

UMRCC Fall 2008 Water Quality Technical Section Update

Lucille Carver Mississippi River Environmental Research Station (Pool 16) Fariport, IA

Name	Agency	Email
Dave Bierl	USACE	David.p.bierl@usace.army.mil
Cindy DiStefano	MO Dep. Conservation	Cindy.distefano@mdc.mo.gov
Tex Hawkins	USFWS	Tex_hawkins@fws.gov
Louise Hotka	MN PCA	Louise.hotka@state.mn.gov
Travis Kueter	IA DNR	Travis.kueter@dnr.iowa.gov
John Olson	IA DNR	John.olson@dnr.iowa.gov
Matt Short	IEPA	Matt.short@illinois.gov
Doug Schnoebelen	Univ Iowa	Douglas-schnoebelen@uiowa.edu
John Sullivan	WI DNR	John.sullivan@wisconsin.gov
Scott Yess	FWS/UMRCC Coordinator	Scott_yess@fws.gov

State Updates

Illinois: Matt Short

Monitoring: Illinois EPA shut down the 211 station statewide ambient monitoring network in October 2007 due to staff limitations. The network was restarted with 86 stations in May of 2008 and as of October 1, and additional 60 stations were added. The 60 sites are being sampled under contracts with the ISWS and USGS at an annual cost of \$2,200 per site. The eleven stations on the Mississippi River have been retained but will only be sampled quarterly.

Illinois experienced five major flood events in 2008 that impacted monitoring: January 8, northeast, February 5, eastern, March 18, southern, June 4, central (provisionally categorized as a 500-yr frequency event), September 13, statewide. The September flooding was the result of rains from Hurricane Ike and will likely set new records at several gages.

In addition to routine monitoring the IEPA conducted a preliminary sampling study of Pharmaceuticals and Personal Care Products (PPCP) in water. Intake and treated PWS samples were collected from five cities (Chicago, Aurora and Elgin) along with two on the Mississippi River: Rock Island and East St. Louis. The focus was Human Health Risk based: what concentrations of PPCPs would result in people consuming in excess of ADI (acceptable daily intake). Sixteen PPCPs were found in the water but none above levels of concern. For more information see: <http://www.epa.state.il.us/water/pharmaceuticals-in-drinking-water.pdf>

Standards: Illinois new D.O. standard (not approved by USEPA) includes four segments on the Mississippi River with the Level 1 criteria (Mar-July min. 5.0 mg/l and Aug-Feb min 4.0 mg/l). Covers ~230 river miles: State-line to L&D 14, L&D 21 to L&D 24, From below Chain-of-Rocks to Fountain Cr confluence, and Santa Fe Chute (dns of Thebes) to the mouth. Illinois is

also working on a new sulfate standard based on hardness and chlorides and at the same time dropping TDS from the General Use standards.

Research on nutrients in Illinois streams has to date, failed to produce a clear standard. Several proposals dependent on other variables (i.e., dissolved oxygen violations) have been rejected by the workgroup as they would not provide numeric criteria to all waters of the state. Currently USEPA is evaluating the Illinois stream dataset (biological and chemical) to try and identify a useable signal.

CWA Integrated Report: Illinois 2008 report is currently under review at USEPA Region V. The primary disagreement is related to the listing of non-standard impairments (i.e., nitrogen) and the use of new Illinois standards not approved, as yet, by USEPA.

Miscellaneous

A Petition for Rulemaking has been sent to USEPA to adopt numeric nutrient standards in “at least the Mississippi River basin” but preferably all navigable waters. Several of the petitioners are members of the McKnight Mississippi River Water Quality Collaborative

Florida environmental advocacy groups have filed a lawsuit against USEPA for not promulgating, or forcing the state of Florida to promulgate, numeric nutrient criteria for the protection of lake/stream water quality. Photographs included in the petition show some widespread algal blooms. The environmental advocacy’s overall rationale for the suit – citizens can’t use the water, or if they use the water they are endangered, because the lack of nutrient standards have lead to excessive algal blooms that produce toxins – dermatotoxins, hepatotoxins, neurotoxins, etc.

USGS has finalized flux estimates for nutrients for the Mississippi River Basin and various subbasins for the Water Year 2007 (October 2006 - September 2007). Tables, maps, and graphics for download and viewing are available at http://toxics.usgs.gov/hypoxia/mississippi/flux_ests/index.html

An update by the USEPA Science Advisory Board (December 2007) to the Hypoxia Action Plan continues to call for 45% reduction in nutrients (nitrogen and phosphorus flux) to the Gulf of Mexico to reduce the hypoxic zone to 5000 km².

Iowa: John Olson

Monitoring: As part of 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 2007: Guttenberg, Montrose and Keokuk. Iowa’s only current advisory for the UMR is a one-meal/week advisory from Pool 12 (Bellevue upriver to Dubuque) due to high levels of mercury in predator fish (see <http://www.iowadnr.com/fish/news/consump.html>). RAFT monitoring will continue at the following sites along Iowa’s reach of the UMR in 2008: Lansing, Dubuque and Davenport.

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

CWA Integrated Report: Iowa DNR did not meet the April 1st deadline but continues to work on its draft 2008 303(d) list and Integrated Report. This will be the first assessment/listing cycle to reflect the March 2006 changes to Iowa WQ Standards that presumes all rivers and streams are capable of supporting the highest levels of primary contact recreation uses and aquatic life uses. This so-called “rebuttable presumption” will result in additional impairments on small streams due to high levels of indicator bacteria. IDNR’s assessment database (ADBNet) is on-line at <http://programs.iowadnr.gov/adbnet/index.aspx>.

Iowa’s 2006 Section 303(d) list was approved by Region 7 in mid-July 2008. Impairments on Iowa’s reach of the UMR remained basically the same as in the past with arsenic/drinking water impairments at Ft. Madison, Keokuk and Davenport and bacterial slime problem downstream of Clinton. New impairments include aquatic life impairments for aluminum upriver from Keokuk and from Burlington (based on IL-EPA data) and the addition of primary contact recreation impairments for segments identified by the IL-EPA as impaired (covers most of the Iowa reach of the UMR except upriver from Guttenburg to the MN state line).

Minnesota: Louise Hotka

Lake Pepin TMDL update from Norm Senjem, (norman.senjem@pca.state.mn.us) :

-- We have a draft site-specific standard for eutrophication which will be presented to the Science Advisory Panel Oct. 8 for comment. At this point, the elements are: 32 ug/L chlorophyll a, 0.8 Secchi transparency, and 100 ug/L TP, all lake-wide averages. Originally we had looked at 28 or 30 ug/L chlorophyll a. In the end, however, it became clear that Lake Pepin tends to be dominated by diatoms and green algae grown in upstream tributaries, so most chlorophyll readings are dominated by non- nuisance species. User studies identified 50 ug/L chlorophyll a as a severe nuisance level for Lake Pepin. The average annual value of 32 ug/L would minimize excursions to this level. The phosphorus target of 100 is roughly half the long-term average for Lake Pepin, and corresponds to an early 20th century plateau of 80-100 indicated by diatom reconstruction from sediment cores.

-- We are working closely with Wisconsin DNR (John Sullivan) on turbidity targets for the Mississippi. The targets may differ somewhat for Lock and Dam 2 and 3, with the first site being dominated more by the Minnesota River and the second benefitting from some St Croix dilution and settling out. In terms of the LTRMP turbidity meter, we are looking within a range of 20-40 NTRUs as representing conditions favorable for SAV growth and maintenance. The UMRCC criteria for light include the 20 NTRU value, as a growing season average, and this will apply to Lock and Dam 3. A somewhat higher value such as 30 may apply at Lock and Dam 2. Both of these values are considerably below our 25 NTU (Met Council meter) standard. A joint state DNR team is correlating a range of turbidity values with corresponding expectations for SAV (sago pondweed, Valsineria).

-- Limno-Tech has completed developing the UMR-LP model from Lock and Dam 1 - 4. Early indications are that load reductions of 50% for the Minnesota River and Cannon River combined with 20% load reductions from other tributaries (TSS, TP), will meet the above targets. Questions remain about setting allocations to take into account anticipated growth in point source discharges, fairness between PS and NPS, etc.

Gulf of Mexico Hypoxia, from Wayne Anderson, MPCA Agricultural Liaison,
(wayne.anderson@pca.state.mn.us)

The MPCA is involved in development for three projects related to nutrient management to address problems with hypoxia in the Gulf.

* Norm Senjem is managing a project with EPA to develop a nitrogen reduction strategy as part of the implementation planning with Lake Pepin.

* Marvin Hora and Wayne Anderson are managing a proposal to LCCMR to develop a nitrogen budget for the Mississippi River Basin.

* The Conservation Technology Information Center is working with stakeholders in Minnesota to coordinate a nutrient management alliance for southern Minnesota.

Finally, the coordinating committee of the Hypoxia Task Force is working to develop templates for statewide nutrient strategies called for in the Hypoxia Action Plan-2008.

2010 Clean Water Act Assessment and Reporting Highlights:

- The MPCA will begin assessing Class 1B and 1C surface waters, which are protected for drinking water purposes, for impairment by nitrates beginning with the 2010 assessment cycle. The drinking water standard for nitrate nitrogen of 10 mg/L will be applied. Note that many Class 1B and 1C waters are also designated as Class 2A trout waters or Class 2Bd waters, which are common in southeast Minnesota.

The agency is taking this initiative at the specific request of people in the karst region of southeast Minnesota, recognizing the danger of nitrates in domestic wells where ground water-surface water interaction is high, and the trend statewide toward higher levels of nitrate in surface waters.

Note that several current efforts that involve or potentially involve nitrate in Minnesota waters are underway at the MPCA. These include development of an aquatic toxicity standard for nitrate nitrogen; development of river nutrient standards; evaluation of Upper Mississippi River Basin contributions to Gulf of Mexico hypoxia; and non-degradation rulemaking. These efforts strongly suggest a need for an agency-wide nitrogen strategy that is similar in scope to the successful phosphorus strategy that was developed by the MPCA in 1996.

- MPCA will soon be requesting data from the LTRMP, the Wisconsin DNR, and the Metropolitan Council to use in the assessment process in the spring of 2009.

MPCA initiating triennial rulemaking.

- Addition of numeric water quality standards for nutrients and their impacts to river and stream ecosystems;
- Modification of the existing turbidity standard, with consideration to watershed and/or ecoregional context, adding an aquatic recreation use criteria, and defined duration and frequency;
- Propose water use reclassifications for specific water bodies;
- Adoption of two or three priority U. S. Environmental Protection Agency (EPA) 304(a) Ambient Water Quality Criteria for protection of beneficial uses of surface waters (e.g. nonylphenol and diazinon, see EPA's Water Quality Criteria website for a full list <http://www.epa.gov/waterscience/criteria/aqlife.html>) or MPCA-derived Class 2 water quality criteria for other pollutants of concern in Minnesota's surface waters;
- Updates to human health-based water quality chronic standards needed to maintain consistency with the Minnesota Department of Health's Health Risk Limits in Minn. R. ch. 4717 (currently under revision);
- Re-evaluate and update existing Class 3 (Industrial Consumption) and Class 4 (Agriculture and Wildlife) water use standards; and
- Other minor nonsubstantive changes.

More information and contacts are available at

<http://www.pca.state.mn.us/water/standards/rulechange.html>.

Tiered Aquatic Life Use Standards.

We continue to move forward with TALU development in Minnesota, and are currently developing the stream classification approach and IBIs in advance of rulemaking.

Background: Currently, in Minnesota, all waters are considered fishable and swimmable with the exception of waters designated as limited resource value waters, which are protected for secondary body contact only. It has become clear that we will be more effective if we develop more tiers, or levels, of aquatic life-use based on a stream's type and potential. This approach is expected to provide better protection for high quality resources and attainable goals for channelized streams, for instance.

Contact: Scott Niemela, North Biological Unit supervisor, scott.niemela@pca.state.mn.us

Missouri: Cindy DiStefano: Lake Sturgeon were collected from the Hannibal area and fillets analyzed for standard metals and pesticides. Data will be available in early 2009.

Shovelnose Sturgeon reproduction project will be conducted in 2009. Fish with relatively low levels of organochlorine contamination in eggs (collected from Saverton/Hannibal area) will be compared to eggs with high levels of organochlorine compounds (collected from Chester and

Cape Girardeau areas). Fish will be taken to the hatchery, spawned and monitored for egg fertilization and development.

USGS staff are sampling sturgeon at 11 sites on the Missouri and Mississippi Rivers to examine males for occurrence of intersex. Results will be available in 2009.

The Missouri Department of Natural Resources published the proposed Missouri 2008 303(d) List for public review and comment until Jan. 16, 2009. The public may view copies of the [proposed 2008 303\(d\) List and supporting documents](http://dnr.mo.gov/env/wpp/waterquality/303d/2008/proposed-2008-303d-list-pn.htm) on the MDNR Web site at: <http://dnr.mo.gov/env/wpp/waterquality/303d/2008/proposed-2008-303d-list-pn.htm>

Wisconsin

John Sullivan: also gave a talk on nutrient impairment in Mississippi River backwaters. Specifically the effect of metaphyton (i.e., filamentous algae and duckweed) covering the water surface, excluding light penetration. Based on a comparison with unimpacted sites, John has come up with some potential numbers for N and P to limit this impact.

Wisconsin has provided the 2008 Impaired Waters List to USEPA earlier this year and we are waiting for their review and approval. Two new impairments were added for the Mississippi including decreased submersed aquatic vegetation (sediment pollutant) for river reach extending from the St. Croix River to upper Lake Pepin, and a new fish tissue contaminant for the same reach – perfluroctane sulfonate (PFOS). Both these additions are consistent with Minnesota's 303d listing for the river. Sullivan was uncertain of the status of an integrated 305(b) / 303(d) report.

John Sullivan participated in a PFOS monitoring survey this past spring at selected sites on the river and at large tributaries in cooperation with USEPA and other states. The analytical results are not available. Our Mississippi River Work Team conducted its annual longitudinal water quality and zebra mussel veliger sampling surveys from LD 2 at Hastings to LD 9 near Lynxville, WI during July, August and September. Turbidity values were often well below 20 NTRU from LD 4 to LD 8 during the three surveys. Higher values were noted above Lake Pepin and at LD 9. High runoff during the June survey likely contributed to high fecal coliform levels at LD 8 and LD 9. Sediment traps deployed for contaminant and nutrient monitoring this summer at LD 4 at Alma, WI were heavily infested by small zebra mussels upon retrieval in mid-September. The results of veliger sampling will likely not be available until early 2009.

Sullivan indicated that he planned to have a report describing his monitoring of nutrient impairment problems in backwaters and wetlands completed soon. A presentation of his report was given at the meeting. The WDNR LTRM Field Station has finished EMAP related sampling this summer. A draft report evaluating the influence of various daytime electrofishing protocols (EMAP-GRE, MPCA, LTRMP and WDNR) on IBI scores has been prepared and is under review. Vegetation specialists from Wisconsin's and Minnesota's LTRM field stations collected a third set of SAV data from Pool 1 to Pool 11. SAV frequency was again highest in the reach from Lake Pepin to LD 11. The draft of this work should be available next year. A work group

of vegetation and water quality specialist has been formed to define a SAV goal for the Pool 2 to Lake Pepin turbidity TMDL.

FWS – refuge Tex Hawkins: video on reclaiming forested areas to ensure aquifer maintenance in Costa Rica

UMRCC Coordinators Report: Scott Yess: has been working on three main projects and the newsletter: updating the web site, working with the Fisheries team on a new management plan, and the Fish & Farmers Initiative. The annual meeting will be March 24-26, 2009 in La Crosse, Wisconsin.

UMRBA Water Quality Task Force: Matt Short

CWA – Ecosystem Restoration Workshops were held in Dubuque, IA in April and June 2008. Their purpose was to discuss the linkage between the CWA monitoring and assessments activities/needs and Ecosystem Restoration activities/needs and identify opportunities for enhanced interaction and cooperation. The April meeting provided an overview of CWA and EMP activities on the Mississippi River. The June meeting included case studies from Chesapeake Bay, Florida Everglades, TMDL on Miss R pools 2-4. Five predominant themes came out of the workshop:

- Ecosystem restoration objectives and water quality standards
- Biological Indicators
- Water Quality Monitoring
- Watersheds, Tributaries and TMDLs
- Water Quality Considerations in Ecosystem Restoration Projects

The UMRBA WQTF meets next week. Discussions will include the Designated Uses Project, Interagency Personnel Agreement with USEPA, potential application of Fish IBI to UMR Main Channel, and ongoing Consultation on Water Quality Assessments

The UMRBA coordinated PFC sampling again for 2008. (Perfluorinated organic compounds) PFCs are:

- Persistent in environment, bioaccumulative and toxic in some animals
- Found in fish tissue, human blood
- Widespread use in industrial and commercial applications
- Sampling by UMR states
- Purpose was to aid in further development of method initially used on Cape Fear River
 - 2007 on Mississippi River mainstem
 - 2008 mainstem and selected tribs

Unfortunately, researches had to pull a report published in Env. Sci and Technology June 2008 when they realized that the results were effected by an interfering compound that occurs in chicken eggs. The same research group also was involved in 2008 publications on PFCs in fish tissue (Environmental Pollution) based on samples collected as part of the EMAP project.

According to Andy Lindstrom, this will not effect the analysis of the water samples we collected, other than delaying an analysis of the information.

USACE Rock Island District Update: Dave Bierl:

EMP HREP Monitoring: Performance evaluation monitoring was performed during the summer at the following HREPs: McCartney Lake, Pool 11 Islands (Sunfish Lake and Mud Lake), Brown's Lake, Andalusia and Big Timber. Baseline monitoring was performed at the Huron Island project.

EMP HREP Construction: The Lake Odessa HREP project is under construction. Lake interior dredging commenced in the spring but was halted due to high water. It is anticipated that lake interior dredging will resume in 2009.

Transparency Tube Measurements at District Locks: Transparency tube measurements continue to be taken at District L/Ds. The frequency of measurements is dependant on lock personnel availability to take the samples. Ideally, measurements will be taken daily (Monday through Friday) from April through October and less frequently during the remainder of the year. The data are available to the public and can be viewed on the rivergages.com website.

Starved Rock Section 519 Restoration Project: The primary goal of the Starved Rock project is to restore island and associated aquatic habitat in lower Starved Rock pool. One of the objectives associated with this goal is to provide suitable conditions for the growth of submerged aquatic vegetation. A continuous monitor (light penetration, DO, pH, temperature, turbidity and conductivity) was deployed in the lower pool during the summer in an effort to measure baseline conditions. Funds were not available for water samples to be collected for herbicide analysis in support of a mesocosm enclosure study being performed by the Illinois Natural History Survey.

Middle Peoria Pool NESP Project: It is anticipated that dredging and island construction will be utilized for backwater habitat restoration as part of the Middle Peoria Pool NESP project. Baseline conditions (wind speed and direction, DO, pH, temperature, turbidity and conductivity) were measured this summer in Goose Lake, a backwater of the Illinois River near Lacon, IL.

Dave also gave a presentation on transparency tube measurements that have been going on at the lock and dams the last couple of years. There was better clarity in 2006, but more depth which offset the potential benefits of clearer water.