MEMORANDUM
Comfort Lake-Forest Lake Watershed District

To: Board of Managers                                      Date: November 13, 2019
From: Mike Kinney                                         
Subject: LSC One Watershed One Plan Update

Background/Discussion

This is a placeholder for further discussion with the Board as it relates to the current topics of the LSC 1W1P staff and Policy Committee meetings. As a part of this discussion, the focus areas will include a summary structure for a PTM (Prioritized, Targeted and Measurable) framework as well as an outline of the Joint Powers options that are potentially available for this effort.

Attached: Prioritized, Targeted, Measurable Review Memo
Purpose

The purpose of this memo is to recommend an action plan based on existing modeling and assessment tools in the Lower St. Croix Watershed that can be used by the local partners to prioritize resources, target implementation activities, and quantify measurable improvements in water quality. The Lower St. Croix Watershed includes watershed districts, watershed management organizations, and existing TMDL study areas (see Figure 1 and Figure 2).

PTM Action Plan

Based on the available modeling and assessment tools in the Lower St. Croix Watershed, the planning partners could utilize the following action plan to prioritize resources and subwatershed, target implementation activities, set measurable goals for improvements in water quality, and track progress toward goals:

1. **Prioritizing Resources and Subwatersheds:**
   a. The Lake St. Croix SWAT model can be used to prioritize subbasins in the Lower St. Croix Watershed with the highest phosphorus, nitrogen and sediment yields (see Figure 3 through Figure 5), or using monitoring data collected by USGS from major tributaries to the St. Croix River (Figure 6 and Figure 7).
   b. Resources can be prioritized based on whether they fall within one of the highest pollutant yielding subbasins and/or meet one or more of the following elements of the 2018 Nonpoint Priority Funding Plan:
      i. Restore those impaired waters that are closest to meeting state water quality standards
      ii. Protect those high-quality unimpaired waters at greatest risk of becoming impaired
      iii. Restore and protect water resources for public use and public health, including drinking water

The LSC Implementation Table Lake Lists currently contains 116 lakes and could be sorted by proximity to the water quality standards to select a smaller number of priority lakes to set measurable goals and target implementation activities. The local partners could request that MPCA Monitoring and Assessment staff provide a list of streams in closest proximity to water quality standards.

2. **Targeting Implementation Activities:**
   a. Modeling and assessment tools developed locally for a priority resource at the lake or stream drainage area scale should be utilized if available. For example, the CLFLWD has completed targeting tributary monitoring to identify the highest phosphorus
loading areas to priority resources at the lakeshed scale, CMSCWD has completed a modified GIS-terrain analysis to identify the highest sediment and phosphorus loading areas to priority resources at the lakeshed scale, and BCWD has completed PTMApp in select subbasins. If local targeting tools are not available, the Lake St. Croix SWAT model could be utilized to target project implementation sites within the subbasin of each priority resource.

b. Implementation activities should be ranked by cost-effectiveness to select the activities with the lowest cost per unit of pollutant load reduced to be implemented first.

c. Implementation activities can be further prioritized by their expected longevity and secondary water quality or other environmental benefits.

3. Setting Measurable Goals and Tracking Progress towards Goals:

a. Many resource specific load reduction goals already exist in local Watershed Management Plans or completed Total Maximum Daily Load studies. Some Watershed Districts have set goals that go beyond state water quality standards. Where resource specific load reduction goals do not already exist, the 27% phosphorus reduction goal set for the Lake St. Croix TMDL could be used as an interim goal for priority resources.

b. The local partners can collaborate with the St. Croix Watershed Research Station to use the Lake St. Croix SWAT model to estimate the pollutant reductions achieved by the implementation activities identified by the planning partners within each priority resource drainage area, and track progress towards goals. This model can be used for the entire Lower St. Croix Watershed to estimate the pollutant reductions that are expected to be achieved by implementing the activities identified in the Plan. If the resource specific load reduction goals are not achieved by the current level of implementation, additional implementation activities should be identified and targeted within the priority resource drainage area to achieve the resource specific load reduction goals. The total number of priority resources may need to be reduced if the cost the implementation activities needed to meet the goals exceeds the total amount of the Plan that can be supported by Watershed-based Funding, local contributions, and other funding sources.

Existing Studies for the Lake St. Croix Basin

- MPCA 2012 Lake St. Croix TMDL
- 2013 Lake St. Croix TMDL Implementation Plan
- Magdalene 2009 Lake St. Croix Total Phosphorus Loading Study
- Almendinger et al. 2015 Constructing a SWAT model of the St. Croix River Basin (Figure 3 through Figure 5)
- Almendinger 2016 Applying a SWAT Model of the St. Croix River Basin to Estimate Phosphorus and Sediment Load Reductions due to Agricultural Best Management Practices and the accompanying factsheet
Figure 1. Watershed Districts, Watershed Management Organizations, and TMDL/WRAPS Study Areas within the Lower St. Croix Planning Area
Figure 2. The Lake St. Croix TMDL Study Area within Minnesota in relation to the Lower St. Croix Planning Area
Figure 3. Average annual sediment yield at the subbasin scale in the St. Croix SWAT model, 2000-07 (Figure 4 in Almendinger 2016).
Figure 4. Average annual phosphorus yield at the subbasin scale in the St. Croix SWAT model, 2000-07 (Figure 5 in Almendinger 2016).
Figure 5. Average annual nitrogen yield at the subbasin scale in the St. Croix SWAT model, 2000-07 (Figure 6 in Almendinger 2016).
Figure 6. Suspended-sediment loads and yields of the St. Croix tributaries, Wisconsin and Minnesota (Figure 4a in USGS 2003)

Figure 7. Total phosphorus loads and yields of the St. Croix tributaries, Wisconsin and Minnesota (Figure 4b in USGS 2003)