Hydrologic and Soil Erosion Research at the Walnut Gulch Experimental Watershed, southeastern Arizona

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Watershed research is critical for quantifying the unique characteristics of hydrologic processes in any environment. In 1953, the United States Department of Agriculture established the Walnut Gulch Experimental Watershed (WGEW), which covers an area of 150 square kilometers in southeastern Arizona, U.S.A. near the town of Tombstone. WGEW data have been used to quantify and characterize semiarid rainfall, runoff, infiltration, and transmission losses; to develop and validate simulation models; and to support broader, regional, watershed-scale research. Currently the watershed functions as an outdoor laboratory for the USDA-ARS Southwest Watershed Research Center (SWRC) for many and various research directions related to rainfall, runoff, sediment, meteorology, remote sensing, and land/atmosphere fluxes. Basic data collection continues at the WGEW, and data use has evolved to support several multiple government agencies, universities, and international research programs. SWRC scientists have produced over 1500 manuscripts and several computer simulation models so that the hydrologic knowledge gained can be transferred to users worldwide. Some of the hydrologic models developed that relied on data and concepts from WGEW include AGWA, RHEM, CREAMS, RUSLE, WEPP, WEPPCAT, and KINEROS. A complete list of publications, models and databases is available from the SWRC website. This presentation will overview a portion of the research currently underway as well as new work being initiated to better understand the dynamics and processes of rainfall, runoff, erosion, sediment transport, and landscape evolution in the semi-arid environment.