

Technical Memorandum

Significant Nutrient Nonpoint Sources in the Northeast River Watershed

The U.S. Environmental Protection Agency requires that Total Maximum Daily Load (TMDL) allocations account for all significant sources of each impairing pollutant. This technical memorandum identifies, in detail, the significant nonpoint sources of nitrogen (TN) and phosphorus (TP) in the Northeast River watershed and their distribution between different land uses. Details are provided for allocating NPS loads for nutrients to different land use categories. These are conceptual values that are within the TMDL thresholds. The Maryland Department of the Environment (MDE) expressly reserves the right to allocate the TMDLs among different sources in any manner that is reasonably calculated to achieve water quality standards.

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

The total nonpoint source loads for these average annual conditions were calculated using an average of all the observed 1999 data collected by MDE. The loads were computed as the product of the observed concentrations and estimated average flow. The nutrient loads account for contributions from atmospheric deposition, septic tanks, cropland, pasture, feedlots, forest, and urban land. The percentages of these loads by landuse were determined using ratios of land use percentages and loading coefficients by landuse from the Chesapeake Bay Program. The land use information was based on 1997 Maryland Department of Planning data. These percentages were then applied to the TMDL loads estimated from MDE observed data.

Tables 1A and 1B provide one possible scenario for the distribution of average annual nitrogen and phosphorus NPS loads between different land use categories.

Table 1A
Nonpoint Source Nitrogen Loads Attributed to
Significant Land Uses for Northeast River Average Annual TMDLs

Land Use Category	Percentage of Nonpoint Source Load	Nonpoint Source Load (lbs/yr)
Mixed Agricultural	76.7 %	57,301
Forest and Other Herbaceous	22.2 %	16,658
Atmospheric Deposition ²	1.1 %	790
Total	100.0 %	74,749

Table 1B
Nonpoint Source Phosphorus Loads Attributed to
Significant Land Uses for Northeast River Average Annual TMDLs

Land Use Category	Percentage of Nonpoint Source Load	Nonpoint Source Load (lbs/yr)
Mixed Agricultural	95.3 %	3,587
Forest and Other Herbaceous	4.0 %	149
Atmosphere Deposition ²	0.7 %	27
Total	100.0 %	3,763

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.