

SOFTWARE REVIEW

igwmc International Ground Water Modeling Center

Department of Geology and Geological Engineering

Reviewers:
P.J. Lemonds and J.E. McCray

Soil and Water Assessment Tool

Developed by
U.S.D.A. Agricultural Research Service

Ease Of Use:

Application: Watershed Water Quality and Surface Hydrology

Documentation:

Speed:

GUI:

Output/Plotting:

Best Feature: ArcView Interface

Worst Feature: Limited output processing

Overall Rating:

Rock Hammer Rating System

Excellent

Very Good

Good

Satisfactory

Poor

Software Review from the International Ground Water Modeling Center

Paula Jo Lemonds and John E. McCray, International Ground Water Modeling Center, Colorado School of Mines

The Soil and Water Assessment Tool (SWAT) is a watershed-scale water quality model developed by the USDA Agricultural Research Service (ARS) to predict the impact of management practices on water, sediment, nutrient, and chemical yields in watersheds that have different soils, land uses, and management conditions over long durations. SWAT uses physically-based data. That is, instead of using regression equations, it utilizes theory-based hydrologic and climate equations. Data from the watershed are used as input to these equations. Other important attributes of SWAT include its computational efficiency that allows for complex watersheds to be modeled in a straightforward manner, its incorporation of easily accessible data that is available for most watersheds from government agencies, and its ability to simulate long-term impacts of pollutant buildup and downstream impact. SWAT can simulate many different processes, including surface runoff, return flow, evapotranspiration,

pond and reservoir storage, crop growth, reach routing, nutrient and pesticide loading from point and nonpoint sources, chemical transformations, inter-basin water transfers, irrigation, fertilization, and several types of tillage operations. Model development involves splitting a basin into sub-watersheds based on topography from a digital elevation model (DEM). Model output is easily compared to watershed data for calibration with the built-in SWAT calibration tool. A limitation of SWAT is that it does not rigorously simulate groundwater flow and transport. Model development may require significant time, depending on the user's modeling background and knowledge of surface water and groundwater systems. SWAT is available free of charge. It may be downloaded from the SWAT Web page (www.brc.tamus.edu/swat/) or from the EPA's BASINS web page (www.epa.gov/OST/BASINS/). Both formats operate on a PC platform in an ArcView GIS environment, but other interfaces have been developed. Technical assistance is available in the form of beginner and intermediate training workshops and a Web-based user's forum from the SWAT Web page.

Visit www.mines.edu/igwmc



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ES-120; lifts 120-feet

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Specifications

| | ES-90 | ES-120 |
|---------------|--|----------------------------------|
| Well depth | Up to 90' | Up to 120' |
| Lead line | 100-feet | 130-feet |
| Output (max.) | 4.5 gpm | 5 gpm |
| Diameter | 1.5" | 1.5" |
| Length | 14" | 19" |
| Expected life | 300 to 450 hrs. (55,000 gallons) | 300 to 450 hrs. (55,000 gallons) |
| Power * | 12 Volt: Both the ES-90 and ES-120 require a power booster to increase voltage | |

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