

Summary of Shallow Groundwater Nitrate at Neal Smith National Wildlife Refuge

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Twelve sub-watershed catchments (approximately 4-7 acres each) were identified during the spring of 2004 through site visits and consultations with the staff of the Neal Smith NWR. Experimental treatments were established after tillage of the watersheds. The treatment design includes three replicates of four treatments: (1) completely corn/bean, (2) ~10% prairie cover in the footslope position, (3) ~10% prairie cover distributed between the footslope and contour positions, and (4) ~20% prairie cover distributed between the footslope and contour positions

Groundwater wells were installed in the fall of 2004 at two locations in each subcatchment: the summit and foot positions. Groundwater level has been recorded on a monthly basis since beginning in the spring of 2006. Early results on nitrate-N concentrations in shallow groundwater through 2008 were reported in Zhou et al. (2010). As shown in Figure 1, we have summarized results collected through 2014. The reductions in shallow groundwater nitrate-N concentrations by the prairie strips continue to increase with reductions as great as 87% in 2014. Future work will attempt to quantify the mass reduction of nitrate-N provided by these prairie strips.

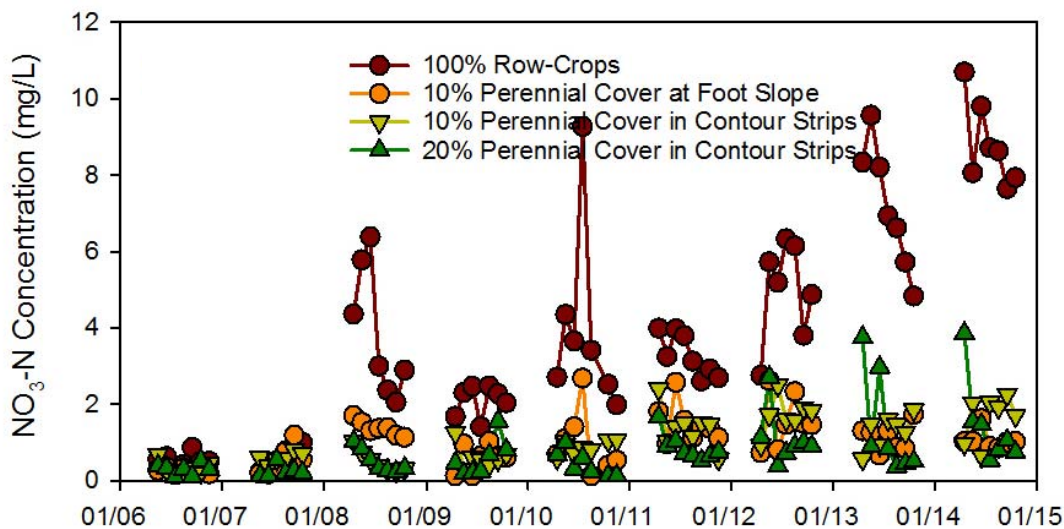


Figure 1. Summary of nitrate-N concentration in shallow groundwater

Zhou, X., M.J. Helmers, H. Asbjornsen, R. Kolka, and M. Tomer. 2010. Perennial filter strips reduce nitrate levels in soil and shallow groundwater after grassland-to-cropland conversion. *Journal of Environmental Quality* 39(6): 2006-2015.