



Reducing hydrological connectivity of depressions to streams in glacial till landscapes

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Isolated depressions (also known as potholes) are a common feature in many glacial till landscapes. Glacial till soils are among the most productive in the world, and thus to maximize agricultural production, many depressions are farmed. However, these areas must be drained of surface water in order to be effectively farmed. One of the most common methods to drain the surface water from depressions is by using a pipe (commonly referred to as a tile riser) that conveys surface water directly from the depression to a stream, even though there may be > 1 km between the two. An alternative management practice has been tested at the field and watershed scale in the St. Joseph River watershed, northeast Indiana, United States. This practice, known as a blind inlet, is basically dense network of subsurface tile drains located in a bed of gravel that has been encased in geotextile, and has been built so that farm equipment can operate over the structure. At the field scale in 2010, sediment loading was reduced by as much as 79%, soluble and total phosphorus have been decreased by more than 70%, and nitrogen has been reduced by 24 to 59%. In early 2010, all (13) of the tile risers in a small, 300 ha watershed were replaced with blind inlets. The relationship between discharge and total phosphorus indicates that after installation, the predominant fluxes of total phosphorus at the watershed outlet was likely due to in-stream resuspension of sediments. This appears to be a promising method to improve water quality by unlinking the direct connectivity between the fields and streams.