

Oral Presentation

Preliminary estimates of phosphorus loads and delivery to coastal areas in North Carolina

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Anthropogenic activities such as the intensive animal production and urbanization are important sources of phosphorus transport to streams and led to productivity and eutrophication of lakes and reservoirs in the Southeastern United States. Effective management of phosphorus transport requires a systematic understanding of the sources and delivery at watershed and regional scales. The U.S. Geological Survey (USGS) has developed a modeling tool, SPARROW (SPATIally Referenced Regression On Watershed Attributes) that statistically relates landscape attributes to monitored phosphorus loads. Preliminary results from a recently completed phosphorus SPARROW model for the Southeast were compiled for 2002. The physical basis for the empirical model framework builds upon research on phosphorus sources and factors, such as erosion and soil properties, that influence transport at the field-scale and in small catchments. Total phosphorus yields and shares of delivered phosphorus to the Albemarle Sound, Pamlico Sound, and Cape Fear estuary are presented.

The findings for Southeastern U.S. streams emphasize the importance of accounting for phosphorus in the soil profile; the source variable used to include background phosphorus in soil and parent rock proved highly statistically significant. According to preliminary model predictions, the greatest sources of phosphorus delivered to downstream receiving water bodies in the study area are background phosphorus in soil parent rock and phosphorus associated with the extent of agricultural land. Other sources considered include phosphorus in permitted wastewater discharge, nonpoint urban runoff, manure applications and mining activities in high phosphate areas.