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**Title:**

GIS and Terrain Analysis for Sizing Vegetative Filters Around Grassed Waterways and Streams in Agricultural Landscapes.

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**Abstract:**

The objectives of this study were to combine analyses in a GIS framework in order to determine 1) where grassed waterway should be placed in agricultural landscapes to reduce ephemeral gully erosion and 2) the dimensions of vegetative buffers placed at field borders and on either side of streams and grassed waterways in order to reduce sediment delivery to surface and groundwater. Terrain attributes were calculated with Taudem and ArcGIS. A previously published logistic regression model was used to determine where waterways should be placed. A procedure employing VFSSMOD was used to determine the appropriate vegetative buffer dimensions around the edges of grassed waterways and field boundaries required achieve a sediment runoff trapping efficiency of some user specified value. We will evaluate the robustness of these GIS tools and compare results obtained using elevation data from both USGS DEMs and LiDAR.