AGWA is the product of a cooperative effort by the following

United States Department of Agriculture

US EPA Office of Research & Development

THE UNIVERSITY OF ARIZONA

Additional information on AGWA is available at our web site:
http://www.epa.gov/nerlesd1/land-sci/agwa/index.htm

http://www.tucson.ars.ag.gov/agwa/

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Information on SWAT can be found at:
http://www.brc.tamus.edu/swat/

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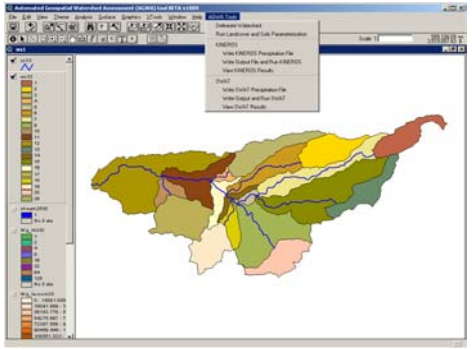
AGWA

Automated Geospatial Watershed Assessment Tool

EPA/600/R-02/046
ARS/137460

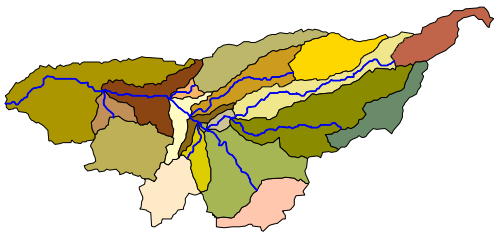


What is AGWA?

The Automated Geospatial Watershed Assessment (AGWA) tool is a GIS-based multipurpose hydrologic analysis system for use by watershed, water resource, land use, and biological resource managers and scientists in performing watershed- and basin-scale studies. It is an extension for ESRI's ArcView 3.2 that uses readily available spatial data sets to parameterize and run two widely used watershed runoff and erosion models. AGWA is designed to support landscape assessment at multiple spatial and temporal scales.

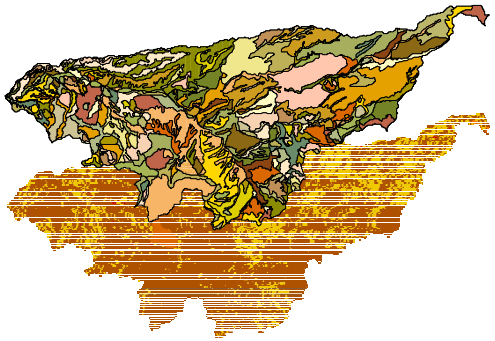
Watershed Delineation

The watershed is delineated from a DEM based on an outlet selected by the user or a known gage location. The watershed is then discretized according to the model type and a user-defined contributing source area.



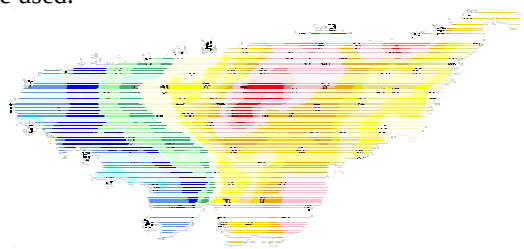
Land Cover and Soils Parameterization

Watershed elements are intersected with soil and land cover data layers to extract requisite hydrologic properties.



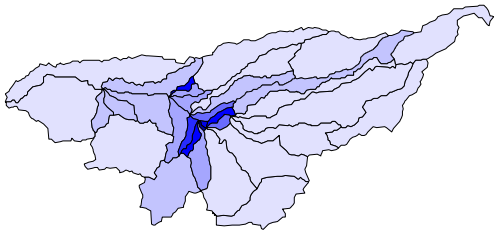
Rainfall

Both models can handle distributed rainfall input – KINEROS interpolates a rainfall surface, and rainfall depths for SWAT watershed elements are computed in AGWA using the Thiessen polygon method. Uniform rainfall (single gage), or design storm (KINEROS only) data can also be used.



Visualization

Results from model simulations can be displayed visually for both watershed elements and channels. All reported components of the water budget for each model can be viewed.



Watershed model descriptions

KINEROS

The kinematic runoff and erosion model KINEROS is an event oriented, physically based model developed at the USDA-ARS to describe the processes of interception, infiltration, surface runoff and erosion from small agricultural and urban watersheds. The watershed is represented by a cascade of planes and channels; the partial differential equations describing overland flow, channel flow, erosion and sediment transport are solved by finite difference techniques. The spatial variation of rainfall, infiltration, runoff, and erosion parameters can be accommodated. KINEROS may be used to determine the effects of various artificial features such as urban developments, small detention reservoirs, or lined channels on flood hydrographs and sediment yield.

SWAT

The Soil and Water Assessment Tool (SWAT) is a distributed, lumped-parameter model developed at the USDA-ARS to predict the impact of land management practices on water, sediment and agricultural chemical yields in large (basin scale) complex watersheds with varying soils, land use and management conditions over long periods of time (> 1 year). SWAT is a continuous-time model, i.e. a long-term yield model, using daily average input values, and is not designed to simulate detailed, single-event flood routing. Major components of the model include: hydrology, weather generator, sedimentation, soil temperature, crop growth, nutrients, pesticides, groundwater and lateral flow, and agricultural management. The Curve Number method is used to compute rainfall excess, and flow is routed through the channels using a variable storage coefficient method.