



A person wearing a suit and tie

Description automatically generated

**Jeffrey Kast**

**September 11, 2020 | 2:00-3:00 PM**

Zoom Meeting ID: 989 2470 8162

<https://osu.zoom.us/j/98924708162?pwd=VFF1WWNwOGFGd2kzZWN3RXQ0Z09uQT09>

Targeting BMP Placement: Integrating Human Decision-Making Factors into Watershed Modeling of the Western Lake Erie Basin

Abstract

Watershed modeling studies, including those of the Maumee River watershed, have found that targeting agricultural best management practices (BMPs) to fields with the highest nutrient loadings is more effective than randomly placing BMPs in reducing watershed-scale nutrient losses. However, farmers who manage these high nutrient-loss fields may not be the most willing to adopt BMPs. This study seeks to understand how targeting BMP placement by farmers’ willingness to engage in conservation practices affects nutrient loading from the Maumee River watershed as compared to the targeting of BMPs to fields with the highest nutrient loadings. To analyze the effect of targeting BMP placement by a farmer’s willingness to adopt a BMP, county-level distributions of farmer conservation identities, derived from farmer surveys taken in the watershed were embedded into a field-scale SWAT model of the Maumee River watershed. For both the adoption of subsurface placement of phosphorus and buffer strips, targeting by HRU level total phosphorus losses resulted in the most efficient rate of total phosphorus reduction (32% for placement of subsurface phosphorus and 23% for buffer strips), while targeting by conservation identity of HRUs managed by model primary operators resulted in a phosphorus reduction rate similar to the random adoption pathway. A hybrid targeting approach, one that is a function of both HRU level total phosphorus losses and of model primary operators' conservation identities, resulted in phosphorus reduction rates similar to that as when solely targeting by total phosphorus losses. This indicates that in policies designed to increase conservation practice adoption in watersheds across the globe there is a need to account for human characteristics. If not, needed adoption rates to achieve water quality targets derived through modeling may be underestimated resulting in an inefficient use of limited resources to accelerate water quality improvements.

For more information, contact Heather Lochotzki ([Lochotzki.7@osu.edu](mailto:Lochotzki.7@osu.edu)) or visit <https://esgp.osu.edu/>

**Environmental Science Graduate Program**

**Student Seminar Series**