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JWARP > Vol.2 No.5, May 2010

OPEN ACCESS

## Evaluation of Best Management Practices in Millsboro Pond Watershed Using Soil and Water Assessment Tool (SWAT) Model

PDF (Size: 2160KB) PP. 403-412 DOI: 10.4236/jwarp.2010.25047

### Author(s)

Aditya Sood, William F. Ritter

### ABSTRACT

The Inland Bays in southern Delaware (USA) are facing eutrophication due to the nutrient loading from its watershed. The source of nutrients in the watershed is predominantly agriculture. The Millsboro Pond, a sub-watershed within the Inland Bays basin, was modeled using the Soil and Water Assessment Tool (SWAT) model. It was found that the contribution of ground water from outside the watershed had a significant impact on the hydrology of the region. Once the model was calibrated and validated, five management scenarios were implemented, one at a time, to measure its effectiveness in reducing the nutrient loading in the watershed. Among the Best Management Practices (BMPs), planting winter cover crops on the agriculture land was the most effective method in reducing the nutrient loads. The second most effective method was to provide grassland riparian zones. The BMPs alone were not able to achieve the nutrient load reduction as required by the Total Maximum Daily Loads (TMDLs). Two extra scenarios that involved in replacing agriculture land with forest, first with deciduous trees and then with high yielding trees were considered. It is suggested that to achieve the required TMDL for the watershed, some parts of the agricultural land may have to be effectively converted into the managed forest with some high yielding trees such as hybrid poplar trees providing cellulose raw material for bio fuels. The remaining agriculture land should take up the practice of planting winter cover crops and better nutrient management. Riparian zones, either in form of forest or grasslands, should be the final line of defense for reducing nutrient loading in the watershed.

### KEYWORDS

Watershed, BMPs, Modelling, SWAT

### Cite this paper

A. Sood and W. Ritter, "Evaluation of Best Management Practices in Millsboro Pond Watershed Using Soil and Water Assessment Tool (SWAT) Model," *Journal of Water Resource and Protection*, Vol. 2 No. 5, 2010, pp. 403-412. doi: 10.4236/jwarp.2010.25047.

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