Southeastern Section–56th Annual Meeting (29–30 March 2007)

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GIS BASED WATER QUALITY ASSESSMENT OF THE SALUDA AND REEDY RIVER BASINS USING SWAT MODEL

IRIZARRY, Ivan, Dept. of Earth and Environmental Sciences, Furman Univ, 3300 Poinsett Highway, Greenville, SC 29613, ivan.irizarry@furman.edu and MUTHUKRISHNAN, Suresh, Earth and Environmental Sciences, Furman University, 3300 Poinsett Highway, Greenville, SC 29613

Algal bloom is a serious concern caused by excessive nutrient flow into lakes and rivers. Increased nutrient load is caused by point and non-point sources such as waste water treatment facility, industrial discharge sites, and different land cover areas. Lake Greenwood in the lower piedmont of South Carolina has two major rivers, Saluda and Reedy, feeding into it and has shown algal bloom on Reedy side of the lake but not on Saluda side. A study done in 2005 involving analysis of water samples identified treated effluent from waste water treatment plants (point sources) located along the Reedy River to be one of the main sources of higher nutrient load in to the lake. Present study focuses on understanding the non-point source contribution of nutrients using GIS based water quality modeling approach and comparing model predicted results to the observed values. Modeling based approach to understand nutrient loads in river systems provides the advantage of the ability to simulate or predict loads based on various land cover scenarios. For this study, land cover and soil data, digital elevation model, and weather data were used with Soil and Water Assessment Tool (SWAT) to model the contribution of nutrients from different hydrologic response units. Results from the model for both Saluda and Reedy Rivers showed an increasing nitrate concentration trend from head waters towards Lake Greenwood. However, model predictions were opposite of what was observed with respect to the algal bloom. In the Reedy River, model predictions were generally much lower than the observed values at each of the outlet locations. A part of the reason for the contrasting results obtained between the model prediction and field observation is lack of point source discharge contribution in the model prediction. Further studies at a more detailed spatial scale than hydrologic response units is necessary along with calibration of the results to improve model usability for predicting the impacts of future land cover changes.

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General Information for this Meeting

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Undergraduate Research (Posters)
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