

Cost Analysis for Nitrogen Control Strategies in the Chesapeake Basin

Lynn R. Shuyler, and Robin Snyder,
EPA Chesapeake Bay Program, USA

During the Chesapeake Bay Program's reevaluation of the nutrient reduction strategy for the Bay, it became necessary to develop a system to determine the cost and cost effectiveness of implementation of abatement control technologies within the Bay basin. The system utilizes several products of the program; the watershed model, results from watershed model simulations, nonpoint source (NPS) best management practice (BMP) installation tracking information, and several cost studies of point and NPS controls strategies.

The watershed model simulates the load reductions, by land use, achieved by installation of BMPs for NPS pollution control and by changes in treatment plant technology. The total cost for implementation of NPS controls is calculated by using the amortized cost per acre for the selected BMPs and the number of acres that have the selected BMPs applied to them. Treatment plant improvement costs are developed from installation data for the technology proposed and the costs to operate the technology over the size ranges needed.

These data are then combined to calculate the total cost for the management scenario selected and the cost per pound of nutrient removed is calculated for each scenario simulated. The various treatment alternatives for point and NPS can be ranked based on cost per pound of nutrient removed to determine the most cost effective strategy for each tributary and or model segment in the watershed. The Chesapeake Bay Program has used these systems to develop costs for the limit of technology scenario for point and NPS controls in the basin. This paper presents the methodology used and results of cost studies completed for the Bay Program.