



2009 CSREES National Water Conference; St. Louis, MO

CEAP Synthesis: Regional Classification for Identification of Dominant Hydrologic Flow Paths and Critical Management Zones

Jan Boll*, Erin Brooks, Tammo Steenhuis, Zach Easton, George Vellidis, Lyuba Kurkalova, JD Wulfhorst, Robert Mahler

University of Idaho; *jboll@uidaho.edu

Abstract:

As part of the Conservation Effectiveness Assessment Program (CEAP), lessons learned across 13 CSREES-NRCS-funded CEAP project are being summarized and analyzed. This project includes three phases: analysis, synthesis and outreach to answer key CEAP questions, and produce science-based knowledge to inform policy makers and key stakeholder groups. CEAP synthesis will lead to tools for the optimal placement of systems of BMPs in watersheds across the nation. We take lessons learned at the local level and integrate them with a regional scale classification system. In this study we introduce a framework for developing a regional hydrologic classification system that can be used by watershed managers to identify dominant hydrologic flow paths and critical management zones within a landscape. At the hillslope scale dominant hydrologic flow paths are largely influenced by variability in topography, soil structure, and land use. At a regional scale differences in climate greatly influence the dominant hydrologic flow path. We demonstrate the variability in the dominant flow paths at the hillslope scale and at the regional scale using a modified version of the Water Erosion Prediction Project (WEPP) model. The WEPP model has an extensive soil and climatic database for all the major soil types and climate stations throughout the US. Detailed algorithms are also available to simulate a wide range of agricultural management practices. Model output including long term average infiltration excess and saturation excess runoff, subsurface stormflow, deep percolation, and evapotranspiration was used to identify dominant hydrologic flow paths at regional and hillslope scales for various conservation management practices. We discuss the benefits and challenges of a regional hydrologic classification system for use in management decisions and as an aid in diagnosing dominant hydrologic flow processes in ungaged basins.

Impact Statement:

This project will establish the foundation for continued analysis and synthesis of BMP systems in other watersheds by developing CEAP watershed assessment tools. Our research and outreach methods are in line with the goal of National Integrated Water Quality Program to contribute to the improvement of the quality of our Nation's surface water and groundwater resources.

Category: CEAP

Type of Presentation: Oral Presentation