Chapter 14

Running Simulations

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Chapter 14

Running Simulations

When you have entered all required data and have created Alternatives, you are ready to perform a Simulation. A Simulation is where you specify the time window and time interval parameters for either a single Alternative or a group of Alternatives. After a successful Simulation, you can analyze the results, make revisions, and perform additional Simulations to better evaluate the reservoir operations in your watershed.

14.1 Recognizing Simulation Screen Components

The **Simulation Module** (Figure 14.1) provides the tools you will need to create and run Simulations. The following is a discussion of the components and features of the Simulation Module.

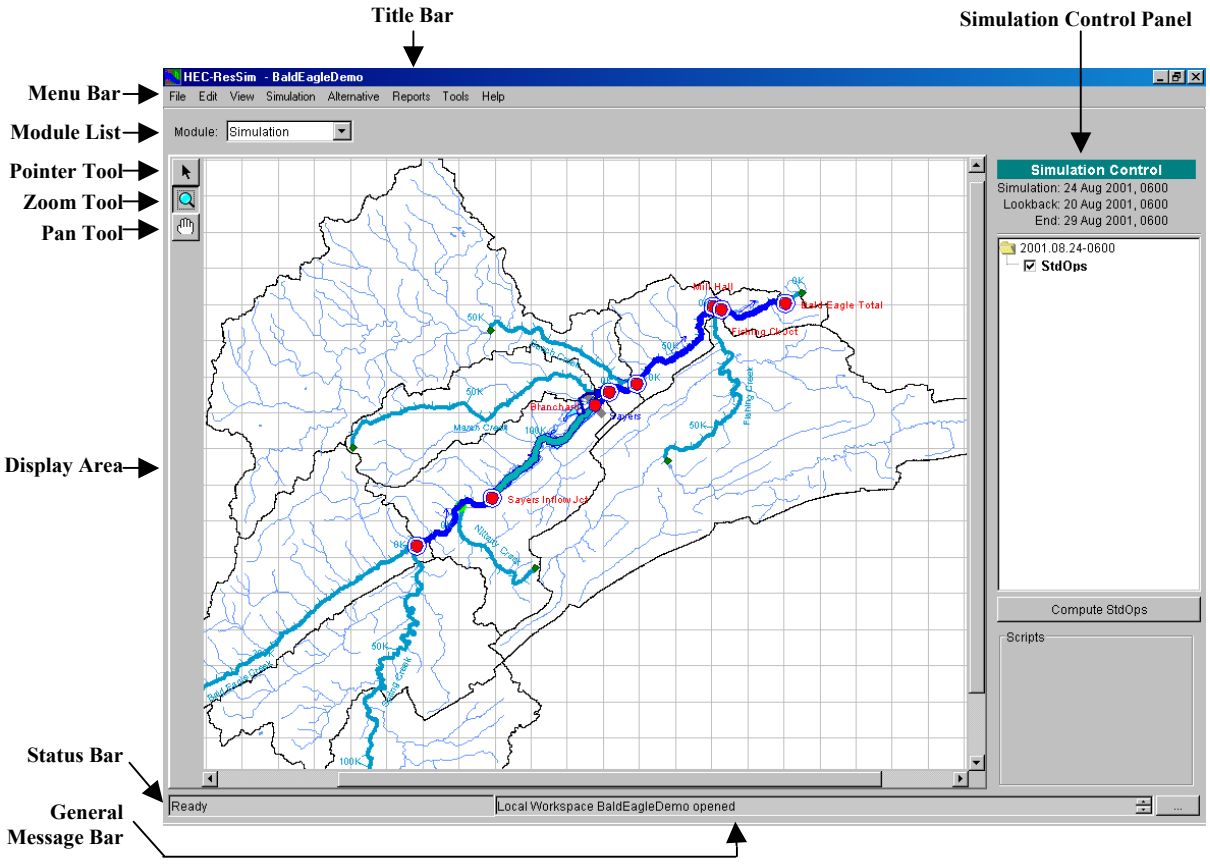


Figure 14.1 Simulation Module Main Window

The **Title Bar** displays the name of the window or dialog box currently open in ResSim. The name of opened watershed displays next to **HEC-ResSim**.

The **Simulation Control Panel** provides Module-dependent controls that execute commands and/or display important dialog boxes. For more detail, see Section 14.1.3.

The **Menu Bar** contains menus of commands that you can use in ResSim. The items on the menus change as you switch between the various Modules, offering Module-specific commands. You can select a menu bar item by clicking on the name of the menu (such as **File**), then pointing and clicking on the item you wish to select. The Menu Bar is described in more detail below.

The **Module List** contains all the available Modules of ResSim. Use this list to move between the Watershed Setup, Reservoir Network, and Simulation Modules. By default, the Module List opens to the Module most recently used.

14.1.1 Menu Bar

The following is an overview of the **Simulation Module**'s Menu Bar tools, which allow you to create and edit Simulations. The tools specific to this module will be described in more detail in the context of particular tasks later in this chapter.

The **File** menu (Figure 14.2) allows you to **Open** an existing watershed, **Save** a watershed, **Save Map** (saves the display area) and **Exit** ResSim. Your most-recently-used watersheds are listed at the bottom of the File menu.

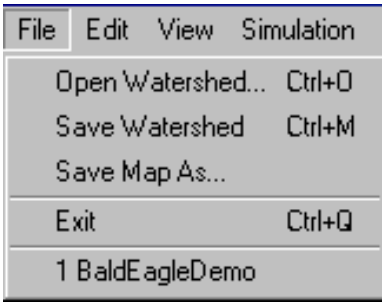


Figure 14.2 File Menu

The **Edit** menu (Figure 14.3) provides access to the **Script List**, allows you to **Set the Active Alternative,** and allows access to editors for **Reservoirs**, **Reaches**, **Junctions**, **Diversions**, and **Reservoir Systems**. Note that any revision you make to these elements applies only to the active Alternative. If you want the revisions to apply to subsequent Simulations, you must save the changes to your base directory (see Section 14.7.1).

Figure 14.3 Edit Menu

In the **View** menu (Figure 14.4) select **Zoom to All** to restore your watershed map view to full size. **Layers...** opens the Layers Selector dialog box. **Unit System** allows you to customize the display (view) settings for your watershed. If a dialog or editor window is open but inactive**, Restore Windows** brings the dialog or editor window to the front as the active window.

Figure 14.4
View Menu

The **Simulation** menu (Figure 14.5) is unique to the Simulation Module. It allows you to create a **New** Simulation, and **Open**, **Re-Open**, **Close**, **Save**, or **Delete** an existing Simulation. The **Edit** command opens the Simulation Period dialog box, while **Info** allows you to view the name, directory path, and user information for the current Simulation. You can also access **Release Overrides** for a Simulation.

Figure 14.5
Simulation Menu

The **Alternative** menu (Figure 14.6), also available in the Reservoir Network Module, provides access to the Alternative Editor.

Figure 14.6
Alternative Menu

The **Reports** menu (Figure 14.7) provides access to the **Reservoir Summary**, **Flow Summary**, **Power Summary**, **Gates Summary**, **Stage Summary**, and **Release Decision** reports, as well as **Compute** logs. You can also access **Network** reports, including the Reservoir List, Reach List, Junction List, Diversion List, and the Network Connectivity Summary report.

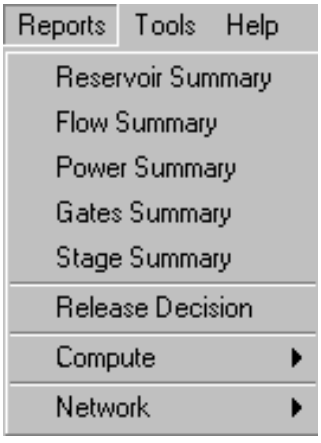


Figure 14.7
Reports Menu

As in the other Modules, the **Tools** menu (Figure 14.8) provides access to **Hec-DssVue** and **Scripts**. **Options** lets you specify watershed locations for storing your watersheds; specify a directory for caching map files; set the colors for compute messages and the format of log files; set the level of debug messages; choose whether or not you want a confirmation message to appear when you exit ResSim; and choose whether you want the last watershed reloaded at startup of the program. **Information** provides details about client, user, and watershed settings as well as server and system properties.

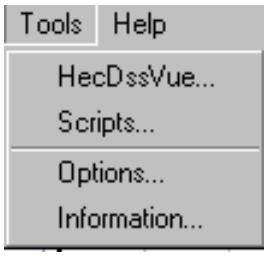


Figure 14.8
Tools Menu

The **Help** menu (Figure 14.9) displays information about the current version of ResSim. **About** specifies the version, revision and build numbers.

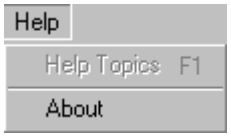


Figure 14.9
Help Menu

14.1.2 Map (Mouse) Tools

The **Map (Mouse) Tools**, which appear in a toolbar on the left side of the ResSim screen, allow you to interact with objects in the map display. The Simulation Module has three Map Tools and all are available in the other ResSim Modules:

Pointer Tool
In the Simulation Module, right-click model schematic elements in the map display with the Pointer Tool to access editors, default and user-defined plots, and release decision reports (for reservoirs).

Zoom Tool
The Zoom Tool allows you to zoom in and out of the display area in all Modules. To zoom in, hold the left mouse button down and outline the area you want to enlarge. To zoom out, click the right mouse button. Zooming out using the right-click button zooms out by a factor of two, positioning the clicked location at the center of the screen.

Pan Tool
After you have zoomed in with the Zoom Tool, you can use the Pan Tool to view watershed areas that fall outside of the ResSim window borders.

14.1.3 Simulation Control Panel

The **Simulation Control Panel** (Figure 14.10) displays details about the current Simulation and allows you to interact with Alternatives.

Displayed at the top of the panel are the **Simulation** time, **Lookback** time, and **End** time.

Below these details is the **Simulation Tree**, which displays the name of the current Simulation and its associated Alternatives. The currently active **Alternative** displays as bold, and a check mark in the box beside an Alternative indicates that it will be included in reports. Right-click on a Simulation or Alternative to access their shortcut menus.

When you select an Alternative, the **Compute** button becomes available, allowing you to execute a Simulation.

At the bottom of the Simulation Control Panel, the **Scripts** area displays buttons that launch user-created scripts.

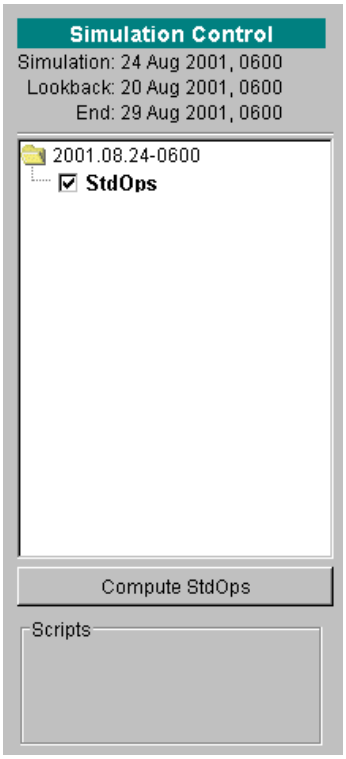


Figure 14.10 Simulation Control Panel

14.1.4 Display Area

The **Display Area** displays model schematic objects and map layers representing the **Active Alternative**.

Model elements of a Reservoir Network will not appear in the display area until you have created or opened a Simulation and activated an Alternative (see Section 14.4.1).

14.2 Creating a Simulation

Once you have created a reservoir network, entered element data, and developed alternatives in the Reservoir Network Module, you can configure the model for a Simulation in the Simulation Model.

To create a new Simulation:

1. From the **Simulation** menu, select **New**. Or, in the **Simulation Control Panel**, right-click on the currently-active Simulation or *No Simulation* folder to access the shortcut menu (Figure 14.11). Select **New**.
2. The **Simulation Period** dialog box will open (Figure 14.12).

Figure 14.11 Simulation Control Panel Shortcut Menu: New Simulation

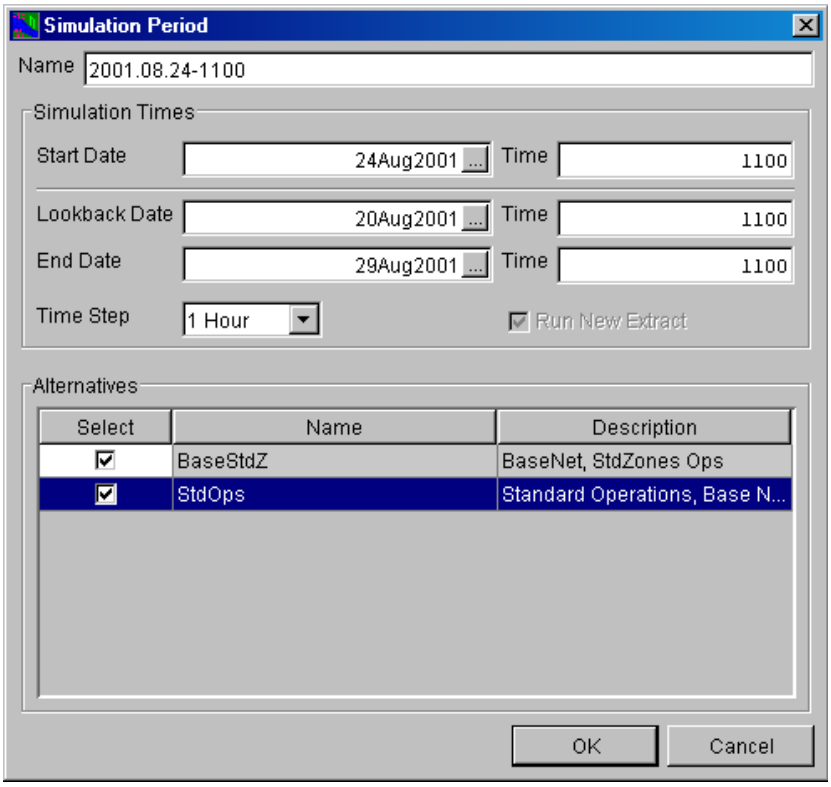


Figure 14.12 Simulation Period Dialog Box

3. The **Name** field contains a default name for the Simulation based on the current date and time. You may either accept the default or enter a name that is more meaningful to you.

4. Enter a **Start Date** and **Time** specifying when you want the Simulation to begin. It must occur after the Lookback Date.
5. Enter a **Lookback Date** and **Time**. The Lookback is the "warm-up" period before the Simulation begins.
6. Enter an **End Date** and **Time** specifying when you want the Simulation to conclude.
7. Choose a **Time Step** from the list. The Time Step is the computation interval and can be 15 Minutes, 30 Minutes, 1 Hour, 3 Hours, 6 Hours, 12 Hours, or 1 Day.
8. The **Alternatives** table includes all of the Alternatives you have defined in the Reservoir Network Module. Select one or more applicable Alternatives for the Simulation by checking the boxes beside them in the **Select** column. Ensure the Alternatives you select include time-series data for the entire Simulation period.
9. Click **OK** to close the Simulation Period dialog box. The **Creating Simulation** window (Figure 14.13) will inform you of the status as ResSim creates the Simulation you have defined.

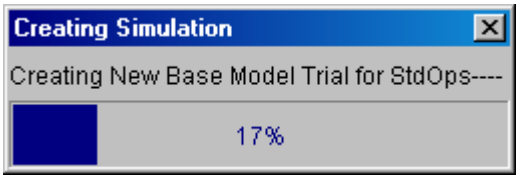


Figure 14.13 Creating Simulation Window

The Simulation you have created will now appear in the Simulation Control Panel.

The Reservoir Network will not appear in the map region until you have set an Alternative to Active (see Section 14.4.1).

14.3 Working with Existing Simulations

If you have previously created a ResSim Simulation, you may want to make revisions to the Lookback date and time or End date and time (the Start date and time cannot be changed), or you may want to revise data in an Alternative (operation rules, reservoir operation zones, etc.). To accomplish this, you will open an existing Simulation.

14.3.1 Opening an Existing Simulation

To open an existing Simulation:

1. From the **Simulation** menu, select **Open**. Or, in the **Control Panel**, right-click on the currently-active Simulation or *No Simulation* folder to access the shortcut menu (Figure 14.14). Select **Open**.
2. The **Open Simulation** dialog box will open (Figure 14.15).

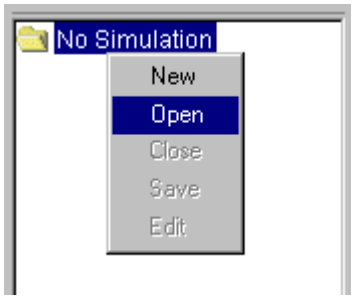


Figure 14.14 Simulation Control Panel Shortcut Menu: Open Simulation

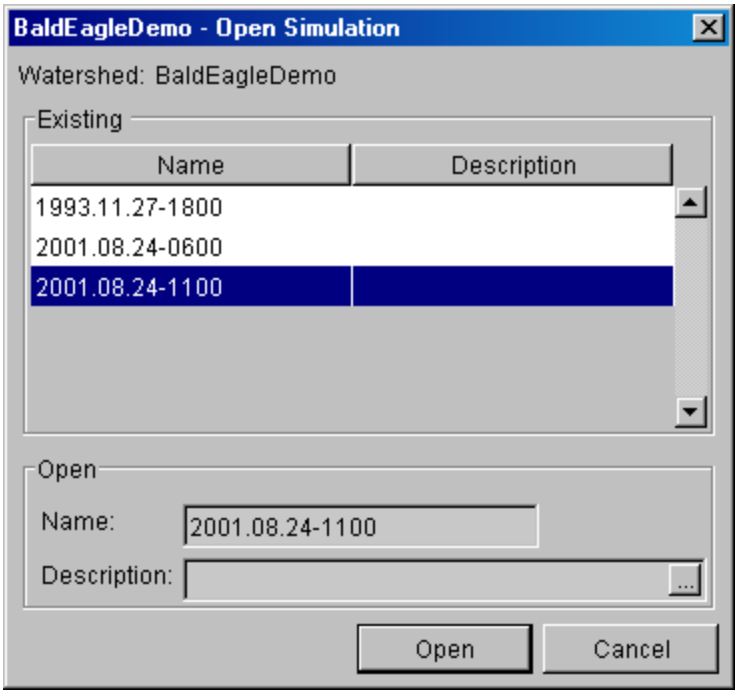


Figure 14.15 Open Simulation Dialog Box

3. Click on the Simulation you want and select **Open**.

The time period details of your selected Simulation will now appear in the Simulation Tree (Figure 14.16), and the map display will now update to show the model schematic for the active Alternative (see Section 14.4.1 for information about setting the alternative to active).

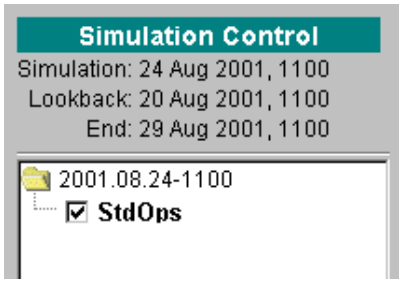


Figure 14.16 Simulation Tree

14.3.2 Editing a Simulation

Once you have created a Simulation, you can use the **Simulation Period** dialog box (Figure 14.12) to edit the Lookback Date and Time, the End Date and Time, Time Step, and selected Alternatives. You cannot change the Start Date or Time.

You can access the **Simulation Period** dialog box two ways:

- Select **Edit** from the **Simulation** menu.
- Right-click on the Simulation folder at the top of the simulation tree in the Simulation Control Panel, then select **Edit** from the shortcut menu.

14.4 Computing a Simulation

After you have created a new simulation or have opened an existing simulation, you are ready to make one of the alternatives active (if not already active) and have ResSim perform the computations.

14.4.1 Setting the Active Alternative

Once you have opened a Simulation, the simulation tree will show all of the selected Alternatives for the Simulation you have chosen.

Model elements of a reservoir network will not appear in the display area until you set an Alternative to Active. During the Alternative activation process, ResSim makes a copy of the active alternative available for the simulation.

To set the **Active Alternative**:

1. Right-click on the Alternative you want in the simulation tree.
2. Select **Set as Active** from the shortcut menu (Figure 14.17).

The map display will now update to show the model schematic for the Alternative you have set as Active.

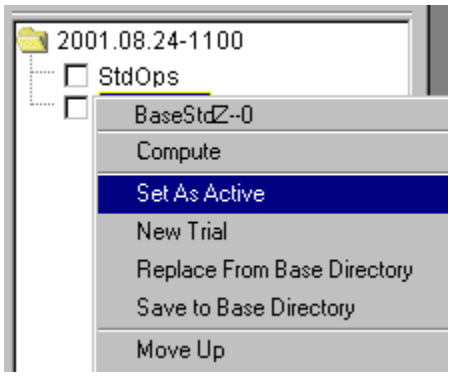


Figure 14.17 Simulation Control Panel Shortcut Menu: Set Alternative As Active

14.4.2 Computing the Simulation

After inputting all data and parameters as desired, you can compute a Simulation.

In the Simulation Control Panel of the main window of the Simulation Module, the simulation tree displays the current Simulation as a folder, beneath which is a list of the Alternatives associated with the Simulation. Also shown in the Simulation Control Panel is the time information associated with the Simulation.

To execute a Simulation, you must first set an Alternative as Active. Right-click on an Alternative in the Simulation Control Panel and, from the shortcut menu, select **Set as Active** (Figure 14.17).

The name of the active Alternative appears in bold in the simulation tree and the **Compute** button becomes available. Also, the model schematic for the active Alternative will appear in the display area.

To compute a Simulation, either click the **Compute** button in the Simulation Control Panel or, in the simulation tree, right-click on the Alternative and select **Compute** from the shortcut menu (Figure 14.18).

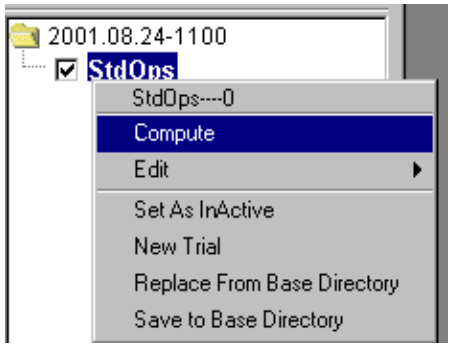


Figure 14.18 Simulation Control Panel Shortcut Menu: Compute

When you compute a Simulation, a **Compute** window opens, as shown in Figure 14.19. The **Compute** window provides **Message Output** that contains information regarding the status of each step of the computation process. The **Progress Bar** indicates the percentage of completion for each step. When the computation is finished, the **Progress Bar** is completely filled in and reads "100%" along with the message "Compute Complete" in the **Message Bar** of the **Compute** window.

If there are errors or any problems during the execution process, you can review the Message Output Text area of the compute window. Also the **Compute Log** can provide information regarding the type of problem that exists (see Section 14.5.1).

Click **Close** to close the Compute window.

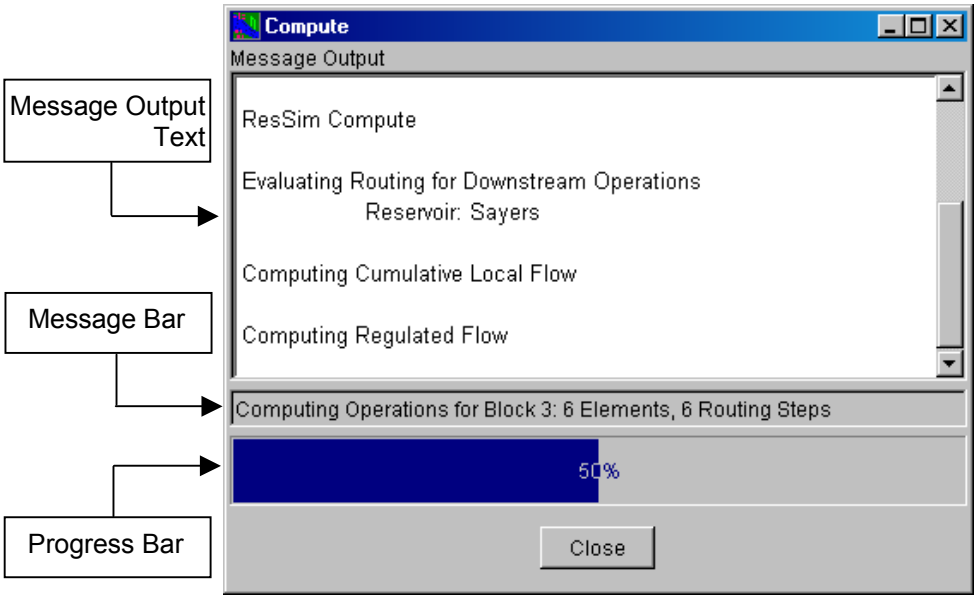


Figure 14.19 Compute Window

14.5 Reviewing Simulation Results

After computing a Simulation, you can review results in many different forms. **Compute Messages** provide information about each step of the computation process. **Plots** and **Tables** in the Simulation Module offer detailed views of data and model results. **Reports** provide details about individual components of the Reservoir Network. These options for viewing your results are described in the following sections.

14.5.1 Viewing Compute Logs

If there are errors or any problems during the computation process, the **Compute Log** (Figure 14.20) can provide information regarding the type of problem that exists. To view **Compute Logs**, select **Compute** from the **Reports** menu, then select the appropriate Alternative.

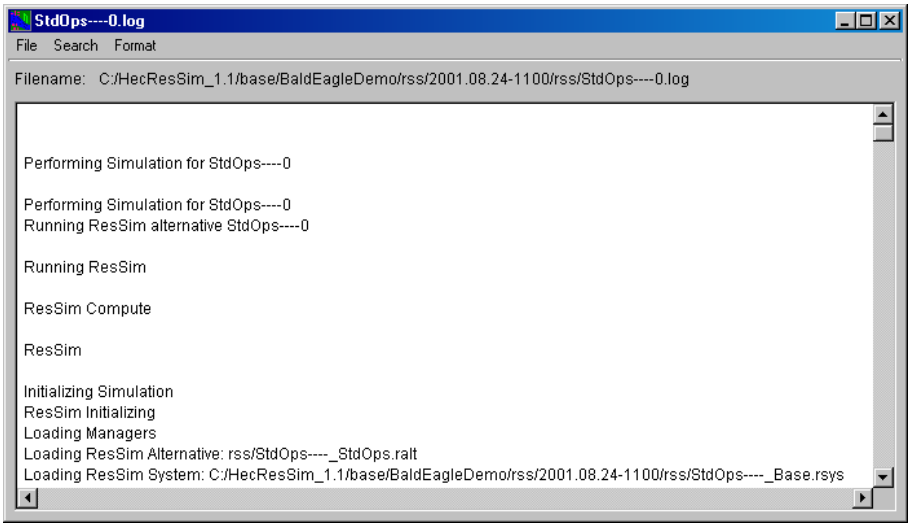


Figure 14.20 Compute Log

You can use the **Find** and **Find Next** commands in the **Search** menu to locate specific issues in a log.

You can customize the appearance of the Compute Log with the **Colors** and **Font** commands in the **Format** menu.

The **Colors** command allows changes to the **Foreground** and **Background** colors. Selecting either one opens the **Select Color** dialog box. See Appendix D for instructions on how to use the **Color Chooser** tools.

The **Font** command opens the **Select Font** dialog box (Figure 14.21), which allows you to choose the font **Type** and **Size**. Also, you can choose whether or not to set the appearance to **Bold** and/or **Italic** characters.

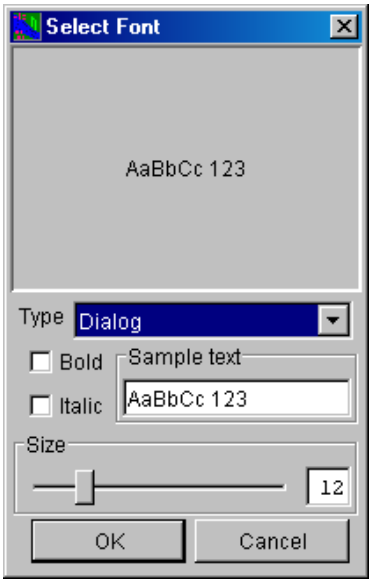


Figure 14.21 Select Font Dialog Box

14.5.2 Using Plots and Tables

Plots and tables in the Simulation Module offer detailed views of data and model results.

You can access plots using shortcut menus in the Simulation Module's display area.

To access a **Plot** from the display area, right-click on a model element in the map display. The shortcut menu will provide a list of one or more plot options, as illustrated in Figure 14.22.

Once you have opened a plot, you can also tabulate values by selecting **Tabulate** from the plot's **File** menu.

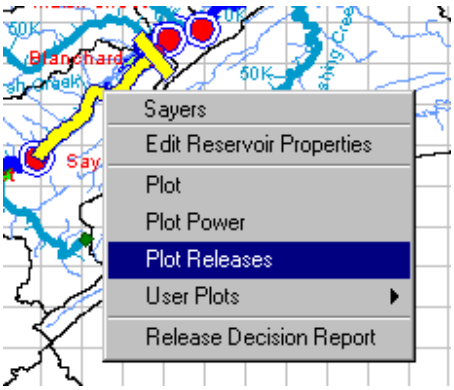


Figure 14.22 Reservoir Shortcut Menu -- Plot Simulation Results

14.5.2.1 Features of Plots

ResSim plots offer a variety of information that will assist you with reviewing the results of a Simulation. Included in the information available from the default plots are reservoir elevation, storage, and release values as well as regulated and unregulated (without reservoirs and other projects) flow values. Figure 14.23 shows a sample plot illustrating reservoir results from a Simulation.

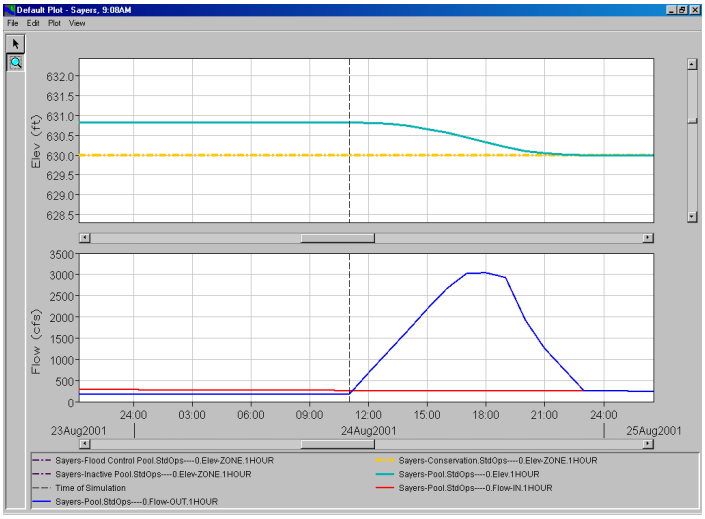


Figure 14.23 Sample Plot of Reservoir Results

The plot window displays the location name in the title bar. Axis labels and a color-coded legend identify the data contained in the plot.

When a plot depicts the results of an Alternative, as in Figure 14.23, a dashed vertical line represents the start time of the Simulation. The Lookback (historic/observed) period occurs prior to the start time.

The **Zoom Tool**  allows you to view data closely at a specific time. To zoom in, hold the left mouse button down and outline the area you want to enlarge. To zoom out, click the right mouse button. To resize a plot, use the mouse to drag the edges of the window. It is possible to zoom in on one section of the entire plot (both the x and y variables simultaneously) or a range for either variable. To zoom in on a section of the plot, outline that area on the plot. To zoom in on a range (for either x or y variable), outline the desired range on the respective axis.

14.5.2.2 Customizing Plots

You can customize the appearance of plots by using several properties editors that you can access from shortcut menus:

Line Properties: Right-clicking on a plot line or point will allow you to open a Curve Properties Editor to edit line colors, styles, and weights, as well as labels and quality symbols.

Background Properties: Right-clicking on the background of a plot will allow you to open a View Port Editor where you can customize the border, background, and gridlines of the plot.

Axis Properties: Right-clicking on a plot axis will allow you to open an Axis Properties Editor where you can customize the axis scale and tic marks.

Label Properties: Right-clicking on an axis label or plot legend will allow you to open a Label Properties Editor where you can add backgrounds and borders to the labels.

14.5.2.3 Creating User-Defined Plots

Since everyone has their own preferences regarding which variables to include in the shortcut menu location plot selections, the **User Defined Plot** capability offers flexibility.

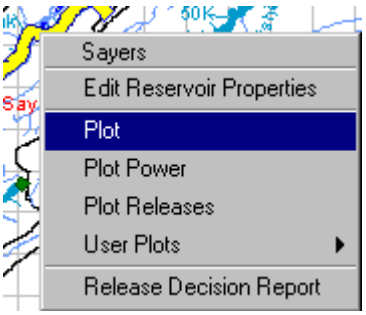


Figure 14.24 Shortcut Menu for an Element

To create a User Defined Plot:

1. Right-click on the element where you want the plot to appear, and select **Plot** from the shortcut menu (Figure 14.24). The default plot for that location will appear.
2. Select **Select Variables** from the **Plot** Menu. The **Select Plot Variables** dialog box will appear (Figure 14.25).

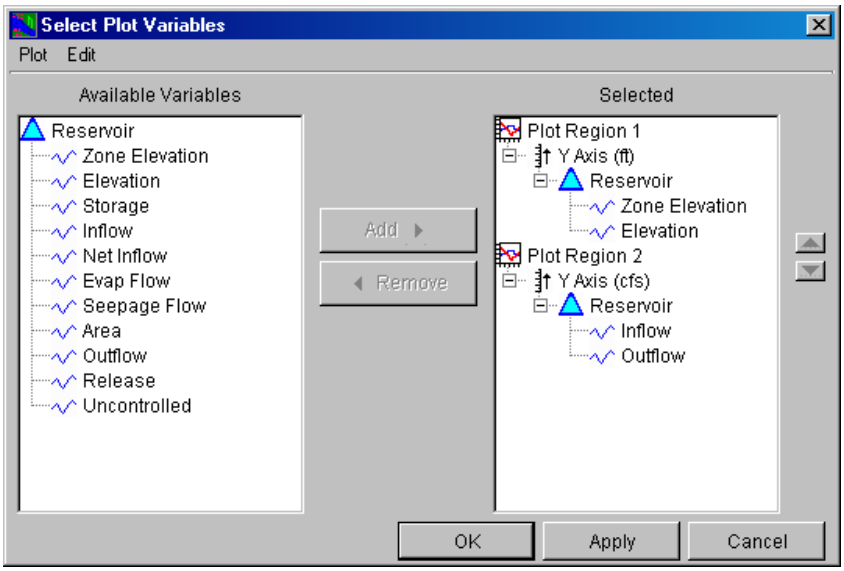


Figure 14.25 Select Plot Variables Dialog Box

The **Available Variables** list shows the variables you can choose for your User Defined Plot. The **Selected** list shows variables you have selected.

To add variables to your User Defined Plot:

1. Click on the variable in the **Available Variables** list, then click on the appropriate Plot Region or component in the **Selected** list. This allows you to specify where you want variables to appear in your plot.

2. Click the **Add** button to add the variable you have chosen to the Selected list. If the added variable reflects different units, a separate Y-axis will be automatically added.

To remove a variable, click on its name in the **Selected** list then click the **Remove** button.

You can also **Move** a Plot Region up or down or **Remove** it by right-clicking on the plot region name and choosing the action desired from the shortcut menu, as illustrated in Figure 14.26.

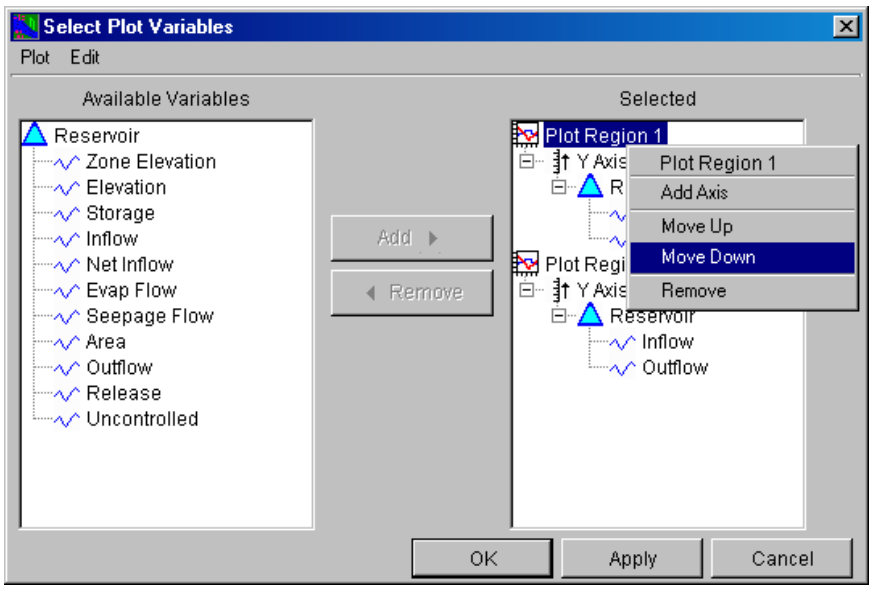


Figure 14.26 Select Plot Variables: Region Shortcut Menu

3. Click the **OK** button. The Select Plot Variables dialog box will close and your User Defined Plot will open.

To save your User Defined Plot:

1. From the **Plot** menu on the plot that appears, select **Save Plot Type...** The **Save Plot Type** dialog box will appear (Figure 14.27). You can specify whether you want this User Defined Plot to be available to **All Applications** or to just **This Watershed only**. Enter a **Name** for the plot.

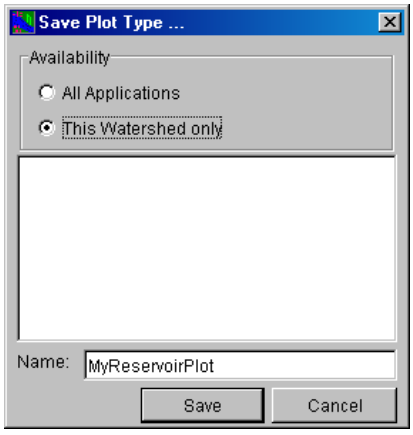


Figure 14.27 Save Plot Type . . .

2. Click the **Save** button. The Save Plot Type... dialog box will close.

The new User Defined Plot will now be available when you select **User Plots** from the right-click shortcut menu in the Display Area (Figure 14.28).

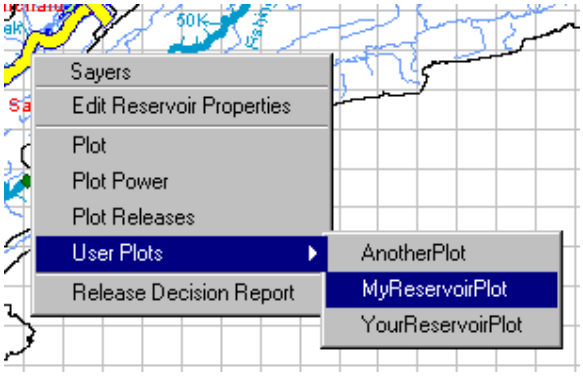


Figure 14.28 Shortcut Menu: User Plots

14.5.2.4 Viewing Data in Tabular Form

You can view plotted data in tabular form by selecting **Tabulate** from the **File** menu of the plot. Figure 14.29 shows an example.

//SAYERS-FLOOD CONTROL POOL/ELEV-ZONE/20AUG2001/1HOUR/STDOPS----0/

File Edit View

Ordinate	Date / Time	SAYERS-FLOOD... ELEV-ZONE STDOPS----0	SAYERS-CONS... ELEV-ZONE STDOPS----0	SAYERS-INACTIV... ELEV-ZONE STDOPS----0	SAYERS-POOL ELEV STDOPS----0	SAYERS-POOL FLOW-IN STDOPS----0	SAYERS-POOL FLOW-OUT STDOPS----0
Units		ft	ft	ft	ft	cfs	cfs
Type		INST-VAL	INST-VAL	INST-VAL	INST-VAL	INST-VAL	INST-VAL
1	20 Aug 01 11:00	657.00	630.00	590.00	630.81	302.34	151.8
2	20 Aug 01 12:00	657.00	630.00	590.00	630.82	302.08	148.7
3	20 Aug 01 13:00	657.00	630.00	590.00	630.83	301.47	150.2
4	20 Aug 01 14:00	657.00	630.00	590.00	630.83	300.79	151.8
5	20 Aug 01 15:00	657.00	630.00	590.00	630.85	300.11	261.3
6	20 Aug 01 16:00	657.00	630.00	590.00	630.85	299.43	276.6
7	20 Aug 01 17:00	657.00	630.00	590.00	630.85	298.75	279.0
8	20 Aug 01 18:00	657.00	630.00	590.00	630.85	298.07	279.0
9	20 Aug 01 19:00	657.00	630.00	590.00	630.85	297.39	279.0
10	20 Aug 01 20:00	657.00	630.00	590.00	630.86	296.72	279.0
11	20 Aug 01 21:00	657.00	630.00	590.00	630.85	296.04	279.0
12	20 Aug 01 22:00	657.00	630.00	590.00	630.85	295.37	279.0
13	20 Aug 01 23:00	657.00	630.00	590.00	630.85	294.70	279.0
14	20 Aug 01 24:00	657.00	630.00	590.00	630.84	294.04	279.0
15	21 Aug 01 01:00	657.00	630.00	590.00	630.84	293.37	279.0
16	21 Aug 01 02:00	657.00	630.00	590.00	630.83	292.71	279.0

Figure 14.29 Data in Tabular Form

The **View** menu of the Tabular Data window offers four display options. The **View Commas** option displays commas in numbers greater than one thousand. The **Date and Time Separately** option splits the date and time into two separate columns. The **Date with 4 Digit Years** option displays the year with four digits instead of the default two. Lastly, you can set the decimal precision for data using the **Show Decimal Places** option.

You can also resize table columns by dragging their borders to the desired position with your mouse.

14.5.2.5 Printing and Exporting Plots and Tables

You can print ResSim plots and tables, copy and paste them into other applications, and specify export options for plots. See Appendix F for details.

14.5.3 Viewing Summary Reports

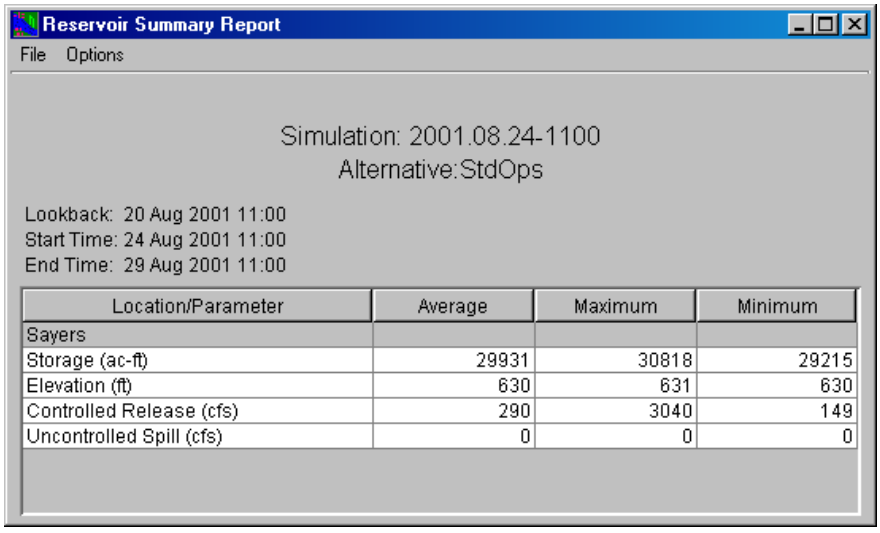
Summary Reports are available from the **Reports** menu. In all Summary Reports, the Simulation name and Alternative appear at the top of the window, along with the Lookback date and time, the Start date and time, and the End date and time.

Summary Reports also have two menus. The **File** menu allows you to **Print** and **Close** the report (see Appendix F for information about printing). The **Options** menu lets you **Specify the Time** to review the simulation results for a single time period.

14.5.3.1 Reservoir Summary Reports

The **Reservoir Summary Report** (Figure 14.30) displays Average, Maximum, and Minimum result values for pertinent reservoir parameters.

To view the Reservoir Summary Report, select **Reservoir Summary** from the **Reports** menu.



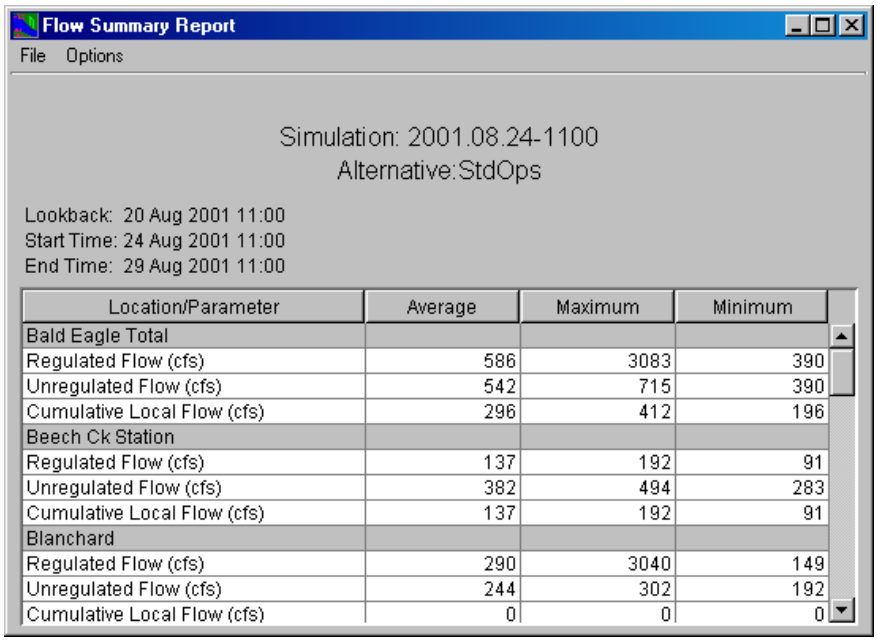
Location/Parameter	Average	Maximum	Minimum
Sayers			
Storage (ac-ft)	29931	30818	29215
Elevation (ft)	630	631	630
Controlled Release (cfs)	290	3040	149
Uncontrolled Spill (cfs)	0	0	0

Figure 14.30 Reservoir Summary Report

14.5.3.2 Flow Summary Reports

The **Flow Summary Report** (Figure 14.31) displays Average, Maximum, and Minimum values for individual location parameters.

To view the Flow Summary Report, select **Flow Summary** from the **Reports** menu.



Location/Parameter	Average	Maximum	Minimum
Bald Eagle Total			
Regulated Flow (cfs)	586	3083	390
Unregulated Flow (cfs)	542	715	390
Cumulative Local Flow (cfs)	296	412	196
Beech Ck Station			
Regulated Flow (cfs)	137	192	91
Unregulated Flow (cfs)	382	494	283
Cumulative Local Flow (cfs)	137	192	91
Blanchard			
Regulated Flow (cfs)	290	3040	149
Unregulated Flow (cfs)	244	302	192
Cumulative Local Flow (cfs)	0	0	0

Figure 14.31 Flow Summary Report

14.5.3.3 Power Summary Reports

The **Power Summary Report** (Figure 14.32) displays Average, Maximum, and Minimum values for individual location parameters.

To view the Power Summary Report, select **Power Summary** from the **Reports** menu.

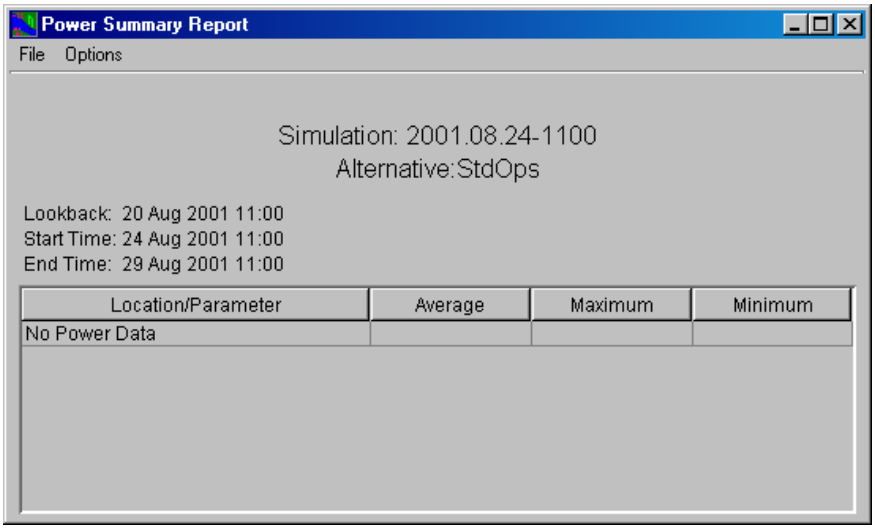


Figure 14.32 Power Summary Report

14.5.3.4 Gate Summary Reports

The **Gate Summary Report** (Figure 14.33) displays Average, Maximum, and Minimum values for individual location parameters.

To view the Gate Summary Report, select **Gate Summary** from the **Reports** menu.

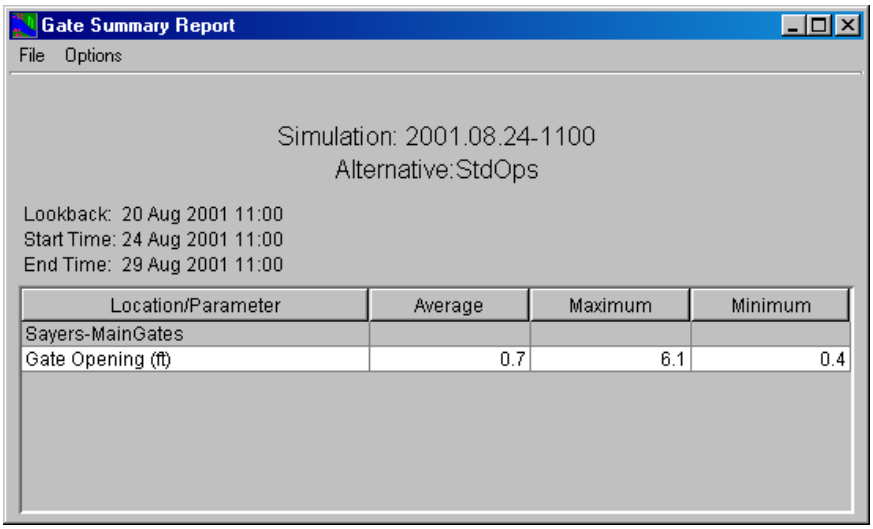


Figure 14.33 Gate Summary Report

14.5.3.5 Stage Summary Reports

The **Stage Summary Report** (Figure 14.34) displays Average, Maximum, and Minimum values for individual location parameters.

To view the Stage Summary Report, select **Stage Summary** from the **Reports** menu.

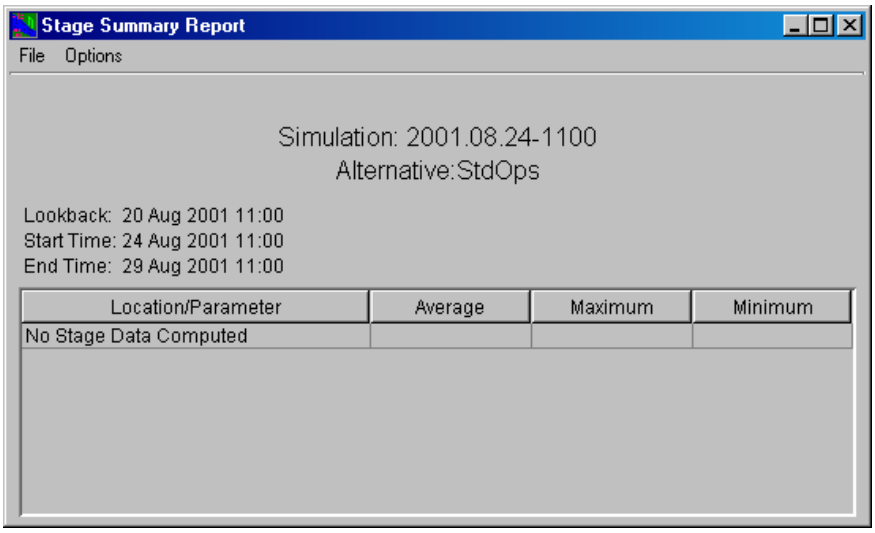
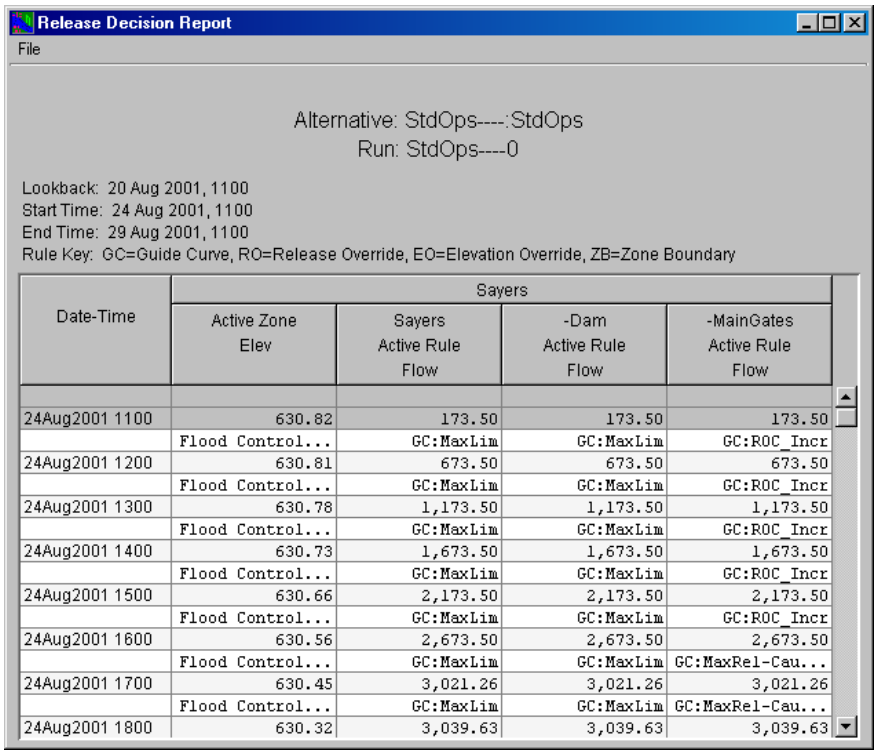


Figure 14.34 Stage Summary Report

14.5.3.6 Release Decision Reports

The **Release Decision Report** (Figure 14.35) displays the Active Zone and Active Rules for the reservoir pool, dam, and outlets at each time step for each reservoir.

To view the Release Decision Report, select **Release Decision** from the **Reports** menu or select **Release Decision Report** from the reservoir's shortcut menu (right-click on reservoir element).



Date-Time	Sayers			
	Active Zone Elev	Sayers Active Rule Flow	-Dam Active Rule Flow	-MainGates Active Rule Flow
24Aug2001 1100	630.82	173.50	173.50	173.50
	Flood Control...	GC:MaxLim	GC:MaxLim	GC:ROC_Incr
24Aug2001 1200	630.81	673.50	673.50	673.50
	Flood Control...	GC:MaxLim	GC:MaxLim	GC:ROC_Incr
24Aug2001 1300	630.78	1,173.50	1,173.50	1,173.50
	Flood Control...	GC:MaxLim	GC:MaxLim	GC:ROC_Incr
24Aug2001 1400	630.73	1,673.50	1,673.50	1,673.50
	Flood Control...	GC:MaxLim	GC:MaxLim	GC:ROC_Incr
24Aug2001 1500	630.66	2,173.50	2,173.50	2,173.50
	Flood Control...	GC:MaxLim	GC:MaxLim	GC:ROC_Incr
24Aug2001 1600	630.56	2,673.50	2,673.50	2,673.50
	Flood Control...	GC:MaxLim	GC:MaxLim	GC:MaxRel-Cau...
24Aug2001 1700	630.45	3,021.26	3,021.26	3,021.26
	Flood Control...	GC:MaxLim	GC:MaxLim	GC:MaxRel-Cau...
24Aug2001 1800	630.32	3,039.63	3,039.63	3,039.63

Figure 14.35 Release Decision Report

The **File** menu allows you to **Print** and **Close** the report (see Appendix F for information about printing).

14.5.3.7 Network Reports

The **Reservoir List**, **Reach List**, **Junction List**, **Diversion List**, and the **Network Connectivity Summary** report are also available from the **Reports** menu of the Simulation Module. Refer to Section 8.5 in Chapter 8 for more information about Network Reports.

14.6 Calibrating the Model and Editing Data

You may need to make adjustments as you test and calibrate your Simulation model. In the Simulation Module of ResSim, you can access editors that allow you to edit all components of your Reservoir Network, modify Alternatives, and fine-tune override controls.

14.6.1 Using the ResSim Editor Interface

In the Simulation Module, the **ResSim Editor Interface** (Figure 14.36) provides access to editors for Reservoirs, Junctions, Reaches, and Diversions, as well as the Alternative Editor, Systems Operations, and the Release Overrides Editor. You can also use the ResSim Editor Interface to quickly set Compute Options.

To access the ResSim Editor Interface, right-click on an Alternative in the simulation tree, then select **Edit > ResSim**.

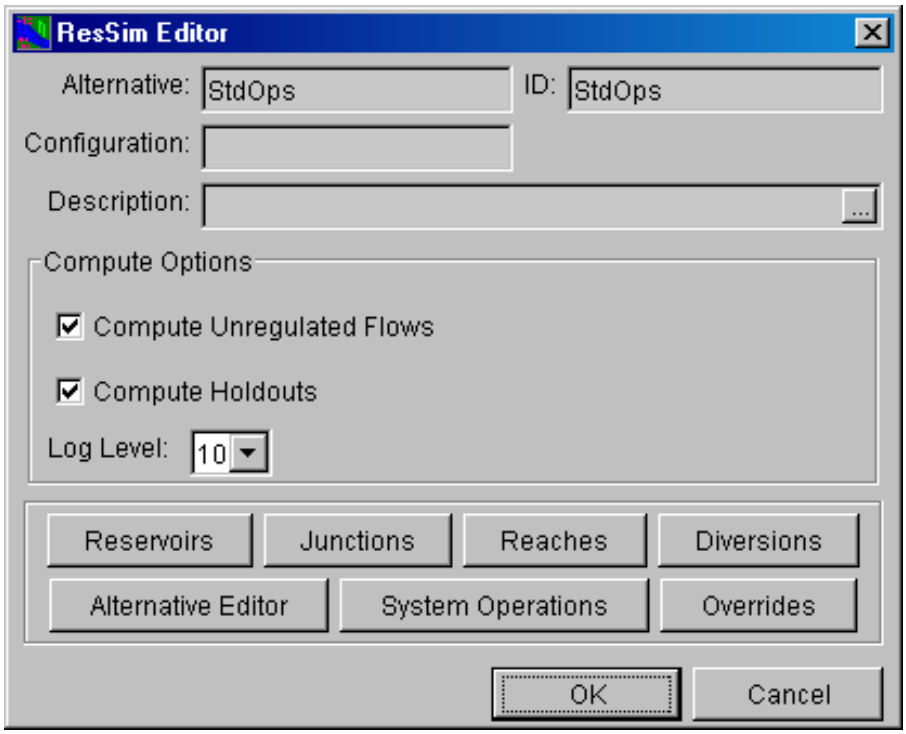


Figure 14.36 ResSim Editor Interface

14.6.2 Editing Alternative Lookback, Time Series, and Observed Data

To edit *references* to Time Series and Observed data, you will need to access the individual editors for Reservoirs, Junctions, Reaches, and Diversions. To adjust Alternative Lookback data, you will need to use the Alternative Editor (see Chapter 13). You can access each of these editors either from the ResSim Editor Interface (Figure 14.36) or from the Edit menu of the Simulation Module or Reservoir Network Module. Refer to Chapters 9, 10 and 11 for detailed descriptions of the element editors available in ResSim.

14.6.3 Editing Release Override Values

Once you have computed a Simulation, the **Release Overrides Editor** (Figure 14.37) allows you to adjust the computed results for each time step of the Simulation. You can access the Release Overrides Editor using the **Overrides** button in the ResSim Editor Interface (described above in Section 14.6.1); or, you can select **Release Overrides** (and the appropriate Alternative) from the **Simulation** Menu.

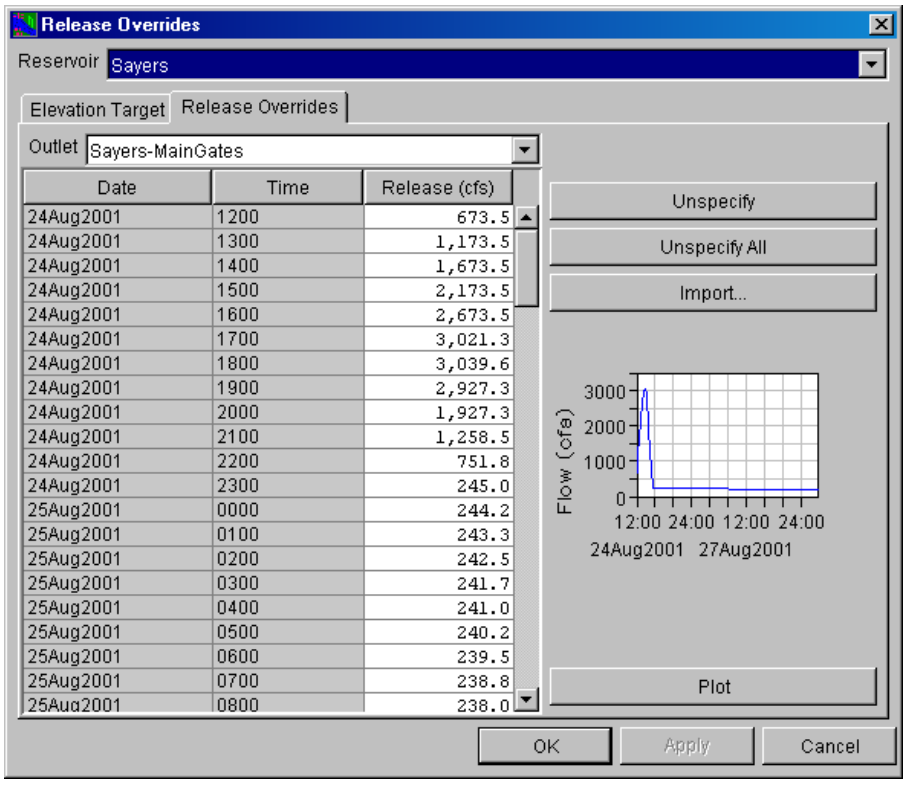


Figure 14.37 Release Overrides Editor

ResSim will use the values you specify for Elevation Target and Release Overrides, within the physical limits of the reservoir. The physical rate-of-change and the amount of water available in the reservoir may preclude ResSim from using your override values.

For the Reservoir shown in the list at the top of the editor, there are two tabs available for overriding the simulation results: **Elevation Target** and **Release Overrides**. Each tab contains a **Date**, **Time** and either "Elevation Target" or "Release." You can use either one of these override capabilities to adjust the simulation results.

Specifying Elevation Target Overrides:
Initially, the Target Elevation is based on the elevation values you specified for the reservoir's "guide curve" (Reservoir Editor, Operations tab). This is typically the top of the Conservation pool and is commonly referred to as the "target" or "guide curve". In addition to meeting all of the other rules that you specify for a reservoir, ResSim will try to keep the reservoir pool at the guide curve elevation. Therefore, by specifying Elevation Target values within this editor, you are inherently overriding the reservoir's release decisions.

Specifying Release Overrides:
During a Simulation, ResSim determines the reservoir release values based on the rules you specified for the Alternative. However, there may be situations where you do not want the results to reflect the rules for specific time steps. Therefore, you can enter release values using the Release Overrides tab.

Editing Override Values
You can specify Elevation Target and Release Overrides by entering single cell values or by revising multiple adjacent values using a fill function.

To revise a *single* value, double-click in the cell you want to revise and enter the new value.

To revise *multiple* adjacent values:

1. Point and click on the first cell, then drag your mouse or shift-click (hold down the shift key while clicking in other cells) to highlight the cells to be revised.
2. Right-click on the highlighted cells, and select **Fill** from the shortcut menu (Figure 14.38). The **Table Fill Options** dialog box will open (Figure 14.39)
3. Select the appropriate fill option in the **Table Fill Options** dialog box (Figure 14.39), then click **OK**.

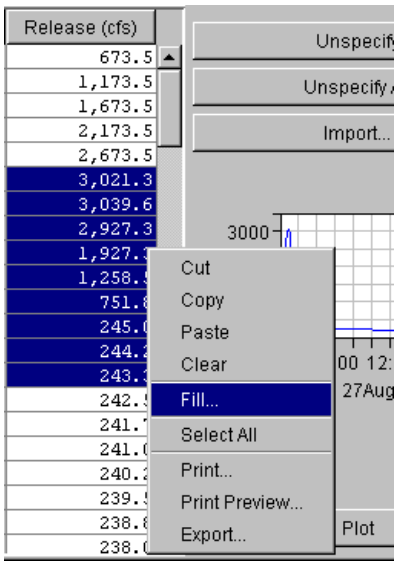


Figure 14.38 Release Overrides Editor Shortcut Menu: Fill Data Values

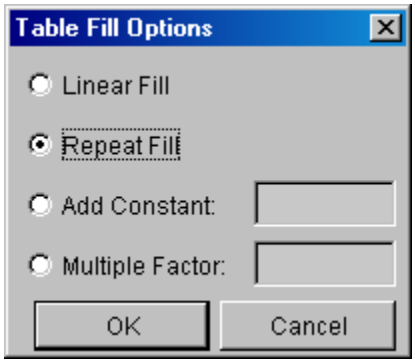


Figure 14.39 Table Fill Options Dialog Box

The revised values will reflect the fill option you selected. In the example shown in Figure 14.39, the **Repeat Fill** option is selected. Therefore, as the table in Figure 14.40 illustrates, all of the highlighted cells equal the value of the first cell selected; also, the color of the revised values changes from black to blue and the mini-plot shows the revised values as a red line. The mini-plot can be viewed in full size when you double-click on it.

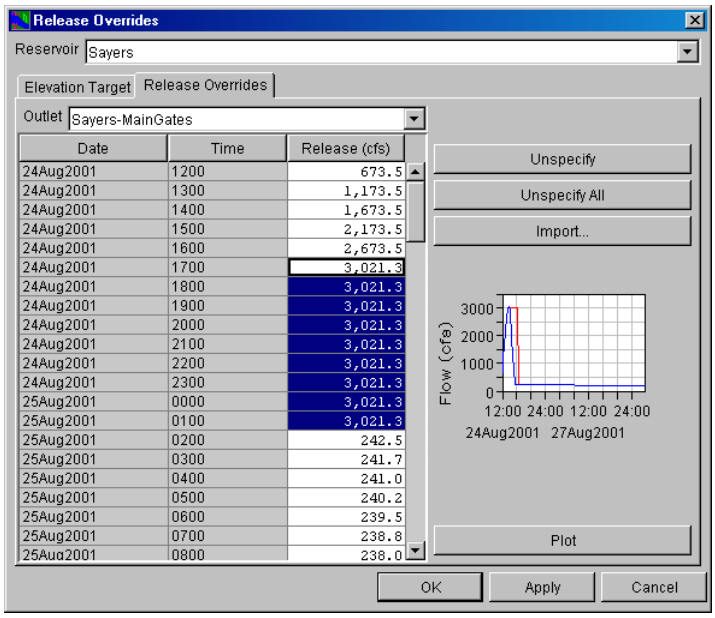


Figure 14.40 Release Overrides Editor Table: Revised Data Values using Repeat Fill Option

For those time steps where you do not specify override values, ResSim uses the reservoir rules to determine the reservoir release values. After running a simulation using your override values, you may decide to no longer use some, or all, of your override values. Therefore, you can use the **Unspecify** and **Unspecify All** buttons to indicate that you want ResSim to determine the release values.

Use the **Unspecify** button when you want release values to be based on the reservoir rules for some of the override values you have specified (override values are in green text after a simulation is computed). Highlight the cells where you have specified override values, then press the **Unspecify** button.

Use the **Unspecify All** button when you want all of the release values to be based on the reservoir rules and not have any overrides specified.

Use the **Import** button when you want to use a time series of override values. The **Import Overrides Time Series** dialog box (Figure 14.41) will open, which functions exactly like the **Select Time Series Path** dialog box used to select time-series records for an Alternative. Refer to Section 13.6 in Chapter 13 for more information.

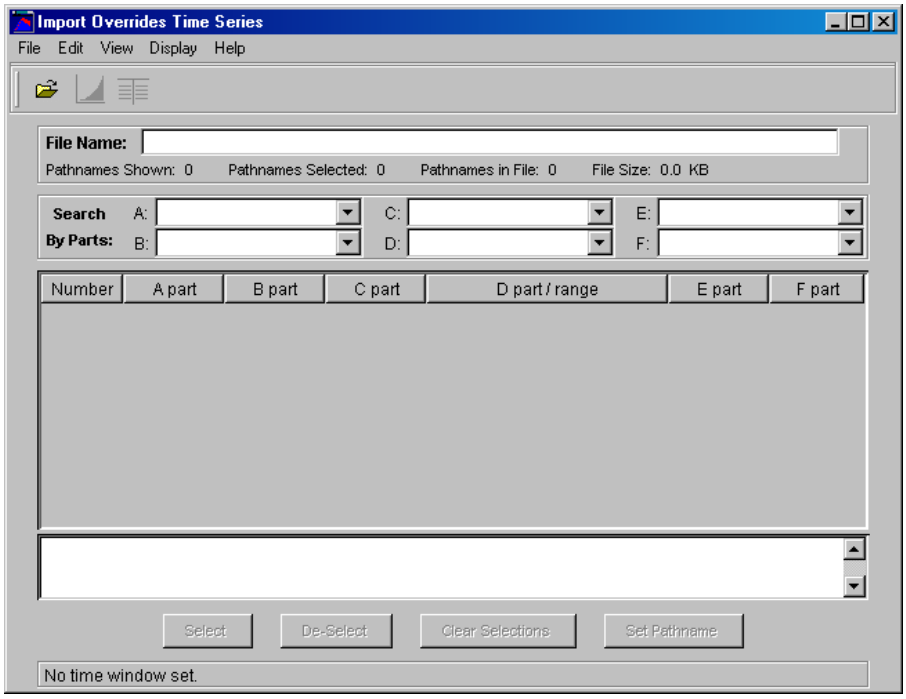


Figure 14.41 Import Time Series Dialog Box

14.6.4 Setting Compute Options

You can quickly set **Compute Options** for an Alternative using the ResSim Editor Interface.

To set Compute Options, access the ResSim Editor Interface by right-clicking on an Alternative in the simulation tree, then selecting **Edit>ResSim**.

The **ResSim Editor Interface** will open. **Compute Options** appear in the center of this interface (Figure 14.42.

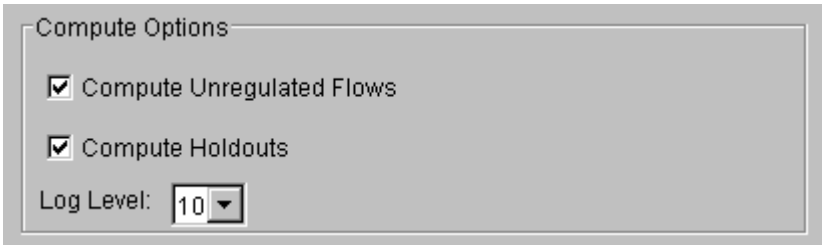


Figure 14.42 ResSim Editor Interface: Compute Options

- Check **Compute Unregulated Flows** if you want ResSim to perform additional calculations to determine the unregulated conditions in the watershed (e.g., without the regulation of reservoirs and projects).
- Check **Compute Holdouts** when you want ResSim to calculate the amount of water the reservoir stores (as opposed to just releasing inflow). Holdouts indicate the effects of reservoir regulation and are most applicable when you will be performing a subsequent Flood Impact or Flood Damage analysis.
- Select the **Log Level** (1-10) to control the amount of detailed messages that will be output during the computations.

14.7 Managing Simulation Data

ResSim facilitates archiving and sharing of Simulation data. There are two operations involved in managing Simulation data. You can save your data to the base directory to make it available for other Simulations, and you can replace data in a Simulation for a specific Alternative with data from the base directory.

14.7.1 Saving Data *to* the Base Directory

When you edit model data from the Simulation Module, your changes apply only to an individual Alternative and are saved in your Simulation directory (see Appendix A for an overview of the ResSim directory structure).

> ***Important:*** *If you want your changes to be available for subsequent Simulations, you will need to* ***save*** *the data* ***back to*** *the Base directory.*

To *save* data *to* the Base directory:

1. In the Simulation Control Panel, right-click on the Alternative to access the shortcut menu, then choose **Save to Base Directory** (Figure 14.43). The **Save Simulation Run Model Parameters to Base Directory** dialog box will appear (Figure 14.44).

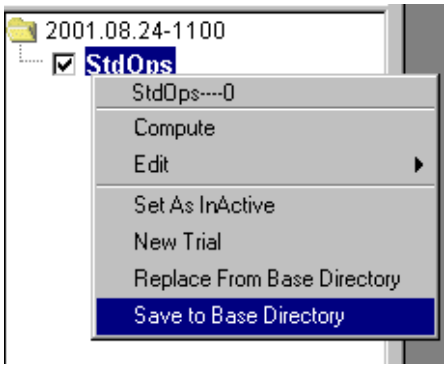


Figure 14.43 Alternative Shortcut Menu: Save to Base Directory

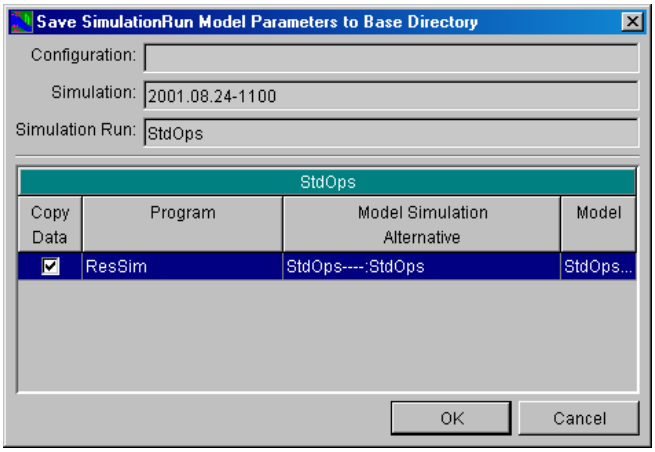


Figure 14.44 Save Simulation Run Model Parameters to Base Directory

2. Select the appropriate boxes in the **Copy Data** column beside the items you wish to copy from the Simulation directory to the Base directory.
3. Click the **OK** button to save the Simulation data to the Base directory.

14.7.2 Replacing Data *from* the Base Directory

If, while editing Simulation data, you need to revert to the original Alternative data, you can *replace* the changed data in your Simulation directory with data *from* the Base directory.

To *replace* Simulation data with data *from* the Base directory:

1. From the Simulation Control Panel, right-click on the Alternative to access the shortcut menu, then choose **Replace from Base Directory** (Figure 14.45). The **Replace Simulation Run Model Parameters from Base Directory** dialog box will appear (Figure 14.46).

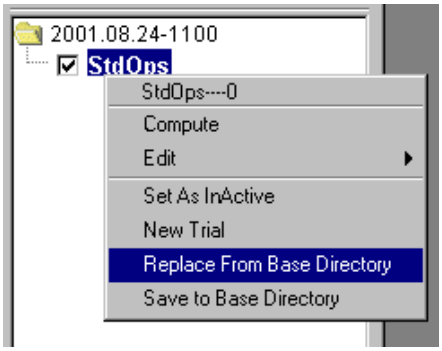


Figure 14.45 Alternative Shortcut Menu: Replace from Base Directory

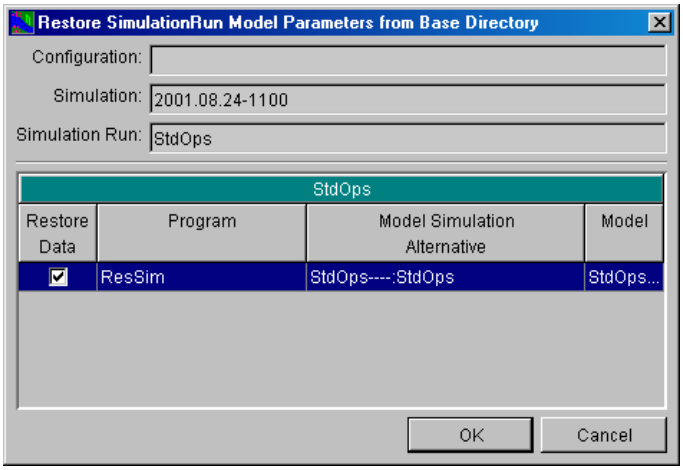


Figure 14.46 Replace Simulation Run Model Parameters from Base Directory

2. Select the appropriate boxes in the **Restore Data** column beside the items you wish to restore from the Base directory to the Simulation directory.
3. Click the **OK** button to replace the Simulation Alternative data you have selected with data from the Base directory.

14.8 Using HEC-DssVue

Included within the framework of ResSim is **HEC-DssVue**, a tool that allows you to access data stored in HEC-DSS database files.

When **HecDssVue** is selected from the **Tools** menu (Figure 14.47) within the Simulation Module, the current "simulation.dss" file is opened.

Figure 14.47 Accessing HEC-DssVue from the Tools Menu

In the Main Window of HEC-DssVue, a listing of pathnames that are contained in the simulation.dss file are provided, as shown in Figure 14.48.

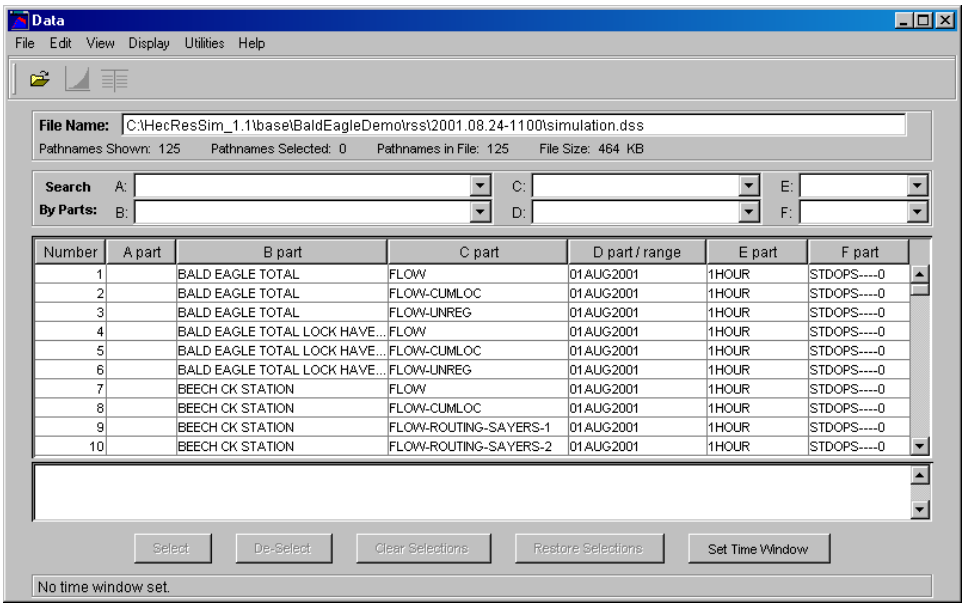


Figure 14.48 HEC-DssVue Main Window Showing Pathname Listing

A screened listing of pathnames can be obtained by selecting a pathname part from the lists in the **Search by Parts** section of the window. For example, if you want a listing of "observed" records, you can select OBS from the F-part list, as shown in Figure 14.49. To obtain an unscreened listing of pathnames, select the "blank" area at the top of the list.

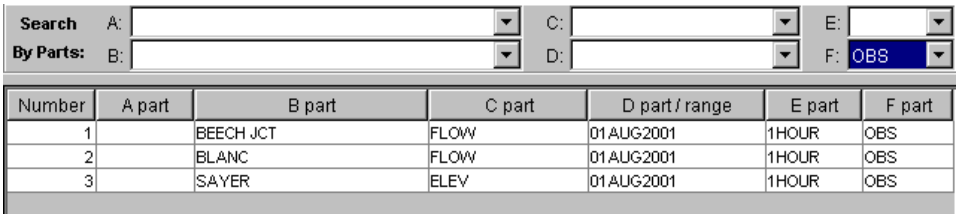


Figure 14.49 Screened Pathname Listing Showing Observed (OBS) Records

To select records to be plotted, tabulated, or edited, highlight the desired pathnames and click on the **Select** button. After one or more records are selected, the icons for the graph  and table  become active. Now, you can click on either icon to generate a plot (Figure 14.50) or table (Figure 14.51) of the selected records.

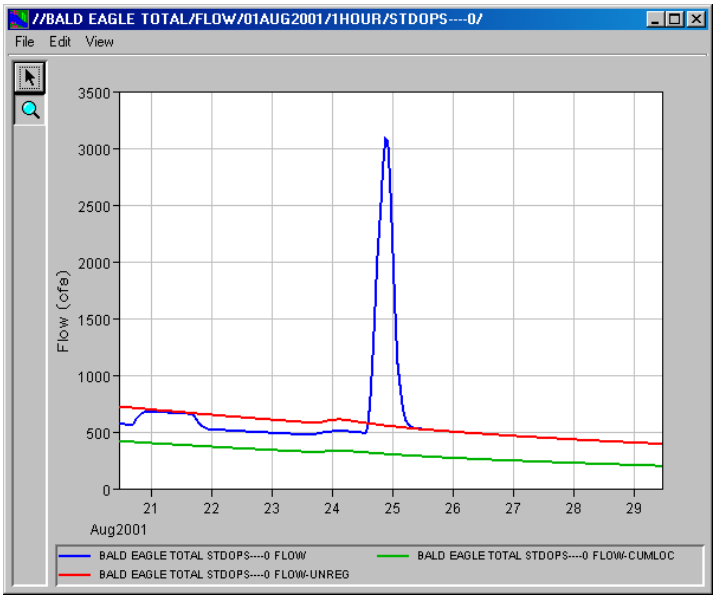
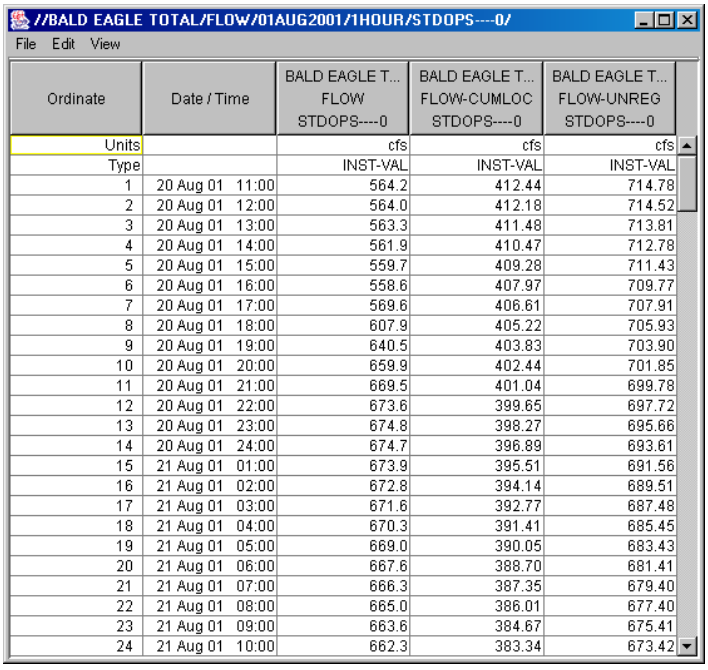


Figure 14.50 Example Plot Using HEC-DssVue



Ordinate	Date / Time	BALD EAGLE T... FLOW STDOPS----0	BALD EAGLE T... FLOW-CUMLOC STDOPS----0	BALD EAGLE T... FLOW-UNREG STDOPS----0
Units		cfs	cfs	cfs
Type		INST-VAL	INST-VAL	INST-VAL
1	20 Aug 01 11:00	564.2	412.44	714.78
2	20 Aug 01 12:00	564.0	412.18	714.52
3	20 Aug 01 13:00	563.3	411.48	713.81
4	20 Aug 01 14:00	561.9	410.47	712.78
5	20 Aug 01 15:00	559.7	409.28	711.43
6	20 Aug 01 16:00	558.6	407.97	709.77
7	20 Aug 01 17:00	569.6	406.61	707.91
8	20 Aug 01 18:00	607.9	405.22	705.93
9	20 Aug 01 19:00	640.5	403.83	703.90
10	20 Aug 01 20:00	659.9	402.44	701.85
11	20 Aug 01 21:00	669.5	401.04	699.78
12	20 Aug 01 22:00	673.6	399.65	697.72
13	20 Aug 01 23:00	674.8	398.27	695.66
14	20 Aug 01 24:00	674.7	396.89	693.61
15	21 Aug 01 01:00	673.9	395.51	691.56
16	21 Aug 01 02:00	672.8	394.14	689.51
17	21 Aug 01 03:00	671.6	392.77	687.48
18	21 Aug 01 04:00	670.3	391.41	685.45
19	21 Aug 01 05:00	669.0	390.05	683.43
20	21 Aug 01 06:00	667.6	388.70	681.41
21	21 Aug 01 07:00	666.3	387.35	679.40
22	21 Aug 01 08:00	665.0	386.01	677.40
23	21 Aug 01 09:00	663.6	384.67	675.41
24	21 Aug 01 10:00	662.3	383.34	673.42

Figure 14.51 Example of Tabulated Data Using HEC-DssVue

For a more detailed description of HEC-DssVue, see Appendix E.