♻EPA FACT SHEET

BASINS 2.0 *A powerful tool for managing watersheds*

BASINS is a multipurpose environmental analysis system for use by regional, state, and local agencies in performing watershed- and water quality-based studies. This new software makes it possible to quickly assess large amounts of point source and nonpoint source data in a format that is easy to use, easy to understand. Installed on a personal computer, BASINS allows the user to assess water quality at selected stream sites or throughout an entire watershed. It is an invaluable tool that integrates environmental data, analytical tools, and modeling programs to support development of cost-effective approaches to environmental protection.

The U.S. Environmental Protection Agency's water programs and their counterparts in states and pollution control agencies are increasingly emphasizing watershed- and water quality-based assessment and integrated analysis of point and nonpoint sources. Better Assessment Science Integrating point and Nonpoint Sources (BASINS) is a system developed to meet the needs of such agencies. It integrates a geographic information system (GIS), national watershed data, and state-of-the-art environmental assessment and modeling tools into one convenient package.

Originally released in September 1996, BASINS addresses three objectives: (1) to facilitate examination of environmental information, (2) to provide an integrated watershed and modeling framework, and (3) to support analysis of point and nonpoint source management alternatives. It supports the development of total maximum daily loads (TMDLs), which require a watershed-based approach that integrates both point and nonpoint sources. BASINS can support the analysis of a number of pollutants at a variety of scales, using tools that range from simple to sophisticated.

Overcoming the lack of integration, limited coordination, and time-intensive execution typical of more traditional assessment tools, BASINS makes watershed and water quality studies easier by bringing key data and analytical components together "under one roof."

The heart of BASINS is its suite of interrelated components essential for performing watershed and water quality analysis. These components are grouped into five categories: (1) national databases; (2) assessment tools (TARGET, ASSESS, and Data Mining) for evaluating water quality and point source loadings at a variety of scales; (3) utilities including local data import, land-use and DEM reclassification, watershed delineation, and management of water quality observation data; (4) watershed and water quality models including NPSM (HSPF), TOXIROUTE, and QUAL2E; and (5) post processing output tools for interpreting model results. BASINS' databases and assessment tools are directly integrated within an ArcView GIS environment. By using GIS, a user can fully visualize, explore, and query to bring a watershed to life. The simulation models run in a Windows environment, using data input files generated in ArcView.
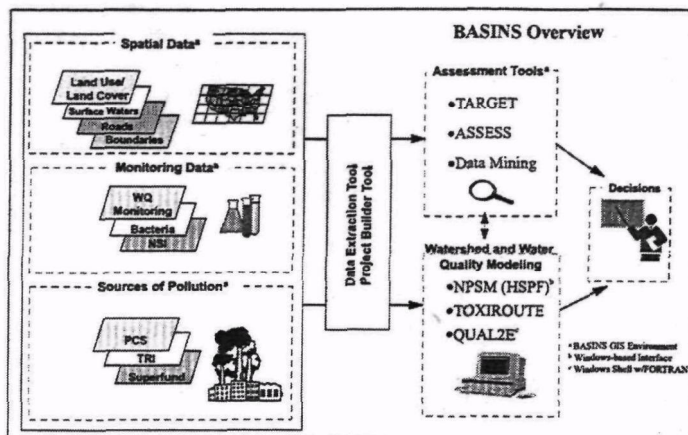
BASINS DATA AND COVERAGES

Spatially Distributed Data

Land use/land cover
Urbanized areas
Populated place locations
River Reach File version 1 (RF1) and RF3 Alpha
Soils (STATSGO)
Elevation contours (DEM)
Major roads
USGS hydrologic unit boundaries (accounting unit, cataloging unit)
Drinking water supply sites
Dam sites
EPA regional, state and county boundaries
Federal and Indian Lands
Ecoregions

Environmental Monitoring Data

Water quality monitoring station summaries
Water quality observation data
Bacteria monitoring station summaries
Weather station sites
USGS gaging stations
Fish consumption advisories
National Sediment Inventory (NSI)
National Shellfish Register
Clean Water Needs Survey

Point Source Data

Permit Compliance System (PCS) sites and computed loadings
Industrial Facilities Discharge (IFD) sites
Toxic Release Inventory (TRI) sites
Superfund National Priority List (NPL) sites
Resource Conservation and Recovery Act (RCRA) sites
Mineral Industry Locations

BASINS ANALYTICAL TOOLS

TARGET is a watershed targeting tool that allows environmental managers to make a broad-based evaluation of a watershed's water quality and/or point source loadings. It operates on a large area such as a region or a state.

ASSESS operates on a single watershed (cataloging unit) or a limited set of watersheds and focuses on the status of specific water quality stations or discharge facilities and their proximity to water bodies.

Data Mining dynamically links different data elements using a combination of tables and maps. This unique linkage adds significant informational value to the raw data on water quality and loadings. Data Mining is a powerful tool that can assist in the integration and environmental interpretation of both geographic and historical information simultaneously.

BASINS MODELING SYSTEM

Three models are integrated into BASINS within an ArcView GIS environment. This allows the user to assess watershed loadings and receiving water impacts at various levels of complexity. ArcView geographic data preparation, selection

BASINS Models

routines, and visual output streamline the use of the models. A post processor graphically displays model results.

Nonpoint Source Model (NPSM) estimates land-use-specific nonpoint source loadings for selected pollutants at a watershed (cataloging unit or user-defined subwatershed scale). The model uses landscape data such as watershed boundaries and land use distribution to automatically prepare many of the input data it requires. NPSM combines a Windows-based interface with EPA's Hydrologic Simulation Program-FORTRAN (HSPF) model and is linked to ArcView.

QUAL2E is a one-dimensional, steady-state water quality and eutrophication model. It is integrated with ArcView to extract point source and stream network data and provides a Windows-based interface to facilitate parameter value assignment. It allows fate and transport modeling for multiple sources and pollutants.

TOXIROUTE is a screening-level stream routing model that performs simple dilution/decay calculations under mean or low flow conditions for a stream system within a given watershed (cataloging unit). TOXIROUTE integrates with the ArcView GIS to extract stream networks, as well as point source loadings computed from the effluent monitoring data.

Data Utilities streamline the importing of local data such as land use, stream networks, and watershed boundaries. Data management tools permit reclassification of land use and DEM data as well as manipulation of water quality observation data.

Post Processing. The BASINS modeling system includes a post processing tool to facilitate the evaluation and analysis of model output. The graphical interface allows the user to select data sets, parameters, and location; define output scales; and overlay multiple graphs and management scenarios.

RELEASE SCHEDULE AND ADDITIONAL INFORMATION

BASINS 2.0 was released on the internet in September 1998 and on CD-ROM in January 1999. EPA plans to update the system periodically by adding new data layers, new databases, expanded state coverage, and enhanced modeling capabilities. EPA maintains a mailing list to notify users of system and data updates as they are developed. Updates are also available through the Internet.
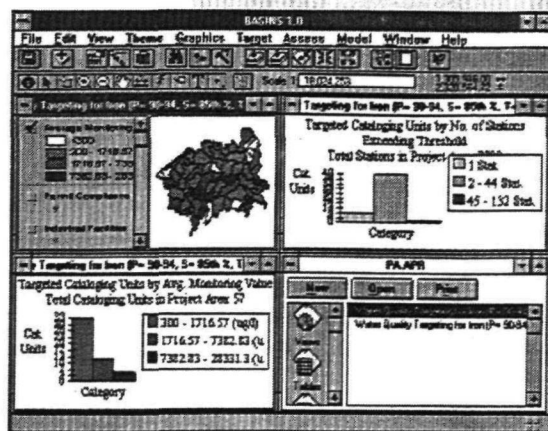
BASINS Targeting Analysis

Minimum System Requirements

BASINS 2.0

Pentium IBM-compatible PC, 133-MHz; 400 mb hard disk space; 32 mb RAM, CD drive, Windows 95 or Windows NT 4.0 (except for QUAL2E); ArcView 3.0a or 3.1.

Obtaining BASINS

BASINS 2.0 is available through the Internet at www.epa.gov/ost/BASINS.

The final version of BASINS 2.0 CD-ROMs is available free of charge through the National Service Center for Environmental Publications (NSCEPI), P.O. Box 42419, Cincinnati, OH 45242. Tel: (513) 489-8190 or (800) 490-9198. Fax: (513) 489-8695. The package includes:

- User's Manual—Better Assessment Science Integrating Point and Nonpoint Sources. BASINS Version 2.0.

- Compact disks specific to one of 10 regions of interest within the conterminous U.S. (Be sure to indicate the EPA region of your choice in your request.)
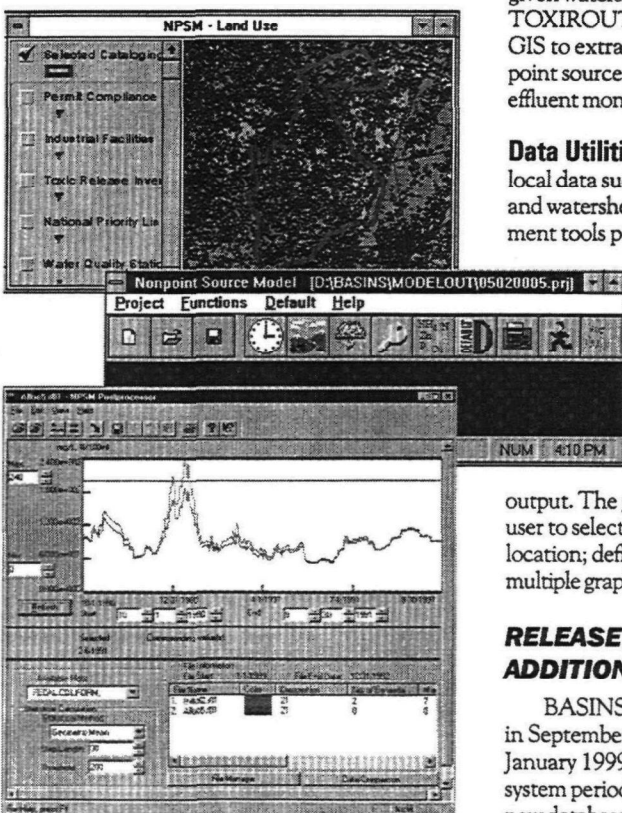
For more information on content, availability, and training, please contact:

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