

Preliminary Observations of Nitrogen Speciation and Transport in Two Watersheds of the Chesapeake Bay Estuary

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Sediment and water samples were collected from November 1997 through April 1999 from two watersheds, Popes Creek, Virginia, and the Pocomoke River, Maryland. The samples were collected to determine sites of nutrient storage and to evaluate nutrient concentrations that are associated with the sediments and dissolved materials being transported from watershed sources to the Chesapeake Bay. Popes Creek, which is located in Westmoreland County, Virginia, is a tributary to the Potomac River that flows into the Chesapeake Bay. The Pocomoke River, which is located on the eastern shore of Maryland, empties into the Chesapeake Bay through the Pocomoke Sound. The watershed of the Pocomoke River is 15 times larger than Popes Creek watershed and has tributaries that drain three counties in Maryland. Both watersheds lie in the Coastal Plain Physiographic Province. Since European settlement in the 1600's, agriculture has been the major land use in both watersheds. Popes Creek watershed, with very little agricultural activity at present, forms the basis for a reference in the comparison of the two watersheds. In the Pocomoke watershed, agricultural practices, such as ditching of fields and channelization of rivers and streams for improved drainage, are important factors in facilitating the transport of sediments and nutrients. Because of these practices, water that drains from agricultural fields effectively bypasses the riparian buffer zones where processing and uptake of nutrients takes place. In contrast to Popes Creek, poultry farming is extensive in the Pocomoke River watershed. In 1992, 182 million chickens were produced in three counties that are drained by the Pocomoke River. The intensive poultry farming, which produces nutrient-rich manure that is disposed of by spreading on fields in the watershed, has created a serious nutrient-enrichment problem in the river and in Pocomoke Sound. The spatial distribution of the concentrations of nitrogen species in sediment and in water in the two watersheds is displayed in a Geographic Information System (GIS) map format as an image coverage that overlies the ditches, river channels, and the geologic framework of the basins.

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