

Technical Memorandum

Significant Nutrient Nonpoint Sources in the Wicomico Creek Watershed

EPA requires that States provide, in support of each Total Maximum Daily Load (TMDL), allocations that account for all significant sources of the impairing pollutant or pollutants. The TMDLs for Wicomico Creek address two impairing pollutants: total nitrogen (TN) and total phosphorus (TP). There are no permitted point sources of TN and TP in the Wicomico Creek watershed. Accordingly, this Technical Memorandum identifies, in detail, the significant nonpoint source loads of TN and TP to Wicomico Creek and the distribution of those loads between different land uses. The information presented represents conceptual values that are consistent with the thresholds of the proposed TMDLs. The Maryland Department of the Environment reserves the right to allocate the loads among various sources in any manner that is reasonably calculated to achieve water quality standards.

TMDLs are being established in the Wicomico Creek watershed for both low-flow and average annual conditions. The nonpoint source loads that were used in the model account for both “natural” and human-induced components. Low-flow nonpoint source loads were based on in-stream monitoring data. Insufficient data are available to distribute the low-flow nonpoint source load among different land use categories.

The average annual nonpoint source loads were determined using land use loading coefficients. The land use information was based on 1997 Maryland Office of Planning data, with crop acreage refined by 1997 Farm Service Agency data. The total nonpoint source load was calculated by summing all of the individual land use areas and multiplying by the corresponding land use loading coefficients. The loading coefficients were based on the results of the Chesapeake Bay Watershed Model¹, a continuous simulation model. The Bay Model loading rates are consistent with what would be expected in the year 2000 assuming continued Best Management Practice (BMP) implementation at a level consistent with current progress. These loads reflect both natural and human sources, including atmospheric deposition, loads coming from septic tanks, loads coming from urban development, agriculture, and forestland. Table 1A and Table 1B provide one possible scenario for the distribution of average annual nitrogen and phosphorus nonpoint source loads between different land use categories.

¹ U.S. EPA Chesapeake Bay Program, “Chesapeake Bay Program: Watershed Model Application to Calculate Bay Nutrient Loadings: Final Findings and Recommendations,” and Appendices, 1996.

Table 1A

**Nonpoint Source Nitrogen Loads
Attributed to Significant Land Uses for Average Annual TMDLs**

Land Use Category	Percent of Nonpoint Source Load	Nonpoint Source Load (lb/yr)
Mixed Agricultural	50.6 %	51,378
Forest and Other Herbaceous	33.4 %	33,873
Urban	12.3 %	12,498
Atmospheric Deposition ²	3.7 %	3,789
Total	100 %	101,538

Table 1B

**Nonpoint Source Phosphorus Loads
Attributed to Significant Land Uses for Average Annual TMDLs**

Land Use Category	Percent of Nonpoint Source Load	Nonpoint Source Load (lb/yr)
Mixed Agricultural	76.9 %	4,484
Forest and Other Herbaceous	12.7 %	741
Urban	6.4 %	372
Atmospheric Deposition ²	4.0 %	236
Total	100 %	5,833

It must be noted that these loads are based on broad-scaled estimates. Efforts are underway to update the Chesapeake Bay model, and MDE anticipates that better estimates of land use and loading rates will be available in the future.

² The atmospheric deposition load is attributable to deposition only to surface water, atmospheric deposition to land surfaces is included in the loads attributed mixed agriculture, forest and other herbaceous, and urban land uses.

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