Texas A & M University and U.S. Bureau of Reclamation
Hydrologic Modeling Inventory
Model Description Form

JUNE 18, 1999

Name of Model:

SIRMOD II

Model Type:

SIRMOD II is a simulation, evaluation, and design program for surface irrigation systems.

Model Objective(s):

Simulation, evaluation, and design of surface irrigation systems

Agency and Office:

Biological and Irrigation Engineering, 4105 Old Main Hill, Logan, Utah 84322-4105

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Technical Contact and Address:

Wynn R. Walker at Agency Office

Model Structure or Mathematical Basis:

SIRMOD II simulation employs user-selectable kinematic-wave, zero-inertia, or full hydrodynamic analyses. Evaluation is based on a two-point power law fit to advance data, and design is based on an optimized volume balance procedure. Simulation and evaluation are event-based.

Model Parameters:

SIRMOD II employs kinematic-wave, zero-inertia, and hydrodynamic simulations of overland flow in the surface irrigation environment. Infiltration, geometry, inflow flow hydrographs, and operational scheme are key model input parameters. Uniformity and efficiency are two key output parameters.

Spatial Scale Employed in the Model:

Spatial scale of SIRMOD II is linear one-dimensional

Temporal Scale Employed in the Model:

The temporal scale of SIRMOD II analyses is variable, usually 1-5 minutes

Input Data Requirements:

Input includes field length, slope, width, and roughness; inflow rate and duration; infiltration parameters for the Kostiakov-Lewis equation; surge flow parameters if needed; description of downstream boundary conditions; cross-sectional shape; method of simulation.

Computer Requirements:

SIRMOD II runs only under Windows 95 and later.

Model Output:

Simulation output, both graphic and digital, includes, advance and recession trajectories, runoff hydrographs, infiltration profiles, and volume balance. Evaluation output is Kostiakov-Lewis intake parameters. Design output includes field dimensions, optimal inflow and cutoff time, and field subdivisions.

Parameter Estimation / Model Calibration:

All SIMOD II input except infiltration must be input by the user.

Model Testing and Verification:

The SIRMOD II software has been extensively tested with US and Australian data. The model is in use at several US and international sites.

Model Sensitivity:

The SIRMOD II simulation sensitivity is primarily a function of how well the Kostiakov-Lewis infiltration parameters are defined.

Model Reliability:

The algorithms of the SIRMOD II software are widely accepted

and used in other software as well.

Model Application / Case Studies:

Simulation, evaluation, and design of surface irrigation systems.

Documentation:

English and Spanish on-line help and users manual.

Other Comments:

Responder:

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Date of Form:	August 1, 2000