Predicting Sediment and Nutrient Loss Using a Hydrologic Model. (S06-mcvay121410-Oral)

Authors:

- K.McVay Kansas State University
- D.Hermel Kansas State University

Abstract:

The Soil and Water Assessment Tool (SWAT) was used to simulate hydrologic processes of a small agricultural watershed in north central Kansas. SWAT is a GIS-based continuous time model that layers elevation, land use, soils, and precipitation data. The watershed is 5.2 ha delineated by SWAT into four sub-basins. We modeled eight years, and calibrated on 70 events of the last two years where surface runoff volume, sediment, organic N, organic P, sediment P, soluble P, and NO3 export were measured. Model predictions compared favorably with observed data after calibration. Critical steps needed for the successful use of SWAT on this small watershed included selecting a proper density of elevation measurements along terrace (sub-basin) boundaries, and choice of a proper time step to provide hydrologic information appropriate for the time of concentration for the watershed area. Also, since initial conditions cannot be set in SWAT, running the model over several years prior to the measurement period improved calibration efforts. This information will be used to improve modeling efforts on a larger watershed and to assess best management practices on Kansas agriculture fields.

Corresponding Author Information:

Kent McVay Kansas State University 2014 Throckmorton Plant Sciences Center Manhattan, KS 66506 phone: 785-532-5776 e-mail: kmcvay@ksu.edu

Presentation Information:

Presentation Date: Tuesday, November 12, 2002 Presentation Time: 10:45 am

Keywords:

runoff, modeling, SWAT