

Application of the Automated Geospatial Watershed Assessment Tool (AGWA)

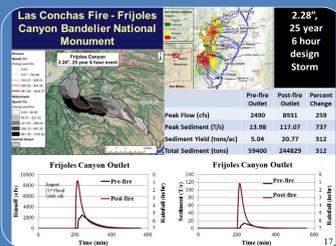
For additional information, see www.tucson.ars.ag.gov/agwa or contact

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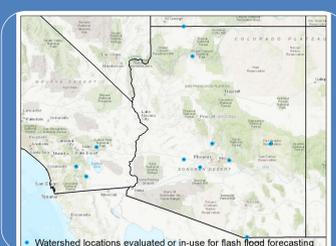
BAER Post-Fire Analysis



KINEROS2/AGWA has been used to aid in the rapid post-fire assessment of watersheds done by Burned Area Emergency Response (BAER) teams following large wildfires. AGWA has been used on over 52 wildfires since 2011, streamlining the hydrologic analysis component of the comprehensive, interdisciplinary treatment plan produced by the end of the 14 day BAER assignment. In one example, on the Elk Fire Complex in Idaho in 2013, AGWA had a key role in the process that the interdisciplinary BAER team used to reduce the area to be treated down from an initially identified 16,000 acres to between 2,000 and 4,000 acres. Based on the final awarded contract for post-fire mulch treatments at a cost of approximately \$600/acre, the BAER/AGWA targeted treatment resulted in a total savings of ~\$7.2 to \$8.4 million by only treating the reduced acreage.

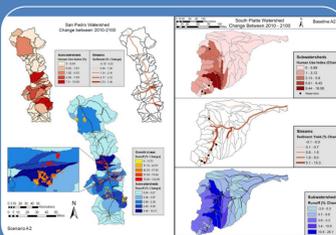
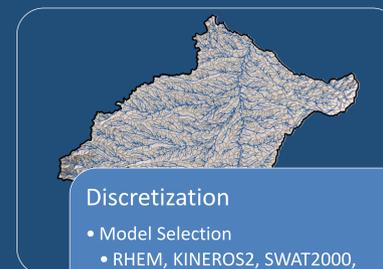
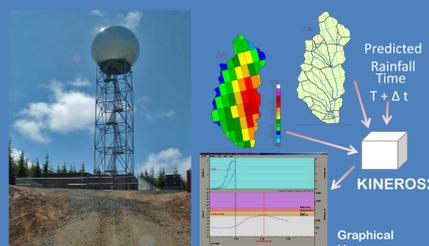
Background

The Automated Geospatial Watershed Assessment (AGWA) tool is a GIS interface jointly developed by the USDA-Agricultural Research Service, the U.S. Environmental Protection Agency, the University of Arizona, and the University of Wyoming to automate the parameterization and execution of a suite of hydrologic and erosion models (RHEM, KINEROS2, and SWAT). AGWA was designed to support watershed assessment and analysis across a range of spatial and temporal scales, automate the model parameterizing process, and graphically visualize modeling results.



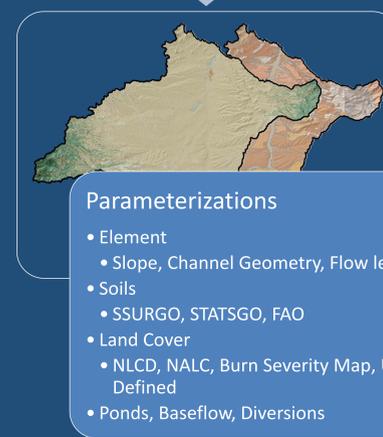
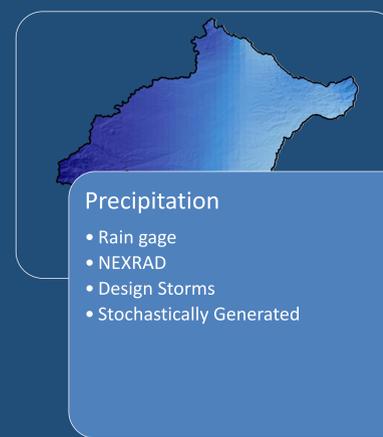
NWS Flash Flood Forecasting

KINEROS2/AGWA has been used to set-up and calibrate 47 watersheds for evaluation and testing purposes by National Weather Service (NWS) Weather Forecast Offices (WFO) as a near real-time flash flood forecasting tool, and is currently in operational use in 10+ of the 47 watersheds. KINEROS2/AGWA real-time flash flood forecasting provides timing and magnitude of peak flows, which is valuable information not provided by current NWS flash flood forecasting methodologies available to WFOs.



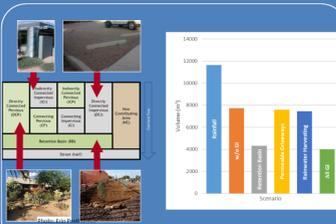
Alternative/Future Scenarios

Long-term land-use/land-cover change and the associated impacts pose critical challenges to sustaining vital hydrological ecosystem services for future generations. Scenario analysis is an important tool to help understand and predict potential impacts caused by decisions regarding conservation and development. Using a methodology developed to utilize US-EPA Integrated Climate and Land-Use Scenarios (ICLUS) housing density maps, AGWA was used to characterize the hydrologic impacts of future urban growth in decadal intervals from 2010 to 2100 on the San Pedro River Basin on the U.S./Mexico border and also in the South Platte River Basin in Colorado, Wyoming, and Nebraska.



Conservation Planning and Assessment

Conservation Effects Assessment Project (CEAP) is a multi-agency effort to quantify the environmental effects of conservation programs. Assessments are carried out at the national scale on cropland, grazing lands, and wetlands. The Cienega Creek Watershed was selected as a case study for the CEAP grazing lands assessment because it has a history of over-grazing and has been the focus of long-term conservation planning. Numerous NRCS and USFS grazing land management and soil erosion conservation activities have been implemented on the watershed. RHEM/AGWA was used to simulate the runoff and sediment for three time periods (historical, pre-conservation, and post-conservation) and to compare the watershed condition before and after implementation of conservation practices.

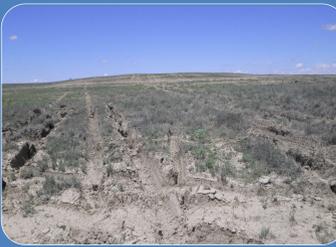
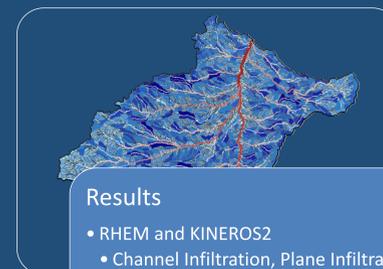
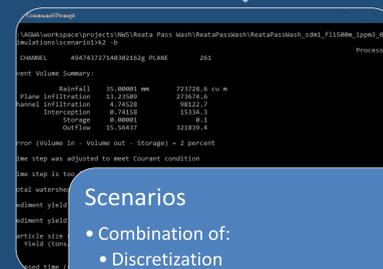


Green Infrastructure Design, Placement, and Impacts

Green Infrastructure (GI) practices like infiltration basins, curb-cuts, and rainwater harvesting cisterns have been implemented in many locations to mitigate flood risks as well as augment outdoor water use. The AGWA Urban Tool provides a GIS tool to allow detailed modeling and rapid assessment of urban hydrology with and without GI practices, facilitating the quantification and assessment of their effectiveness.



The tool is being applied in several efforts, including: Fort Irwin, CA, to simulate urban runoff to a dry well for aquifer recharge, and to evaluate the effects of GI practices on that runoff; Tucson, AZ for the UWIN as part of an NSF funded project.



Management of Impacts from Military Training and Activities

Department of Defense installations are managed to protect installation natural resources to provide sustainable training and testing opportunities. AGWA, coupled with the Facilitator Decision Support System, provides military land managers with a framework to document installation manager knowledge and AGWA simulation results to select a preferred management action. There are several tools within AGWA of value to installation managers, including: the military training disturbance tool to evaluate changes in soil and vegetation cover resulting from training events; the erosion control structure tool for flood and erosion control; the burn severity tool to evaluate fire effects on training areas; and the urban tool to evaluate stormwater flooding and green infrastructure practices. AGWA-Facilitator was applied at Piñon Canyon Maneuver Site, Fort Carson, and Fort Bliss.