

# **An Overview of WCMS: (The Watershed Characterization and Modeling System developed by the Natural Resource Analysis Center at West Virginia University)**

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## **Abstract**

The WCMS was developed to bring spatial data and water quality modeling to the desktop of West Virginia Division of Environmental Protection (WVDEP) personnel. The WCMS is a customized Arc View GIS interface that combines a wide variety of spatial data layers and water quality modeling components for meeting common WVDEP tasks.

The WCMS offers many useful components in an easy to use format. These components consist of an interactive definition of study area, capabilities of querying the 1998 303-D list, non-point source pollution tools, a watershed ranking model, water quality modeling, and Acid Mine Drainage treatment cost modeling. In addition the WCMS offers over twenty five different statewide data layers.

The goal of this presentation is to provide a brief overview as to what WCMS has to offer those concerned with the quality of our watersheds. Some major points that will be discussed include the goals of the system, its major components, data layers included, and a demo. Attached you will find a brief description of the project background, the customized interface, and the modeling components.

## Watershed Characterization and Modeling System

### **Project Background**

The WCMS was developed to bring spatial data and water quality modeling to the desktop of West Virginia Division of Environmental Protection (WVDEP) personnel. The WCMS is a customized ArcView GIS interface that combines a wide variety of spatial data layers and water quality modeling components for meeting common WVDEP tasks.

### **Customized Interface**

*Interactive definition of study area* – users may select a study area from a menu listing of features or a map display of features based on counties, watersheds, stream codes and names, topographic quads, or abandoned mine land problem areas; all available spatial data for the study area extent is displayed

*Query 1998 303D list* – search list by water quality parameter(s) violated, use affected, reporting agency, priority level; view results of query in map display

*Customized tools* – automatic map creation, track steepest path across landscape, delineate watersheds by a specified pour point and report drainage area, coordinate finder and utm location converter, elevation and contour query, advanced distance and area measurement, stream flow estimation and query

### **Modeling Components**

*Watershed ranking model* – interactive multiple criteria watershed ranking, view results as map display with the ability to change criteria weights and rerun model to test the spatial sensitivity of preference on ranking results to prioritize AMD affected watersheds for treatment

*Identify potentially affected streams* – found by tracking the overland flow from possible pollution sources during a precipitation event; the results help to efficiently identify water quality sampling stations

*Water quality modeling* – user inputs water quality sampling points or uses event mean concentrations for land cover types, WCMS models estimated concentrations and loadings of pollutants in affected streams

*Acid mine drainage treatment cost modeling* – Given modeled flow and acidity level, user selects one of eight chemical treatment options and WCMS calculates AMD treatment costs and chemical requirements

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