

Nutrient Monitoring Council (NMC) 13th Meeting

September 10, 2019

Edward R. Madigan Lab, Room 350A

1201 West Gregory Drive, Urbana

Summary

In attendance: Gregg Good, Illinois EPA; Trevor Sample, Illinois EPA; Paul Davidson, University of Illinois; Laura Gentry, Illinois Corn Growers; Tim Hodson, USGS; Laura Keefer, Illinois State Water Survey; Ted Kratschmer, Jong Lee, University of Illinois NCSA; Greg McIsaac, University of Illinois; Keith Richard, Sanitary District of Decatur; Paul Terrio, USGS; Justin Vick, MWRDGC; Kelly Warner, USGS; Eliana Brown, Illinois Extension; and Kate Gardiner, Illinois Extension

Welcome/Housekeeping – Gregg Good and Eliana Brown

Hold the Date for the NLR Partnership Conference December 3rd - 4th, 2019.

NMC March 19, 2019, Meeting Review and Minutes – Gregg Good

The meeting minutes were accepted without changes.

NMC Membership – Gregg Good

The NMC needs to replace Andy Casper, who represented the Illinois Natural History Survey, and Kevin Culver, who represented Aqua America. Nicole Manasco now represents the Army Corps of Engineers at Rock Island. She hasn't been able to attend yet.

Five Minute Updates

NSAC Report Update – Gregg Good

The Nutrient Science Advisory Committee met and deliberated over nutrient standards for Illinois rivers and streams. They outlined their recommendations for both wadeable and non-wadeable streams in a report titled. Once the report was submitted, it was open to a public comment period of 120 days, which resulted in about a dozen sets of comments.

Havana Lowlands Groundwater Monitoring Project Update – Kelly Warner

The study looks at groundwater changes in the Havana Lowlands near Quiver Creek. While they expected N concentrations to be higher during irrigation periods, the highest concentrations seem to happen in the winter. There is now two years' worth of data. A factsheet is coming out soon and a final report analysis will be ready by this winter.

NLRS Data Portal Update – Jong Lee

As the NMC knows, Great Lakes to Gulf Virtual Observatory (GLTG) hosts Mississippi River basin data. While the information is useful, Jong understands that the portal could be more intuitive. NCSA is working with the Walton Family Foundation to develop a more user-friendly and intuitive portal.

Great Lakes to Gulf is piloting this new portal structure using Illinois data. Features of this reorganized portal include storyboards to explain key topics in more detail and a change in how data are displayed.

Jong showed a storyboard for the Illinois NLRS with information taken from the first Biennial Report. When viewing the data, the screen is now split into two panes to simultaneously show the map and the associated information. As you click around on the map, the data automatically update to show the new information. NCSA is currently fixing some problems and cleaning up the data as well.

Ted Kratschmer explained that they want a unified way to track the progress so they can easily compare the data across states.

In other NCSA news, the Blue Waters supercomputer will be decommissioned at the end of this year for National Science Foundation research. They have a small-scale high performance computer (HPC), or supercomputer, in-house and they are trying to acquire two more HPCs.

Water Quality Trends in Illinois Rivers – Tim Hodson

The United States puts a large amount of resources to reduce nutrient pollution and soil erosion in the United States. The efficacy of these programs is hard to calculate, largely due to population and economic trends, lag times, and climate. The point of this report is to know if nutrient and soil loss to rivers attenuated since these efforts began and are they attenuating today.

Illinois has one of the longest-running and most extensive water quality monitoring networks in the US. Tim is using data from that network to assess trends in nutrient and soil loss, distinguish artificial from natural causes, and estimate uncertainty in those trends.

The challenge with streamflow trends is that the trends can manifest in many different ways. This analysis can help distinguish what changes may be controllable by watershed management versus those resulting from climate.

Nutrients are poor tracers. Usually what you put in upstream can be measured downstream, but nutrients can assimilate and change forms. Tim looked at changes in nitrogen, phosphorus, and total suspended solids over time and how those numbers relate to soil erosion, population growth, and agricultural production.

While he doesn't have a concrete explanation for these trends, there are a couple plausible explanations. He suggested that maybe funding levels for clean water act initiatives haven't kept up with production or land is more susceptible to erosion.

In conclusion, nutrient and soil losses have attenuated in some ways, but we are at risk of losing the progress we've made. Potential future work includes investigating recent degradation, looking at finer-scale changes in time and space and large-scale changes like in the Upper Mississippi, and combining watershed modeling and climate data to tease out climate component of streamflow trends.

Nitrogen Related Presentations - Greg McIsaac

Possible Cause of Nitrate Load Increase in the Rock River from 1980-96 to 2013-17

When calculating the Rock River load for Illinois, we subtract off what's coming in at Rockton since it's near the Wisconsin border, but we subtract part of Illinois when we do that. Nitrate-N yield from the Rock River between Rockton and Joslin in 2013-17 was twice as large as the value for the baseline period

of 1980-1996. About half of this increase appeared to be related to an increase in annual water yield, with almost all of the increase occurring between March and August. Analysis is continuing.

Preliminary Nitrate Budget for the Illinois River

When calculating the watershed loads for the NLRS Science Assessment, the scientists came up with some negative numbers. They adjusted the loads for those watersheds based upon neighboring watershed loads. When recalculating the numbers, Dr. McIsaac came up with negative numbers again. He realized the Illinois River drains into a series of lakes and gets rather flat at that point, which may contribute to denitrification. With this in mind, he used the negative load numbers for his science assessment update.

Critique of March 2018 Science Article – N Reduction Lag Times to Gulf of Mexico

Nitrate load from 1955 to 2014 to the Gulf of Mexico is based on measured river flow and concentrations can be modeled with N legacy effects ranging from just four years to 28 years with approximately equal explanatory value to the Van Meter Model. Recovery times are uncertain. Recovery may indeed take decades, as Van Meter *et al.* suggest, but recovery may also be much faster. Chloropigment data from one Gulf sediment core presented in Van Meter *et al.* does not validate their model. River nitrate concentration data from 1895-1906 is limited, but NOT consistent with concentrations and loads similar to the late 1970s as simulated by the Van Meter model.

Estimating Statewide Nutrient Loads from USGS Super Gages, Adding Non-Monitored Areas and Subtracting WI and IN Contributions – Paul Terrio

Paul addressed four areas of concern: areas outside of Illinois that are included in monitored watersheds (Rock River Basin, Fox River, and the Kankakee River Basin), areas outside of Illinois that are not included in monitored watersheds (Galena River and Apple River), areas within the state that are not included in monitored watersheds, and the Des Plaines River at Joliet.

Areas within the state that are not included in monitored watersheds make up about a quarter of the state - approximately 13,954 square miles. This includes watersheds not monitored that drain to bordering rivers and Lake Michigan and watershed areas downstream of the Super Gages.

Paul outlined the approaches taken and tools being used to account for these areas of concern. The NMC discussed these areas of concern and the approaches being taken to address them.

Super Gages Update, and 2021-2025 Operation and Funding Discussion – USGS and IEPA

Currently, funding for the Super Gage network ends about one year from now. It is a priority of the NMC to determine how to maintain funding. The NMC discussed potential ways to fund the Super Gage network, including using the Upper Mississippi River Basin Association Water Quality Improvement Act as a possible long-term solution.

NMC Member Updates

Kelly Warner mentioned the review of a SPARROW model for use by USGS. Laura Gentry expressed her concern and disappointment in farmer attendance at conferences and workshops. She shared publications put out by the Illinois Corn Growers. Jong Lee announced the launch of a new University of

Illinois research center, the Center for Digital Agriculture, and its conference on October 8th, which will serve as the official launch of the new Center. Eliana Brown updated the NMC on her and Kate's renovation of the Red Oak Rain Garden, which is a 10,000 sq. ft. rain garden on the University of Illinois campus. It will be monitored for groundwater levels.

Next Steps – Eliana Brown and Gregg Good

Rick Manner, Kelly Warner, Gregg Good, and Lance will meet to discuss the Havana Lowlands Study. Jong Lee will send out the link to the NMC for the portal storyboards. Kate will send out Doodle Polls for scheduling future meetings.

The next NMC meeting will be held in October or November this year. NMC members are encouraged to attend the 2019 NLRs Partnership Conference on Dec 3rd and 4th. NMC will meet again in March 2020.

Adjourn