

WMS: Watershed Modeling System

Model Uses	The Watershed Modeling System (WMS) is a modeling system for watershed hydrology and hydraulics. WMS is capable of automated delineation of sub-watershed boundaries and flood extent, and includes graphic display options to aid in understanding the drainage characteristics of terrain surfaces as well as several computation features.	
Major Categories	Hydrology and Water Use; Geomorphology	<u>Subject Knowledge Level</u> Advanced
Minor Categories	Runoff; Flood; Flow; Surface water; Drainage; Channel; Classification; Aquifers; Groundwater; Reservoirs	<u>Technical Difficulty Level</u> Advanced
Model Type	Physical Model	<u>Geographic in Nature?</u> Yes

Abstract

The Watershed Modeling System (WMS) is a comprehensive graphical modeling environment for all phases of watershed hydrology and hydraulics. WMS can perform operations such as automated basin delineation, geometric parameter calculations, GIS overlay computations (CN, rainfall depth, roughness coefficients, etc.), cross-section extraction from terrain data, floodplain delineation and mapping, storm drain analysis, runoff, and more.

WMS is organized into eight modules. Each module is associated with a particular object type and can be purchased separately.

Future Developments

Unknown

Model Limitations

Unknown

Model Features (Modules)

- **Terrain Data.** Used for basin delineation with Triangulated Irregular Networks (TINs).
- **Drainage.** Used for basin delineation with gridded Digital Elevation Models (DEMs).
- **Map.** Used to create data layers from GIS objects (drainage, soil, land use etc.)
- **Hydrologic Modeling.** Contains interfaces to hydrologic models.
- **River.** Contains tools for creating 1D hydraulic models.
- **GIS.** Used to open Shapefile data and convert it to feature objects.
- **2D Grid.** Used for finite difference models (currently research models only).
- **2D Scatter Point.** Contains 2D scatter point interpolation tools.

Required Data Types

Data of primary importance to WMS include digital elevation models (DEMs), images, soil type and land use. Other data types such as triangulated irregular networks (TINs), hydrography, precipitation and stream stage can also be essential to a hydrologic model.

WMS is compatible with many data formats. Some of the more popular data formats supported by WMS are:

- USGS DEMs
- USGS NED data
- ArcGIS Raster (ASCII format)
- ESRI Shape files
- DXF and DWG CAD files
- TIFF, JPEG, and MrSID images

Model Outputs

Depending on which module you run, the outputs can vary but may include:

- watershed and sub-basin delineations
- flow paths on the entire terrain model
- floodplain delineation and mapping
- flood extents and flood depth maps
- storm drain networks
- 2D finite-difference grids

The Hydrologic Modeling Module contains several "Calculator" tools for calculating modeling input or analyzing model output. These include:

- time of concentration computations
- curve number calculations
- Green and Ampt calculations
- rainfall depth mapping

- HSPF Segment mapping
- runoff coefficient calculations
- Detention Basin (reservoir) Calculator
- Culvert Calculator
- Weir Calculator
- Open Channel Calculator
- Curb and Gutter Calculator

Source

Environmental Modeling Systems, INC

Source (URL)

http://www.ems-i.com/WMS/WMS_Overview/wms_overview.html

Hardware Requirements

Minimum recommended configuration:

500MhZ processor
 128 MB RAM
 1024x768 w/ High Color
 100 MB disk space

		Supported Platforms	
DOS	<input type="checkbox"/>	UNIX	<input type="checkbox"/>
Windows	<input checked="" type="checkbox"/>	Macintosh	<input type="checkbox"/>

Software Requirements

Windows NT/ME/2000/XP

Cost, Licensing and Availability

The Watershed Modeling System (WMS) can be obtained for public domain use - free of charge. The public domain version does not allow use of the terrain modeling, mapping, or automated delineation modules of WMS.

WMS 7 Complete Package costs \$4600.00 from Environmental Modeling Systems, Inc (see Source URL), as well as many other sources. Modules can also be purchase individually or in packages for a lower cost.