

**Texas A&M University and U.S. Bureau of Reclamation
Hydrologic Modeling Inventory
Model Description Form
June 2007**

Name of Model: HYDROSS (Hydrologic River Operations Study System)

Model Type: General Purpose, Planning and Operations

Model Objective(s): Surface water supply model developed to assist in planning studies for evaluating existing and proposed demands on a river system by simulating the effect of existing and proposed features on the historical natural hydrology.

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Model Structure or Mathematical Basis:

Five program modules which process input data, run the model simulation, and construct reports, are written in Fortran90 source code and have been compiled using Digital Visual Fortran and Lahey Fortran compilers. A graphical user interface to facilitate network construction and input file development is written in Visual C++.

HYDROSS operates in strict sequential order in time (results from one month depend on the system state at the end of the previous month), space (results at one station depend on what is happening upstream and/or downstream), and priority (earlier water right dates are allowed water before later water right dates).

Model Parameters: physical features of river basin management structures (storage and conveyance capacity), input hydrology (inflow, gains, losses), demands for diversion and instream flow, legal river basin management targets and limits (water rights, flood control, operations criteria).

Spatial Scale Employed in the Model: user-determined (typically a river basin management area)

Temporal Scale Employed in the Model: monthly

Input Data Requirements: ascii text files of monthly timeseries or parameter-function (tabular) data.

Computer Requirements: PC running Windows

Model Output: formatted ascii text file – extraction tools create written reports or timeseries traces suitable for plotting.

Parameter Estimation / Model Calibration: user-determined

Model Testing and Verification: user-determined

Model Sensitivity: user-determined

Model Reliability: Good. Tested over nearly 30 years of continuous use. Technical support available as needed from Reclamation TSC and GP Region.

Model Application / Case Studies: mainly Reclamation Great Plains Region applications - Milk River, Republican River, Cannonball River, Lower Bighorn River, Musselshell River, Jocko River, Clark Canyon, and others

Documentation: user's manual available in Microsoft Word or PDF format

Other Comments:

Multiple natural and project water rights

Multiple diversion points can serve a single demand

Reservoir storage in priority

Target reservoir storage

Reservoir balancing

Simple storage ownership (control reservoirs)

Creative use of basic functionality allows representation of highly complex river system management strategies