AGWA Application to Assess Surface Water Availability of the San Pedro Watershed

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Abstract: The Southwest Ecosystem Service Project (SwESP) is part of the U.S. Environmental Protection Agency's new Ecosystem Services Research Program, undertaken to examine the variety of ways in which the landscapes including crop lands, conservation areas, wetlands, lakes, streams, and other land cover types contribute to wildlife and human well-being. The primary goal of the SwESP is to examine the landscape of the Southwestern US and quantify the current magnitude of such contributions, and to examine how ecosystem services in the Southwest have changed in the past decades and/or could change over the next decades. Given the growing demand for water and the likely decreasing precipitation due to climate change, water availability has become a dominant issue in arid and semi-arid ecosystems. Therefore, the overall objective of this study is to assess the amount of current available surface water and how it has changed during the past decades in the San Pedro watershed. To achieve this objective, the Automated Geospatial Watershed Assessment Tool (AGWA), jointly developed by the U.S. Environmental Protection Agency, the U.S. Department of Agriculture Agricultural Research Service, and the University of Arizona, will be applied to evaluate amount of runoff generated from the San Pedro watershed. AGWA is a GIS interface developed to automate the parameterization and execution of the Soil Water Assessment Tool (SWAT) and KINematic Runoff and EROSion (KINEROS2) hydrologic models. The application of these two models allows AGWA to conduct hydrologic modeling and watershed assessments at multiple temporal and spatial scales.

Keywords: Southwest Ecosystem Service Project; hydrological process modeling; surface runoff; land use change; ecosystem services.