

SUCCESS: PRODUCER IMPLEMENTED WATER QUALITY IMPROVEMENT IN THE DRIFTLESS AREA

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A project in southwestern Wisconsin has shown that producers' changes in management can lead to improvements in stream water quality. This project began in 2006 as a pilot to test the targeting ideas of the Wisconsin Buffer Initiative (WBI, CALS, 2005). This was a project with many partners in addition to producers: Dane, Green and Iowa County Land Conservation offices, University of Wisconsin, University of Wisconsin-Extension, The Nature Conservancy, The Natural Resources Conservation Service (NRCS), US Geological Survey, and private sector agronomists.

Two watersheds, both approximately 19 mi², with a similar mix of agriculture, grasslands and woods and similar soils and topography, were selected for the project. The WBI recommended focusing efforts on watersheds of about this size in order to see results relatively quickly. Both of the pair selected were in the upper 10% of the WBI ranking of Wisconsin most likely to benefit from conservation practices to reduce sediment and phosphorus from entering the stream (CALS, 2005). The streams at the outlets of the two watersheds have been monitored for flow, phosphorus and sediment since September 2006. One of the watersheds was picked for targeted conservation efforts, while the other was used as a reference. Having a nearby reference watershed without any special conservation efforts allows us to determine how the project itself affected water quality without having the results obscured by variations in weather and regional land management trends.

The project watershed was inventoried to locate areas that were contributing comparatively high amounts of sediment and nutrients to the stream. The tools used for identifying high loss areas were the Revised Universal Soil Loss Equation 2 (RUSLE2) and the Wisconsin Phosphorus Index in the SnapPlus nutrient management software (UW Soil Science, 2014). Dane County Land Conservation staff also used BARNY to rank barnyards by their potential phosphorus runoff. Using these inventories, the project identified ten operations estimated to be contributing the most total phosphorus in surface runoff to the streams.

Eight of the ten focus operations began working with the project in 2010, and one joined in later. They implemented a combination of in-field and off-field practices to reduce runoff phosphorus and sediment losses with cost-share funding from the NRCS and The Nature Conservancy. The main field management changes were no-till/reduced tillage and pasture/lot systems.

We kept track of cropland and pasture management throughout the project and maintained the SnapPlus databases from the inventory in order to estimate the effects of the project. Participating farmers cut their operations' estimated erosion and phosphorus delivery by half. We also observed that some land not identified as high runoff loss areas in the initial inventory became high loss areas due to management changes. Chief among these changes was conversion of Conservation Reserve Program (CRP) grasslands into tilled cropland. The reference watershed had similar land management trends with CRP conversion.

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In 2013, the first year after full implementation, there was a statistically significant reduction in phosphorus runoff event loads in the project stream compared to the reference stream. This project showed that it is possible to achieve water quality improvements in a relatively short time frame by focusing conservation efforts within watersheds of the WBI-recommended size. Through monitoring both a treatment and reference watershed with both watersheds subject to the same weather and land management trends, we were able to show that producers' management changes had a positive effect.

References

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