



Sediment P in Agricultural Streams: Response to Land Use and Influence on TP Export

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Phosphorus export from agricultural streams can be a significant source to downstream water bodies, contributing to eutrophication, algal blooms and hypoxia. Sediment in agricultural streams can have very high P concentrations and has been proposed as a significant source of P to the water column though bioavailability can be low. Recent work suggests that sediments can sorb P from point sources such as WWTPs, and release this P during disturbances such as high flow events. However, it is unclear if sediment P responds to increased P application to the landscape, or if it is a significant source of P to annual TP export from agricultural streams. We examined 15 streams in southern Ontario, Canada, in highly agricultural catchments, comparing stream sediment P concentration to sediment geochemistry, P application, runoff, tile drainage, water column TP concentration and TP export. Stream sediment P was well correlated to sediment Fe and C and to tile drainage, and weakly correlated to manure P. This could suggest that sediment P responds to P addition, and may temporarily store P incoming from agricultural sources. Annual TP export was not correlated to stream sediment P concentration but was well correlated with runoff and tile drainage. This suggests P stored in sediment is a minor contributor to annual TP export. Effective agricultural P management strategies include implementing drainage water management, buffer zones etc. in catchments with high runoff and tile drainage.