

Use of the ARS Watershed Network for Developing and Validating Models

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Abstract

The ARS experimental watersheds are a unique source of data for developing and validating field and watershed scale models. Long term weather, flow and sediment data have been collected at several ARS watersheds for nearly 70 years. Other advantages of the ARS watershed network are: 1) availability of input data for modeling applications including detailed soils, land use and management, 2) dense weather gages, 3) nested subwatersheds, 4) continuous subdaily flow and sediment, and 5) watersheds scattered across the U.S. in varying hydrological and ecological regions. In addition to continuous flow and sediment data, water quality data are also collected at several watersheds. The water quality data include carbon, nitrogen, phosphorus and pesticides. In this paper, several examples are given showing how the Soil and Water Assessment Tool (SWAT) model has been refined and validated using ARS watershed data. The examples include: 1) phosphorus runoff from poultry litter application fields at Riesel, Texas, 2) flood control structures at Chickasha, Oklahoma, 3) riparian zones in Tifton, Georgia, and 4) surface cracking of clay soils in Riesel, Texas. SWAT is a watershed model that is being used for developing best management practices for pollution control and in U.S. EPA's Total Maximum Daily Load (TMDL) program.

Keywords: watershed models, validation, best management practices