2019 Legislative Recommendations
Legislative Water Commission
Water Retention--Keeping Water on the Land
October 2018

Issue: Water Retention: Keeping Water on the Land
Legislative actions: Legislative direction and funding to increase state agency programs through program enhancement

C 6) Water Retention--Keeping water on the land can improve water quality, soil health, groundwater recharge, and the health or our rivers and lakes. However, we need to be efficient in how we incentivize best-management practices on the landscape.

Based on feedback from the Governor's Town Hall meetings, citizens want water funding allocated for activities at the regional level rather than by state agencies. Citizens also want measurable outcomes, accountability and clear assessments about the improvement being made to our waters. Therefore, programs need to be supported to help to identify and incentivize the most efficient best-management practices at priority locations on the landscape. A cost/benefit/return-on-investment analysis of conservation drainage practices needs to be included to identify the most productive incentive programs, for specific locations, and specific land-use conditions. We need to find ways to cooperate with agro-industry because that data is abundant and detailed. Increase incentives for local implementation of clean water programs by providing additional general fund revenue and additional technical support. Promote existing programs and incentives to leverage state and federal funding programs to maximize land-owner involvement and enrollment in conservation practices. Some of these options may include more efficient agricultural practices, in- watercourse BMP implementation, cover crops, and land set-aside options. Support consensus statements from the Drainage Working Group that make changes to drainage authority rules that allow for assessments to account for downstream water quality, accelerate the buffer-strip initiative, and allow for model results to be used as a tool for ditch assessments. Encourage inter-jurisdictional water planning through the one-watershed/one-plan process. Support legislation, similar to HF 3908 that simplifies and combines planning for programs such as the TMDL, WRAPS and one watershed/one-plan programs. Promote and encourage pilot watershed-scale pollutant trading and banking programs for storm water and wastewater, as potential management practices to reduce nutrients and sediments to rivers and lakes based on pilot programs being funded by the LCCMR. Enabling legislation exists. However, implementation funding and an efficient credit- exchange mechanism are need to increase implementation. Support program to provide a better understanding of the extent of tile drains and ditches as well as their hydrologic consequences

Background: Throughout our state's history, our residents have worked to change how water flows by building dams and dikes, straightening and dredging channels, armoring streambanks, digging ditches, installing subsurface tile, and constructing storm-sewer systems. The most extreme hydrologic alterations are the construction of impervious surfaces such as roads and buildings in our cities. However, the most widespread alterations to our natural hydrology has been the conversion of native prairie to farmland and the construction of a network of drainage ditches and subsurface tile that have been essential for intensive crop production. Altered hydrology occurs in urban, agricultural, and forested parts of the state, and hydrologic alterations are locally more extreme in our cities. However, the total area of affected lands is greater in agricultural parts of the state. In all areas, we need to increase efforts to retain water on the land in order to improve natural streamflow and to improve water quality and aquatic ecology. **The question is as follows: What best management**

practices are most affective in specific landscape settings, and how can they be encouraged to improve our water resources?

Historically, poorly drained soils were saturated or flooded after spring snowmelt, preventing timely farm operations such as tilling and planting. Installation of agricultural drainage, both surface ditches and sub-surface drainage accelerated transport of water from farm fields and resulted in greater crop yields. Agricultural drainage has provided other benefits such as preventing crop drown-out, aerating the soil for improved plant growth, limiting surface runoff and soil erosion, and allowing farmers better access to croplands. Without agricultural drainage on much of Minnesota's croplands, it would have been difficult to realize high-enough crop yields needed for farmers to have economically viable returns on their investments.

In order to enable and enhance agricultural production, transportation, and economic development, the construction of drainage ditches began before Minnesota became a state. Ditches connected the natural stream network to previously unconnected depressions and wetlands and lowered the water table near ditches. Precipitation stored in depressions and soil around them was conveyed to streams and rivers. Many streams were straightened and enlarged to increase transport capacity. Each county has records of the public ditch systems, however no statewide record or map of historical ditch development has been compiled. The most active ditch construction occurred in the period from 1900 to 1929, with the decade of greatest drainage being 1910 to 1919. There was little new drainage installed during the dry years and economic depression of the 1930's. Drainage activity reemerged after World War II, driven by economic factors and periods of above-average precipitation.

The network of ditches has been augmented by installation of subsurface drainage tiles originally fabricated from clay or concrete. More recently, perforated plastic pipe is used instead of clay or concrete. Initially, tile lines were installed to drain individual wet areas that were not intersected by the ditches. With the development of the less expensive plastic drainage pipe and mechanized installation equipment, systems have expanded by patterned installation of pipe to systematically remove water from entire fields. Unlike the public ditch systems, there is no maintained record of subsurface field drainage because those systems are installed by individual landowners and permits are not needed. Subsurface field tile installation in southern Minnesota advanced throughout the 1900's and continues today. Systematic field drainage in the Red River valley was largely limited to surface drainage by ditches until about 2005, when subsurface system installation began at a rapid rate.

While drainage of Minnesota's croplands provides benefits, several environmental concerns are associated with agricultural drainage. These include wetland loss, habitat loss, and degradation of downstream water quality, and reduced potential for groundwater recharge. Early agricultural drainage efforts (pre-20th century) led to the disappearance of much of Minnesota's natural wetlands. The increased focus on preventing or mitigating wetland loss over the last 50 years has helped curtail further losses, even as agricultural drainage proceeds. Prior to establishment of Minnesota statehood, wetlands accounted for more than 10 million acres in Minnesota, including prairie wetlands, peatlands, and forest wetlands that comprised approximately 19 percent of the total land area. In 2018, only half of Minnesota's pre-settlement wetlands remain, mostly in parts of the State that have not experienced widespread drainage.

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