

WATERSHED-SCALE ASSESSMENT OF STACKED DRAINAGE PRACTICES IN THE WESTERN LAKE ERIE BASIN TO IMPROVE WATER QUALITY

The U-M Water Center engages researchers, practitioners, policymakers, and non-profit groups with the goal of supporting, integrating, and improving current and future restoration and protection efforts.

The grants program is an important part of the Water Center's efforts to enhance restoration and protection activities by engaging exceptional multi-sector teams in advancing evaluation and assessment of restoration projects.

FOR MORE INFORMATION

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PROJECT SUMMARY

The Western Lake Erie Basin (WLEB) is intensively farmed and the region is dependent upon managed drainage practices, e.g., tile drainage, channelization, to ensure productive agriculture. However, these drainage practices also facilitate the delivery of excess nutrients and sediments to Lake Erie, which have been linked to recurring algal blooms, subsequent hypoxia and associated ecological problems.

This project focuses on two relatively new best management practices (BMPs), the two-stage ditch and tile drain management. When used in tandem, these two BMPs provide great promise for improving water quality, but their efficacy has been tested only using field- and reach-scale implementation.

This project will evaluate the effectiveness of the two-stage ditch coupled with field-scale tile drain management in improving water quality in the WLEB using the Soil Water Assessment Tool (SWAT) model. The multi-disciplinary project team will parameterize the model, evaluate multiple management scenarios and incorporate the practice input parameters into the SWAT modeling guidebook. This work will build on an ongoing USDA-CEAP (Conservation Effects Assessment Program) project in the WLEB. The CEAP project already has built-in infrastructure for communication between the project team and key stakeholders, which will facilitate incorporation of feedback throughout each step of the modeling process, ultimately ensuring the incorporation of scientifically-based principles into their land-management decision-making.

The two-stage ditch offers several advantages over the conventional drainage ditch.

- *Increased channel stability*
- *Increased sedimentation: particles settle out on floodplains*
- *Increased nutrient retention: more time/space for removal*

