

## 10 Watershed Characterization Reports

The BASINS system includes tools designed to assist in summarizing key watershed information in a format suitable for preparing watershed characterization reports. These tools can be used to make an inventory and characterize both point and nonpoint sources at the watershed and subwatershed scales. The tools' functions include generation of customized maps and tables summarizing the overall condition of the study area.

Watershed characterization is key to understanding water quality issues and pollution sources in the watershed. In addition to evaluation of the watershed condition, it provides the necessary information to assess monitoring programs, identify data gaps, and develop watershed-water quality modeling strategies.

BASINS version 3.0 provides users the capability to generate six different types of watershed characterization reports:

- Point Source Inventory Report
- Water Quality Summary Report
- Toxic Air Emission Report
- Landuse Distribution Report
- Landuse Distribution Report (Grid)
- State Soil Characteristics Report
- Watershed Topographic Report
- Watershed Topographic Report (Grid)

The customized maps and tables generated by these reports are stored in a directory called `\Basins\WcReport\, in which the StudyArea is the user-defined name or identifier of the study area. This study area name corresponds to the name in the View Table of Contents given to the theme that contains the boundary information of the study area. By default, when a user uses the 8-digit cataloging unit as the basis for defining the study area (without delineating a new subwatershed within the 8-digit cataloging unit), the study area is assigned the name "catalogi" based on the theme name Cataloging Unit Boundary in the View Table of Contents. When generating a report for the first time, the user is provided the option to select another name to replace the default study area name.`

The files stored in the `\Reports` directory are of two types text file (\*.txt, \*.tx1, **.tx2**) and image file (.wmf) which, respectively, contain the tabular and map information about the selected watershed characteristic. These files can be directly imported into any standard word processor for further formatting and incorporation into other watershed characterization reports.

## 10.1 Point Source Inventory Report

### *Purpose*

*Point Source Inventory Report* provides a summary of discharge facilities in a given watershed. The report relies on the EPA Permit Compliance System (PCS) database to identify permitted facilities in the selected study area and summarizes their discharge loading for a given pollutant. A discharge loading summary is provided for a given year. BASINS version 3.0 includes annual point source loading data for the period of 1991 to 1999.

### *Application*

*Point Source Inventory Report* is a useful tool for characterizing pollutant loadings in a given watershed. Potential applications of this report tool include rapid identification of point sources, a mapping function to display the geographical distribution of point sources in the study area, and evaluation of their proximity to major streams (streams in Reach File, V1). The inventory and summary of loading discharges also allow the user to perform a planning-level assessment of the magnitude and severity of point source contributions. Generating this report for various years can provide information to evaluate the changes of point sources over time and support trend analysis.

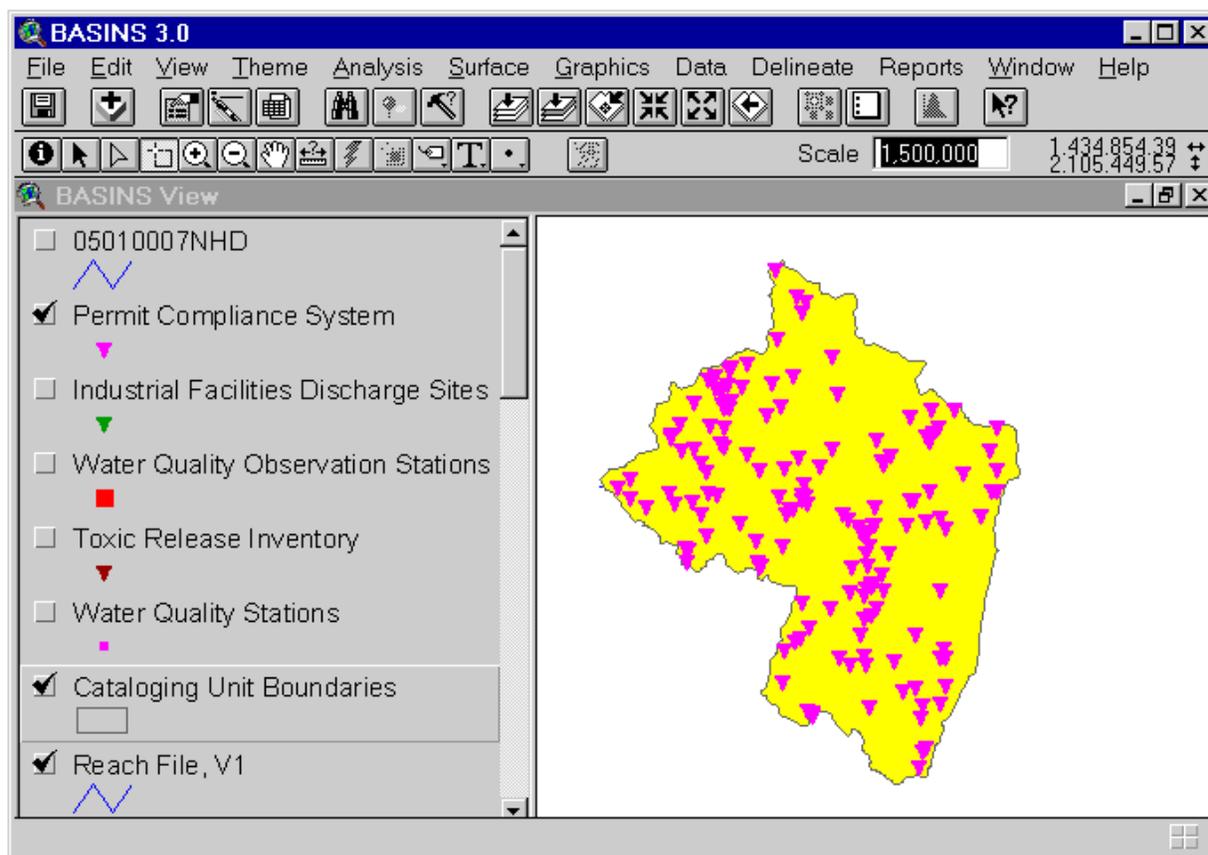
### **Before you Get Started**

First, verify that the “Reports without Spatial Analyst” extension is active in your BASINS project by typing Ctrl+B from the BASINS view and selecting the **Reports** item from the **Extension Categories** dropdown list. The “Reports without Spatial Analyst” entry in the **Basins Extensions** list should be visible and selected. If the “Reports without Spatial Analyst” is not selected (checked), click on it to select it.

### *Key Procedures*

- Activate the watershed boundary theme
- Select the watersheds for which the report will be generated
- Under the Report main menu, select the *Point Sources Inventory Report* submenu
- Select the discharge year, pollutant of interest, and map option in the dialog box

*Operation Steps* In the BASINS View table of contents (Screen 10.1.1), click the name of the appropriate watershed boundary theme to make it active. The watershed boundary theme may be the cataloging Unit boundary theme or a user delineated watershed boundary theme.

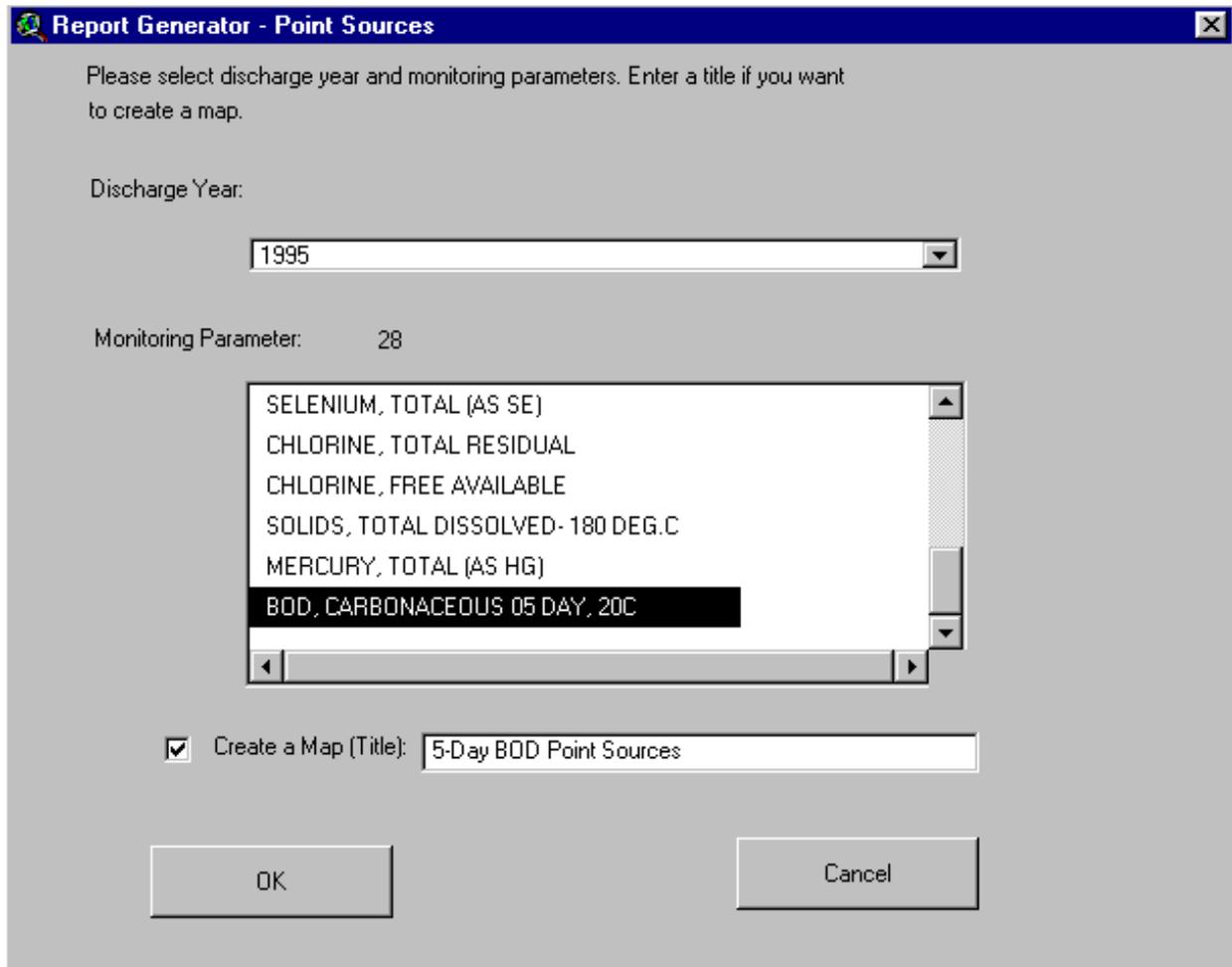


Screen 10.1.1

Activate the *Select Feature* tool and select (by clicking or dragging a box) the watershed(s) for which the Point Source Inventory Report will be generated.

**Tip:** The Select Feature tool allows you to drag a box over a group of features you want to select. Features that fall partly or wholly inside the box you define are selected. To select features that are not adjacent to one another, hold down the SHIFT key and select as many nonadjacent features as you want. By default, selected features are highlighted in yellow on your view.

Under the Report main menu, select the *Point Sources Inventory Report* submenu. In the dialog that appears (Figure 10.1.2), select the discharge year and monitoring (pollutant) parameter from the list boxes provided. Click the check box if a location map of point sources is to be generated. You may choose to enter the map title in the text box provided.



Screen 10.1.2

Click to generate the report; otherwise, click *Cancel* to quit the tool without generating the report.

---

#### TUTORIAL:

Click the theme *Cataloging Unit Boundaries* to make it active.

Check its check box to display the boundary theme in the View Window.

Check the check box of the theme *Permit Compliance System* to display the location of the PCS stations.

Using the *Select Feature* tool, select watershed 05010007. Your BASINS screen should now look like Screen 10.1.1. If necessary, zoom to the study area using the *Zoom to Selected Theme* tool.

Under the Report main menu, select the *Point Sources Inventory Report* submenu.

In the dialog box that appears (Screen 10.1.2), select year 1995 and parameter 5-day BOD, and enter the

---

title 5-Day BOD Point Sources.

Click to continue.

Click to accept the default directory where all report files will be saved. The report files pcs.\* are saved at the \Basins\WcReport\Catalogi\Reports\ directory.

### Generated Report

The generated report includes two tables and a map layout. The first table, “Point Source Inventory - Summary by subwatershed” (Screen 10.1.3), provides a complete list of all discharge facilities within the watershed(s) and pertinent information such as location (city, subwatershed, and reach number), status (major vs. minor facility), and Standard Industrial Classification (SIC) number. The second table, “Point Source Load - Summary by subwatershed,” provides the list of discharge facilities that actually discharged the selected pollutant for the given year (Screen 10.1.4).

Table xx. BOD, CARBONACEOUS 05 DAY, 20C load within the selected study area (PCS, 1995).

Reach File, V1	NPDES	Facility Name	Mile Point	Load (lbs/yr)
-----				
Subwatershed: 05010007				
05010007002	PA0026034	JOHNSTOWN CITY	29.6	1627414.8
05010007003	PA0002054	PENELEC - SEWARD GENERATING		0.0
05010007003	PA0026778	WINDBER AREA AUTH	8.1	252092.3
05010007010	PA0022292	EBENSBURG BORO MUN AUTH	14.3	74416.5
05010007010	PA0032611	PORTAGE AREA SEW AUTH	20.0	68728.3
05010007015	PA0005011	PENELEC CONEMAUGH		1151.3
05010007015	PA0005037	GPU/GENCO-HOMER CITY GENERAT	3.5	2994.3
05010007017	PA0001716	FMC CORP		194.4
Total Number of Facilities: 8				

Screen 10.1.3

Point Source Inventory - Summary by subwatershed

Table xx. Point source inventory within the selected study area (PCS, 1995).

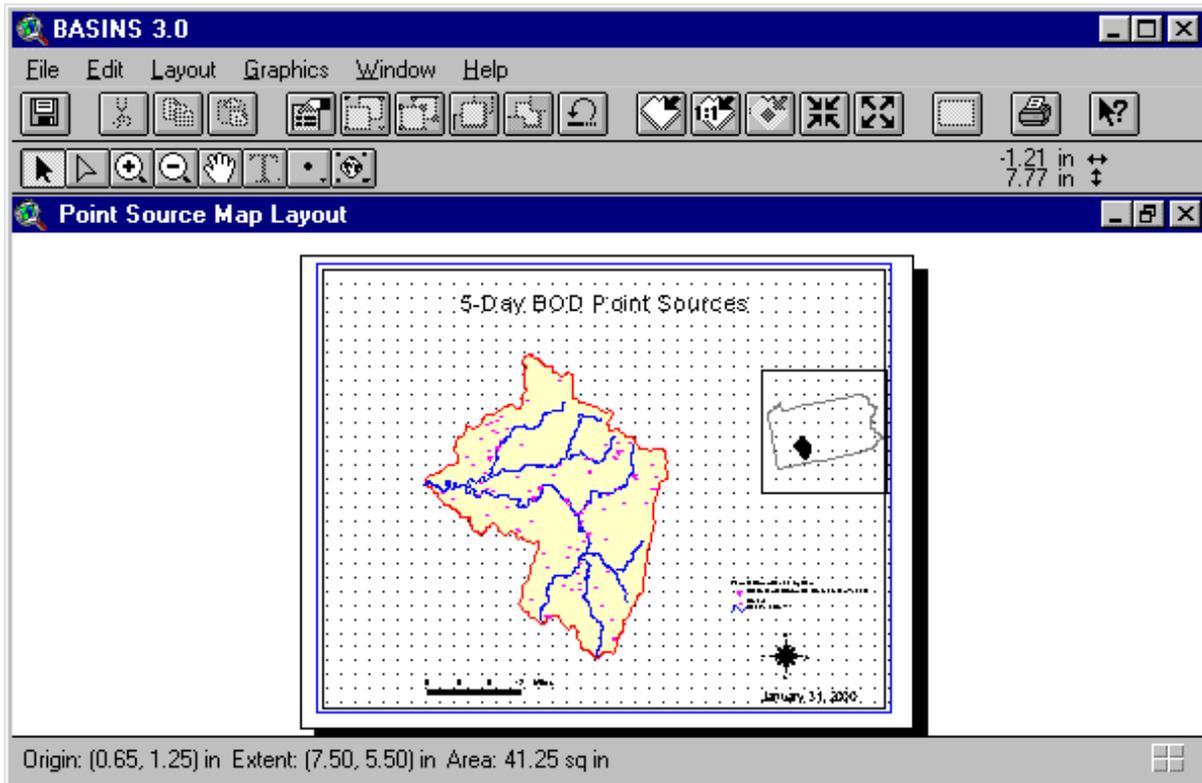
```

-----
NPDES      Facility Name                City                Status  SIC   Reach File, V1
-----
Subwatershed: 05010007
PA0096946  ALEXANDER, RICHARD & BELINDA  68440              minor  495
PA0205435  BENNY, JOSEPH & MARGARET      76020              minor  495
PA0205541  BESTFORM FOUNDATIONS INC      18090              minor
PA0002992  BETHLEHEM STEEL CORP-JOHNSTO  40800              minor  331   05010007006
PA0004499  BLAIRSVILLE MACHINE PROD CO   07000              minor  379   05010007002
PA0215856  BLAIRSVILLE MUN AUTH          07010              minor  494
PA0217107  BRW STEEL CORP                40800              minor
PA0096539  BURRELL FOOD SYSTEMS, INC     10580              minor  495
PA0204331  BURRELL TWP SEW AUTH          10580              minor  495
PA0204153  CAMBRIA COGEN CO              11170              minor  491
PA0095273  CASTLE GAS COMPANY INC        10580              minor  347
PA0204072  CHARLTON, THOMAS              81760              minor  495
PA0056715  CLARK, ROBERT                 46880              minor  495
PA0090140  CLYMER BOROUGH MUN AUTH        14840              minor  495   05010007017
PA0204188  CONEMAUGH TWP AREA SCHOOL DI  19280              minor  821
PA0216399  CONEMAUGH TWP MUN AUTH         40360              minor  494
PA0217301  CONEMAUGH TWP SUPERVISORS     15910              minor
PA0097985  DOLAN ENTERPRIZES, INC.       39840              minor  495
PA0022292  EBENSBURG BORO MUN AUTH        23160              MAJOR  495   05010007010
PA0098612  EBENSBURG POWER COMPANY       11170              minor  491
PA0217336  EMERALD ESTATES INC           11190              minor
PA0205630  ENERGY CENTER, INC.          06880              minor
PA0044431  FAIRFIELD MANOR, INC.         07720              minor  495   05010007002
-----

```

Screen 10.1.4

The map layout shows the locations of all discharge facilities within the watershed(s) (Screen 10.1.5). Different map symbols are used to distinguish the facilities that discharged the selected pollutant for the given year from those facilities that did not. The Reach File network is also drawn in the map for reference purposes. A map inset is included to show the general location of the selected watershed(s) relative to the EPA regional boundary.



Screen 10.1.5

When the map layout is active, it can be printed through the Print submenu under the File main menu. Another way to print the map layout is through the *Print* button in the Project Window with the Layouts component selected and the “Point Source Map Layout” layout highlighted.

The print function that ArcView provides for the tables is intentionally deactivated in BASINS. Since this ArcView print function does not provide any formatting options, it fails to generate an acceptable printout of the BASINS tables, particularly when the tables are large. It is recommended that you import the content of the tables using a word processor.

---

**Tip:** The subwatershed ID listed in the reports corresponds to the unique ID number automatically assigned to the subwatershed by the delineation tool or watershed boundary import utility. The subwatershed ID corresponds to a cataloging unit number (eg. 05010007) if the report generator was run using the cataloging unit theme or an RF1 or RF3 segment ID for user delineated or imported watershed boundary themes (eg. RF1 = 05010007020 or RF3 = 5010007\_035\_4.93).

---

---

**Tip:** The files pcs.tx1 and pcs.tx2, which contain the tables, and pcs.wmf, which contains the point source map, are located in the \Basins\WcReport\\Reports\ directory. The <StudyArea> is the user-defined name or identifier given to the study area. It corresponds to the name in the View Table of Contents given to the theme that contains the boundary information of the study area.

---

## 10.2 Water Quality Summary Report

### *Purpose*

*Water Quality Summary Report* provides a summary of water quality monitoring stations within the selected watershed that monitored a particular pollutant during a given time period. The water quality data are presented as statistical summaries of the mean and selected percentiles of the observed data. The data were originally obtained from USEPA's Storage and Retrieval System (STORET). The information generated in this report is summarized in table format and, if selected, in a map format.

### *Application*

The *Water Quality Summary Report* generates information for characterizing water quality conditions of water bodies within a given watershed and can be used to support various watershed assessment and evaluation programs. Potential applications include review of existing monitoring programs, evaluation of ongoing monitoring activities, location of key stations with sufficient and relevant monitoring data for model calibration, and evaluation of data gaps. Although the information is summarized statistically, it can provide basic information to assess the conditions of a given water body, as well as to evaluate its changes over time.

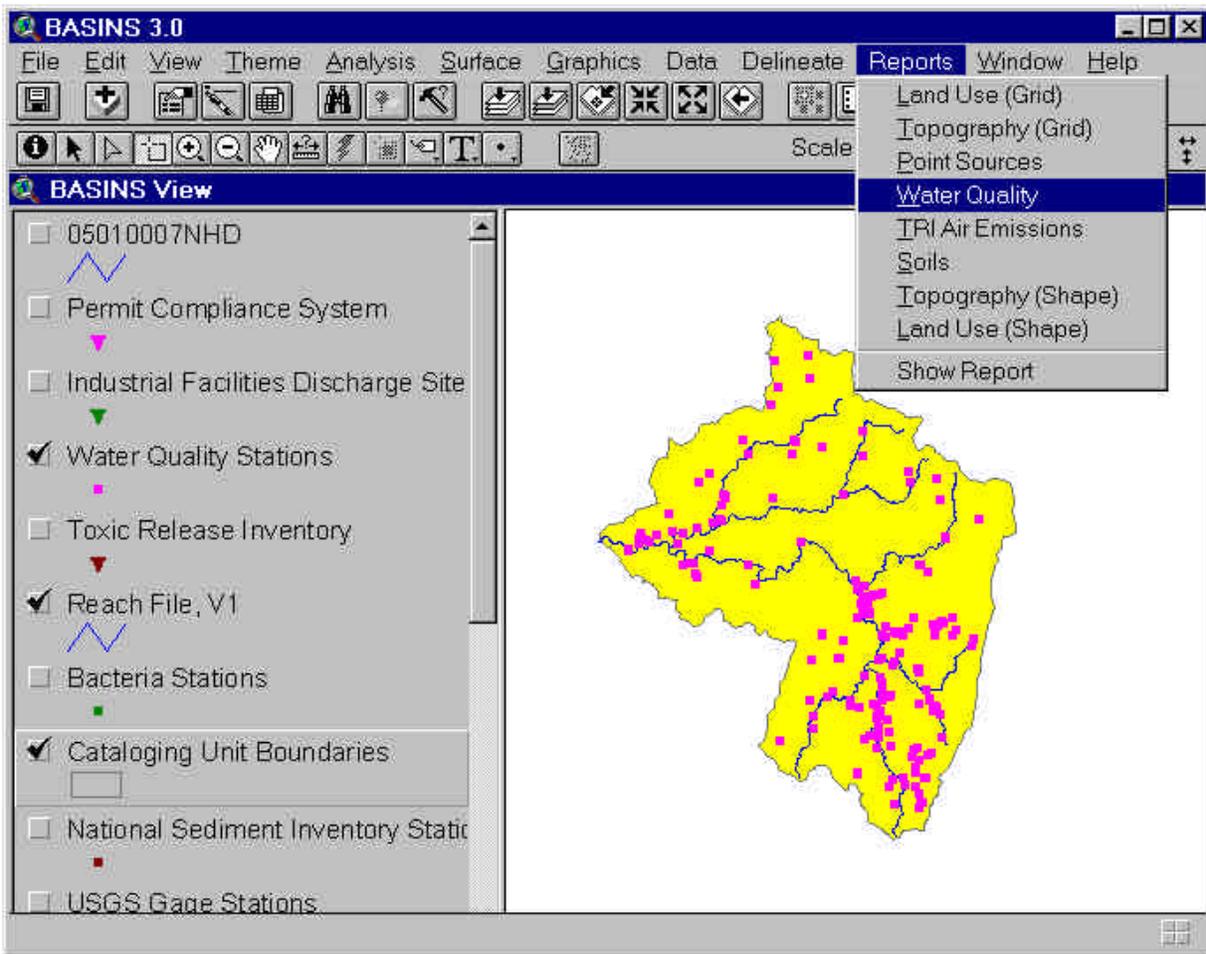
### **Before you Get Started**

First, verify that the "Reports without Spatial Analyst" extension is active in your BASINS project by typing Ctrl+B from the BASINS view and selecting the **Reports** item from the **Extension Categories** dropdown list. The "Reports without Spatial Analyst" entry in the **Basins Extensions** list should be visible and selected. If the "Reports without Spatial Analyst" is not selected (checked), click on it to select it.

### *Key Procedures*

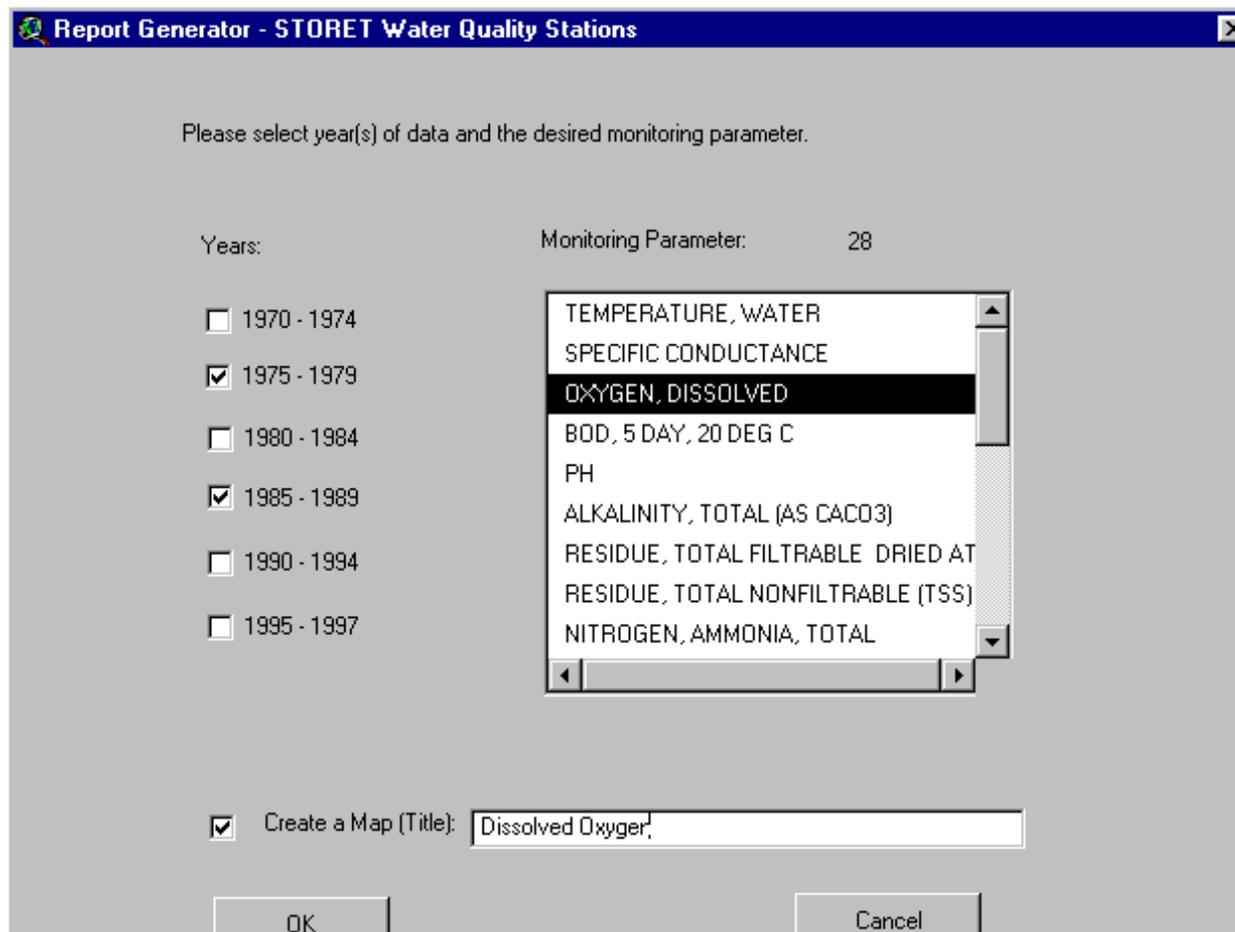
- Activate the watershed boundary theme
- Select the watersheds for which the report will be generated
- Under the Report main menu, select the *Water Quality Summary Report* submenu
- Select the time period, pollutant, and map option in the dialog box

*Operation Steps* In the BASINS View table of contents (Screen 10.2.1), click the name of the appropriate watershed boundary theme to make it active. The watershed boundary theme can be the cataloging unit boundary theme or a user delineated watershed boundary theme.



Screen 10.2.1

Activate the *Select Feature* tool and select (by clicking or dragging a box) the watershed for which the Water Quality Summary Report will be generated. Under the Report main menu, select the Water Quality Summary Report submenu. In the dialog (Screen 10.2.2) that appears, select the time period(s) from the check boxes and monitoring (pollutant) parameter from the list box provided in the dialog. Several time periods can be checked at one time. Click the check box if a location map of water quality monitoring stations is to be generated. You may choose to enter the map title in the text box provided.



Screen 10.2.2

Click to generate the report; otherwise, click *Cancel* to quit the tool without generating the report.

---

#### TUTORIAL:

Click the theme *Cataloging Unit Boundaries* to make it active.

Check its check box to display the boundary theme in the View Window.

Check the check box of the theme *Water Quality Station* to display the location of the water quality stations.

Using the *Select Feature* tool, select watershed 05010007. Your BASINS screen should now look like Screen 10.2.1. If necessary, zoom to the study area using the *Zoom to Selected Theme* tool.

Assign a value of 20 to “Hilltop Zone”, 10 to “Hilltop Classification Interval”, 20 to “Valley Zone”, and 10 to “Valley Classification Interval”. Select the Red Monochromatic color scheme. Click *OK*. Note that the entire DEM 05010007 theme is reclassified to better represent your selected area.

---

Under the Report main menu, select the *Water Quality Summary Report* submenu.

In the dialog box that appears (Screen 10.2.2), select the time periods 1975-1979 and 1985-1989 and the parameter Dissolved Oxygen, and enter the title Dissolved Oxygen.

Click to continue.

Click to accept the default directory where all report files will be saved. The report files wq.\* are saved at the \Basins\WcReport\Catalogi\Reports\ directory.

*Generated Report*

The generated report includes several tables and a map layout. The first table, “Water Quality Station Inventory - Summary by Subwatershed” (Screen 10.2.3), provides a complete list of all water quality monitoring stations within the watershed(s) and pertinent information such as county location, river basin, and reach location. Not all of the water quality stations listed in the table might actually have monitored the selected pollutant for the given time period. The second set of tables, “Water Quality Summary - by Station” (Screen 10.2.4), contain the water quality stations that actually monitored the selected pollutant for the given time period(s). Each table is associated with a different water quality station and shows the statistics of the observed data for each time period selected.

Table xx. Water quality station inventory within the selected study area(s)  
(years of data: 75-79, and 85-89)

Agency	Station No.	Location	County	Watershed	Seg	No of Obs (OXYGEN, DISSOLV)
03039200	112WRD	CLEAR RUN NEAR BUCKSTOWN, PA	SOMERSET	05010007		0
03039300	112WRD	WELLS C AT MOSTOLLER, PA	SOMERSET	05010007		0
03039340	112WRD	BEAVERDAM C AT STOYSTOWN, PA	SOMERSET	05010007		0
03039420	112WRD	NORTH BRANCH QUEMAHONING CR	SOMERSET	05010007		0
03039440	112WRD	QUEMAHONING C AT BOSWELL, PA	SOMERSET	05010007		0
03039700	112WRD	DARK SHADE CR. AT CENTRAL CI	SOMERSET	05010007		0
03039750	112WRD	DARK SHADE C AT REITZ, PA	SOMERSET	05010007		0
03039800	112WRD	CLEAR SHADE CR AT OGLETOWN,	SOMERSET	05010007	009	0
03039920	112WRD	LITTLE PAINT CREEK AT SCALP	CAMBRIA	05010007		0
03039925	112WRD	NORTH FORK BENS CR AT NORTH	SOMERSET	05010007		0
03039926	112WRD	NORTH FORK BENS CR AT N.F. R	SOMERSET	05010007		0
03039930	112WRD	SOUTH FORK BENS CR NR THOMAS	SOMERSET	05010007		0
03039931	112WRD	SOUTH FORK BENS CR NR THOMAS	SOMERSET	05010007		0
03039950	112WRD	S FK BENS C NR FERNDAL, PA	SOMERSET	05010007		0
03039957	112WRD	BENS C AT FERNDAL, PA	SOMERSET	05010007		0
03040000	112WRD	STONYCREEK RIVER AT FERNDAL	CAMBRIA	05010007		5
03040100	112WRD	L CONEMAUGH RIVER AT WILMORE	CAMBRIA	05010007		0
03040110	112WRD	HOWELLS RUN NEAR EBENSBURG,	CAMBRIA	05010007		0
03040511	112WRD	S FORK AT SOUKSBERG, PA	CAMBRIA	05010007		0
03041025	112WRD	LITTLE CONEMAUGH RIVER AT JO	CAMBRIA	05010007	010	5
03041028	112WRD	HINCKSTON RUN AT MINERSVILLE	CAMBRIA	05010007	002	0
03041500	112WRD	CONEMAUGH RIVER AT SEWARD, P	WESTMORELAND	05010007		5
03041650	112WRD	HENDRICKS C NR WEST FAIRFIEL	WESTMORELAND	05010007	002	0
03041675	112WRD	TOMS RUN NEAR BLAIRSVILLE, P	INDIANA	05010007		0
03041700	112WRD	MCGEE RN AT BRENIZER, PA	WESTMORELAND	05010007	002	0
03041710	112WRD	DUTCH RUN NEAR BLUE GOOSE, P	CAMBRIA	05010007		0
03041720	112WRD	ELK CREEK NEAR BELSANO, PA	CAMBRIA	05010007		0
03041800	112WRD	SOUTH BRANCH BLACKLICK CREEK	CAMBRIA	05010007		0
03041800	112WRD	DUTCH CREEK AT CLAYBOR, PA	INDIANA	05010007		0

Screen 10.2.3

The map layout shows the locations of all water quality monitoring stations within the watershed(s) (Screen 10.2.5). Different map symbols are used to distinguish the facilities that monitored the selected pollutant for the given time period from those facilities that did not. The Reach File network is also drawn in the map for reference purposes. A map inset is included to show the general location of the selected watershed(s) relative to the EPA regional boundary.

When the map layout is active, it can be printed through the Print submenu under the File main menu. The print function that ArcView provides for the tables is intentionally deactivated in BASINS. Since this ArcView print function does not provide any formatting options, it fails to generate an acceptable printout of the BASINS tables, particularly when the tables are large. It is recommended that you import the content of the tables using a word processor.

Water Quality Summary --by Station

Table xx. Water Quality Summary for 112WRD Station No.03040000: OXYGEN, DISSOLVED (Units: MG/L).  
(Location: STONYCREEK RIVER AT FERNDALE, PA., CAMBRIA, Watershed: 05010007, Reach Segment: ).

Years	No of Obs	Mean	25th %	50th %	75th %
1975 - 1979	5	7.20	6.50	7.00	8.00
1985 - 1989	NO DATA				

=====  
End of Table

Table xx. Water Quality Summary for 112WRD Station No.03041025: OXYGEN, DISSOLVED (Units: MG/L).  
(Location: LITTLE CONEMAUGH RIVER AT JOHNSTOWN, PA., CAMBRIA, Watershed: 05010007, Reach Segment: ).

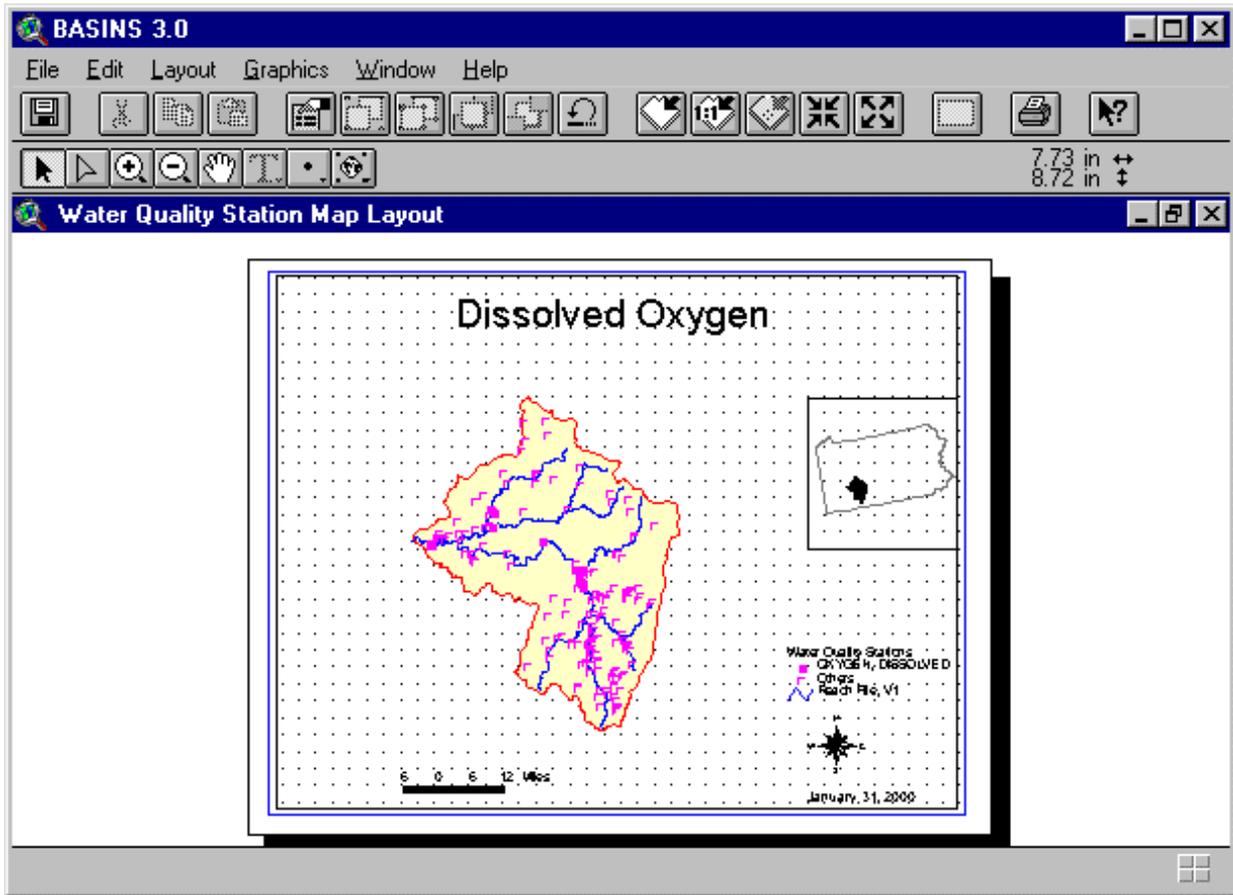
Years	No of Obs	Mean	25th %	50th %	75th %
1975 - 1979	5	8.60	8.00	9.00	9.00
1985 - 1989	NO DATA				

=====  
End of Table

Table xx. Water Quality Summary for 112WRD Station No.03041500: OXYGEN, DISSOLVED (Units: MG/L).  
(Location: CONEMAUGH RIVER AT SEWARD, PA. SITE 31, WESTMORELAND, Watershed: 05010007, Reach Segment: ).

Years	No of Obs	Mean	25th %	50th %	75th %
1975 - 1979	5	11.00	9.25	12.00	12.00

Screen 10.2.4



Screen 10.2.5

The tables and the map are developed for the purpose of integrating them into a single document. A standard word processor can be used to import both the tables and the map for further editing and formatting.

**Tip:** The files wq.tx1 and wq.tx2, which contain the tables, and wq.wmf, which contains the location map of the water quality stations, are located in the \Basins\WcReport\\Reports\ directory. The <StudyArea> is the user-defined name or identifier given to the study area. It corresponds to the name in the View Table of Contents given to the theme that contains the boundary information of the study area.

## 10.3 Toxic Air Emission Report

### *Purpose*

Toxic Air Emission Report provides a summary of facilities that are part of the Toxic Release Inventory (TRI) and have estimated air releases of a particular pollutant in a selected watershed.

### *Application*

Information generated in Toxic Air Emission Report can be used to support the characterization of emission sources in a given watershed. It generates tabular summaries of TRI facilities with their corresponding estimates of pollutant air releases and other pertinent information such as facility identification name, city location, status (active or inactive facility), ownership type (government, commercial), and SIC code number. Together with other reports generated in BASINS, such as point source discharges, land use distribution, and water quality summary, this report can support analysis of the relative magnitude of air emissions in the overall watershed loading. This report also generates a map showing the location of the TRI facilities overlaid with the Reach File network and the boundary of the selected watershed.

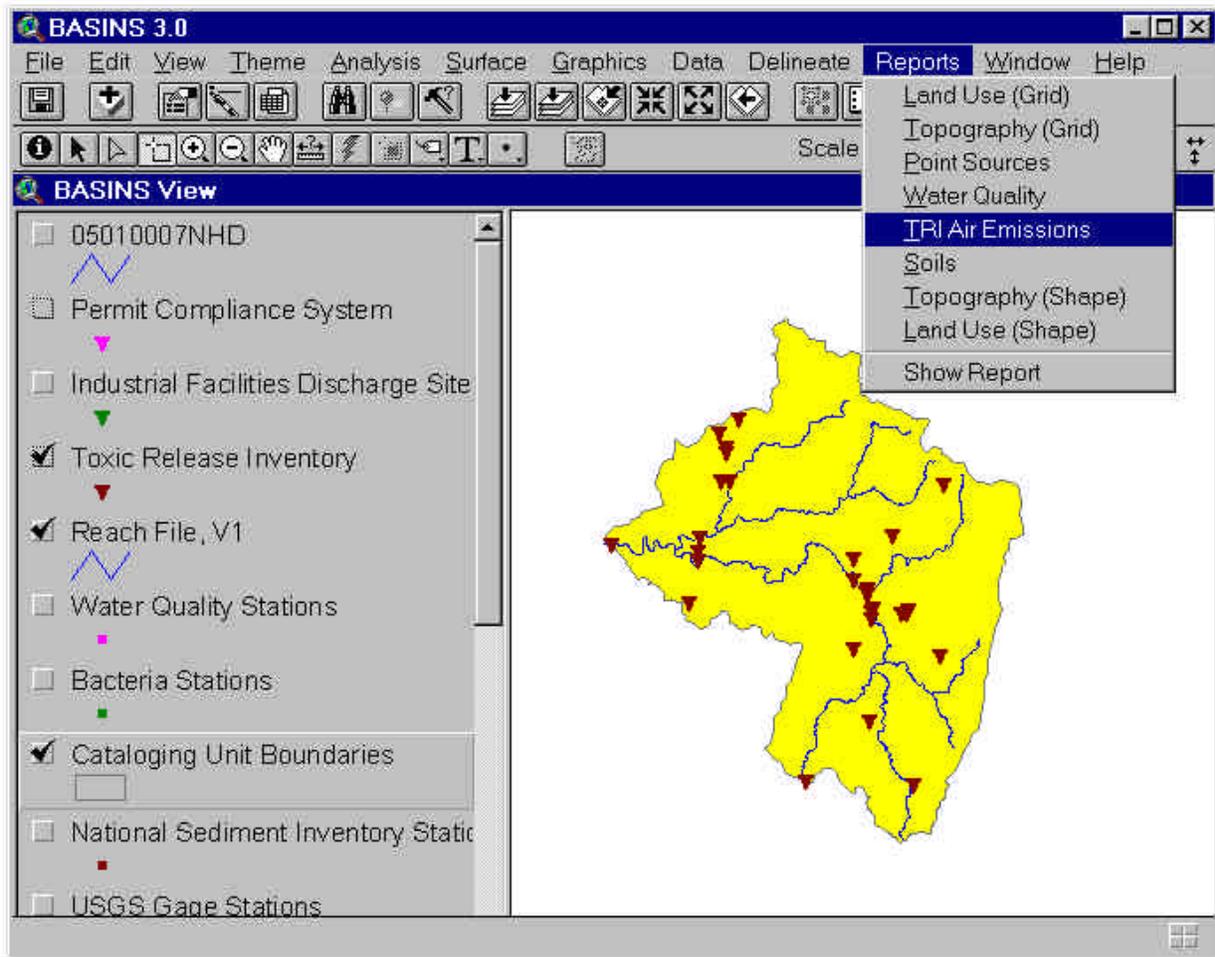
### **Before you Get Started**

First, verify that the “Reports without Spatial Analyst” extension is active in your BASINS project by typing Ctrl+B from the BASINS view and selecting the **Reports** item from the **Extension Categories** dropdown list. The “Reports without Spatial Analyst” entry in the **Basins Extensions** list should be visible and selected. If the “Reports without Spatial Analyst” is not selected (checked), click on it to select it.

### *Key Procedures*

- Activate the watershed boundary theme
- Select the watersheds for which the report will be generated
- Under the Report main menu, select the *Toxic Air Emission Report* submenu
- Select the toxic release year, pollutant type, and the map option in the dialog box

*Operation Steps* In the BASINS View table of contents (Screen 10.3.1), click the name of the appropriate watershed boundary theme to make it active. The watershed boundary theme can be the cataloging unit boundary theme or a user delineated watershed boundary theme.



Screen 10.3.1

Activate the *Select Feature* tool and select (by clicking or dragging a box) the watershed(s) for which the Toxic Air Emission Report will be generated. Under the Report main menu, select the *Toxic Air Emission Report* submenu. In the dialog box that appears (Figure 10.3.2), select the toxic release year and monitoring (pollutant) parameter in the list boxes provided. Click the check box if a location map of TRI facilities is to be generated. You may choose to enter the map title in the text box provided.

Report Generator - Toxic Air Emission

Please select release year and monitoring parameters. Enter a title if you want to create a map.

Toxic Release Year: Toxic Air Emission 1992

Monitoring Parameter: 38

COPPER  
**ZINC (FUME OR DUST)**  
 HYDROCHLORIC ACID (1995 AND AFTER ACID AEROSOLS ONLY)  
 PHOSPHORIC ACID  
 HYDROGEN FLUORIDE  
 AMMONIA  
 SULFURIC ACID

Create a Map (Title): Zinc (Fume or Dust) Air Emission

OK Cancel

Screen 10.3.2

Click **OK** to generate the report; otherwise, click *Cancel* to quit the tool without generating the report.

---

#### TUTORIAL:

Click the theme *Cataloging Unit Boundaries* to make it active.

Check its check box to display the boundary theme in the View window.

Check the check box of the theme *Toxic Release Inventory* to display the location of the TRI facilities. Using the *Select Feature* tool, select watershed 05010007. Your BASINS screen should now look like Screen 10.3.1. If necessary, zoom to the study area using the *Zoom to Selected Theme* tool.

Under the Report main menu, select *Toxic Air Emission Report* submenu.

In the dialog box that appears (Screen 10.3.2), select the year 1992 and parameter Zinc (Fumes and Dust),

and enter the title Zinc (Fumes and Dust) Air Emission.

Click to continue.

Click to accept the default directory where all report files will be saved. The report files tri.\* are saved at the \Basins\WcReport\Catalogi\Reports\ directory.

### Generated Report

The generated report includes two tables and a map layout. The first table, “Toxic Air Inventory - Summary by subwatershed” (Screen 10.3.3), provides a complete list of all TRI facilities within the watershed(s) and pertinent information such as city location, status (active or inactive facility), type of ownership (government, commercial), and Standard Industrial Classification number. The second table, “Toxic Air Emission - Summary by subwatershed” (Screen 10.3.4), provides the list of TRI facilities that actually released the selected pollutant for the given year. The air releases are grouped into two types, stack and fugitive emissions. Stack emissions include releases that occur through stacks, vents, ducts, pipes, or other confined air streams, as well as storage tank emissions and air releases from air pollution control equipment. Fugitive emissions include equipment leaks from valves, pump seals, flanges, compressors, sampling connections, and open ended lines; evaporative losses from surface impoundments and spills; and releases from building ventilation systems.

Table xx. Toxic air emission source inventory within the selected study area (TRI, 1992).

ID	Facility Name	City	SIC	Ownership	Status
-----					
Subwatershed: 05010007					
15501CRBS	PENN CARBOSE INC.	SOMERSET	2679	Commercial	Active
15501GLMR	GILMOUR MFG. CO.	SOMERSET	3089	Commercial	Active
15501MLTS	MULTI-SERVICE EQUIPMENT CORP	SOMERSET	3089	Commercial	Active
15501THCL	FLEETWOOD FOLDING TRAILERS I	SOMERSET	3792	Commercial	Active
15541WMPM	WAMPUM HARDWARE CO.	FREIDENS	2892	Commercial	Active
15563HGHL	HIGHLAND TANK & MFG. CO.	STOYSTOWN	3443	Commercial	Active
15601SSNL	SEASON-ALL IND. INC.	INDIANA	3442	Commercial	Inactive
15627CRNN	CRAIN IND. INC.	DERRY	3086	Commercial	Active
15627KYST	KEYSTONE FOAM CORP.	DERRY	3069	Commercial	Active
15627NDST	INDUSTRIAL CERAMICS INC.	DERRY	3264	Commercial	Inactive
15681BRZN	BREEZE INDUSTRIAL PRODUCTS	SALTSBURG	3429	Commercial	Active
15681FDRL	TRANSTECHNOLOGY CORP. FEDERA	SALTSBURG	2869	Commercial	Active
15701FSHR	FISHER SCIENTIFIC CO.	INDIANA	3821	Commercial	Active
15701MCCR	SPECIALTY TIRES OF AMERICA I	INDIANA	3011	Commercial	Active
15701SCHR	SCHROTH IND.	INDIANA	2491	Commercial	Active
15717BLRS	BLAIRSVILLE MACHINE PRODS. C	BLAIRSVILLE	3499	Commercial	Active
15717FMCC	FMC CORP. BLAIRSVILLE PLANT	BLAIRSVILLE	3535	Commercial	Active
15717WSTN	WESTINGHOUSE ELECTRIC CORP.	DERRY TOWNSHIP	3356	Commercial	Active
15748FMCC	FMC CORP. HOMER CITY PLANT	HOMER CITY	3535	Commercial	Active
15748STRM	STAR MFG. CO.	HOMER CITY	3448	Commercial	Active
15901SNDR	PENN TRAFFIC CO. SANI-DAIRY	JOHNSTOWN	2024	Commercial	Active
15902CCKR	KORNS GALVANIZING CO.	JOHNSTOWN	3429	Commercial	Active
15902JHNS	JOHNSTOWN CORP.	JOHNSTOWN	3325	Commercial	Active
15902SCMM	SCM METAL PRODS. INC.	JOHNSTOWN	3399	Commercial	Active
15904CLLV	CALLIKER DAIRY CO.	JOHNSTOWN	2026	Commercial	Active

Screen 10.3.3

The map layout shows the location of all TRI facilities within the watershed(s) (Screen 10.3.5). Different map symbols are used to distinguish the facilities that released the selected pollutant for the given year from those facilities that did not. The Reach File network is also drawn in the map for reference purposes. A map inset is included to show the general location of the selected watershed(s) relative to the EPA regional boundary.

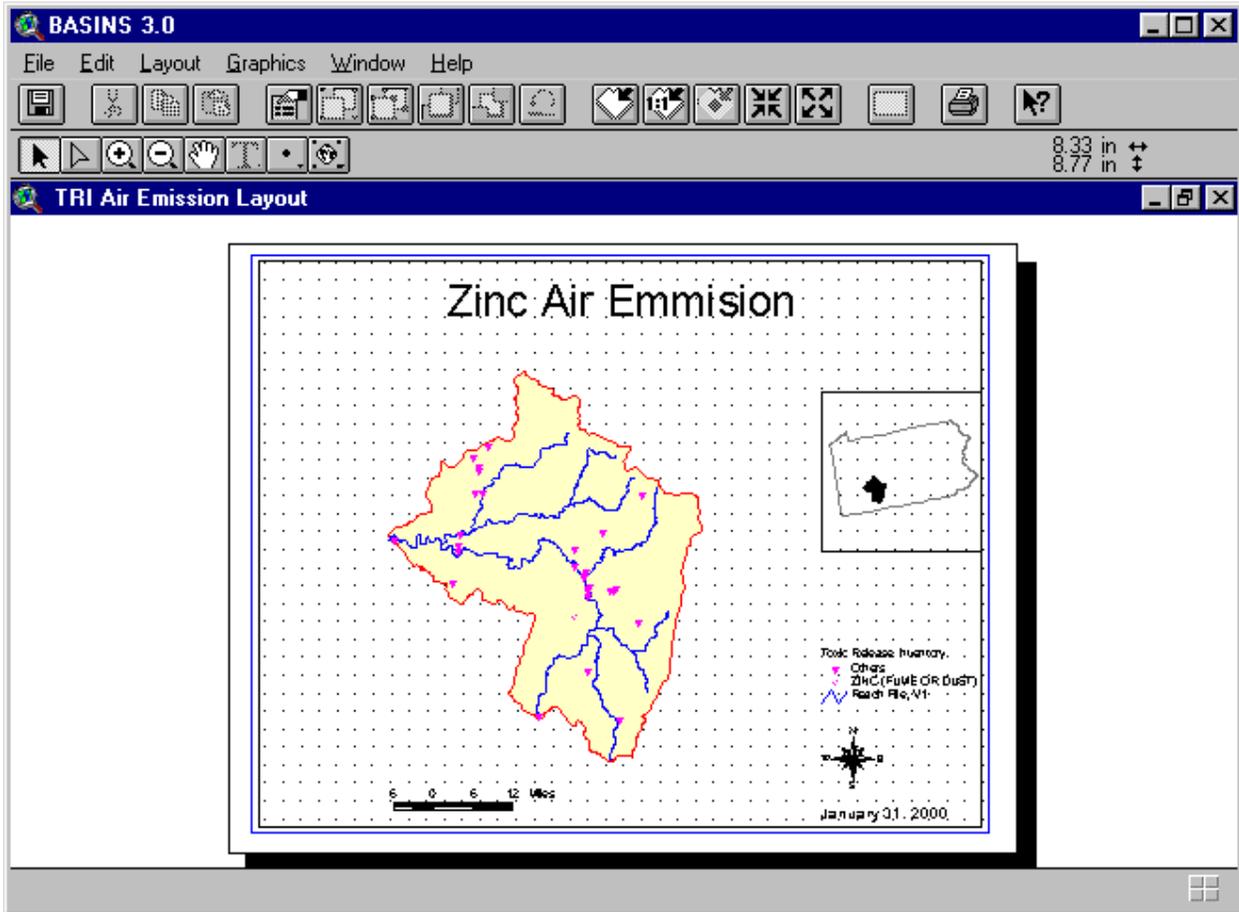
When the map layout is active, it can be printed through the Print submenu under the File main menu. Another way to print the Toxic Air Emission map layout is through the Print button in the Project Window with the Layouts component selected and the “Toxic Air Emission Layout” layout highlighted.

The print function that ArcView provides for the tables is intentionally deactivated in BASINS. Since this ArcView print function does not provide any formatting options, it fails to generate an acceptable printout of the BASINS tables, particularly when the tables are large. It is recommended that you import the content of the tables using a word processor.

The screenshot shows the BASINS 3.0 application window. The main window title is "BASINS 3.0" and it has a menu bar with "File", "Window", and "Help". Below the menu bar are icons for a printer and a help icon. The main content area displays a table titled "TRI Air Emission - Summary by Subwatershed". The table header is "Table xx. ZINC (FUME OR DUST) (lbs./yr) air emission within the selected study area (TRI, 1992)". The table has four columns: "Facility ID", "Facility Name", "Fugitive Emission", and "Stack Emission". The data row shows a facility with ID "15935FRSTMRT" and name "FIRSTMISS STEEL INC." with fugitive emissions of 5200 lbs./yr and stack emissions of 4882 lbs./yr. The subwatershed is identified as "05010007" and there is a note that the total number of facilities is 1.

Facility ID	Facility Name	Fugitive Emission	Stack Emission
Subwatershed: 05010007			
15935FRSTMRT	FIRSTMISS STEEL INC.	5200	4882
Total number of facilities: 1			

Screen 10.3.4



Screen 10.3.5

Tip: The files tri.tx1 and tri.tx2, which contain the tables, and tri.wmf, which contains the location map of the TRI facilities, are located in the \Basins\WcReport\\Reports\ directory. The <StudyArea> is the user-defined name or identifier given to the study area. It corresponds to the name in the View Table of Contents given to the theme that contains the boundary information of the study area.

## 10.4 Land Use Distribution Report

### *Purpose*

*Landuse Distribution Report* provides a summary of the land use distribution within the selected watershed(s). The BASINS default land use data were originally obtained from the USGS Geographic Information Retrieval and Analysis System (GIRAS) and use the Anderson Level II classification. The information generated in this report is summarized in both table and map layout formats.

### *Application*

*Landuse Distribution Report* can be used to examine the various land uses in the study area (by subwatershed) to assist in developing a modeling strategy such as the selection of nonpoint source segments (subwatershed) and the land use classes to be represented in the nonpoint source model. It can also be used to assess the need for a nonpoint source monitoring program and to determine areas where monitoring data are most useful for model parameterization and calibration. The report generates two tables. The first table is a tabular summary of the total acreage under each land use category (Anderson Level I classification). The second table provides the breakdown of the land use distribution in more detail using the Anderson Level II classification. The report also generates a map showing the land distribution within the watershed overlaid with the Reach File network and the boundary of the selected watershed.

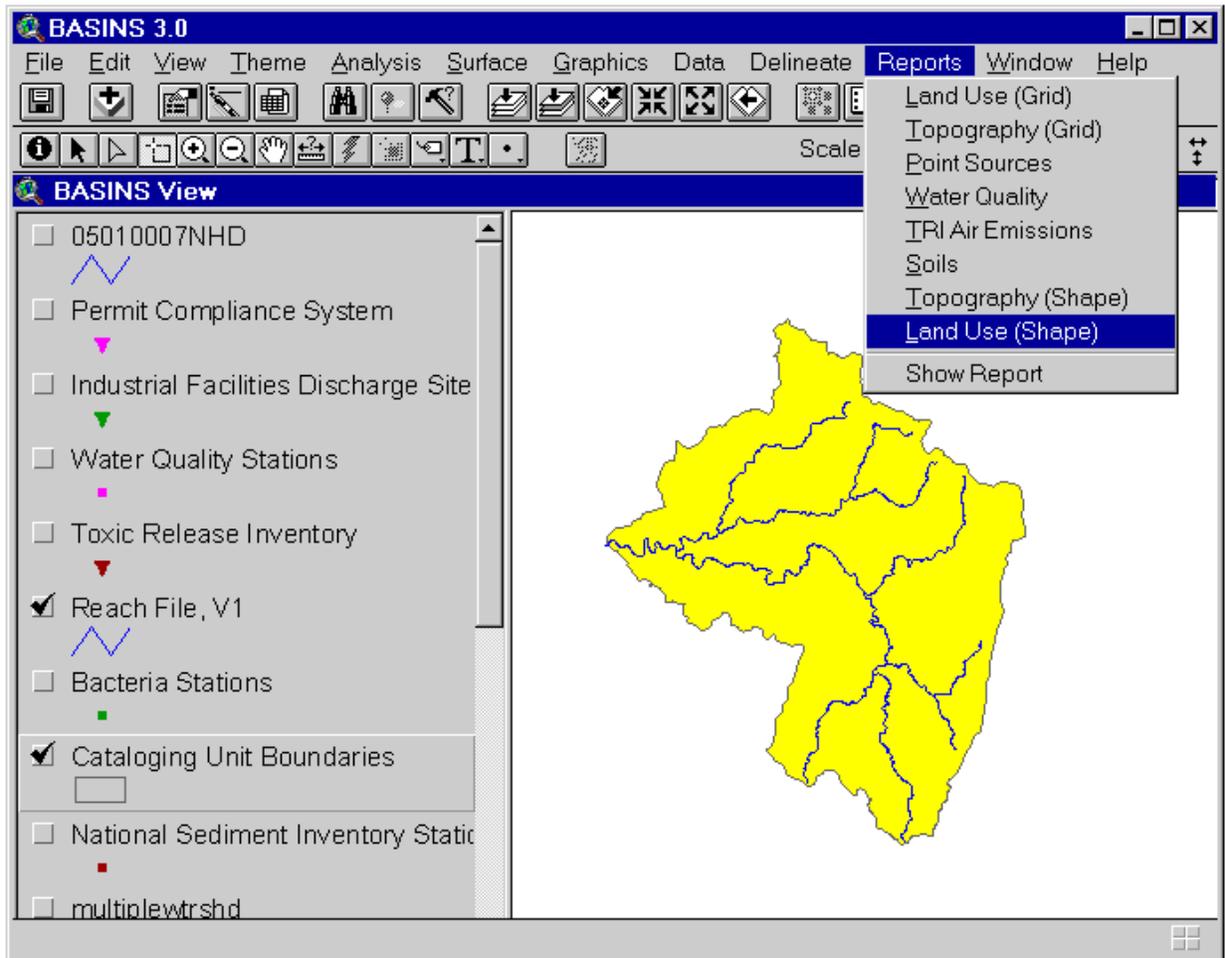
### **Before you Get Started**

First, verify that the “Reports without Spatial Analyst” extension is active in your BASINS project by typing Ctrl+B from the BASINS view and selecting the **Reports** item from the **Extension Categories** dropdown list. The “Reports without Spatial Analyst” entry in the **Basins Extensions** list should be visible and selected. If the “Reports without Spatial Analyst” is not selected (checked), click on it to select it.

### *Key Procedures*

- Activate the watershed boundary theme
- Select the watersheds for which the report will be generated
- Under the Report main menu, select the *Landuse Distribution* submenu

*Operation Steps* In the BASINS View table of contents (Screen 10.4.1), click the name of the appropriate watershed boundary theme to make it active. The watershed boundary theme can be the cataloging unit boundary theme or a user delineated watershed boundary theme.



Screen 10.4.1

Activate the *Select Feature* tool and select (by clicking or dragging a box) the watershed for which the Land Use Distribution Report will be generated. Under the Report main menu, select the *Land Use Distribution Report* submenu. In the dialog box that appears, enter the land use map title. Click to generate the report; otherwise, click *Cancel* to quit the tool without generating the report.

---

#### TUTORIAL:

Click the theme *Watershed.shp* to make it active. This demonstrates that the report tools can also be applied to user-delineated watersheds.

Check its Check Box to display the boundary theme in the View Window.

Using the *Select Feature* tool, select the three delineated subwatersheds. Your BASINS screen should now look like Screen 10.4.1. If necessary, zoom to the study area using the *Zoom to Selected Theme* tool.

Under the Report main menu, select *Land Use Distribution Report* submenu.

---

In the dialog box that appears, enter the title “Land Use Distribution”.

Click to continue.

Click to accept the default directory where all report files will be saved. The report files landuse.\* are saved at the \Basins\WcReport\Watershe\Reports\ directory.

### *Generated Report*

The generated report includes two tables and a map layout. The first table, “Land Use Information - Summary by Major Land Use Category” (Screen 10.4.2), contains the total acreage under major land use category. The second table, “Land Use Information - Summary” (Screen 10.4.3), contains the acreage under more detailed land use classification.

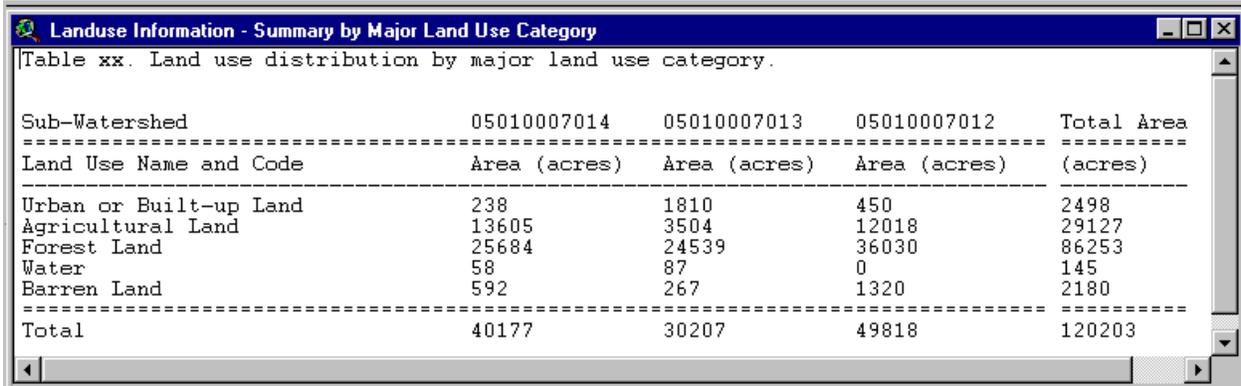


Table xx. Land use distribution by major land use category.

Sub-Watershed	05010007014	05010007013	05010007012	Total Area
Land Use Name and Code	Area (acres)	Area (acres)	Area (acres)	(acres)
Urban or Built-up Land	238	1810	450	2498
Agricultural Land	13605	3504	12018	29127
Forest Land	25684	24539	36030	86253
Water	58	87	0	145
Barren Land	592	267	1320	2180
Total	40177	30207	49818	120203

*Screen 10.4.2*

Land Use Information - Summary

Table xx. Detailed land use distribution.

Sub-Watershed	05010007014	05010007013	05010007012	Total Area
Land Use Name and Code	Area (acres)	Area (acres)	Area (acres)	(acres)
<b>Urban or Built-up Land</b>				
RESIDENTIAL-11	238	1034	280	1552
COMMERCIAL AND SERVICES-12	0	437	45	482
INDUSTRIAL-13	0	44	18	62
TRANS. COMM. UTIL-14	0	270	0	270
OTHER URBAN OR BUILT-UP-17	0	25	107	132
Subtotal	238	1810	450	2498
<b>Agricultural Land</b>				
CROPLAND AND PASTURE-21	13605	3504	12018	29127
Subtotal	13605	3504	12018	29127
<b>Forest Land</b>				
DECIDUOUS FOREST LAND-41	13313	16903	35602	65818
EVERGREEN FOREST LAND-42	10993	6509	428	17930
MIXED FOREST LAND-43	1378	1127	0	2505
Subtotal	25684	24539	36030	86253
<b>Water</b>				
RESERVOIRS-53	58	87	0	145
Subtotal	58	87	0	145
<b>Barren Land</b>				
STRIP MINES-75	592	267	1320	2180
Subtotal	592	267	1320	2180
<b>Total</b>	<b>40177</b>	<b>30207</b>	<b>48818</b>	<b>120202</b>

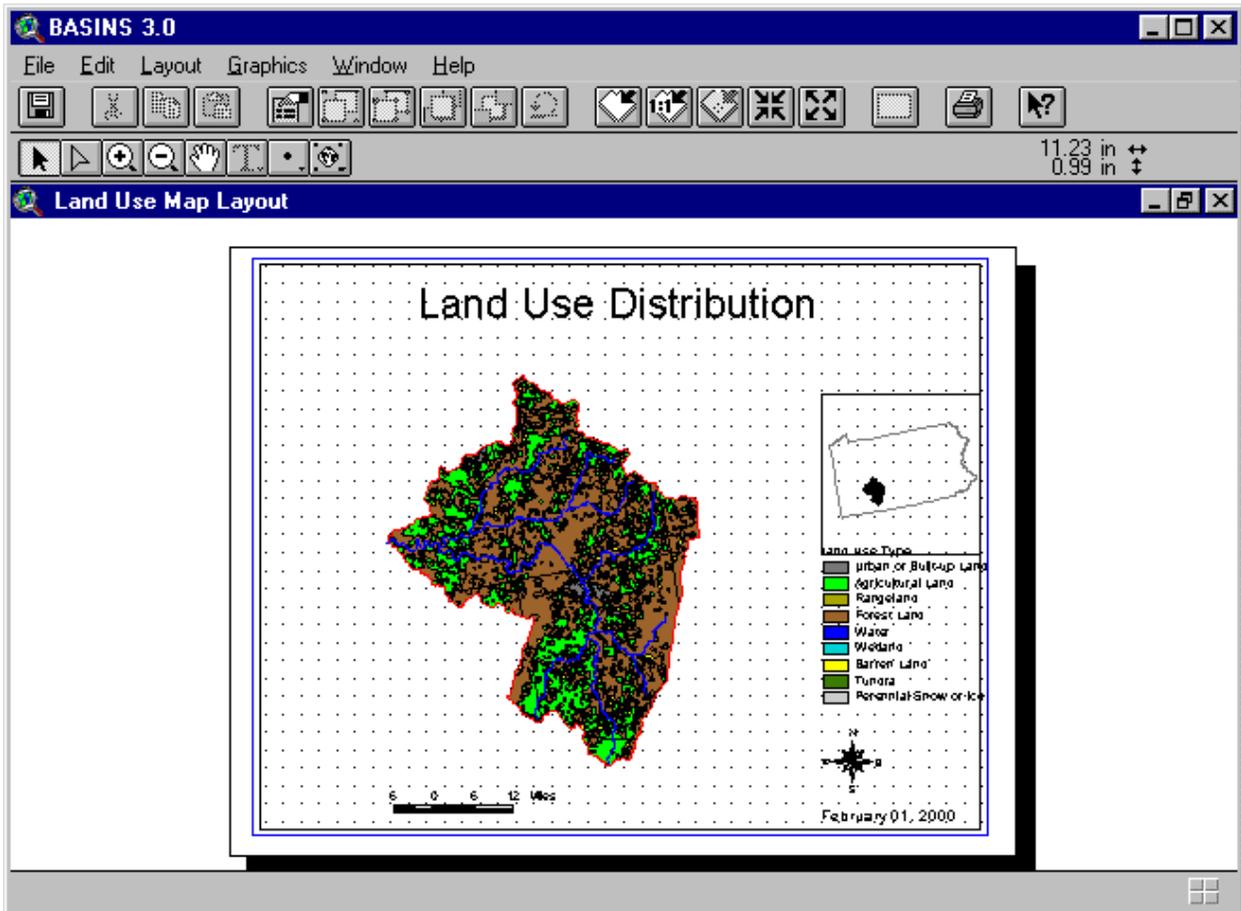
Screen 10.4.3

The map layout, "Land Use Map Layout" (Screen 10.4.4), shows the land use distribution using the major land use categories. The Reach File network is also drawn in the map layout for reference purposes. A map inset is included to show the general location of the selected watershed(s) relative to the EPA regional boundary.

When the map layout is active, it can be printed through the Print submenu under the File main menu. The map can also be imported into a document using a word processor.

The print function that ArcView provides for the tables is intentionally deactivated in BASINS. Since this ArcView print function does not provide any formatting options, it fails to generate an acceptable printout for the BASINS tables, particularly when the tables are large. It is recommended that you import the content of the tables using a word processor.

**Tip:** The files landuse.tx1 and landuse.tx2, which contain the tables, and landuse.wmf, which contains the land use map, are located in the \Basins\WcReort\<StudyArea>\Reports\directory. The <StudyArea> is the user-defined name or identifier given to the study area. It corresponds to the name in the View Table of Contents given to the theme that contains the boundary information of the study area.



Screen 10.4.5

## 10.5 State Soil Characteristic Report

### *Purpose*

*State Soil Characteristic Report* provides a summary of the spatial variability of selected soil parameters within one or a set of subwatersheds. The soil parameters considered include water table depth, bedrock depth, soil erodibility, available water capacity, permeability, bulk density, pH, organic matter content, soil liquid limit, soil plasticity, percent clay content, and percent silt and clay content. The data were originally obtained from the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) State Soil and Geographic Database (STATSGO). The information generated in this report is summarized in table format and, if selected, presented in map format.

### *Application*

*State Soil Characteristic Report* is a useful tool for characterizing the spatial variability of soil within the selected watershed(s). The soil data were originally obtained from the STATSGO database, which breaks down an area coverage into smaller georeferenced units called map units. Each map unit is further broken down into soil components and layers.

Soil parameter values are calculated by STATSGO map units and by subwatershed through a combination of aggregation methods such as area-weighting and depth integration. The parameter value for a particular map unit can also be selected so that it corresponds to the value of the largest soil component within the map unit (e.g., mode method) and/or to the value of the soil surface layer. The calculation can be based on the minimum, maximum, or mean values of the soil parameters available in the STATSGO database.

The soil report generates a table of aggregated values of the selected parameter by STATSGO map unit and by subwatershed. It also generates maps showing the spatial variability of the selected soil parameter by map unit and by subwatershed overlaid with the Reach File network (RF1) and the boundary of the selected watershed.

### *Key Procedures*

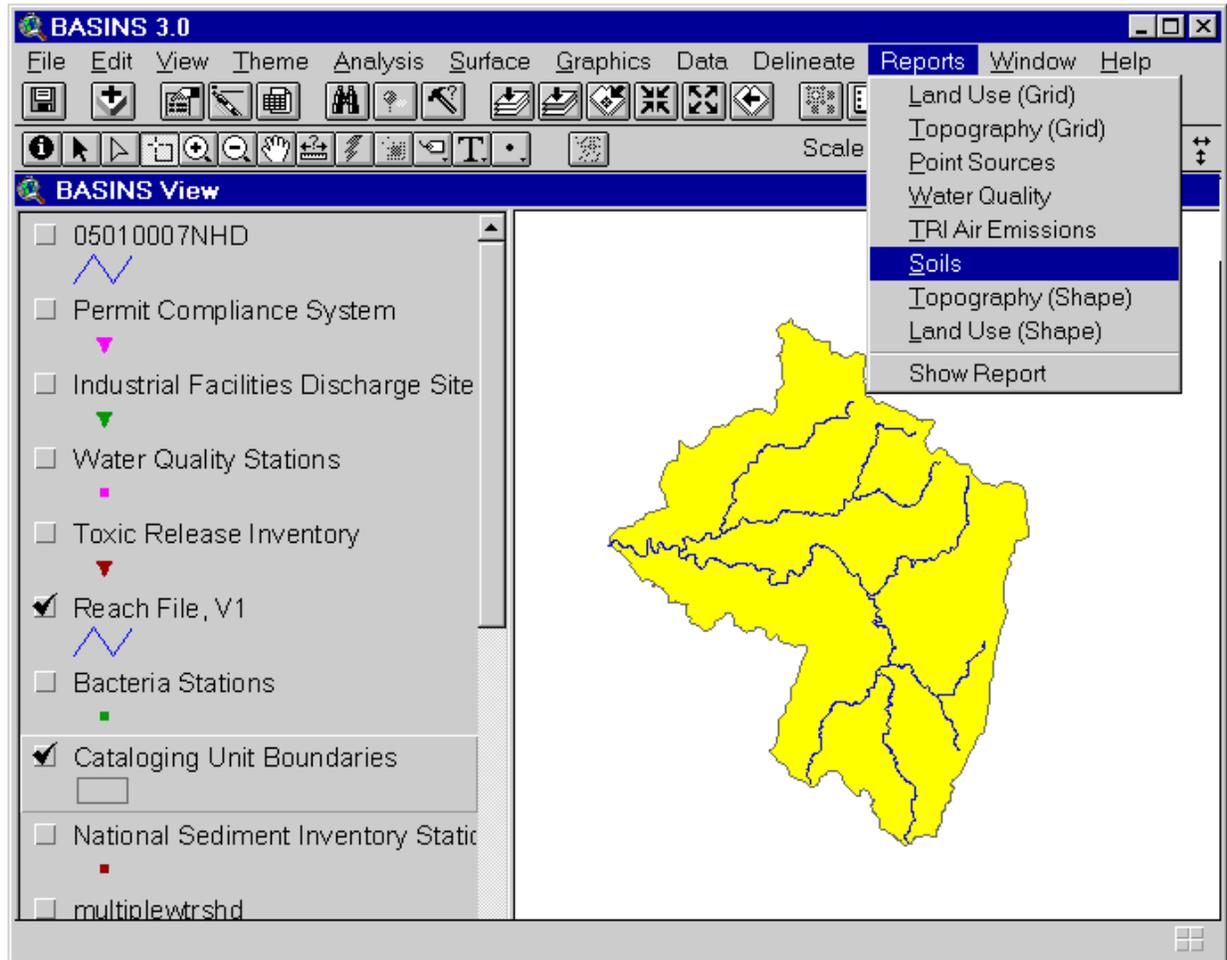
- Activate the watershed boundary theme
- Select the watersheds for which the report will be generated
- Under the Report main menu, select the *State Soil Characteristic Report* submenu
- Select the soil parameter, type of estimate, aggregation method, and map option in the dialog box

### **Before you Get Started**

First, verify that the “Reports without Spatial Analyst” extension is active in your BASINS project by typing Ctrl+B from the BASINS view and selecting the **Reports** item from the **Extension Categories** dropdown list. The “Reports without Spatial Analyst” entry in the **Basins Extensions** list should be

visible and selected. If the “Reports without Spatial Analyst” is not selected (checked), click on it to select it.

*Operation Steps* In the BASINS View table of contents (Screen 10.5.1), click the name of the watershed boundary theme to make it active. The watershed boundary theme can be the cataloging unit boundary theme or a user delineated watershed boundary theme.



Screen 10.5.1

Activate the *Select Feature* tool and select (by clicking or dragging a box) the watershed(s) for which the soil report will be generated. Under the Report main menu, select the *State Soil Characteristic Report* submenu. In the dialog box that appears (Screen 10.5.2), select the soil parameter from the list box and the type of estimate, component aggregation method, and (if necessary) layer aggregation method through the check boxes. Click the check box if soil maps are to be generated. You may choose to enter the map title in the text box provided.

For soil parameters that do not vary with depth, such as water table and bedrock depths, only soil component aggregation is required to obtain the “representative” values by map units. You may choose

the area-weighted method of aggregating the soil components within a map unit to obtain the “representative” value. On the other hand, you may choose the value of the largest soil component within the map unit as the “representative” value for the entire map unit.

The screenshot shows a dialog box titled "Report Generator - Soil". At the top, there is a "Parameter:" label followed by a dropdown menu showing "Permeability (in/hr)". Below this are three grouped sections: "Type of Estimate" with radio buttons for "Mean" (selected), "Low", and "High"; "Component" with radio buttons for "Area-weighted" (selected) and "Mode"; and "Layer" with radio buttons for "Depth-integration" (selected) and "Surface Layer". At the bottom, there is a checked checkbox labeled "Create a Map (Title):" followed by a text input field containing "Soil Permeability". Two buttons, "OK" and "Cancel", are positioned at the very bottom.

Screen 10.5.2

For the rest of the soil parameters that also vary with depth (soil layers) such as soil erodibility, available water capacity, permeability, bulk density, pH, organic matter content, soil liquid limit, soil plasticity, percent clay content, and percent silt and clay content, an extra step of layer aggregation is required to obtain a “representative” value for all soil layers. You may choose the depth-integration (depth-weighted) method of aggregating the soil layers of a particular soil component within the map unit. On the other hand, you may choose the value associated with the surface soil layer as the “representative” value for all soil layers.

For the soil parameters supported in this report tool, the STATSGO database reports both minimum and maximum values. This provides the user an option of generating the soil characterization report based on minimum, maximum, or mean (of the minimum and maximum) values. Click to generate the report; otherwise, click *Cancel* to quit the tool without generating the report.

---

**TUTORIAL:**

---

Click the theme *Watershed.shp* to make it active. This demonstrates that the report tools can also be applied to user-delineated watersheds.

Check its check box to display the boundary theme in the View window.

Using the *Select Feature* tool, select the three delineated subwatersheds. Your BASINS screen should now look like Screen 10.5.1. If necessary, zoom to the study area using the *Zoom to Selected Theme* tool.

Under the Report main menu, select the *State Soil Characteristic Report* submenu.

In the dialog box that appears (Screen 10.5.2), select *Parameter Permeability and Options Mean, Area-Weighted and Depth-Integration*.

Enter the title “Soil Permeability”.

Click to continue.

Click to accept the default directory where all report files will be saved. The report files soil.\* are saved at the \Basins\WcReport\Watershe\Reports\ directory.

---

### *Generated Report*

The generated report includes two tables and two map layouts. The first table, “State Soil Report - Summary by subwatershed” (Screen 10.5.3), contains the acreage of the STATSGO map unit and the corresponding aggregated values of the selected parameter. The second table, “State Soil Statistics - Summary by subwatershed” (Screen 10.5.4), contains the total acreage of the subwatershed and the mean, maximum, and minimum of the map unit values within the subwatershed.

Table xx. Soil Distribution by STATSGO Map Unit.

```
=====
```

Map Unit	Area (acre)	Permeability (in/hr)
Subwatershed: 05010007		
PA022	324047	9.33
PA033	10436	3.28
PA044	26699	1.06
PA051	22143	3.89
PA052	2229	1.23
PA053	402399	0.77
PA054	11960	4.28
PA055	57684	1.17
PA056	20429	0.77

```
=====
```

Note: Type of estimate: Mean; Components: Area-weighted; Layers: Depth-integration.

Screen 10.5.3

Table xx. Soil Statistics - Summary by Subwatershed (Parameter: Permeability (in/hr)).

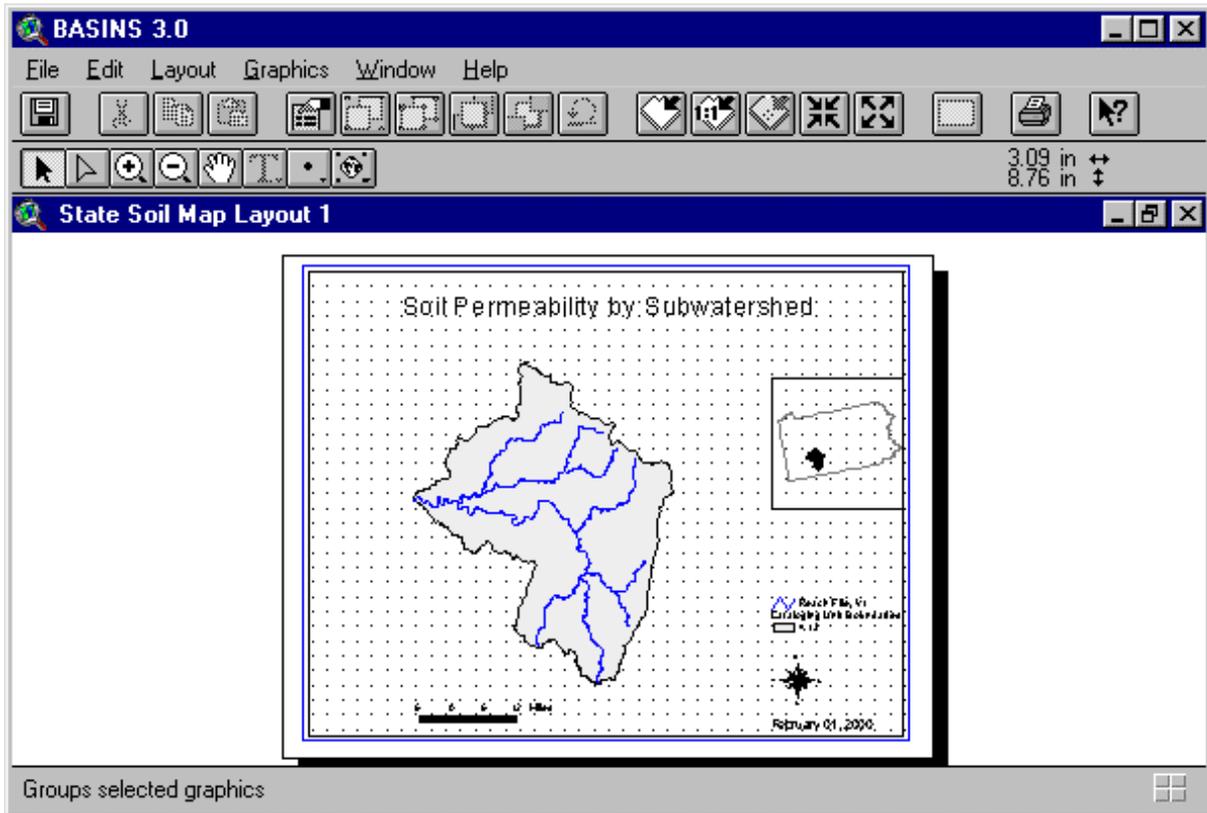
```

=====
Statistics      05010007      Composite
-----
Area (acre)    878025      878025
Mean           4.12        4.12
Min            0.77        0.77
Max            9.33        9.33
=====
Note: Type of estimate: Mean; Components: Area-weighted; Layers: Depth-integration.

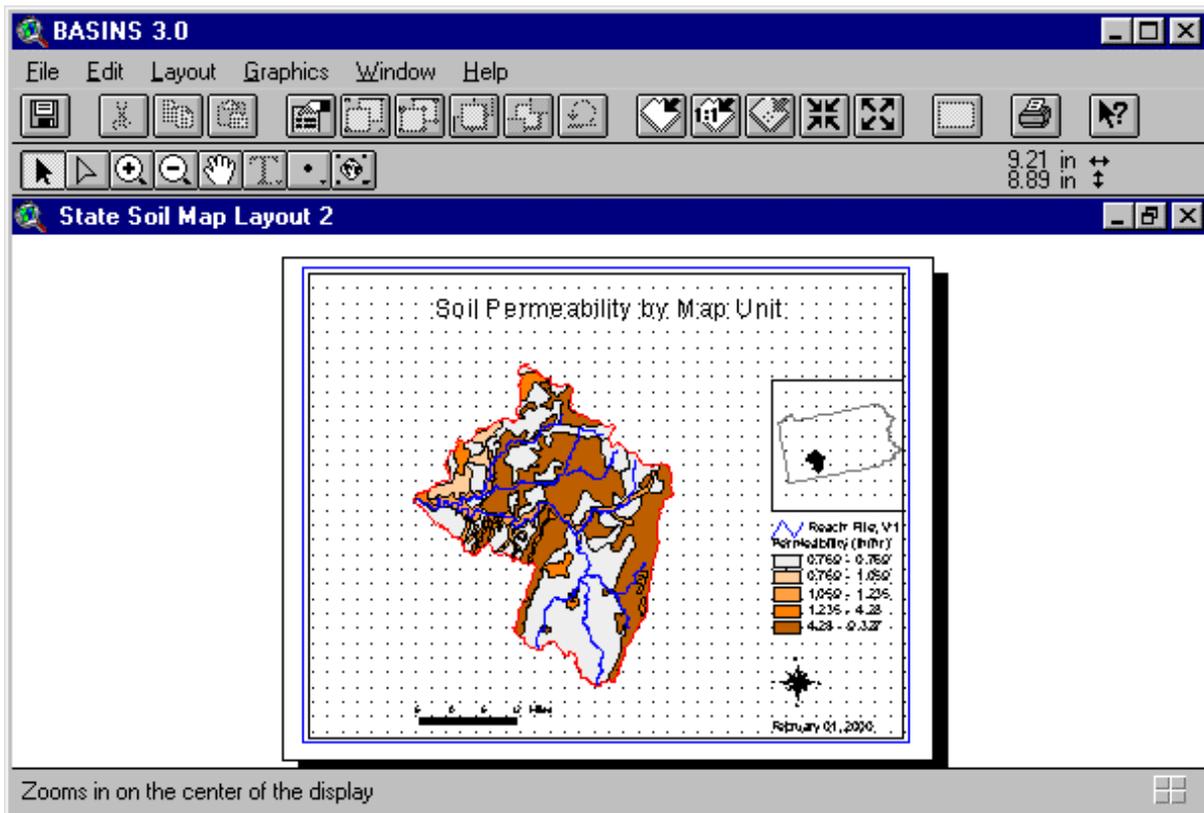
```

Screen 10.5.4

The first map layout (State Soil Map Layout 1) shows the spatial distribution of the selected soil parameter by watershed in which one value is assigned for each subwatershed (Screen 10.5.5). The second map layout, "State Soil Map Layout 2," shows the spatial distribution of the selected soil parameter by STATSGO map unit (Screen 10.5.6). On both maps, the Reach File network is also drawn for reference purposes. A map inset is included to show the general location of the selected watershed(s) relative to the EPA regional boundary.



Screen 10.5.5



Screen 10.5.6

When the map layout is active, it can be printed through the Print submenu under the File main menu. The map layout can be activated by clicking on it. Another way to print the map layout is through the *Print* button in the Project Window with the Layouts component selected and the “State Soil Map Layout #” layout highlighted.

The print function that ArcView provides for the tables is intentionally deactivated in BASINS. Since this ArcView print function does not provide any formatting options, it fails to generate a good printout of the BASINS tables, particularly when the tables are large. It is recommended that you use a word processor to import both the tables and maps for printing, further editing and formatting, or incorporation into other documents.

---

**Tip:** The files soil.tx1 and soil.tx2, which contain the tables, and soil.wmf, which contains the soil map, are located in the \Basins\WcReport\


---

## 10.6 Watershed Topographic Report

### *Purpose*

*Watershed Topographic Report* provides a statistical summary and distribution of discrete land surface elevations in the watershed. It also generates an elevation map of the selected watershed. The default source elevation map in BASINS is derived from the conversion of the USGS one degree Digital Elevation Map (DEM) into a vector map product. The information generated in this report is summarized in table format and, if selected, in map format.

### *Application*

*Watershed Topographic Report* is a useful tool for characterizing the magnitudes and distribution of elevations in the watershed. Statistical measures of elevation such as minimum, maximum, mean, median, and standard deviation are provided. A graph showing the cumulative percentage of the total area under a particular elevation is generated (hypsothetic curve). This information can be used to quickly evaluate the relative “steepness” of the watershed compared to that of other watersheds and to correlate it with the results of water quality modeling. In conjunction with the Reach File data, the DEM data can be used to assist users in delineating watersheds more accurately. Using the *Identify* tool, the user can determine the elevation at key locations such as the headwaters of a stream. The hypsothetic curve provides an overall description of the elevation in the watershed and consequently can assist in defining key topographic parameters generally required for water quality and nonpoint source modeling.

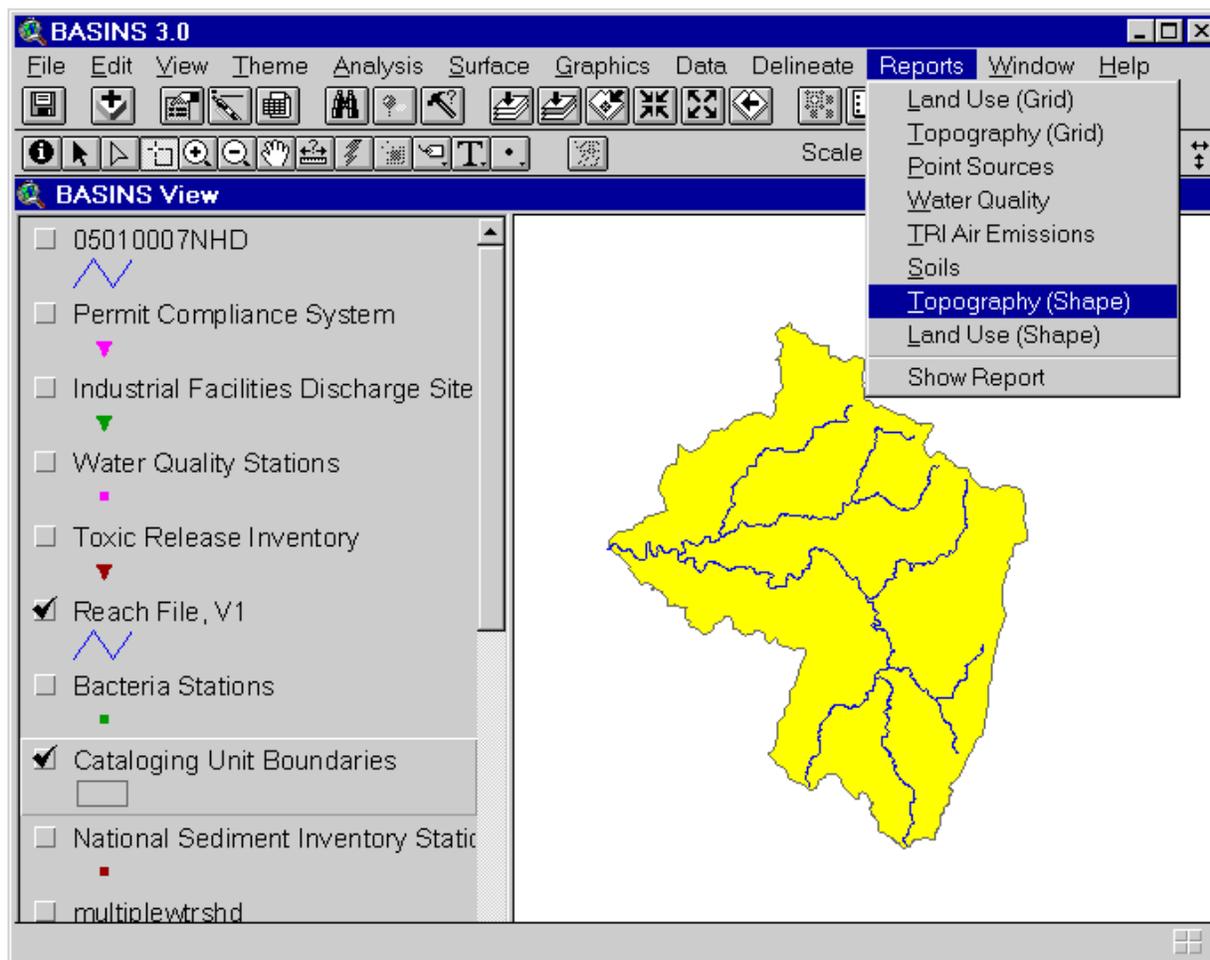
### **Before you Get Started**

First, verify that the “Reports without Spatial Analyst” extension is active in your BASINS project by typing Ctrl+B from the BASINS view and selecting the **Reports** item from the **Extension Categories** dropdown list. The “Reports without Spatial Analyst” entry in the **Basins Extensions** list should be visible and selected. If the “Reports without Spatial Analyst” is not selected (checked), click on it to select it.

### *Key Procedures*

- Activate the watershed boundary theme
- Select the watersheds for which the report will be generated
- Under the Report main menu, select the *Watershed Topographic Report* submenu

*Operation Steps* In BASINS View’s Table of Contents (Screen 10.6.1), click the name of the watershed boundary theme to make it active. The watershed boundary theme can be the cataloging unit boundary theme or a user delineated watershed boundary theme.



Screen 10.6.1

Activate the *Select Feature* tool and select (by clicking or dragging a box) the watershed(s) for which the land use report will be generated. Under the Report main menu, select the *Watershed Topographic Report* submenu. In the text box that appears, enter the map title. Click to generate the report; otherwise, click *Cancel*.

---

**Tip:** The BASINS DEM data layer is tiled by watershed (8-digit cataloging unit). Due to the size of each watershed DEM file, it is recommended that you import only the needed files. Refer to Section 7.2 for instructions on how to import DEM files.

---



---

**Tip:** The DEM theme for the selected watershed should be available. Since DEM is not a part of the BASINS core data, it has to be imported manually. Default BASINS DEM data that came with the extracted data are stored in `\BASINS\Data\<User-Specified Data Directory>\Dem\`. The

---

---

<User-Specified Data Directory> is the directory where the BASINS extracted data are stored, and it was specified during data extraction.

---

---

#### TUTORIAL:

---

Click the theme *Watershed.shp* to make it active. This demonstrates that the report tools can also be applied to user-delineated watersheds.

Check its check box to display the boundary theme in the View Window.

Using the *Select Feature* tool, select the three delineated subwatersheds. Your BASINS screen should now look like Screen 10.6.1. If necessary, zoom to the study area using the *Zoom to Selected Theme* tool. This requires that the DEM data for the particular selected subwatersheds have been imported into the BASINS View already.

Under the Report main menu, select the *Watershed Topographic Report* submenu.

In the dialog box that appears, enter the title “Land Surface Elevation”.

Click to continue.

Click to accept the default directory where all report files will be saved. The report files dem.\* are saved at the \Basins\WcReport\Watershe\Reports\ directory.

---

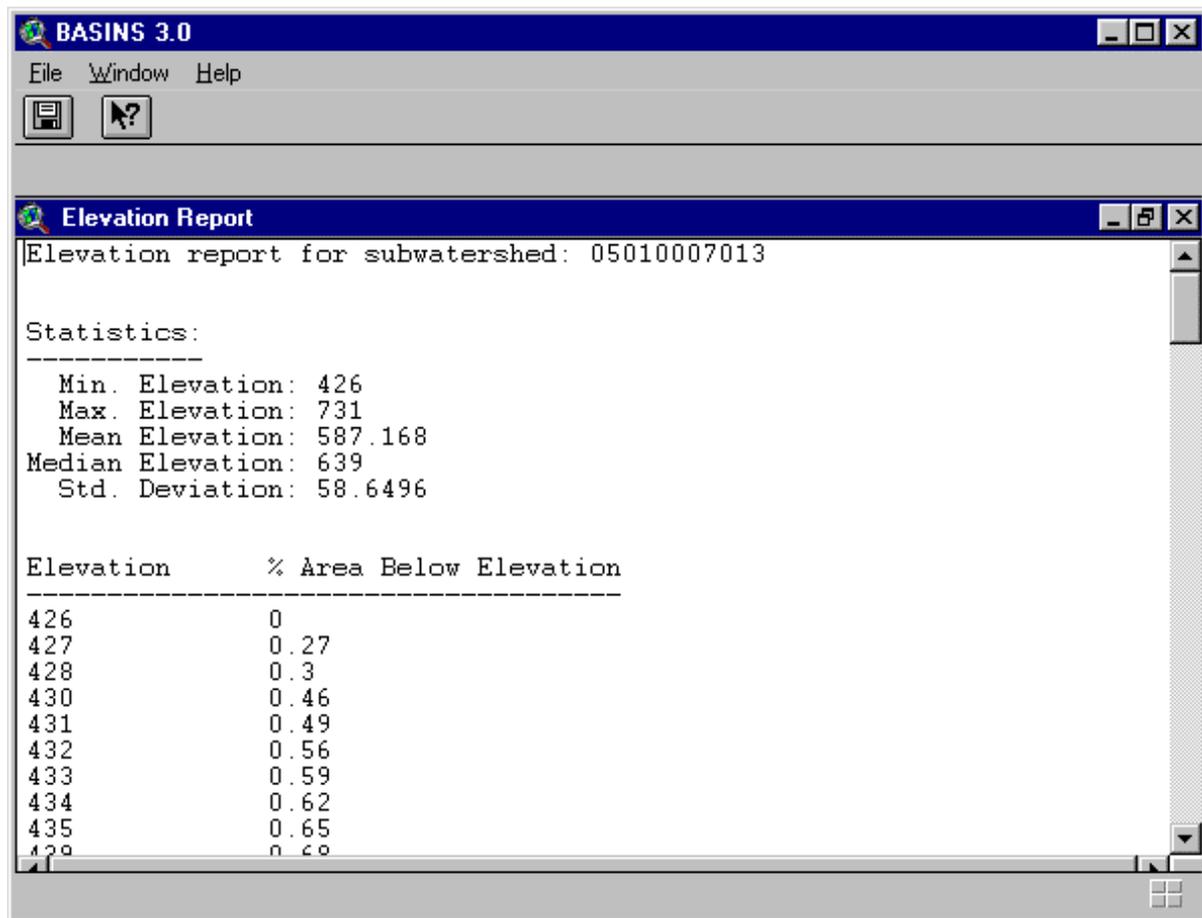
#### *Generated Report*

The generated report includes a table, chart, and map layout. The table, “Elevation Report” contains the summary statistics of the land surface elevations in the watershed (Screen 10.6.2). It also shows the percent distribution of the total watershed area under a particular elevation. This distribution is plotted in the chart component of the report (Screen 10.6.3). The map layout shows the land surface elevation map in the watershed (Screen 10.6.4). The Reach File network is also drawn for reference purposes. A map inset is included to show the general location of the selected watershed(s) relative to the EPA regional boundary.

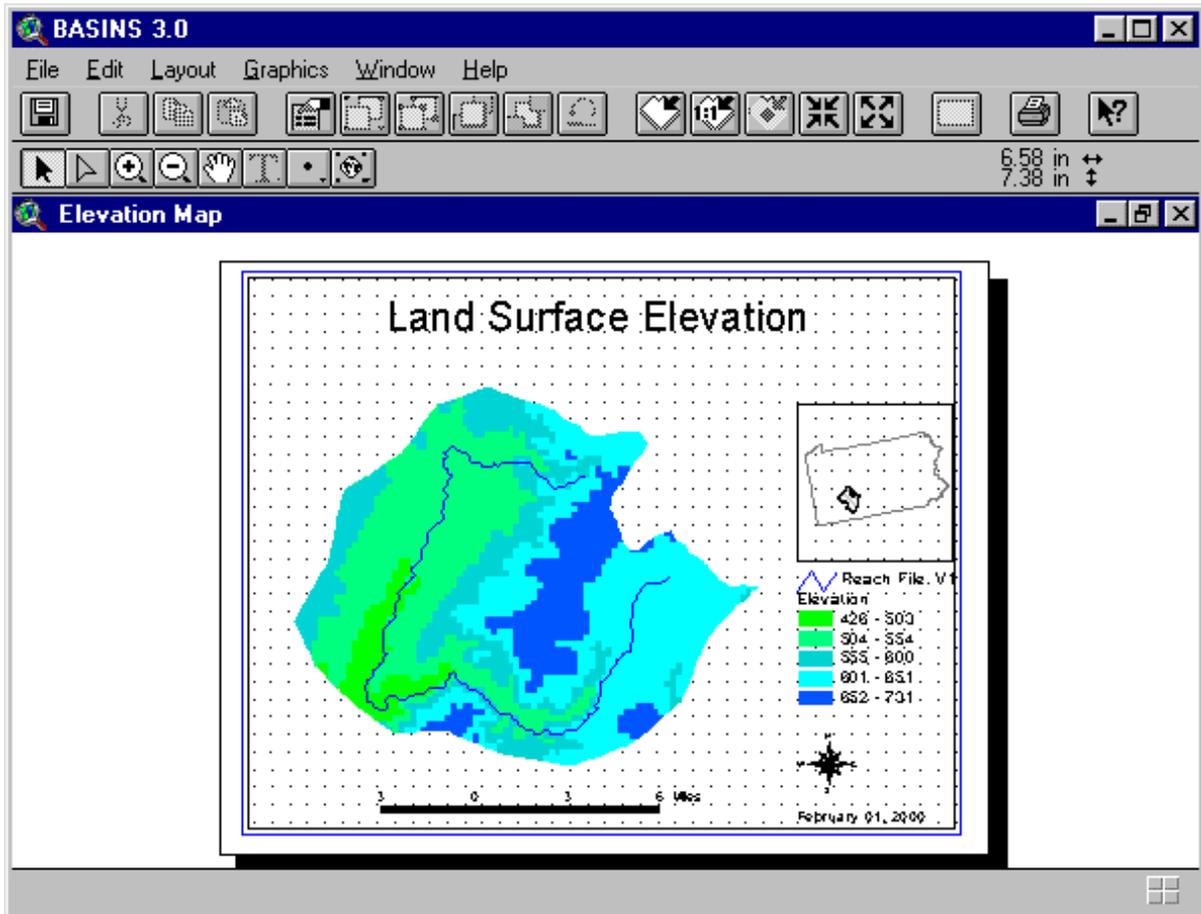
When the map layout is active, it can be printed through the Print submenu under the File main menu. The map layout can be activated by clicking on it. Another way to print the map layout is through the Print button in the Project Window with the Layouts component selected and the “Elevation Map” layout highlighted.

The print function that ArcView provides for the tables is intentionally deactivated in BASINS. Since this ArcView print function does not provide any formatting options, it fails to generate a good printout of the BASINS tables, particularly when the tables are large. It is recommended that you use a word processor to import both the tables and maps for printing, further editing and formatting, or incorporation into other documents.

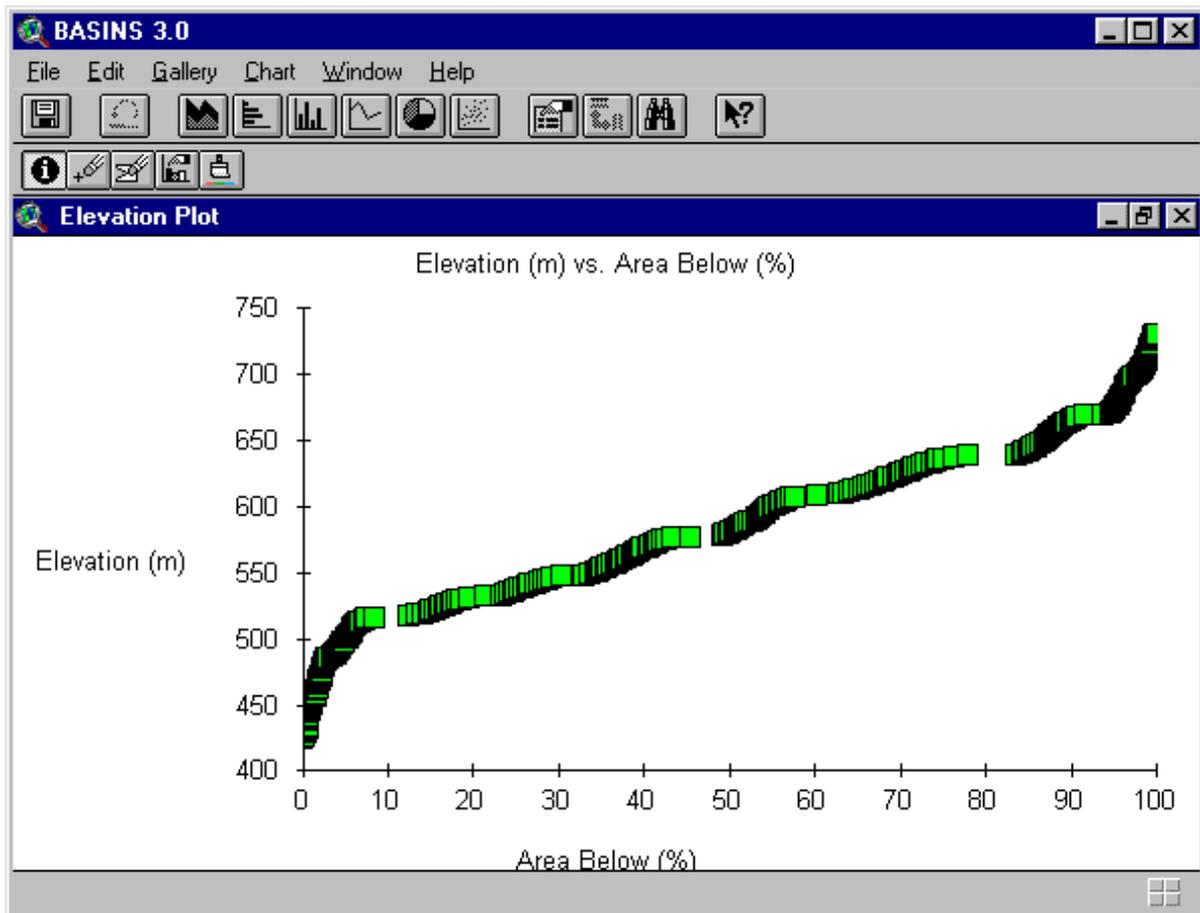
Tip: The file dem.txt, which contains the table, and dem.wmf, which contains the elevation map, are located in the \Basins\WcReport\



Screen 10.6.2



Screen 10.6.3



Screen 10.6.4

## 10.7 Land Use Distribution Report (Grid)

### *Purpose*

*Landuse Distribution Report (Grid)* provides a summary of the land use distribution within the selected watershed(s). The new Multi Resolution Land Cover (MRLC) data (grid based) can be used to generate the landuse distribution report. The information generated in this report is summarized in both table and map layout formats.

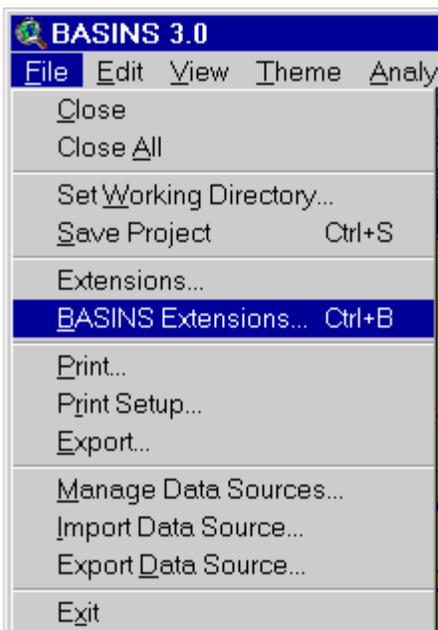
### *Application*

*Landuse Distribution Report (Grid)* can be used to examine the various land uses in the study area (by subwatershed) to assist in developing a modeling strategy such as the selection of nonpoint source segments (subwatershed) and the land use classes to be represented in the nonpoint source model. It can also be used to assess the need for a nonpoint source monitoring program and to determine areas where monitoring data are most useful for model parameterization and calibration. This report requires the ArcView Spatial Analyst extension. A report showing all the landuse distribution for the required watershed by major land use category is generated. A map showing the land distribution within the watershed overlaid with the Reach File network and the boundary of the selected watershed is also generated.

### *Key Procedures*

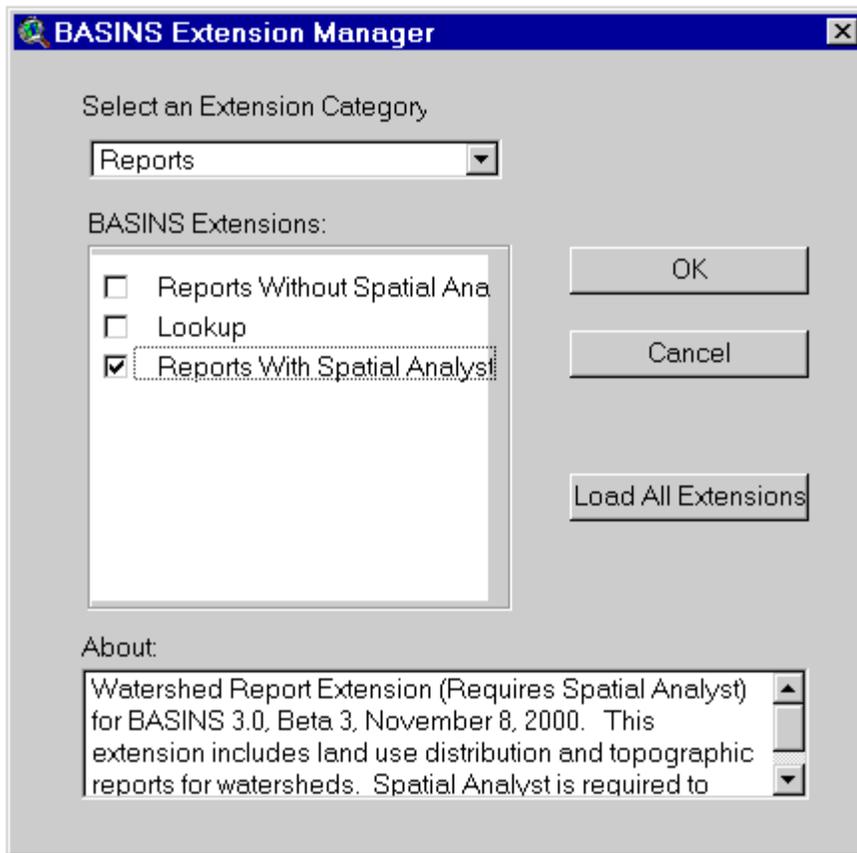
- Select the *BASINS extensions* submenu under the *File* menu
- Select Report as the extension category and check the *Reports with Spatial analyst* extension
- Import the Grid theme using the *Add Theme (Grid)* BASINS extension
- Activate the watershed boundary theme
- Select the watersheds for which the report will be generated
- Under the Report main menu, select the *Landuse (Grid)* submenu

*Operation Steps* With BASINS View active, select the Basins Extensions... menu under the File menu (Screen 10.7.1).

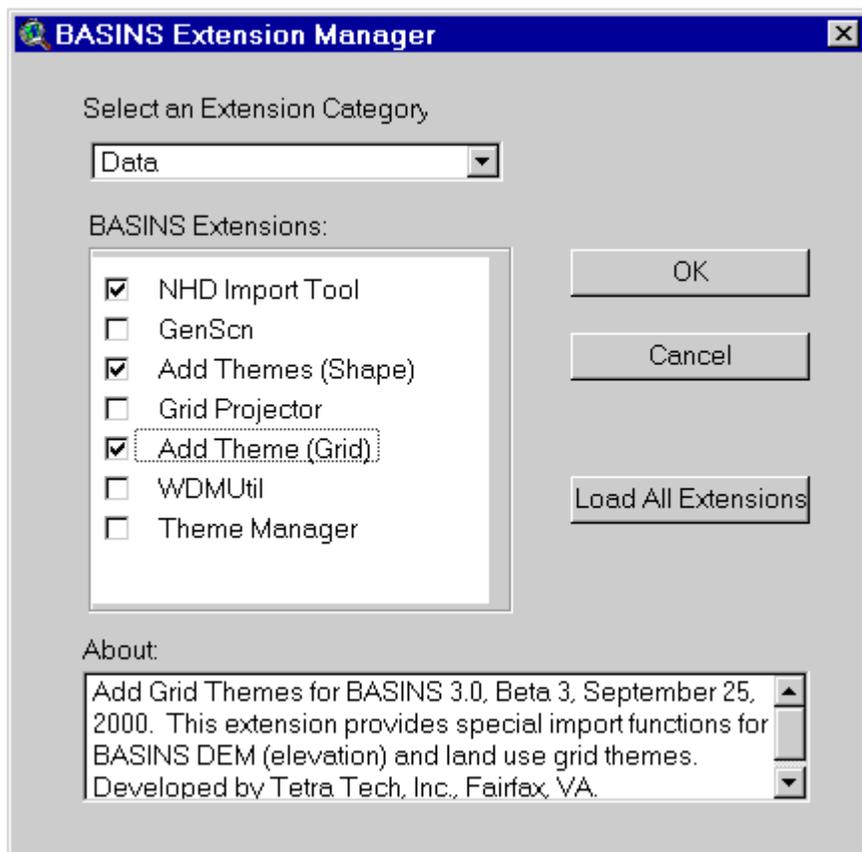


Screen 10.7.1

A “BASINS Extension Manager” dialog box will open. Select “Reports” under “Select Extension Category”. Click Report with Spatial Analyst as the BASINS extension (Screen 10.7.2). A short description of the extension is provided at the bottom of the dialog box. Similarly click on the *Add Theme (Grid)* extension under *Data* extension category (Screen 10.7.3). Click on *OK* when done. Note this will add a *Landuse (Grid)* submenu to the Reports menu and a *Add Theme (Grid)* submenu under the *Data* menu.

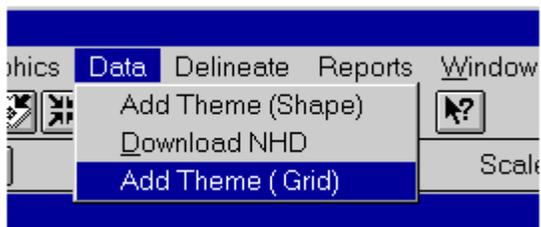


Screen 10.7.2



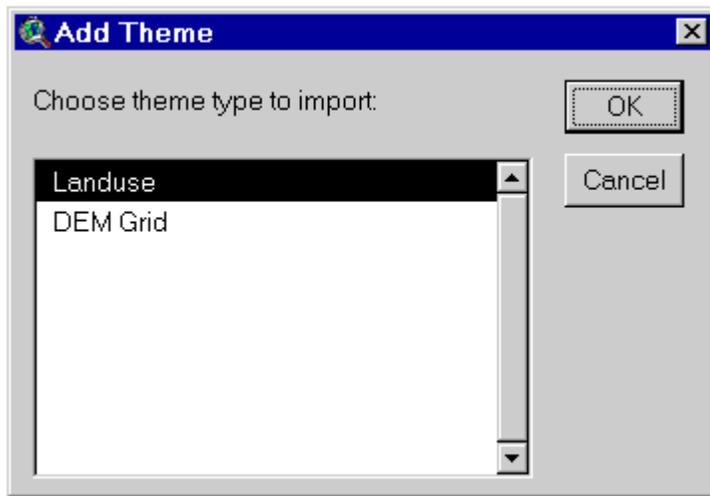
Screen 10.7.3

Select the *Add Theme (Grid)* submenu under the *Data* menu to import the required grid theme (Screen 10.7.4).



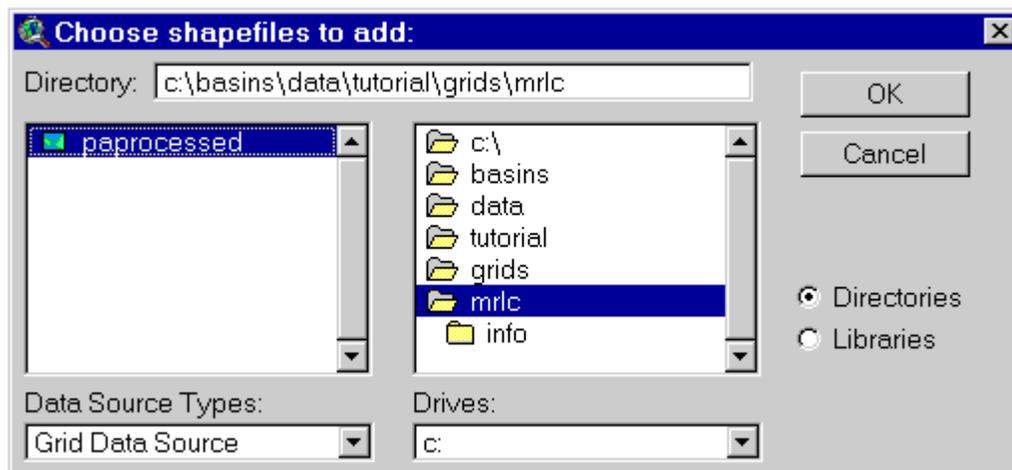
Screen 10.7.4

Select "Landuse" from the Add Theme message box (Screen 10.7.5)



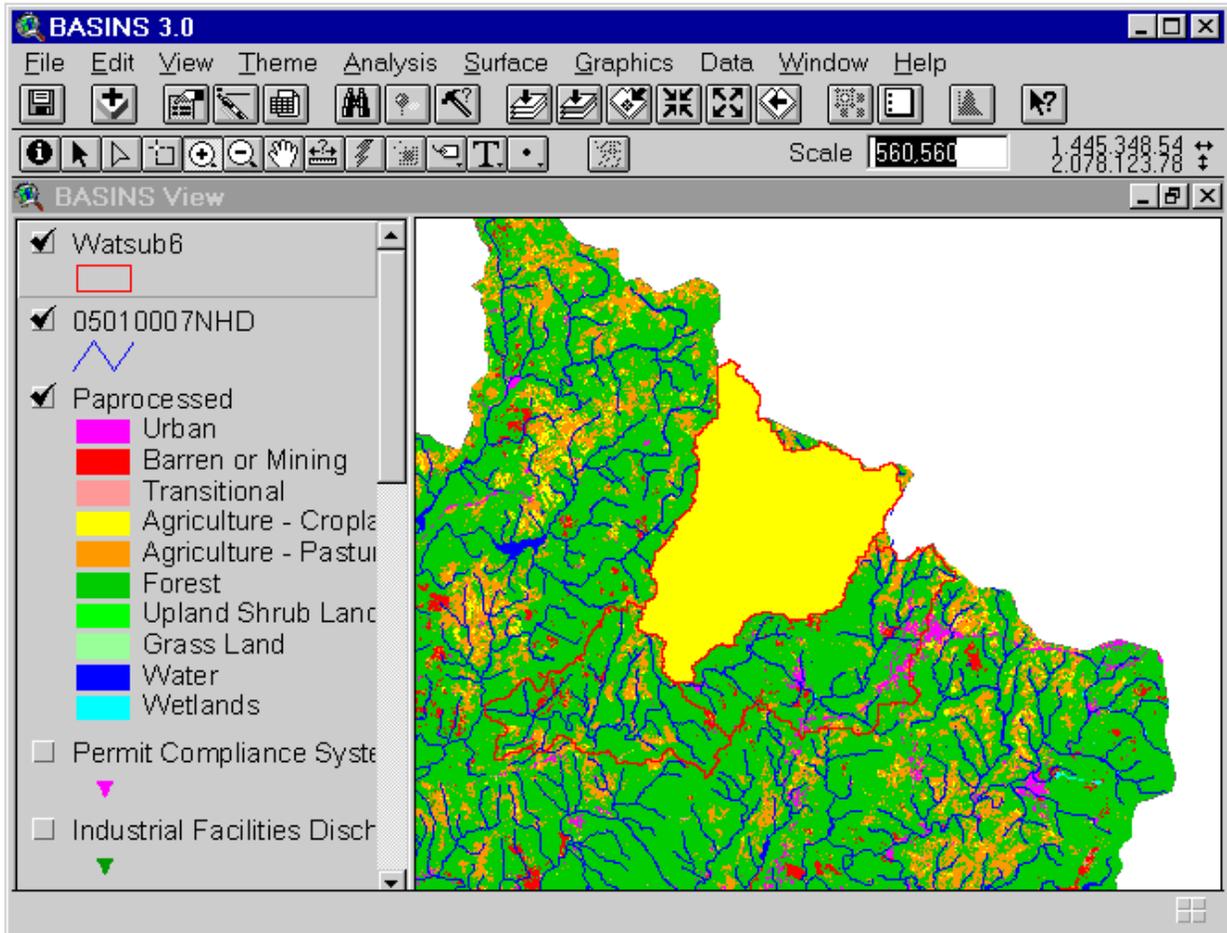
Screen 10.7.5

Select the shape file to be imported (Screen 10.7.6). Note the landuse GRID files can be stored in any directory. For demonstration purposes, the Tutorial data set is provided with the MRLC data under \BASINS\DATA\&LTProject name&GT\GRIDS\MRLC. The users will need to provide the MRLC data for thier watershed(s) before they can use this option.



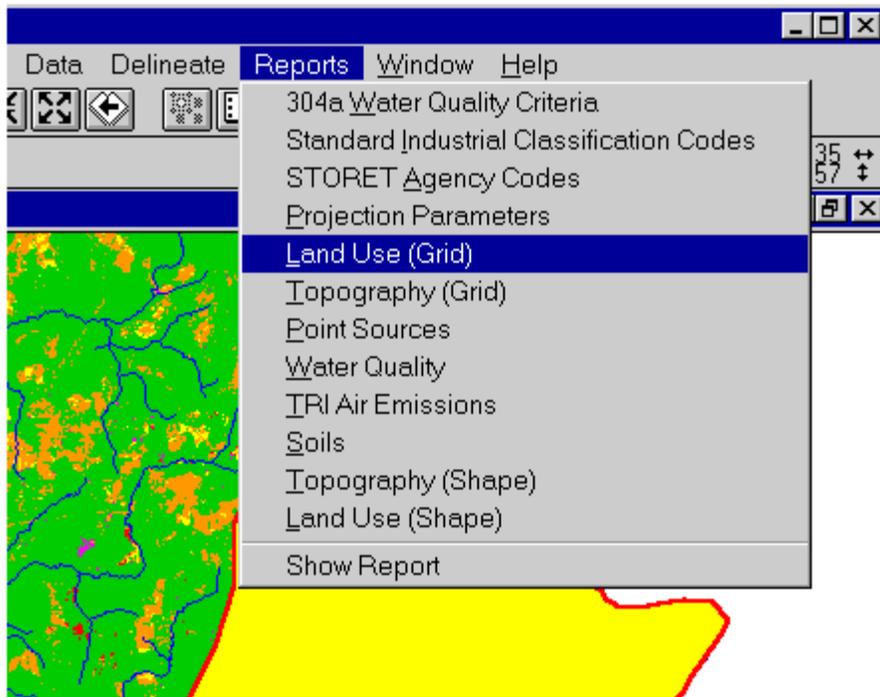
Screen 10.7.6

In the BASINS View table of contents (Screen 10.7.7), click the name of the appropriate watershed boundary theme to make it active. The watershed boundary theme can be the cataloging unit boundary theme or a user delineated watershed boundary theme. You may display the landuse GRID theme to ensure that it completely covers the watershed(s). Activate the *Select Feature* tool and select (by clicking or dragging a box) the watershed for which the Grid based Land Use Distribution Report will be generated (Screen 10.7.7)

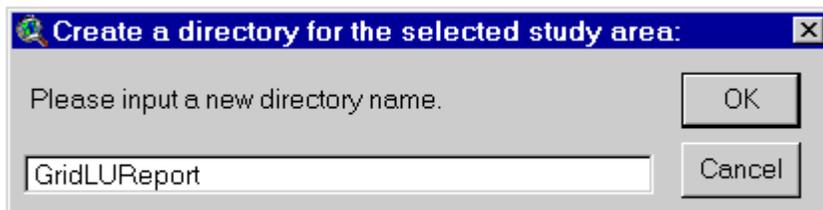


Screen 10.7.7

Under the Report main menu, select the *Landuse (Grid)* submenu (Screen 10.7.8). In the dialog box that appears, enter the directory name under which the report will be stored for the study area (Screen 10.7.9).

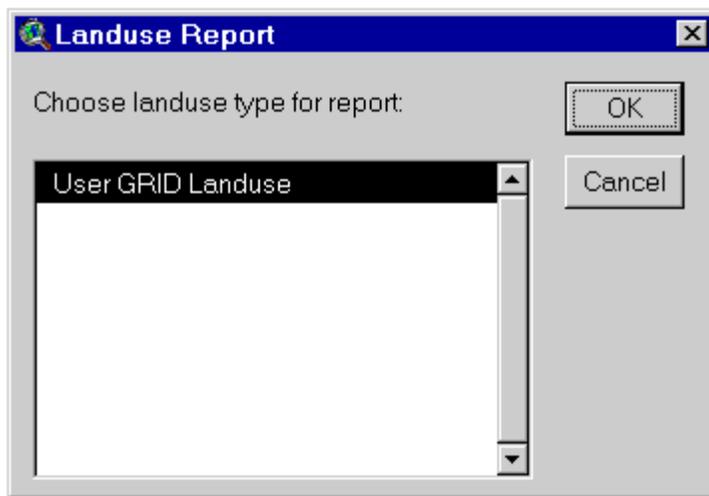


Screen 10.7.8



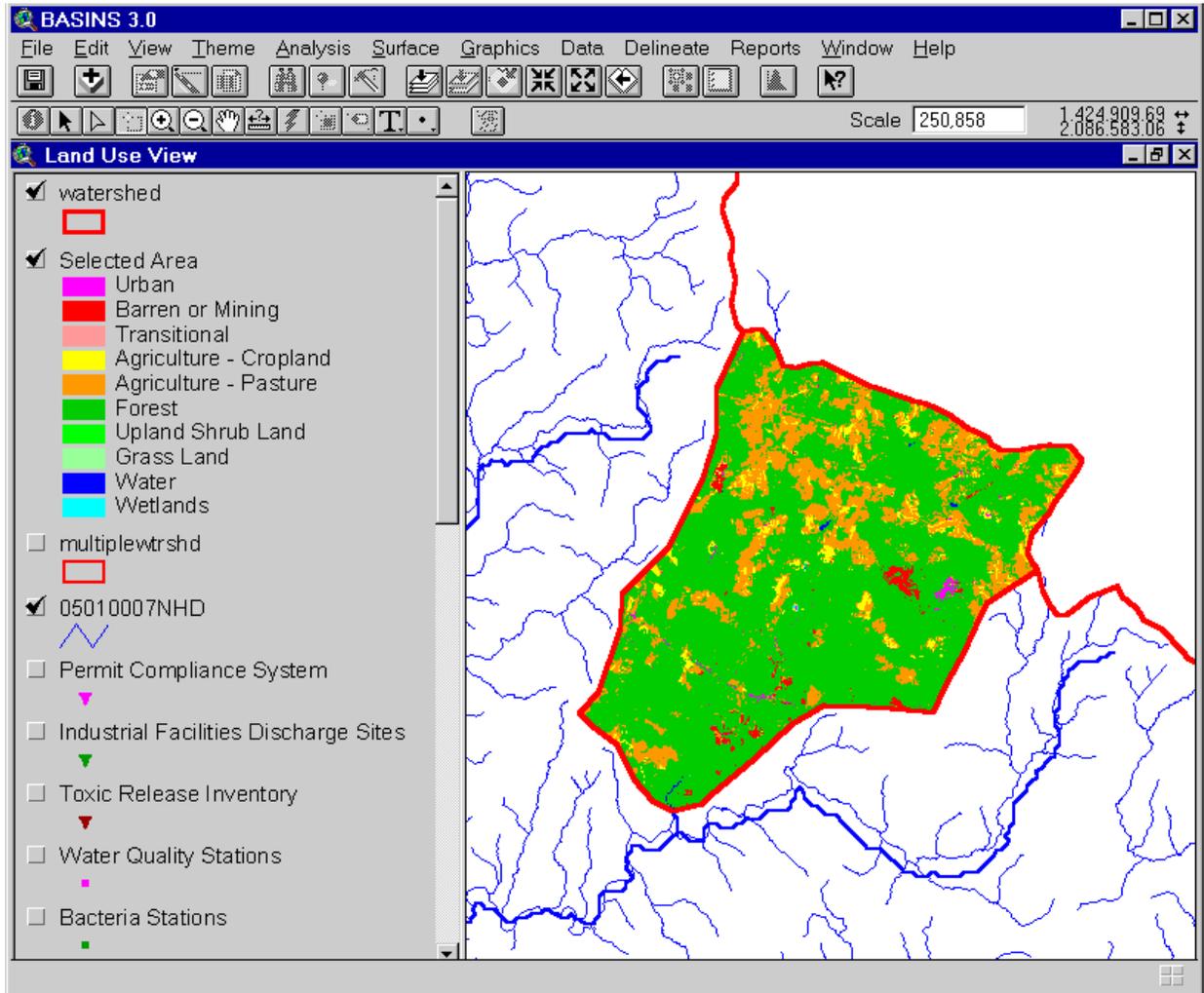
Screen 10.7.9

Select "User Grid Landuse" as the landuse type to report (Screen 10.7.10)



*Screen 10.7.10*

Click *OK* to generate the report. A new theme is generated with the landuse distribution for the selected watershed (Screen 10.7.11)



Screen 10.7.11

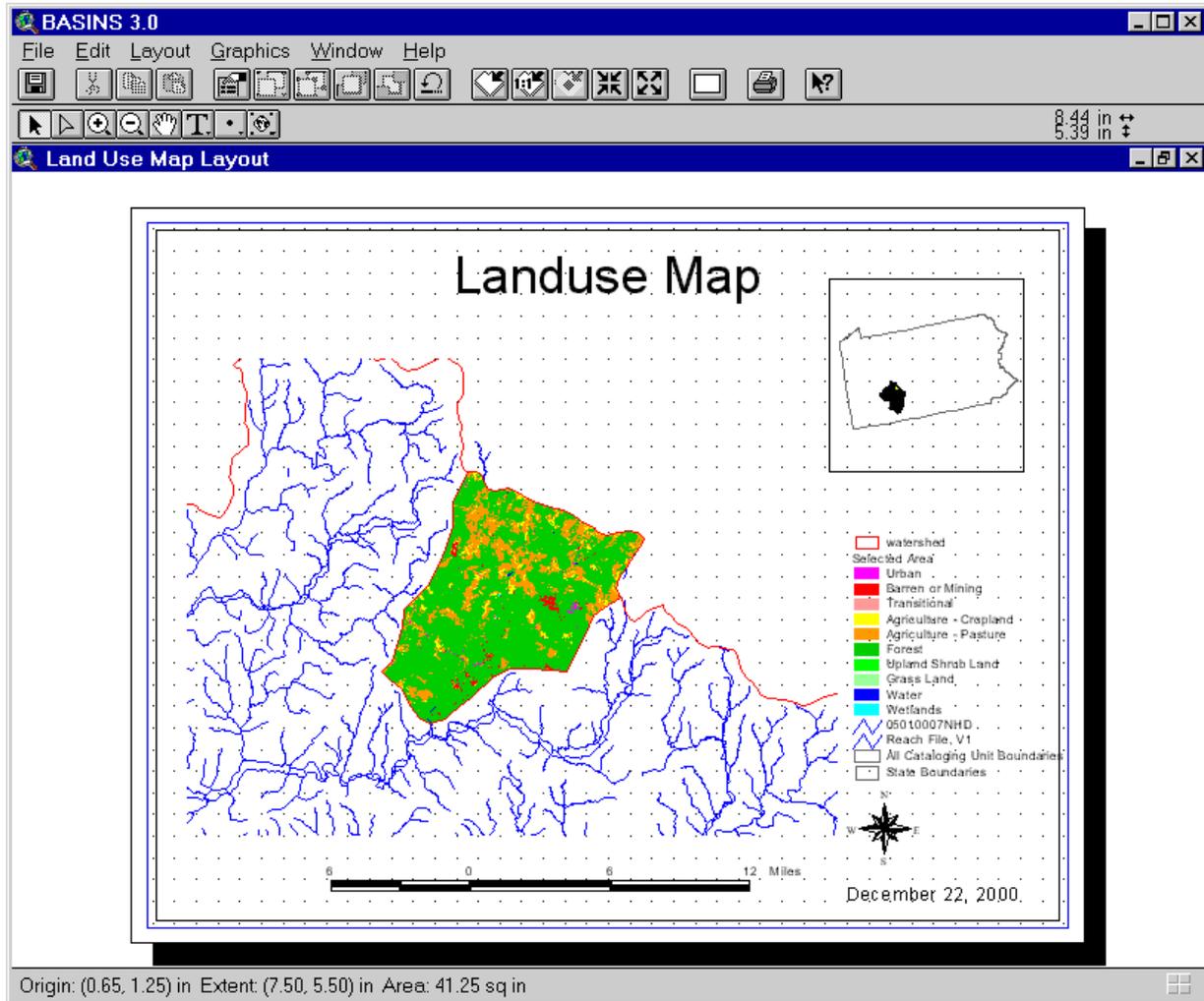
### Generated Report

The generated report includes a table and a map layout. The table, “Land Use Distribution by Major Land Use Category” (Screen 10.7.12), contains the total acreage under major land use category.

Landuse Information - Summary by Major Landuse Category	
Table: Land use distribution by major land use category.	
=====	
Land Use Name and Code	Area (acres)
11	3.78071
21	68.72
23	0.667185
32	126.543
41	8052.92
42	1045.03
43	818.413
81	2158.56
82	554.653
Total:	12829.3

Screen 10.7.12

The map layout, "Land Use" Map Layout (Screen 10.7.13), shows the land use distribution using the major land use categories. The Reach File network is also drawn in the map layout for reference purposes. A map inset is included to show the general location of the selected watershed(s) relative to the EPA regional boundary.



Screen 10.7.13

When the map layout is active, it can be printed through the Print submenu under the File main menu. The map can also be imported into a document using a word processor.

The print function that ArcView provides for the tables is intentionally deactivated in BASINS. Since this ArcView print function does not provide any formatting options, it fails to generate an acceptable printout for the BASINS tables, particularly when the tables are large. It is recommended that you import the content of the tables using a word processor.

**Tip:** The layout and all the temporary files that are used to generate the layout and table are located in the \Basins\WcReport\&LTDDirectoryName&GT\ where the DirectoryName is the name given during the report generation process.

## 10.8 Watershed Topographic Report (Grid)

### *Purpose*

*Watershed Topographic Report (Grid)* provides a statistical summary and distribution of discrete land surface elevations in the watershed. It also generates an elevation map of the selected watershed. The source elevation map in BASINS is a Grid based DEM. The information generated in this report is summarized in table, chart and in map formats.

### *Application*

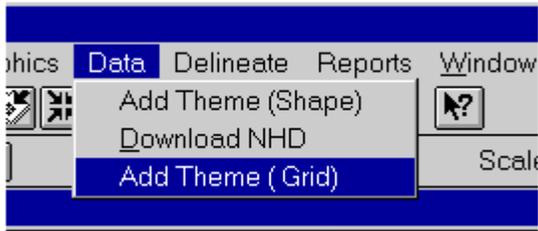
*Watershed Topographic Report (Grid)* is a useful tool for characterizing the magnitudes and distribution of elevations in the watershed. Statistical measures of elevation such as minimum, maximum, mean, median, and standard deviation are provided. A graph showing the cumulative percentage of the total area under a particular elevation is generated (hypsothetic curve). This information can be used to quickly evaluate the relative “steepness” of the watershed compared to that of other watersheds and to correlate it with the results of water quality modeling. The hypsothetic curve provides an overall description of the elevation in the watershed and consequently can assist in defining key topographic parameters generally required for water quality and nonpoint source modeling. This report requires the ArcView Spatial Analyst Extension.

### *Key Procedures*

- Select the *BASINS extensions* submenu under the *File* menu
- Select Report as the extension category and check the *Reports with Spatial analyst* extension
- Import the Grid theme using the *Add theme(Grid)*
- Activate the watershed boundary theme
- Select the watersheds for which the report will be generated
- Under the Report main menu, select the *Topography (Grid)* submenu

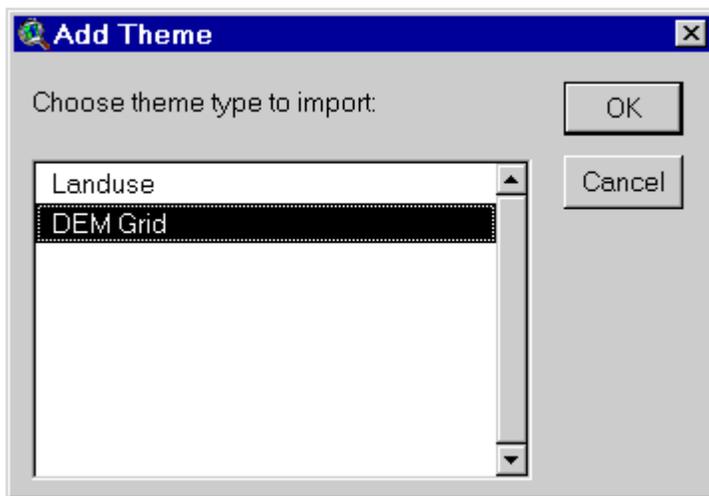
*Operation Steps* With BASINS View active follow step 1 and step 2 as given in Section 10.7. A *Topography (Grid)* sub menu will be added to the Report menu and a *Add Theme (Grid)* submenu under the *Data* menu.

Select the *Add Theme (Grid)* submenu under the *Data* menu to import the required grid theme (Screen 10.8.1).



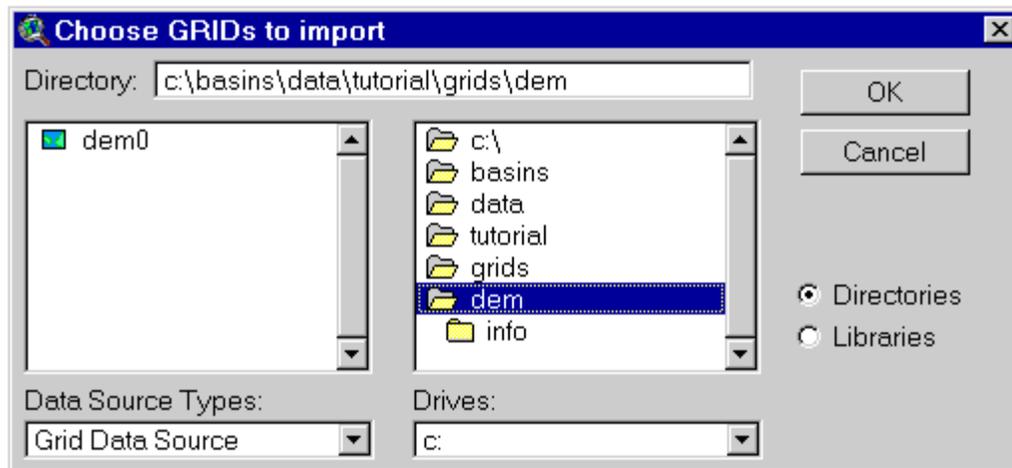
Screen 10.8.1

Select "DEM Grid" from the Add Theme message box (Screen 10.8.2)



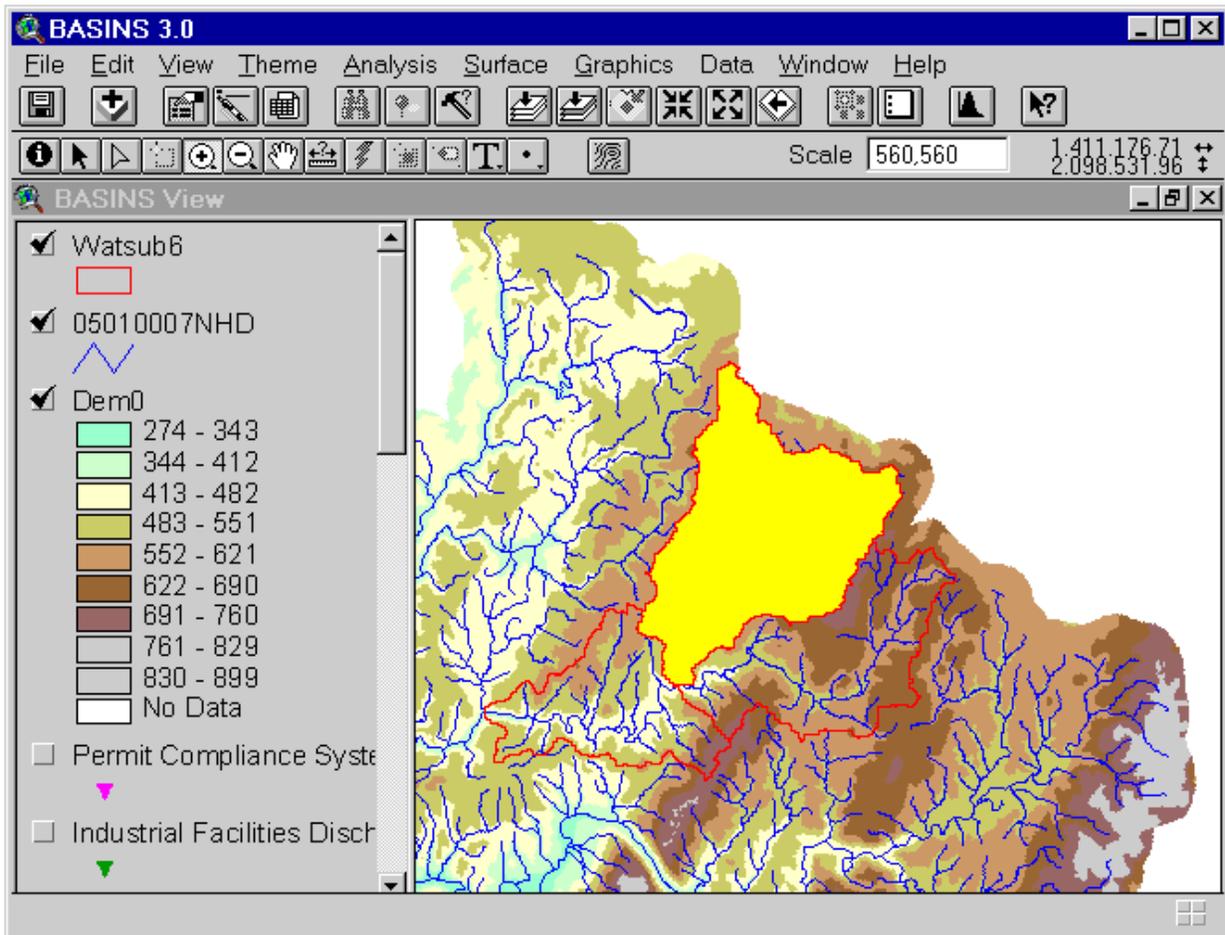
Screen 10.8.2

Select the shape file to be imported (Screen 10.8.3). Note the DEM grid files are stored under \BASINS\DATA\&LTProject name&GT\GRIDS\DEM. Higher resolution DEM grid data (eg. 24K) can be used.



Screen 10.8.3

In the BASINS View table of contents (Screen 10.8.4), click the name of the appropriate watershed boundary theme to make it active. The watershed boundary theme can be the cataloging unit boundary theme or a user delineated watershed boundary theme. Make sure the imported DEM GRID theme is also active. Activate the *Select Feature* tool and select (by clicking or dragging a box) the watershed for which the Grid based Topography Distribution Report will be generated (Screen 10.8.4). You may display the DEM grid theme to ensure that it completely covers the watershed.

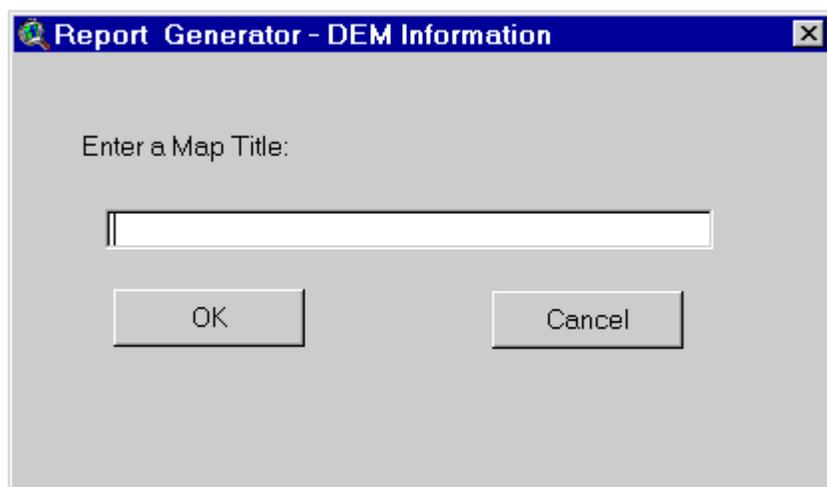


Screen 10.8.4

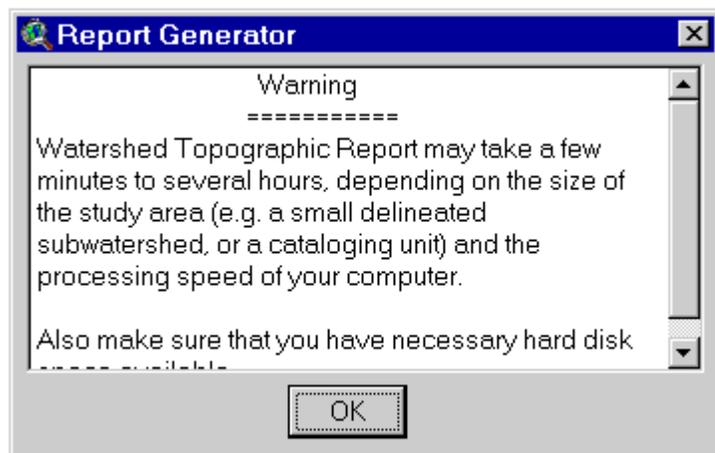
Under the *Report* main menu, select the *Topography (Grid)* submenu (Screen 10.8.5). In the text box that appears, enter the map title (Screen 10.8.6). A Report Generator warning message box will appear (Screen 10.8.7). The message describes the computational intensive nature of this operation. Click on *OK* after reading the message.



Screen 10.8.5

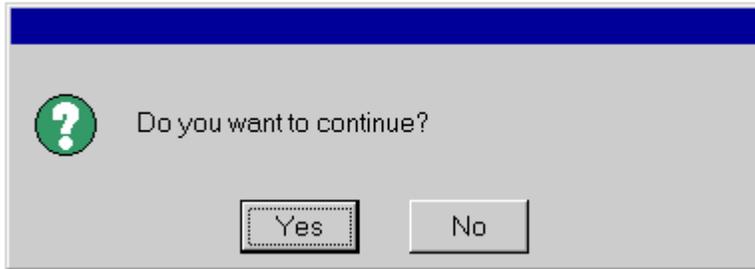


Screen 10.8.6



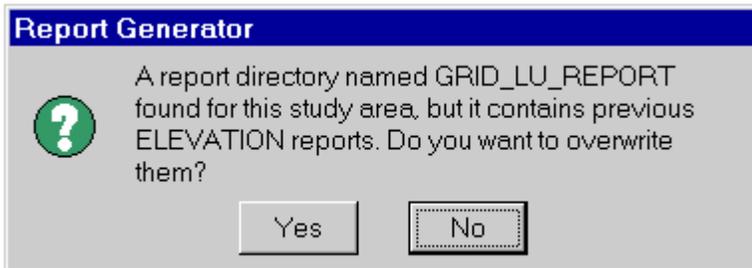
Screen 10.8.7

A message box will appear asking whether to proceed with the report generation process or not. Click on *OK* to generate the report; otherwise, click *Cancel* to abort (Screen 10.8.8).

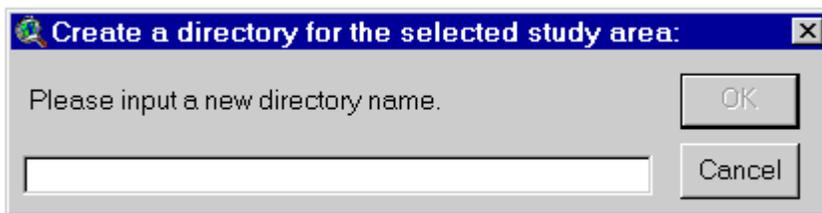


Screen 10.8.8

A Report generator message box will pop up asking the user to either create a new directory to store the report or use an existing directory (Screen 10.8.9). On clicking *No* an input box will pop up, prompting the user to enter the name of the directory (Screen 10.8.10). Clicking on *Yes* will start the report generation process right away and store the resulting report in the existing directory. Note upon completion of report generation process a new theme is created with the DEM elevation just for the selected watershed in addition to the report.



Screen 10.8.9



Screen 10.8.10

---

**Tip:** The DEM theme for the selected watershed should be available. The DEM is not included in the project by default and has to be imported manually. Default BASINS DEM data that came with the extracted data are stored in `\BASINS\Data\\GRIDS\DEM\`. The `<User-Specified Data Directory>` is the directory where the BASINS extracted data are stored, and it was specified during data extraction.

---

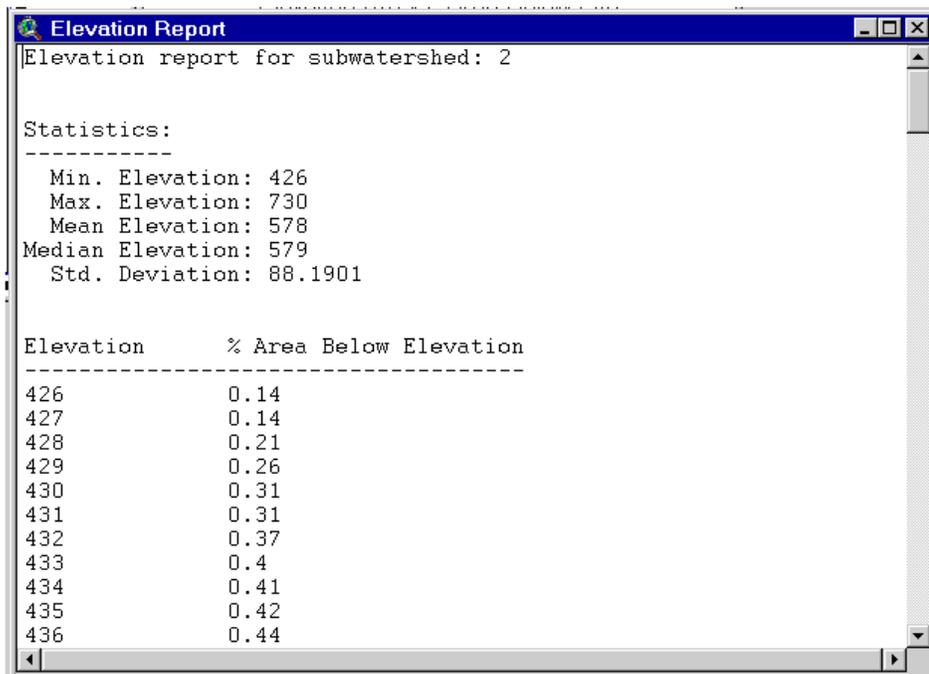
### Generated Report

The generated report includes a table, chart, and map layout. The table, “Elevation Report” contains the summary statistics of the land surface elevations in the watershed (Screen 10.8.11). It also shows the percent distribution of the total watershed area under a particular elevation. This distribution is plotted in the chart component of the report (Screen 10.8.12). The map layout shows the land surface elevation map in the watershed (Screen 10.8.13). The Reach File network is also drawn for reference purposes. A map inset is included to show the general location of the selected watershed(s) relative to the EPA regional boundary.

When the map layout is active, it can be printed through the Print submenu under the File main menu. The map layout can be activated by clicking on it. Another way to print the map layout is through the Print button in the Project Window with the Layouts component selected and the “Elevation Map” layout highlighted.

The print function that ArcView provides for the tables is intentionally deactivated in BASINS. Since this ArcView print function does not provide any formatting options, it fails to generate a good printout of the BASINS tables, particularly when the tables are large. It is recommended that you use a word processor to import both the tables and maps for printing, further editing and formatting, or incorporation into other documents.

**Tip:** The file dem.txt, which contains the table, and dem.wmf, which contains the elevation map, are located in the \Basins\WcReport\



Elevation report for subwatershed: 2

Statistics:

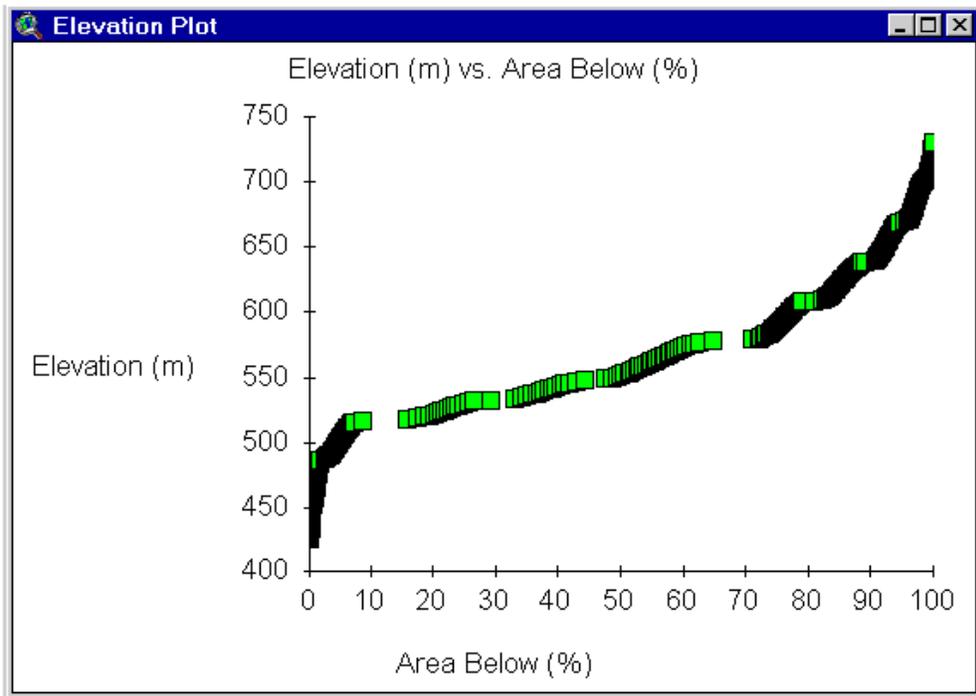
```

-----
  Min. Elevation: 426
  Max. Elevation: 730
  Mean Elevation: 578
  Median Elevation: 579
  Std. Deviation: 88.1901

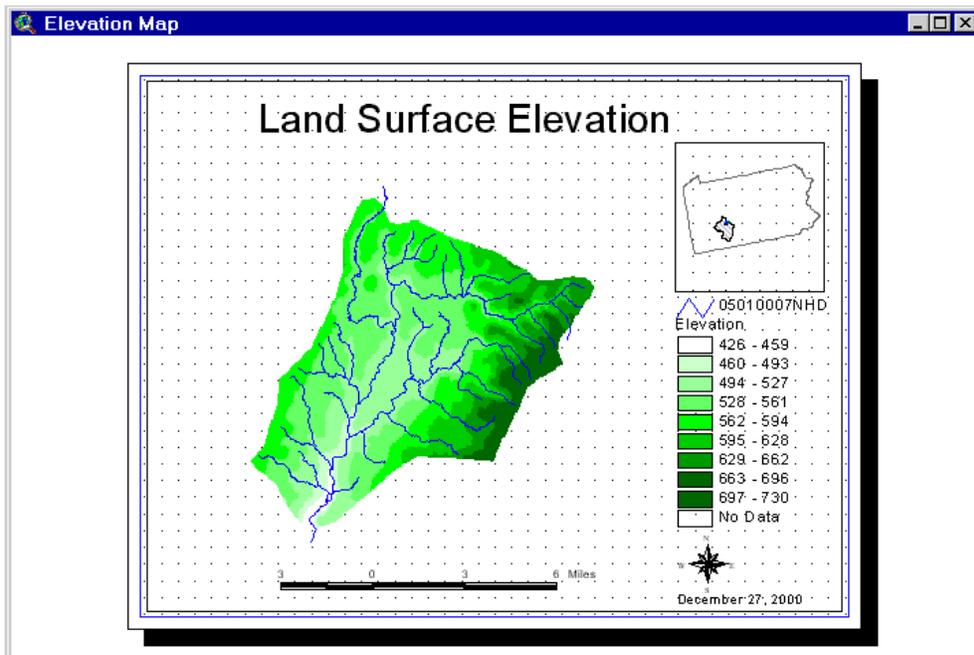
```

Elevation	% Area Below Elevation
426	0.14
427	0.14
428	0.21
429	0.26
430	0.31
431	0.31
432	0.37
433	0.4
434	0.41
435	0.42
436	0.44

Screen 10.8.11



Screen 10.8.12



Screen 10.8.13

## 10.9 Lookup Tables

### *Purpose*

The *Lookup Tables* provide users quick and easy access to important reference information such as the map projection, definitions of agency codes, Standard Industrial Classification (SIC) codes, and the water quality criteria and threshold values of a particular pollutant.

### *Application*

The *Lookup Tables* provide four types of information: (1) water quality criteria and threshold values, (2) SIC codes and definitions, (3) STORET agency codes and definitions, and (4) the map projection of the map products in the current BASINS project file.

The lookup table for the water quality criteria provides key threshold values that a user needs when applying *TARGET* at a regional scale or when examining water quality summary data at specific monitoring stations.

The lookup table for the map projection of the data products in the current BASINS project file is useful for reference purposes, particularly when new data have to be added. For the new spatial data to be displayed in the same map extent as the existing data, the map projection parameters specified in the lookup table should be used during projection.

The lookup table for the agency codes can be used as a reference to identify the source of monitoring data in BASINS. The lookup table for the SIC codes can be used as a reference to identify the industrial classification of a point source discharger.

### *Key Procedures*

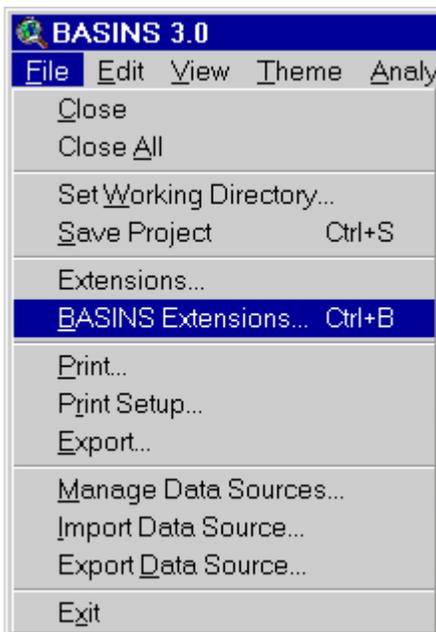
- Select the *BASINS extensions* submenu under the *File* menu
- Select Reports as the extension category and check the Lookup extension
- Water Quality Criteria and Threshold Values
  - Under the Reports menu, select the Water Quality Criteria menu
  - Select the pollutant in the dialog box to view the corresponding threshold values
- Standard Industrial Classification Codes and Definitions
  - Under the Reports menu, select the Standard Industrial Codes menu
  - Select the search option (SIC Number or SIC Name) in the dialog box and select a specific SIC number (or name) to display the corresponding SIC name (or number)
- STORET Codes and Definitions
  - Under the Reports menu, select the STORET agency codes and definitions menu
  - Select the STORET agency code in the dialog box to display the corresponding program name,

contact person, and telephone number

- Map Projection Parameters
  - Under the Reports menu, select the Projection Parameters menu

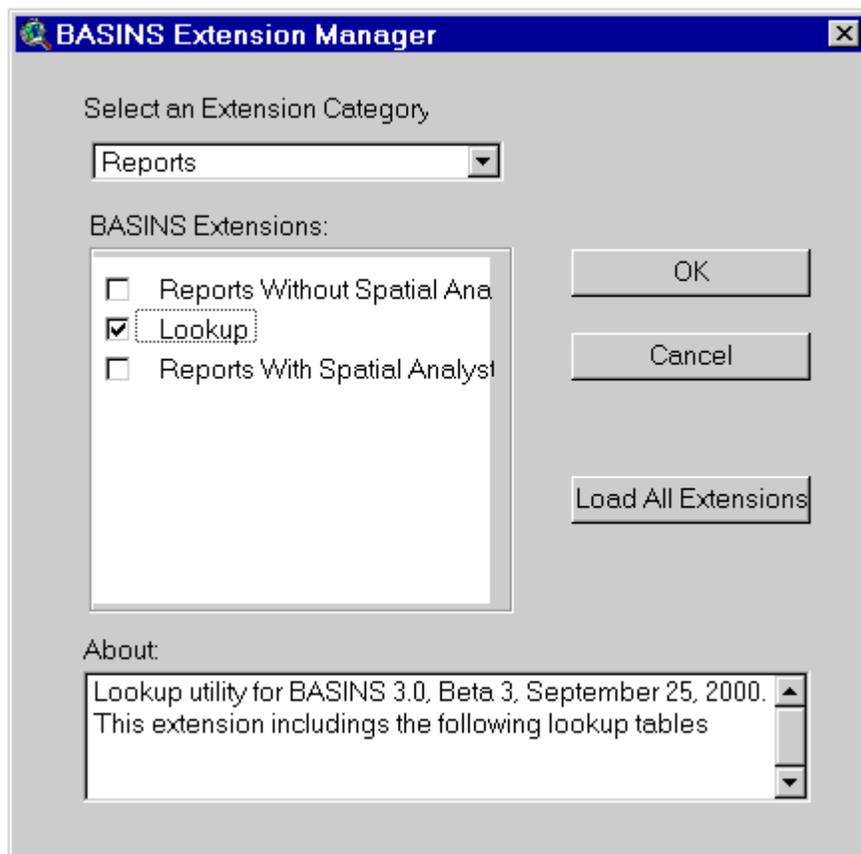
### *Detailed Operations*

- With BASINS View active, select the Basins Extensions... menu under the File menu (Screen 10.9.1).



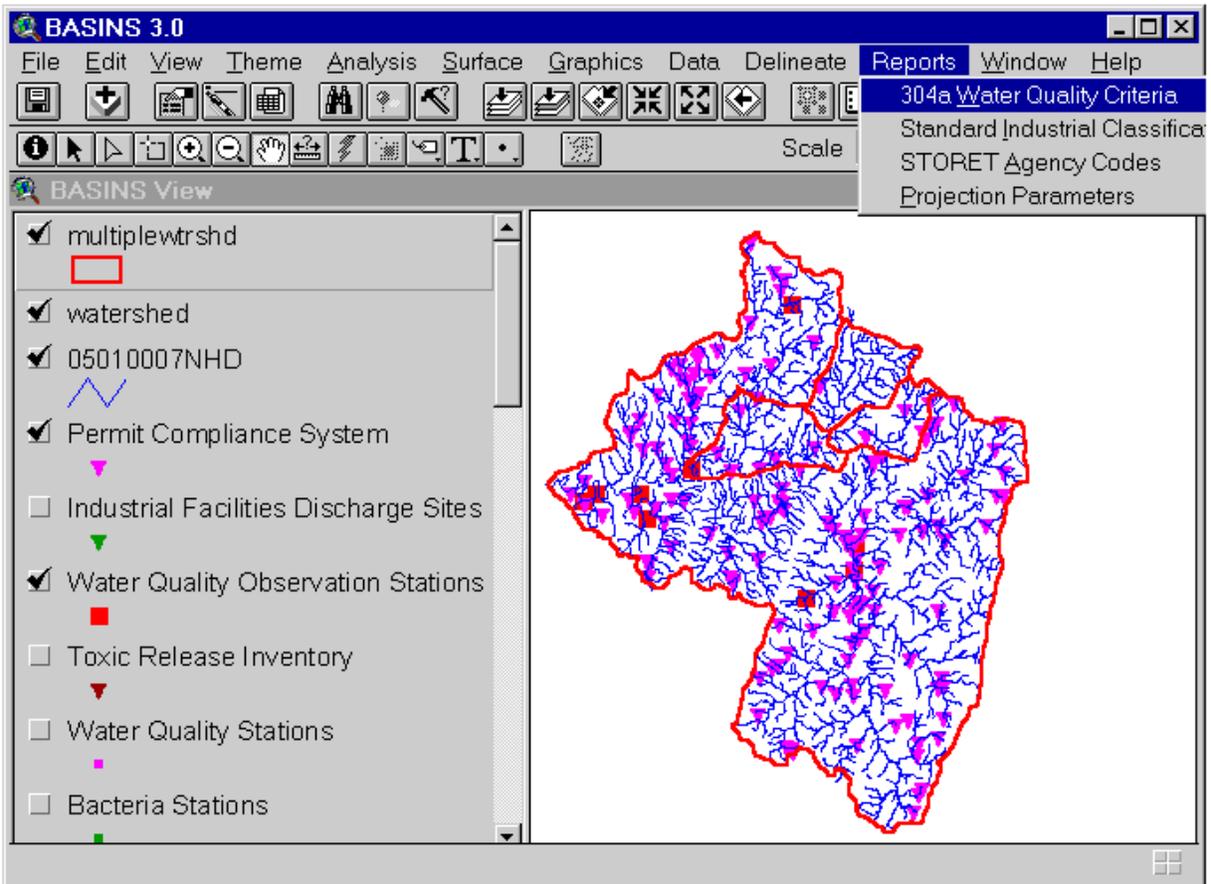
Screen 10.9.1

- A “BASINS Extension Manager” dialog box will open. Select “Reports” under “Select Extension Category”. Click *Lookup* as the BASINS extension (Screen 10.9.2). A small description of the extension is provided at the bottom of the dialog box. Click on *Ok* when done. Note this will add four submenus under the *Reports* menu : 1) 304 a Water Quality Criteria 2) Standard Industrial Classification Codes 3) STORET Agency Codes and 4) Projection Parameters.



Screen 10.9.2

**Water Quality Criteria and Threshold Values** With BASINS View active (Screen 10.9.3), select the *304 a Water Quality Criteria* submenu under the Reports menu. Note that the lookup tables do not depend on what themes are active in the BASINS View window. In the scroll box of the dialog box that appears (Screen 10.9.3), select the monitoring parameter by clicking on its name. The threshold values associated with the selected pollutant parameter for six water quality criteria are displayed in the text box in the bottom half of the dialog box. Threshold values are displayed for freshwater acute and chronic, marine acute and chronic, and human health carcinogenic risk (recalculated values) for water and organic tissue. The Chemical Abstract Service (CAS) number and the STORET parameter code are also provided for the selected pollutant. Select as many parameters as needed. To quit the dialog box, click the *X* at the upper right corner of the dialog box.



Screen 10.9.3

Select a monitoring parameter:

Parameter Information:

CAS Number: 22569-72-8

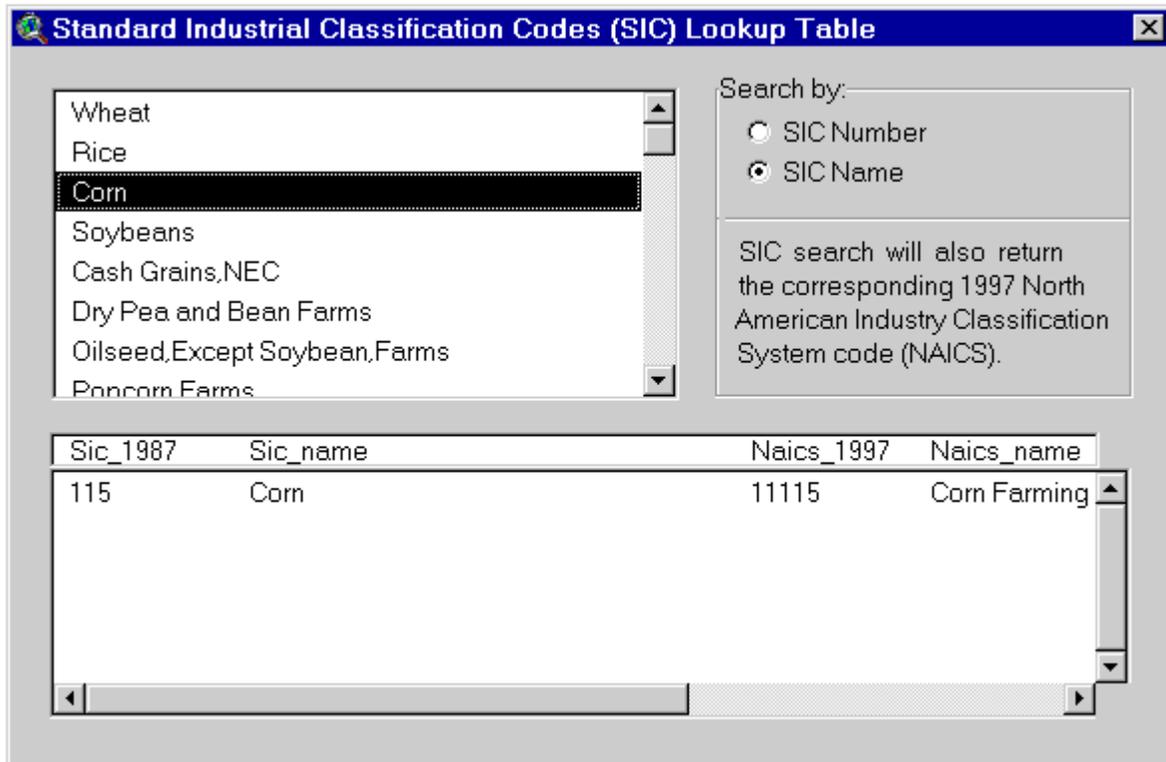
Parameter Code: 01002

Water Quality Criteria for Selected Parameter:

Name:	Value:	Units:
Freshwater Acute	360	ug/l
Freshwater Chronic	190	ug/l
Marine Acute	69	ug/l
Marine Chronic	36	ug/l
HHRV Water	Unknown	ug/l
HHRV Organ	Unknown	ug/l

Screen 10.9.4

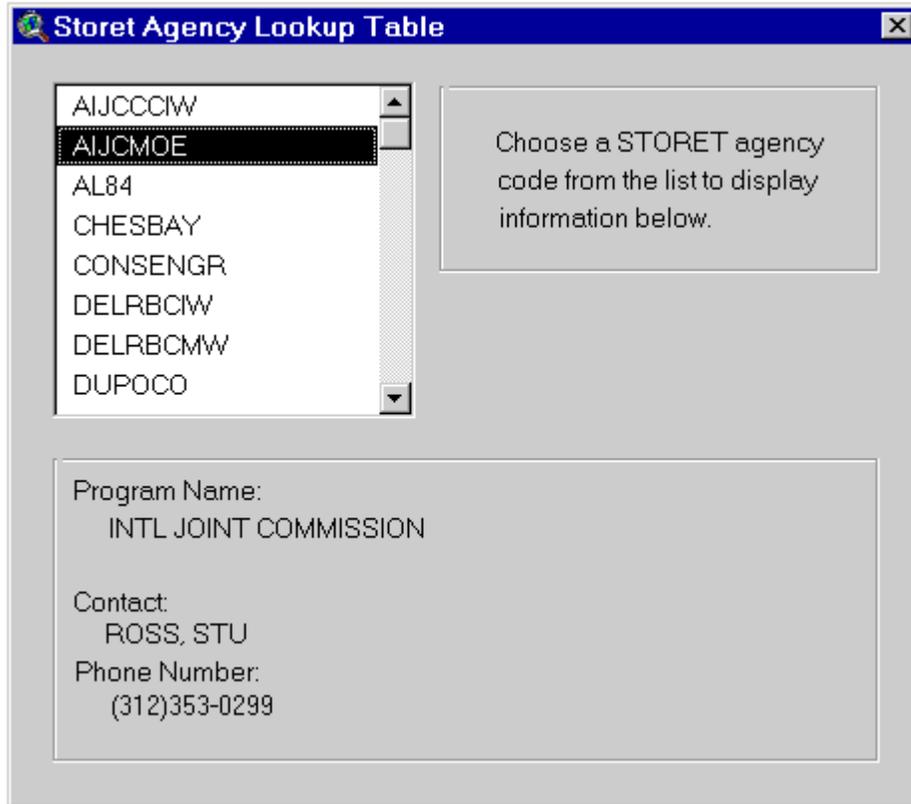
**Standard Industrial Classification Codes and Definitions** With BASINS View active (Screen 10.9.3), select the *Standard Industrial Codes* submenu under the Reports menu. Note that the Lookup Tables do not depend on what themes are active in the BASINS View window. In the dialog box that appears (Screen 10.9.5), click the radio button associated with the preferred search option by SIC number or by name. Depending on the selected search option, select the SIC number or name in the scroll box by clicking on it to display the corresponding SIC name or number in the text box in the bottom half of the dialog box. The 1997 North American Industry Classification System (NAICS) code and name associated with the selected SIC number or name are also included in the display.



Screen 10.9.5

Select as many SIC names or numbers as needed. To quit the dialog box, click the X at the upper right corner of the dialog box.

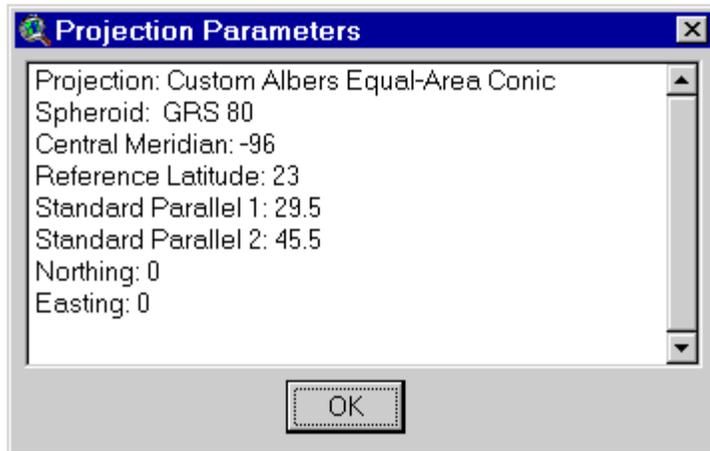
**STORET Codes and Definitions** With BASINS View active (Screen 10.9.3), select the *STORET Agency Codes* submenu under the Reports menu. Note that the Lookup Tables do not depend on what themes are active in the BASINS View window. In the scroll box of the dialog box that appears (Screen 10.9.6), select the STORET agency code. The corresponding program name, contact person, and telephone number are displayed in the bottom half of the dialog box.



Screen 10.9.6

Select as many STORET agency codes as needed. To quit the dialog box, click the X at the upper right corner of the dialog box.

**Map Projection Parameters** With BASINS View active (Screen 10.9.3), select the Projection Parameters menu under the Reports menu. Note that the Lookup Tables do not depend on what themes are active in the BASINS View window. The projection parameters of the data products in the BASINS View of the current BASINS project file are shown in the text box that appears (Screen 10.9.7).



*Screen 10.9.7*

Click *OK* to quit the text box.