Summary of the Fall 2016 UMRCC Water Quality Technical Section meeting, October 27, 2016.

Chair: Molly Sobotka

Missouri Dept of Conservation

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The Fall 2016 UMRCC WQTS meeting was held October 27th, 2016 from 8:00 – 12:30 at the Cape Girardeau Conservation Nature Center in Cape Girardeau, Missouri. The following persons attended the technical section meeting.

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|  | **Name:** | **Agency/Location:** |
| 1. | Molly Sobotka | Missouri Dept of Conservation - LTRM |
| 2. | Shawn Giblin | Wisconsin Dept of Natural Resources |
| 3. | John Olson | Iowa Dept of Natural Resources |
| 4. | Daniel Kendall | Iowa Dept of Natural Resources |
| 5. | Doyn Kellerhals | Illinois Natural History Survey – LTRM |
| 6. | Jim Noren | USACE St. Paul |
| 7. | Mark Boon | LMRCC |
| 8. | Karen Hagerty | USACE Rock Island - UMRR |
| 9. | Rob Burdis | Minnesota Dept of Natural Resources - LTRM |
| 10. | Elizabeth Bruns | USACE Rock Island |
| 11. | T Leo Keller | USACE Rock Island |
| 12. | Dave Herzog | Missouri Dept of Conservation |
| 13. | Quinton Phelps | Missouri Dept of Conservation - LTRM |
| 14. | Kevin Slattery | USACE Saint Louis |
| 15. | Jennie Sauer | USGS- LTRM |
| 16. | KathiJo Jankowski | USGS - LTRM |
| 17 | Yao Yin | USGS - LTRM |

UMRCC Agenda: Fall meeting 2016

Cape Girardeau Conservation Nature Center

2289 County Park Dr, Cape Girardeau, MO 63701

October 26, 2016

UMRR A-Team meeting

**1100 -1110 AM-** Introductions and Roll Call, Shawn Giblin

**1110-1115 AM-** Time and Place for next meeting- UMESC Jan 24th (online)

**1115-1120 AM-** Approval of minutes from August meeting (Group)

**1120- 1135 AM-** UMRR update, Marv Hubbell, USACE

**1135-1205 PM-** LTRM Science Update, Jeff Houser, USGS

**1205-1230 PM-** Long-term decreases in phosphorus and suspended solids but not nitrogen in six upper Mississippi River tributaries, 1991-2014, Becky Kreiling, USGS

**1230-1300 PM**- Lunch- Pizza available $5-10- depending on group size

**How Water Velocity Drives Water Quality and Habitat Outcomes Session**

**1300- 1325 PM-** Water Quality, Rob Burdis, MN DNR

**1325- 1350 PM-** Vegetation, Yao Yin, USGS

**1350- 1415 PM**- Water Velocity Discussion

**1415-1440 PM**- Fish Indicators vote and discussion.

**1440-1500 PM**- Additional funding and associated projects discussion.

Adjourn- Open river tour commences- Dinner $10.

**1530** meet at Red Star Access for river tour and dinner

October 27, 2017

Cape Girardeau Conservation Nature Center

2289 County Park Dr, Cape Girardeau, MO 63701

UMRCC Water Quality Technical Section meeting

Agency updates

**Wisconsin, Shawn Giblin**

* Clean Water Act Monitoring Pilot with Minnesota is ongoing- fish, invertebrate, vegetation, probabilistic water quality, lab splits are completed.  Final fixed site sample will be collected in April 2017.
* Alex Latzka is doing post-doctorate work looking at total suspended solids statewide in Wisconsin streams as well as interactions between biota and TSS.
* Jordan Weeks was hired as Mississippi River Fisheries Supervisor. He started his duties on October 1st.
* Several summer kill incidents were observed in early-August in Pools 7 and 8 as floodwaters receded.
* Curlyleaf Pondweed research project sampling was finished in October.
* Numerous water quality surveys were completed in Pools 4-11 during 2016.  Hydraulic connectivity was the major emphasis of these surveys.
* Sediment trap and zebra mussel (veligers and adult biomass) sampling were completed for 2016.

**Minnesota, Rob Burdis**

The Lake City LTRM field station plans to conduct water quality monitoring on the Peterson Lake HREP located in lower Pool 4 beginning this winter. In an effort to increase the area suitable for winter fish use a proposal to shut off a major inlet into the upper lake and partial closures of two other inlets is being proposed. Pre and post water quality monitoring of upper Peterson Lake would determine if this adaptive management strategy is successful. A combination of continuous temperature and dissolved oxygen loggers along with spatial in-situ measurement of temperature, dissolved oxygen and current velocity will be used to evaluate the modification to this backwater lake. Modification of the backwater is not expected to occur any early than late-summer of 2017.

**Iowa, John Olson**

The Iowa state update is appended.

**Illinois, Doyn Kellerhals**

Doyn is seeing high numbers of YOY fishes going into the winter and ending up with low recruitment. CPUE of some quality sized fish appears to be decreasing (IRBS unpublished data). IL will be investigating overwintering conditions to elucidate the choke point. Potential issues include shallowing of backwaters and high velocity during winter. Publication forthcoming.

**Missouri, Molly Sobotka**

MDC Big Rivers and Wetlands field station is working on getting velocity models for the MMR in order to better understand impacts of water control structures and water retention in side channels.

**USACOE – Rock Island, Elizabeth Bruns & Leo Keller**

USACE MVR performed HREP WQ monitoring during the summer of 2016.

Pre-Project Construction - Steamboat (Pool 14), Keithsburg Division (Pool 1\*

Post-Project Construction - McCartney (Pool 11), Pool 11 Islands, Sunfish Lake (Pool 12), Big Timber (Pool 17), Huron Island (Pool 18) Both Pool 12 Overwintering and Huron Island (Pool 18) projects are currently in the construction phase.

MVR's water quality and geotech labs are in the design phase of a complete remodel. Construction of the new labs is tentatively scheduled to begin in 2017 and last the entire summer monitoring season.

The 3 reservoirs in MVR all experienced high water this fall, but were all lucky to have no HAB events. Only a few E. coli beach warnings/postings occurred in this summer, down from last summer which saw multiple high E.coli events.

MVR is in the final year of a water quality monitoring contract with ISU. ISU has worked with the Corps for over 30 years to monitor the Des Moines and Iowa River for potential impacts to water quality due to impoundment. Donna Lutz of ISU retired this summer and Dr. Bill Crumpton has temporarily assumed the duty of lead PI for ISU on this contract. DR. Grace Wilkenson will take over as lead PI for ISU upon her arrival to ISU in the spring of 2017.

MVR's Water Quality and Sedimentation Section is in the process of creating a Rock Island District Water Quality Management Program. This program will detail our WQ monitoring goals, objectives, methodology, and WQ concerns. Supplemental sections to the main program report will detail specific issues and possible management actions for MVR reservoirs.

**USACOE – ST. Paul, Jim Noren**

1) The St. Paul District collects bi-weekly transparency tube measurements at a number of our L/Ds each year between April 15 - Oct 15.

2) As part of our annual testing of historic dredge cuts, our district staff collected sediment samples this year from 15 locations in pools 5, 5A, 6 and 7. We are working on posting all of our dredge cut sediment data on a webpage for easier public access.

3) We deployed a YSI buoy below L/D 1 this summer to collect continuous pre-project turbidity measurements for a scour repair project that should begin next year. We also collected TSS grab samples in order to develop a TSS-turbidity relationship. Project and post-project monitoring is also being planned.

**USACOE – Saint Louis, Ben Greeling**

-We have wrapped up our WQ sampling season. Consists of in-situ readings (depth, water temp., Redox, Conductivity, DO, secchi, and pH) in lakes and rivers upstream and downstream of dams and in main lake tributaries. This generally occurs approximately 2-4 times per year from April through September on the UMR, lower IL River and 5 Corps Lakes (Mark Twain, Wappapello, Rend, Carlyle, & Shelbyville) - depending on funding. We also grab samples for TSS, TVSS, chlorophyll-a, pheophytin-a, NP Pesticides, total organic carbon, total phosphate, ortho phosphate, nitrate, ammonia nitrogen, total iron, total manganese, and E. Coli.

-We also have continuous monitoring at the outflow of reservoir dams at Mark Twain Lake, Carlyle Lake, and Shelbyville Lake (DO, Temp, Conductivity).

-Mark Twain Lake has a re-regulation pool which has a history of some very low DO. We have acquired and installed a continuous monitoring station pontoon which has the ability to take profile measurements and transmit them via satellite. We have anchored it in the lake just upstream of the dam to get real time DO concentrations. We expect it to be fully functional in the Spring of 2017.

-Some of our WQ data is available to the public at this link.

<http://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Environmental-and-Munitions/Environmental_Quality_and_HTRW/>

We are in the process of adding more data. As of right now only 2014 data is uploaded. Annual reports are currently available back to 1997.

**USGS – UMESC, Jennie Sauer**

The UMRR-LTRM has hired KathiJo Jankowski ([kjankowski@usgs.gov](mailto:kjankowski@usgs.gov)) as the new water quality component lead.

Harmful algal bloom links:

<https://www.usgs.gov/news/science-harmful-algae-blooms>

<https://www.usgs.gov/science/harmful-algal-blooms>

Presentations

**Dave Herzog: Effects of river training structures on Water Quality/Quantity in the Open Mississippi River**

The Mississippi River has a rich history of economic and ecological benefits that the river ecosystem provided.    River managers have investigated the impacts of training structures on biota.  However, little attention has been given to the cumulative impacts of river training structures on the water quality and quantity in the Open Mississippi River.  We discussed the types of structures and their intended use and impact on habitat stratum (i.e. juxtaposition and function).  We examined “natural river” channel morphology and estimated potential impacts of an incised channel to tributary head-cutting and perching. We anecdotally described system-wide influences of these structures on large scale issues since the 1800’s (e.g. climate change, gulf-hypoxia) and policy issues required to be met (e.g. Clean Water Act, NEPA, SEIS).  We presented mitigating water quality/quantity loss approaches through documents prepared by the St. Louis District, Army Corps of Engineers (e.g.  Geomorphology study of the Middle Mississippi River).  Lastly, we discussed potential areas as consideration for habitat restoration programs to restore ecological processes related to water quality/quantity in the Open Mississippi River (e.g. Windy Bar [Schenimann chute] and Devils Island [Picayune chute]).

**Quinton Phelps: Velocity as a driver of fish communities.**

Habitat management is a crucial aspect of fisheries management. Without knowledge of habitat associations, fisheries scientists are unable to effectively make habitat conservation or restoration recommendations. This becomes especially prominent when trying to manage commercially harvested populations and protect threatened or endangered species. To determine juvenile fishes habitat associations in the Middle Mississippi River, we analyzed mini-trawl catch data of six common juvenile fish species: blue catfish (Ictalurus furcatus), channel catfish (Ictalurus punctatus), channel shiner (Notropis wickliffi), freshwater drum (Aplodinotus grunniens), paddlefish (Polyodon spathula), and shovelnose sturgeon (Scaphirhynchus platorynchus). Overall, we conducted 2251 mini-trawl sampling efforts between 2002 and 2013, resulting in the capture of 23,742 target specimens. Catch per unit effort was evaluated by structural habitat (i.e. velocity, depth, and substrate). Overall, these data suggest that juvenile fish species are more prevalent in shallow water and slower velocities. Ultimately the information garnered during this evaluation should be incorporated when considering habitat modifications, especially those modifications that impact the availability of shallow-low velocity habitats.

**Molly Sobotka: Hydrologic connectivity in the Middle Mississippi River.**

Hydrologic connectivity in the MMR tends to be of interest at very high water levels when we are interested in connectivity to the floodplain and at low water levels when we are interested in connectivity to more permanent off-channel areas. In both instances off-channel habitat is limited and is likely an important refuge. Flood events occur regularly in the MMR however it is only during major events that the floodplain is inundated, in part because steep reveted banks constrain the channel. Floodplain inundation occurred in 16 of the last 26 years however these events are mostly of short duration (< 30 days). High rates of GPP are possible on the floodplain but only in areas protected from velocity; channel constriction and incisement restricts these areas. Long periods of floodplain inundation are also associated with greater rates of native fish recruitment. During non-flood periods side channels provide shallower and lower velocity conditions when compared to the main channel and can also be sites of elevated primary productivity. Similarly to floodplain conditions, GPP behind wing dikes is negatively correlated to discharge, thus these areas only off refuge habitat during non-flood periods. Connectivity in the MMR is a moving target and we must consider habitat availability at every river stage. During years when floods fail to inundate the floodplain there is likely little slow water, shallow habitat available. Restoration to increase habitat variability should take into account how connectivity will interact with river levels.

**Leo Keller: USACE Water Quality Data Management.**

**John Olson: 30-year retrospective of the Tech. Section and WQ of the UMR.**

Discussion

1 - DO targets for overwintering fish. Is 5mg/L really the low-end number? Currently we are not modeling high levels of DO...how can we take supersaturation into consideration?

2 – Harmful algal blooms (HABs): What do we know, what should we know? Obviously there is the public health issue that EPA, recreational beaches, water intakes, and health departments need to be monitoring for (we are monitoring for microcystine at our reservoir beaches). But what should/could we be monitoring for regarding ecosystem health?

LaLiberte, Gina – WDNR: Gina.LaLiberte@wisconsin.gov

**TO:** UMRCC WQ Tech. Section

**FROM:** John Olson, Iowa DNR, Water Quality Monitoring & Assessment Section

**Date:** October 28, 2016

**RE:** state updates for WQTS meeting

* **Iowa Nutrient Reduction Strategy:**  The focus of activity for Iowa’s voluntary NRS is tracking the implementation of nutrient reduction practices/technologies and measuring progress. The Third Annual “*Iowa Nutrient Reduction Strategy Progress Report*” (for 2015 & 2016) is available online (search for “Iowa NRS”). There are a number of efforts & developments highlighted (handout).

Also recently available on-line is the report *Stream Water Quality Monitoring Conducted in Support of the Iowa Nutrient Reduction Strategy*. This report documents known stream monitoring efforts in Iowa that can help answer questions such as

* + how much nitrogen and phosphorus are being exported from Iowa?
  + what reductions in nitrogen and phosphorus occur following implementation of nutrient reduction practices by nonpoint sources?
  + what reductions in nitrogen and phosphorus occur following installation of nutrient reduction technologies by point sources?

The report recommends the following:

* + Develop a reliable method for providing periodic statewide estimates of phosphorus loads
  + Form a workgroup to develop a long-range plan for what monitoring should be conducted and at what frequencies;
  + The use of paired watershed monitoring to identify refinements needed for future monitoring to measure nutrient reduction progress
* **TMDLs:** I, along with IDNR staff from Fisheries Bureau and Wastewater Permits Section met with ADM at their Clinton, IA plant on July 19th. The goal of the meeting was to see whether ADM could reduce or terminate their slime (*S. natans*) monitoring program. ADM’s consultant reported that while the portion of the river affected by slime has decreased significantly, especially due to plant upgrades from 2005-2009, there are seasonal accumulations of slime along the ADM facility. Thus, ADM has not met the target of EPA’s 2010 TMDL: no increase in *S. natans* downstream of the ADM facility compared to upstream conditions. This target is translation of Iowa’s narrative WQ standards protecting against aesthetically objectionable conditions and nuisance aquatic life. Slime monitoring will continue near the ADM facility although there was some discussion of monitoring during only one season (spring or fall) of the year and reducing the time of deployment for samplers.
* **Des Moines Water Works intent to sue over nitrate:** On January 9, 2015, the Des Moines Water Works filed a notice of intent to sue three drainage districts in the North Raccoon River watershed due to levels of nitrate that have exceeded the nitrate MCL and that have thus required the DMWW to operate its nitrate removal facility at a cost of ~$7,000/day. The notice of intent to sue document can be found at the following: <http://www.dmww.com/upl/documents/library/notice-of-intent-to-sue-document.pdf>. The notice of intent to sue makes the arguments (1) that the system of tiles and drainage ditches that deliver the high-nitrate water to the Raccoon River—and eventually to the water intake area for the DMWW—is a piping system (point source) for groundwater that illegally discharges a pollutant to a surface waters and (2) that Iowa’s Nutrient Reduction Strategy *is contrary to existing law and regulation and ignores the unique situation of the Raccoon River and Des Moines River watersheds, including a massive artificial subsurface drainage infrastructure*. Because the nitrate is in groundwater, the DMWW contends that the discharge of this pollutant to surface waters is not covered by the Clean Water Act’s exemption for farm field runoff. In early March 2015, the DMWW board decided to file the suit in federal district court.

A recent development is that the drainage districts submitted to federal district court the argument that Iowa law grants them immunity from the damages sought by DMWW. There is long-standing state law granting drainage districts immunity from such damages. DMWW argues that this law is outdated and needs to be changed. The federal court ruled that the Iowa Supreme Court needs to decide the issue of immunity from damages before the lawsuit can proceed. Arguments regarding this issue are being presented to the Iowa Supreme Court soon (this week?). Legal experts have doubts as to whether the ISC will overturn this long-standing Iowa law (an uphill legal battle). Depending on how the Iowa Supreme Court rules, all claims not arising under the Clean Water Act (i.e., seeking monetary compensation from the three counties named in the suit) could be dismissed. Regardless of the outcome, the other potion of the law suit regarding increased federal oversight (via the CWA) of drainage districts will go forward. The trial date has been moved from August 2016 to June 2017.

* Staff changes in IDNR WQ Monitoring & Assessment Section

Dan Kendall is the new coordinator for our ambient lakes monitoring program and assists with Clean Water Act Integrated Reporting. Dan replaced Michelle Balmer who is now working for the Iowa DNR’s lake restoration program.

UMRBA:

