USE OF ANNAGNPS AND REMOTELY-SENSED DATA IN WATERSHED CONSERVATION MANAGEMENT PLANNING

Ronald L. Bingner, Agricultural Engineer, National Sedimentation Laboratory, United States Department of Agriculture-Agricultural Research Service, Oxford, MS, Ron.Bingner@ars.usda.gov; Henrique G. Momm, Assistant Professor, Department of Geosciences, Middle Tennessee State University, Murfreesboro, TN, Henrique.Momm@mtsu.edu; Robert R. Wells, Research Hydraulic Engineer, National Sedimentation Laboratory, United States Department of Agriculture-Agricultural Research Service, Oxford, MS, Robert.Wells@ars.usda.gov; Roger A. Kuhnle, Research Hydraulic Engineer, National Sedimentation Laboratory, United States Department of Agriculture-Agricultural Research Service, Oxford, MS, Roger.Kuhnle@ars.usda.gov

Abstract: The development of watershed conservation management plans involves many decisions that affect various aspects of a watershed system, with consequences that are difficult to measure. In addition, the efficient placement of practices throughout a watershed as part of an integrated management plan can be difficult without the use of remote sensing data and technology. Watershed modeling technology can use remotely sensed data to evaluate the best placement of edge-of-field buffers and grassed waterways or drop-pipes for gully erosion control for efficient use of conservation resources. This study evaluated the capability of using remotely sensed data and technology for assessments with the USDA Annualized Agricultural Non-Point Source pollutant loading model, AnnAGNPS, in agricultural watersheds. Identification of ephemeral gully and riparian buffers locations and their characteristics were developed using remote sensing components developed as part of AnnAGNPS for comparison to actual locations and characteristics observed in the Goodwin Creek Watershed in North-Central Mississippi that is part of the USDA-ARS Benchmark CEAP-Watershed Assessment Study project. Simulations were performed with AnnAGNPS to assess various levels of conservation practice implementations identified with remotely sensed data and compared to measured loads.

Developing enhanced technology and research to assess conservation management plans is critical for planning and implementing conservation practices specifically designed for erosion and other pollutant control. This study describes the current state of using remote sensed data and research needs for assessing integrated conservation practices and management planning for controlling pollutant loads using the AnnAGNPS watershed model.