

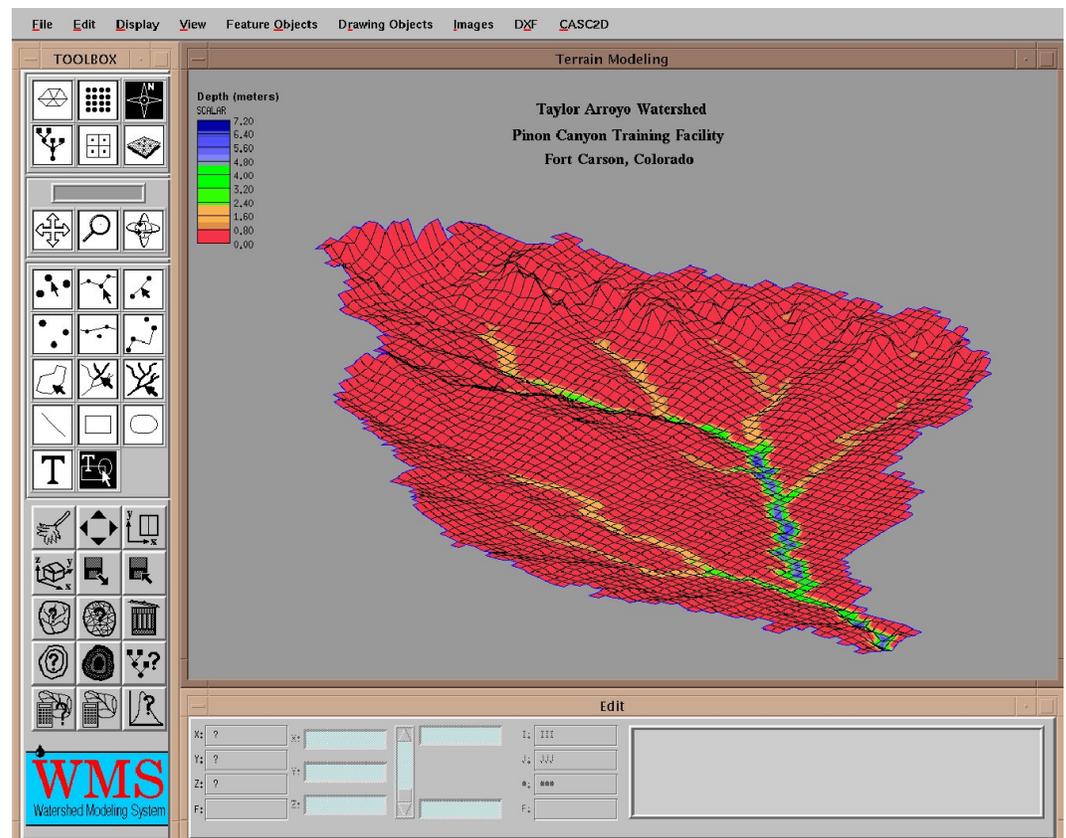


**US Army Corps  
of Engineers®**  
Engineer Research and  
Development Center

# Watershed Modeling System

## Technology

The Department of Defense (DoD) Watershed Modeling System (WMS) is a state-of-the-art computer software program that integrates hydrology, hydraulics, and water quality to help civil engineers and others involved in hydrodynamic modeling make informed decisions about watershed management. A variety of watershed models are available, each requiring different input data in a structured format. The models utilize digital terrain data to delineate watershed and sub-basin boundaries and compute geometric parameters used in hydrologic modeling. Digital elevation, land use, and soil data can be analyzed to determine watershed boundaries, stream networks, and hydrologic parameters necessary for model construction. WMS allows the incorporation of other sources of data, such as imagery and radar rainfall estimates, into the modeling process. Model results can be analyzed in a number of ways including traditional plotting of outflow hydrographs, color contouring of spatial results, animation of spatial data over time, and export of results in standard formats.



## Problem

The nation deals daily with the problems of urban flooding, stream erosion, and non-point source pollution due to urban runoff, construction activities, hydrologic modifications, and forestry, mining, and agriculture practices. These problems are complex and involve atmospheric, land based, wetland, riverine, and coastal systems. Management of these

problems requires an integrated knowledge of the systems involved and requires quantitative analysis and predictive capability.

**Expected Cost To Implement**

WMS is available at no cost to employees of the Department of Defense, the U.S. Environmental Protection Agency (USEPA), or onsite contractors of these agencies. Outside these agencies, users may obtain WMS commercially from Environmental Modeling Systems, Inc. (EMS-I). It is only available on Windows platforms.

**Benefits/Savings**

WMS integrates and simplifies the process of applying hydrologic models by bringing together all of the tools needed to complete a successful study. The WMS system significantly increases hydrologic modeling productivity by reducing the amount of time needed to assimilate disparate sources of data and construct hydrologic model inputs. Whereas it might require a month or more to construct a typical lumped parameter model, such as TR-20 or HEC-1, using traditional methods, such a model can be constructed in about 1 week with the WMS. For a typical project engineer, that's a savings of about \$6,000 per study, just in model setup. This time savings, and the ability to easily modify model input, allows more time to be spent on modeling scenarios and less on model setup and modification. It also allows engineers to apply more complicated models, such as GSSHA, in less time than a simple model can be applied without WMS.

**Status**

WMS works only on Windows platforms, which include Windows 98, NT, 2000, and XP. Currently, WMS provides an interface for the following hydrologic models: Rational Method, TR-20, TR-55, HEC-1, NFF, HSPF, and GSSHA. Current development is focused on expanding the water quality and land management modeling capabilities for the two-dimensional, physical-based, hydrologic model GSSHA, and development of an interface for the receiving water model CEQUAL-W2.

**ERDC POC**

Jeffrey D. Jorgeson, CEERD-HC-H, e-mail: [Jeffrey.D.Jorgeson@erdc.usace.army.mil](mailto:Jeffrey.D.Jorgeson@erdc.usace.army.mil)  
Phone: 601-634-3091.

**Distribution Sources**

WMS is distributed via Internet download, which includes the full program, tutorial files, documentation, and supported model executables. WMS is available at no cost to employees of the DoD, USEPA, and onsite contractors of these agencies. Contact WMS, ERDC-CHL, 3909 Halls Ferry Road, Vicksburg, MS 39180. Phone: 601-634-2344; e-mail: [WMS@erdc.usace.army.mil](mailto:WMS@erdc.usace.army.mil) Outside these agencies, users may obtain WMS commercially from Environmental Modeling Systems, Inc. (EMS-I), 1204 W. South Jordan Parkway, Suite B, South Jordan, UT 84095-4600. Phone: 801-302-1400. FAX: 801-302-1160. e-mail: [info@ems-i.com](mailto:info@ems-i.com). More information is available at the EMS-I Web site at <http://www.ems-i.com/>

**Available Documentation**

WMS Program, Tutorial Documentation, and Reference Manual

- WMS Reference Manual <http://chl.wes.army.mil/software/wms/docs.htm>

**Available Training**

Inquiries by DoD/USEPA users can be directed to Jeffrey D. Jorgeson, CEERD-HC-H, e-mail: [WMS@erdc.usace.army.mil](mailto:WMS@erdc.usace.army.mil). Phone: 601-634-3091. All others may direct questions to Environmental Modeling Systems, Inc. (EMS-I), 1204 W. South Jordan Parkway, Suite B, South Jordan, UT 84095-4600. Phone: 801-302-1400. FAX: 801-302-1160. e-mail: [info@ems-i.com](mailto:info@ems-i.com). EMS-I conducts WMS training courses on a continuing basis throughout the year. Inquiries can be directed to [info@ems-i.com](mailto:info@ems-i.com) or call 801-302-1400.

**Available Support**

DoD/USEPA users may direct questions about WMS to: [WMS@erdc.usace.army.mil](mailto:WMS@erdc.usace.army.mil). More information can be found at the Coastal and Hydraulics Laboratory Home Page: <http://chl.wes.army.mil/software/wms>. All users outside the DoD, USEPA, or DoE may direct questions to Environmental Modeling Systems, Inc. (EMS-I), 1204 W. South Jordan Parkway, Suite B, South Jordan, UT 84095-4600. Phone: 801-302-1400. FAX:

801-302-1160. e-mail: [info@ems-i.com](mailto:info@ems-i.com). More information is available at the EMS-I  
Web site at <http://www.ems-i.com/>