Texas A & M University and U.S. Bureau of Reclamation
Hydrologic Modeling Inventory
Model Description Form
JULY, 2008

Name of Model:	**RootCanal**
Model Type:	**Unsteady, one-dimensional, open-channel flow**
Model Objective(s) :	**Simulate branching/looping canal system hydraulic operation, including several gate/boundary types and local gate automation**
Agency and Office:	**Bio & Irrigation Engrg Dept, Utah State Univ.**
Technical Contact and Address:	**Gary Merkley, 4105 Old Main Hill, Utah State University, Logan, Utah 84322-4105** **e-mail:** gary.merkley@usu.edu **phone: (435) 797-1139**
Model Structure or Mathematical Basis:	**Variation of 4-pt implicit solution, rectangular grid in the x-t plane**
Model Parameters:	**Canal system dimensions (reach connections, lengths, bed slope(s), cross sectional geometry, etc.); hydraulic calibration (Manning or Chezy roughness, seepage, evaporation, gate/weir/other calibration parameters); operational settings (duration of simulation, gate/weir/other settings, hydrographs, etc.); interface options for viewing simulation results.**
Spatial Scale Employed in the Model:	**Variable according to specified parameters and simulation results, but typically 1 to 100 m between computational nodes in direction of flow**
Temporal Scale Employed in the Model:	**User-specified, from 1 second to 1 hour (default is 1 minute)**
Input Data Requirements:	**Same as model parameters**
Computer Requirements:	**PC running MS Windows 98 and later versions**

Model Output:	**Flow rates and depths as a function of time, gate/weir/other settings. Tabular & graphical on-screen and printed results. Output to text files in tabular format. Multiple-window output on-screen and playback of water levels, flow rates, average flow velocities, and flow cross sectional areas.**
Parameter Estimation / Model Calibration:	**Requires precise knowledge of hydraulic roughness (Manning or Chezy), seepage loss rates, evaporation, and wind speed. Includes "calculator" for estimating roughness as a function of field data.**
Model Testing and Verification:	**Previous versions (Canal, Canals, and CanalMan) were tested with field data from USBR and elsewhere, and against other hydraulic models of this type.**
Model Sensitivity:	**Water depths to within 1 mm, flow rates to within 1 lps.**
Model Reliability:	**Highly robust and highly developed user interface**
Model Application / Case Studies:	**World-wide**
Documentation:	**On-screen interactive "help" and printed users' manual.**
Other Comments:	**Download free of charge at: http://www.neng.usu.edu/bie/faculty/merkley/BIE6300.htm**