reid and Mike Griffin leading the effort.
4. The Coordinator staffed a UMRCC booth at the National AFS Meeting in St. Paul. The UMRCC also supported a kids fishing event, with a \$250 donation, held in conjunction with the AFS Meeting.

5. The Coordinator also attended an International Rivers Conference in Russia in May. The UMRCC was highlighted during their Poster Session and during interviews.

Action items to be addressed prior to the Annual Meeting are to:

- Refine Standard Monitoring Techniques for Fisheries
- Work with USGS on Vegetation Data
- Schedule and coordinate the summer vegetation monitoring
- Update the Water Quality Database
- Initiate a volunteer Monitoring Program for Mayflies
- Review the UMR Water Quality Monitoring Strategy

Presentations

Patterns in nutrient, chlorophyll, and suspended solids concentrations across channel, impounded, and backwater areas in the LTRMP study reaches – Jeff Houser, USGS-MESC.

In rivers that are hydraulically connected to their floodplain, spatial variability across the floodplain in the connectivity of various aquatic areas to the channel and the resulting physical, chemical and biological patterns can strongly affect floodplain and channel characteristics. The LTRMP data included in this analysis span an unusually large longitudinal (1300 km) and lateral (main channel, side channel, contiguous backwaters, floodplain lakes, and impounded regions) gradient in the Upper Mississippi River System (UMRS) from 1994 through 2011. I used this data to investigate the extent to which the observed patterns in nutrients, chlorophyll and suspended solids are consistent with our current understanding of the dominant mechanisms determining the distribution of these constituents. I found that summer median total phosphorus in backwaters (TPbw) was generally higher than TP in the main channel (TPmc) and impounded areas, and TPbw exceeded TPmc more often during summer than during other seasons. The largest contrasts between TPbw and TPmc were observed during low discharge. Nitrogen concentrations were nearly always higher in channels than in backwaters. The magnitude of this difference was largest during low discharge conditions. Patterns across various aquatic areas were more diverse among pools for chlorophyll and TSS than for nutrients. Generally, when significant differences were observed, backwater chlorophyll concentrations were higher than those of channel areas. During summer, TSS was most often lower in off channel areas than in channel areas, but this pattern varied with discharge. At low discharge, TSSbw generally exceeded TSSmc, whereas at high discharge the opposite was true. TSS, nutrients, and chlorophyll concentrations were often high relative to various existing and proposed water quality criteria. Jeff Houser contact (jhouser@usgs.gov).

Lead Contamination Investigations in the La Crosse Marsh - John Sullivan, WDNR-La Crosse.

This presentation provided a summary water and sediment quality investigations conducted in the La Crosse Marsh during the summer of 2012. Legacy lead contamination is present from a large trap shooting range that operated near the marsh for many years.

Surface bed sediment concentrations and suspended sediment samples revealed very high lead concentrations exceeding the Department's sediment quality guidelines. Limited water quality sampling conducted by the Department also indicated relatively high total lead concentrations in the water column. However, sediment toxicity tests were negative. The Department is also working with researchers from the University of Wisconsin –La Crosse who obtained an Urban Waters Grant from the EPA to study the contamination problem. The primary goals of this study are to determine the extent of contamination, identify threats to aquatic life, wildlife and the public and to determine if sediment remediation needs to be considered. Another important goal is to educate the public and strengthen partnerships of marsh stakeholders in the La Crosse community. These investigations are expected to provide assessment methods for evaluating similarly impacted wetlands. John Sullivan contact (John.Sullivan@Wisconsin.gov).

Update on PFC monitoring Minnesota and Illinois –input from Matt Short, Illinois EPA and Bruce Monson, MPCA.

Illinois - In 2011, the IEPA participated in a one year sampling program for perfluorinated chemicals PFCs in fish tissue and water samples. The initial project plan was for 24 sites on rivers, including three sites on the Mississippi River, and 16 lakes. The sites were a mix of rural and urban sites. The fish tissue was subsampled from a composite of fillets from each site with the water sample collected the same time or proximate to the fish tissue sample. Sample analysis is being provided by the USEPA National Exposure Research Laboratory located in Research Triangle Park, North Carolina. Unfortunately the lab has a backlog of analysis to do and the final results will not be available until 2013. For more information, contact Matt Short (matt.short@illinois.gov).

Minnesota –Summary of PFC data collection on the Mississippi in Minnesota: Fish were first collected and analyzed for PFCs from the Mississippi River Pool 2 in 2004. Since then, fish have been analyzed from Pools 1, 2, 3, 4, 5, and 5a, as well as near Bemidji, Brainerd, and Sauk Rapids.

2009 – MPCA, working with the DNR, coordinated fish and water collection for PFCs in Pool 2. Five fish species were chosen for collection: bluegill sunfish, common carp, freshwater drum, smallmouth bass, and white bass. Nearly 300 fish were collected and analyzed for PFCs and water was collected and analyzed from 12 stations throughout Pool 2. The results were used by MDH to assess fish consumption advisories and by MPCA to assess impairment and to develop a site-specific water quality criteria for PFOS in Pool 2. The outcome was freshwater drum in Pool 2 had a fish consumption advisory of a meal per month, which led to MPCA listing Pool 2 as impaired for PFOS in fish. A report on the 2009 study is available on the MPCA web site:

<http://www.pca.state.mn.us/index.php/waste/waste-and-cleanup/cleanup-programs-and-topics/topics/perfluorochemicals-pfc/perfluorochemicals-pfcs.html>

2011 – 3M contracted with Cardno Entrix for fish and water collection in Pool 2. They collected 100 of each of the following four fish species: sunfish, freshwater drum, smallmouth bass, and white bass. The results were presented in a report prepared by Cardno Entrix. 3M contracted with the consulting firm, Exponent, to prepare a summary report that compared the results of the 2009 and 2011 studies. Results indicated PFOS concentrations in fish were lower than those measured in 2009.

2011 – In August 2011, fish were collected from the upper and lower sections of Pool 3. At the request of MPCA, DNR collected 70 fish comprised of the five species collected from Pool 2 in 2009. The fish were analyzed for PFCs in June 2012. These results have not yet been statistically analyzed or provided to the MDH for fish consumption advisory assessment.

2012 Update – MPCA, working with DNR, collected bluegill sunfish, common carp, freshwater drum, smallmouth bass, and white bass from Pool 2, following the sampling plan used in 2009. The goal to collect 60 of each species throughout Pool 2 was met except for the shortfall of four white bass. In addition, water samples at 12 stations were collected in the fall. Sediments and benthic invertebrates were collected in November, 2011, in May, 2012, and a third round was completed in October, 2012. For more information, contact Bruce Monson (bruce.monson@state.mn.us) .

UMR Clean Water Act Monitoring Strategy Update - John Olson, IADNR.

In response to the need for improved CWA-focused monitoring for the UMR, the Illinois EPA provided support using CWA Section 106 Monitoring Initiative funds to initiate the current UMRBA project to develop a comprehensive UMR water quality monitoring strategy. Through the UMRBA Water Quality Executive Committee, all UMR states supported the Illinois EPA proposal and made a commitment to implementing the final strategy as resources allow. The Midwest Biodiversity Institute's Chris Yoder, a nationally recognized expert in CWA monitoring, is serving as a technical contractor on the project. The central goal of this two-year project is to develop a monitoring strategy for an improved CWA assessment of the chemical, physical, and biological conditions of the UMR to better meet the states' biennial reporting obligations to U.S. EPA pursuant to Section 305(b) of the CWA. Specifically, the UMR monitoring strategy will be designed to provide the information needed by states to assess support of all four major beneficial uses designated for the UMR in state water quality standards: aquatic life protection, water contact recreation, fish consumption, and as a raw water source for public drinking water supplies. Ultimately, the UMR CWA monitoring strategy will allow the states, through the collaboration provided by the WQEC and the Water Quality Task Force, to develop a unified UMR-specific impaired waters list to better meet the requirements of Section 303(d) of the CWA.

A supporting goal of the strategy is to monitor and assess the UMR in such a way that other CWA management objectives can be met. These other CWA objectives include identification of trends in water quality over time, supporting development of state water quality criteria, providing estimates of nutrient loading to the UMR through monitoring of major tributary inputs (pour points), and identifying the effectiveness of CWA programs such as the National Pollutant Discharge Elimination System (NPDES) designed to protect UMR water quality. The water quality data produced and the water quality assessments developed as part of the strategy may also be of use to non-CWA programs such as USACE's Upper Mississippi River Restoration-Environmental Management Program (UMRR-EMP).

***UMR Clean Water Act Monitoring Strategy Update continued
Progress and Status***

To date, work on the project has identified a number of monitoring design options that, to varying degrees, can meet the strategy's primary (river-wide CWA water quality assessment) and supporting (aiding other CWA management objectives) goals. Design options include the traditional and existing approaches of main channel fixed station monitoring, as well as more intensive probabilistic monitoring incorporating designs such as those used in U.S. EPA's Great Rivers Ecosystems EMAP project from 2004-2006. Probabilistic options considered thus far include four levels of design that range from a relatively short term river-wide assessment to a more time and resource-intensive design based on the 13 common UMR assessment reaches used by the UMR states for CWA reporting and impaired waters listing. Also being considered is an intensive pollution survey option. This design adapts the placement of monitoring sites to better assess the magnitude and extent of the various pollution stressors such as wastewater discharges and tributary inputs on the UMR's water quality.

Two project work sessions were held in 2012, engaging the WQTF, state and U.S. EPA monitoring staff, and numerous other scientists and river experts. The WQTF is in the process of reviewing and providing comments on the draft monitoring options. A final monitoring options document will be available in summer 2013. Based on the monitoring options described, the WQTF will draft a recommended monitoring plan for review and approval by the WQEC and UMRBA Board, with the monitoring strategy project – including both the monitoring options document and recommended monitoring plan – being fully complete by September 30, 2013. Separately, the WQTF has also initiated work on a UMR CWA assessment methodology to accompany and inform monitoring strategy development. As with any monitoring program, adequate funding will then be needed to implement the final monitoring strategy. John Olson contact (john.olson@dnr.iowa.gov).

Benthos Blitz at Keithsburg Division, Port Louisa National Wildlife Refuge, Iowa – Mike Coffey, USFWS - Illinois.

In June of 2012, a team of biologists and students assessed the abundance and diversity of benthic (bottom dwelling) macroinvertebrates to determine water quality conditions at the Keithsburg Division of Port Louisa National Wildlife Refuge. Keithsburg Division is a backwater lake and wetland system adjacent to the Upper Mississippi River. The results of the 2012 benthos blitz were similar to the 1995 assessment and indicated that the waters at Keithsburg Division are limited by hyper-eutrophic water quality conditions. There were low numbers of mostly pollution tolerant organisms such as aquatic worms and bloodworms that typically survive in organic rich sediments with low dissolved oxygen concentrations. River backwaters provide a critical ecological service by treating run-off of the nutrient loads from crop fields so that the Mississippi River water is cleaner as it flows into the Gulf of Mexico. However, the nutrient loads should not be so excessive at any one backwater as to limit the function of producing a healthy fishery and sufficient, quality food for migratory birds. For more information, please contact Cathy Henry, Refuge Manager, at the Port Louisa National Wildlife Refuge (cathy_henry@fws.gov) or Mike Coffey, Contaminants Biologist, at the Greater Illinois and Iowa Ecological Services Field Office (michael_coffey@fws.gov).

Hydrology modeling report from the LACMRERS - Oscar Hernandez, IIHR-Hydrosience and Engineering, University of Iowa. Oscar Hernandez, a PhD student in the LACMRERS modeling group overseen by Doug Schnoebelen at IIHR-Hydrosience and Engineering, University of Iowa, presented his work to date on 3-D model using OPENFOAM software. This is open source code software available to the scientific community. The model is combining the hydrodynamics with chemistry to solve both sets of equations at the same time in 3-D space and time. The new model will provide biologists and managers a tool to look at nitrate processing scenarios in river reaches and pools of the Mississippi River. Early results on Round Lake, a backwater lake in Pool 8 of the Mississippi River near La Crosse, WI, showed good results. It has been a breakthrough in that for the first time the hydrodynamics and chemistry can be run at the same time. The chemical part of the process is accurately portraying nitrate in the nitrogen cycle currently using 8 equations and 45 coefficients. Equations from nitrogen cycle using such variables as temperature, dissolved oxygen, algae have been incorporated. Variables such as residence time and travel paths of chemical constituents were shown. Subprograms to validate model results have been completed and other chemical equations can be incorporated into the model in the future. For more information, contact Oscar Hernandez (oscar-hernandezmurcia@uiowa.edu) or Doug Schnoebelen (Douglas-Schnoebelen@uiowa.edu).

Dissolved oxygen metabolism in the Open River side channels - Molly Sobotka, Missouri Department of Conservation – LTRMP.

Molly Sobotka shared the design and field protocol for her dissolved oxygen study and requested input on practical deployment in the next season, as well as on interpretation of some aspects of the resulting data. molly.sobotka@mdc.mo.gov

**Water Quality Technical Section Meeting Attendees
October, 2012**

Name	Agency
John Sullivan	Wisconsin Department of Natural Resources
Mark Steingraeber	US Fish and Wildlife Service, Wisconsin
Cathy Henry	US Fish and Wildlife Service, Illinois cathy_henry@fws.gov
Kent Johnson	Metropolitan Council Environmental Services, Minnesota
Mike Coffey	US Fish and Wildlife Service, Illinois
Scott Yess	US Fish and Wildlife Service, Wisconsin
Jeff Houser	USGS/Upper Mississippi Environmental Science Center, Wisconsin
Doug Schnoebelen	University of Iowa /LACMRERS
Caroline Davis	University of Iowa /LACMRERS
Oscar Hernandez	University of Iowa/IIHR Oscar-hernandezmurcia@uiowa.edu
Louise Hotka	Minnesota Pollution Control Agency
John Olson	Iowa Department of Natural Resources
Andy Casper	Illinois Natural History Survey – Illinois River Biological Station

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(Participating remotely)

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Dave Hokanson Upper Mississippi River Basin Association

For contact information not listed here, please refer to [UMRCC 2012 Directory](#)