

## NOTES

### Phosphorus Loading Subgroup

Thursday, August 13, 2020

1:00-2:00 p.m.

Virtual Meeting

**Members:** Matt Diebel, Laura Good, Dale Robertson, Dick Lathrop, Paul Dearlove, Mark Riedel, Jake Vander Zanden, Greg Fries, Todd Stuntebeck, Kyle Minks

**Lead/Spokesperson:** Matt Diebel

**Recorder:** Paul Dearlove

**Charge:** From 12/6/19 Steering Team Notes: *"The group will focus on the biophysical side of the issue, and not social impacts. It will address questions such as: How does the system work? What kind of lake responses can we expect with different phosphorus reduction scenarios? What models and assumptions should we be using? The process will start with a system inventory and focus on the science and technical aspects of the problem. The subgroup will not get into the recommendation of specific strategies."*

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**Attendance:** Matt Diebel, Dick Lathrop, Paul Dearlove, Kyle Minks, Dave Merritt, Dale Robertson, Greg Fries, Laura Good, Todd Stuntebeck, Mark Riedel (via offline communication)

Agenda:

1. Do we need to update the lake P-loading goal?
2. Do we need to update the SWAT model?
3. How should we track P dynamics in the watershed?

Discussion notes:

- Good feedback was received from the Steering Team on the Water Quality Fundamentals document. However, no changes to the document are proposed. The document will now go to tomorrow's Executive Committee meeting for formal approval.
- Before Compact efforts turn to the specific actions needed to improve lake conditions, the subgroup needs to decide if we should revisit reduction targets, models, and the process used to track and message progress.
- Diebel previously shared for comment a document he created summarizing an adaptive management philosophy that can be used to guide our efforts. The purpose of the document was to address two major questions: How does uncertainty affect strategy selection? Should the P-reduction targets be revised?
- Yahara CLEAN 2.0 conveys a high degree of certainty with respect to the average annual loading target seen during drought years. Lathrop presented a graphical representation of how we might approach goal setting within a world of uncertainty. Considerable discussion ensued:

- CLEAN 2.0 estimated 34,000 kg annual mean load of phosphorus to Lake Mendota. Needed to cut that amount in half to get to the desired drought load (46,200 lbs.).
- Discussed relative proportion of loading from downstream watersheds and the cascading effect of phosphorus as it moves through the system.
- Discussed the narrowing or shifting of the probability distribution to the left by eliminating more of the high-load events. We don't control runoff volumes but we do control the concentrations through BMP implementation. "Mean" loads never really get down to the drought year levels that were set as a target.
- The public would benefit from being able to know what the lakes would become under different scenarios. Examples scenarios: "if we had done nothing" vs. "current management levels" vs. "all the management and interventions we can possibly do."  
ACTION ITEM: Vander Zanden will speak to Chris Kucharik about potentially using the Agroibis model to help us analyze some of these scenarios.
- There is lots of uncertainty about how the lakes will respond to various phosphorus-load reductions. If there is any modeling to do, it's the in-lake response modeling based on different loading scenarios. Robert Ladwig(?) is post-doc at the Center for Limnology who probably has the best model for this purpose calibrated for Lake Mendota. We may want to limit the dataset to the years after zebra mussels and spiny waterflea came into play.
- Do we need a really precise reduction target in order to know what we need to do and by what approximate amount? Ultimately, the public wants to know what all this really means in terms of what the lakes will look like.
- Conservation practices alone are not going to get us to where we want to go. We need to think big, and any set of solutions must address the issue of spreading large volumes of raw manure across the landscape.
- Need to recalibrate progress accounting to adjust for new pounds being added. We should not just add up quantified P reductions based on practice implementation. Loading to the lakes is what ultimately matters. However, If we just focus on phosphorus loading in our progress messaging, then we will lose people because they will think nothing is working.
- Modeling in-lake response is less important than modeling the watershed to understand how water and nutrients move through the system.  
ACTION ITEM: Diebel will continue working on developing a model that evaluates the impact of small internally drained areas within the watershed. These areas are believed to be much more extensive than originally thought.

#### Questions for the Subgroup to Address

1. Where are we now in terms of average annual phosphorus loading to the lakes?
2. What amount of reduction is now needed?
3. What is it going to take to get us there (types of actions and scale of implementation?)

#### Supplementary Information

- Diebel handout titled "Yahara CLEAN Strategy Considerations" (draft date: 8/7/20)
- Lathrop graph (see below)

