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Biofuels and the Bay: An Analysis of Crop Production Trends and Their Potential Water Quality Impacts within the Chesapeake Bay Watershed

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Abstract:

The Chesapeake Bay watershed stretches across more than 64,000 square miles, encompassing parts of six states; Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the entire District of Columbia. The Chesapeake's land-to-water ratio (14:1) is the largest of any coastal water body in the world. This is why land use and land management have such significant influences on the health of the Bay. In recent years there has been an intensification of cropping systems and an increase of row crop acres within the Bay watershed; if this trend continues agricultural water quality gains of the last 25 years could be reversed.

Agricultural lands account for approximately 22% of the watershed, and contribute more nutrients to the Bay than any other land use. It is estimated that agricultural operations produce 41% of the nitrogen, 47% of the phosphorus, and 63% of the sediment loads going to the Bay. Due to the considerable acreage within the Chesapeake Bay watershed that is devoted to agricultural production, the annual crop management decisions of producers as a group can have a significant impact on water quality. Many factors influence annual cropping decisions, including the substantial role commodity market trends play in encouraging producers to alter their typical crop production rotations and acreages. The shift to 'green' energy production, such as the use of biofuels could potentially create markets that continue to intensify cropping system patterns. Biofuel production both within and beyond the Bay watershed could have similar impacts, due to global markets and the proximity of the Bay watershed to major population centers with high energy demands. This analysis will explore the present trends in agricultural production systems; as well as the current and possible future effects on water quality in the Bay if these trends continue.

Impact Statement:

The analysis will potentially be used to evaluate the impact of the re-authorization of the National Renewable Fuels Standard (RFS2). This data will be used to evaluate the progress toward attainment of the Chesapeake 2000 Restoration Goals. This information will also be used in developing new tributary strategies and implementation plans in response to the 2010 TMDL.

Category: Conservation and Resource Management

Type of Presentation: Oral Presentation