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Evaluation Of Sediment Load Reductions In Southeastern U.S. Forest Regions

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Water from forests landscape is generally of very high quality especially when compared with other landscapes such as agriculture, urban and industrial. Based on the US EPA National Water Quality Inventory 2000 Report, forest lands causes the least amount of pollutants to rivers and streams. Much of the forest land in the Southeastern US is actively managed with forestry operations such as timber harvesting, road construction etc., which expose the soils and leads to increased sediment loads causing turbidity to streams and rivers. The objective of this research is to quantify sediment load reductions in southeastern US forest regions resulting from selected BMPs. Sediment yields are simulated using the Water Erosion Prediction Project (WEPP 2007) model. WEPP, a field scale deterministic model, especially adapted and tested by US Forest Service personnel as a forest land management tool. For this research, 8 MLRA regions across the southeastern US are selected. Thirty year simulations are performed using WEPP CLIGEN weather generator, 16 forest soil series and pre-selected forest management files. Simulations are conducted for undisturbed forest, clearcut to stream with and without BMP, and forest roads with and without BMPs. BMPs adopted are a 35 feet buffer zone at the bottom of the hillslope for clearcuts and water control structures for forest roads. Preliminary results indicate quantifiable reduction in sediment loads using BMPs under selected simulation conditions. To our knowledge, results from field scale models in the southeastern US have not been extrapolated to the watershed level for use in TMDL planning and implementation. Therefore, results of this study can be used not only to evaluate the effectiveness of selected forest BMPs in the southeastern US using field-scale modeling, but to then upscale results, in terms of BMP effectiveness (i.e. load reduction), to the watershed level.