



International Erosion Control Association

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International Erosion Control Association

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Technical Paper Describing Method for Predicting Erosion of Forest Roads Recognized for Excellence in Erosion Control

STEAMBOAT SPRINGS, Colo. – *Modeling Erosion from Forest Roads with WEPP*, a research report describing the accuracy of a model used for estimating soil erosion and stormwater runoff from forest roads in southern Appalachia, has received the 2007 *Most Distinguished Technical Paper* award from the International Erosion Control Association (IECA).

The paper's author, Johnny McFero Grace, III, Ph.D., CPESC, a research engineer with the USDA Forest Service, Southern Research Station, Forest Operations Research Unit, Auburn, Ala., will accept the award during formal ceremonies February 13, 2007, at Environmental Connection, IECA's annual conference in Reno, Nev. The international award recognizes Grace's outstanding contribution to the erosion control industry.

The eight-year study evaluated the ability of the Water Erosion Prediction Project (WEPP), originally developed for agricultural applications, to model erosion and stormwater runoff from forest roads under different management practices. The research compared the amount of erosion estimated by the WEPP to actual erosion rates on 24 road side slopes in the Talladega National Forest in east-central Alabama and three road sections in the Chattahoochee National Forest in northeastern Georgia. The results revealed that the physically-based soil erosion model was better at predicting sediment yields than amount of runoff.

Grace said this research is important because "it provides managers with critical information on the applicability of the model in predicting soil erosion and the benefits of selected erosion control practices in reducing erosion on similar southern Appalachian roads."

"The investigations were undertaken in response to requests from the National Forests in Alabama for information on forest road erosion and the effectiveness of erosion control alternatives for science-based decisions in forest road management," said Grace. "This report is a vital step in our science delivery."

In the study of erosion on the side slopes, the researcher compared sediment losses where three different methods were used to control erosion – either a rolled erosion control product, native grasses or a mixture of non-native grasses and legumes – to sediment yields from bare, untreated plots for eight years. He found that 60 to 90 percent of total soil losses throughout the study period occurred during the first year on plots treated with the rolled erosion control product or either the native or non-native vegetation. By contrast, 40 percent of the total erosion on the bare, untreated plots occurred in the first year.

The accuracy of the WEPP in predicting erosion was highest on slopes protected by the native grasses and the rolled erosion control product. The much lower prediction accuracy of the WEPP with the non-native vegetation and control slopes reflects the inability to characterize the non-native vegetation in the WEPP model, Grace reports.

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In the other part of the study, the researchers measured erosion of the three road sections following eight storms of various intensities. In this case, the soil losses predicted by the WEPP agreed with the actual measured rates of erosion.

However, the accuracy of this model in predicting the amount of stormwater runoff was much lower. This reflects the inability of describing the effective hydraulic conductivity and soil texture in the model to optimize predictions of both sediment and runoff at the same time, Grace says.

Grace concluded by stating that additional collection of data on soil properties and storm events is required to test applicability of WEPP to predict sediment and runoff yields in this southern Appalachian setting.

About IECA

The International Erosion Control Association (IECA) is the world's oldest and largest association devoted entirely to helping members solve the problems caused by erosion and its byproduct – sediment. Founded in 1972, IECA is a non-profit organization that serves as the premier global resource for the prevention and control of erosion.

This is the 16th year of the annual IECA *Awards of Environmental Excellence* program. The *Most Distinguished Technical Paper* award recognizes clear, concise writing that presents innovative solutions to erosion control. The award is given to one paper, presented at Environmental Connection, which contributes significantly to the advancement of erosion control knowledge.

For more information about state-of-the-art educational events and materials, please visit our web site at www.ieca.org.

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