

Chapter 13

Defining Alternatives

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Chapter 13

Defining Alternatives

An Alternative consists of a Configuration, a Reservoir Network, an Operation Set for each reservoir in the network, a Storage Balance Operation Set for each reservoir system in the network (if applicable), a definition of initial conditions, and a mapping of all time-series records to identified local inflows. To develop an Alternative, you use the **Alternative Editor** to name the Alternative and give it a description, select Reservoir Operation Sets, select System Operation Sets (if applicable), select a Lookback Type, associate time-series data with locations, define observed data, and save the Alternative you have created. This chapter will guide you through the steps.

13.1 Preparing to Develop Alternatives

Before you can develop an alternative, you need to define the operational reservoir data using the Reservoir Editor. Chapter 11 describes this procedure. Also, if your network contains reservoir systems, you need to define the storage balance operation set (as described in Chapter 12, Section 12.7).

13.2 Accessing the Alternative Editor

To access the **Alternative Editor** (Figure 13.1), choose **Edit** from the **Alternative** menu in the Reservoir Network Module.

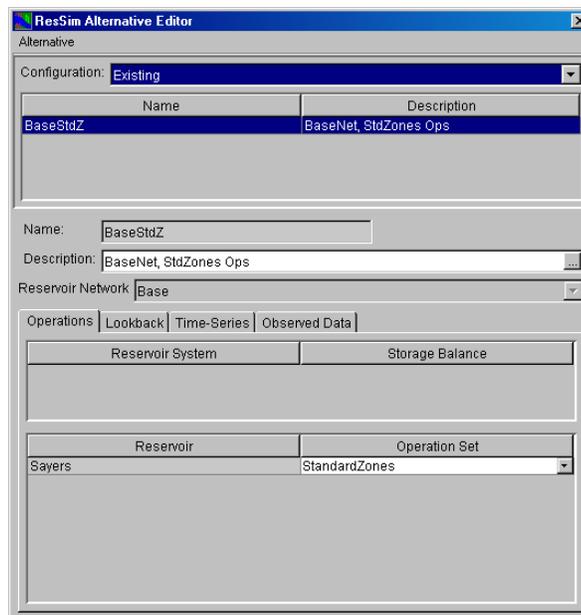


Figure 13.1 Alternative Editor

13.3 Creating a New Alternative

The first step in creating an Alternative is to give it a name and description, associate it with a configuration, and then select the reservoir network you want to use.

To create a New Alternative:

1. From the **Alternative** menu of the Alternative Editor, select **New**. The **New Alternative** dialog box will open (Figure 13.2).

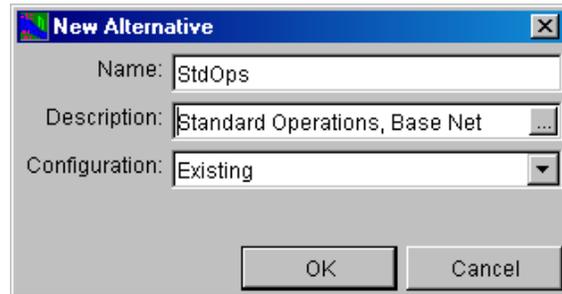


Figure 13.2 New Alternative Dialog Box

2. Enter a **Name** and **Description**. Use the **...** button to open a larger editing window for the description.
3. Select a **Configuration** by choosing from the list of available configurations.
4. Click **OK** to close the New Alternative dialog box. The name and description you entered will now appear in the **Name** and **Description** fields of the Alternative Editor (Figure 13.3).

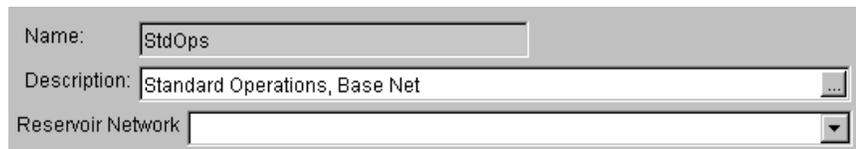


Figure 13.3 Alternative Editor--Name and Description Fields

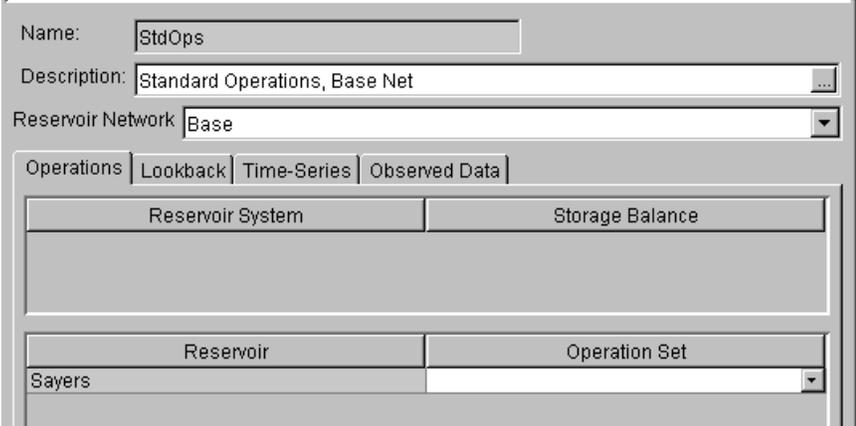
5. Next, choose the **Reservoir Network** you want to use for this alternative. The selection list contains only those networks you have defined for the selected configuration.

13.4 Selecting a Reservoir Operation Set

Once you have given your alternative a name and description and have chosen the configuration and reservoir network, you will need to select the **Operation Set** you want each reservoir to follow for the alternative. You will have created the operation set(s) using the Reservoir Editor (see Chapter 11).

To select a reservoir operation set for an alternative:

1. In the **Alternative Editor**, select the **Operations** tab (Figure 13.4).



The screenshot shows the 'Alternative Editor' interface with the 'Operations' tab selected. The 'Name' field contains 'StdOps' and the 'Description' field contains 'Standard Operations, Base Net'. The 'Reservoir Network' dropdown is set to 'Base'. Below these fields are four tabs: 'Operations', 'Lookback', 'Time-Series', and 'Observed Data'. The 'Operations' tab is active and displays a table with two columns: 'Reservoir System' and 'Storage Balance'. Below this table is another table with two columns: 'Reservoir' and 'Operation Set'. The 'Reservoir' column contains the text 'Sayers' and the 'Operation Set' column contains a dropdown menu.

Figure 13.4 Alternative Editor--Operations Tab, Reservoir Operation Set

2. Select an Operation Set (for each reservoir in the network) by double-clicking on the white **Operation Set** field and choosing from the list.

13.5 Selecting a Reservoir System Storage Balance Operation Set

When you create a reservoir system and define an explicit storage balance scheme for a system operation (described in Chapter 12), an entry will appear in the Alternative Editor's Operations tab that identifies the Reservoir System along with a field in which you are required to select a system storage balance operation for the reservoirs to follow. Note that the individual operation sets for each reservoir containing the Downstream Control and/or Tandem Operation rules have to also be selected in the alternative in order to simulate system operation.

To select a system operation set for an alternative:

1. In the **Alternative Editor**, select the **Operations** tab (Figure 13.5).

The screenshot shows the 'Operations' tab in the Alternative Editor. At the top, there are fields for 'Name' (Parallel), 'Description' (Example of Two Parallel Reservoirs operating as a System with Explicit Storage Balancing), and 'Reservoir Network' (SystemOfTwo). Below these are four tabs: 'Operations', 'Lookback', 'Time-Series', and 'Observed Data'. The 'Operations' tab is active and contains two tables. The first table has columns 'Reservoir System' and 'Storage Balance'. The second table has columns 'Reservoir' and 'Operation Set'.

Reservoir System	Storage Balance
Parallel Explicit Balance	Parallel System Explicit Balance

Reservoir	Operation Set
Beech Creek	System OpSet
Sayers	System OpSet

Figure 13.5 Alternative Editor--Operations Tab, Reservoir System Storage Balance Operation Set

2. In addition to selecting the operation set for each reservoir (as previously described in Section 13.4), select a **Storage Balance** for each **Reservoir System** you have configured by double clicking on the white **Storage Balance** field and choosing from the list. The selection options will be either the operation set that contains the explicit storage balance scheme you want to apply, or "NONE" if you wish to have the alternative use the implicit (default) storage balance scheme instead of the explicit storage balance you previously set up.

13.6 Selecting Lookback Type

After specifying the operation set for each of your reservoirs, you will need to specify the initial (or starting) conditions for the alternative. This is referred to in ResSim as the **Lookback** (or warmup) period. You will need to specify whether constant or “mapped” time-series data will define each element and parameter during the lookback period.

To set the lookback **Type** for locations in your reservoir network:

1. In the **Alternative Editor**, select the **Lookback** tab.
2. For each location or parameter, double-click in the white **Type** cell and select either **Constant** or **Time-Series**, (as shown in Figure 13.6).

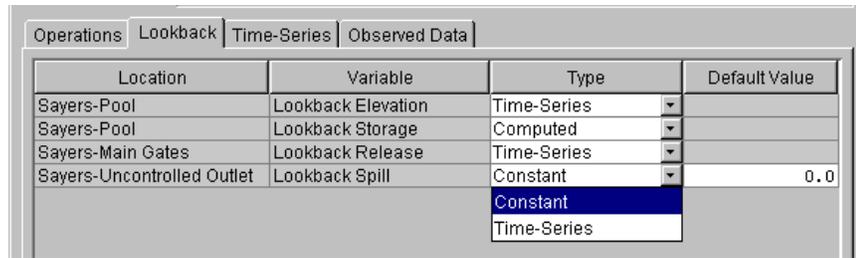


Figure 13.6 Alternative Editor--Lookback Tab

3. For locations or parameters where you have selected **Constant** as the lookback type, enter the value for the constant in the **Default Value** field.

13.7 Associating Time-Series Data with a Location

Next, you will need to associate (by “mapping”) a time-series record to each location or parameter for which Time-Series Data are needed.

To associate Time-Series Data with a Location:

1. In the **Alternative Editor**, select the **Time-Series** tab (Figure 13.7).

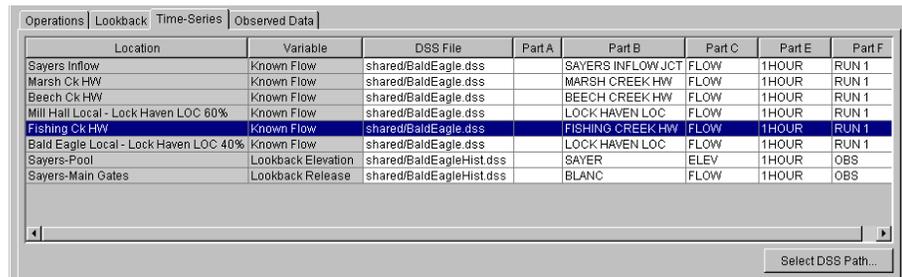


Figure 13.7 Alternative Editor--Time-Series Tab

- Each row in the Time-Series table is a local flow location (specified in the Local Flow tab within the Junction editor in the Reservoir Network module), an element/parameter you have defined on the Lookback tab as Time Series, or a Time Series that is referenced in the Operation rules. Select each row, one at a time, and click the **Select DSS Path** button to access the **Select Time-Series Path** dialog box (Figure 13.8).

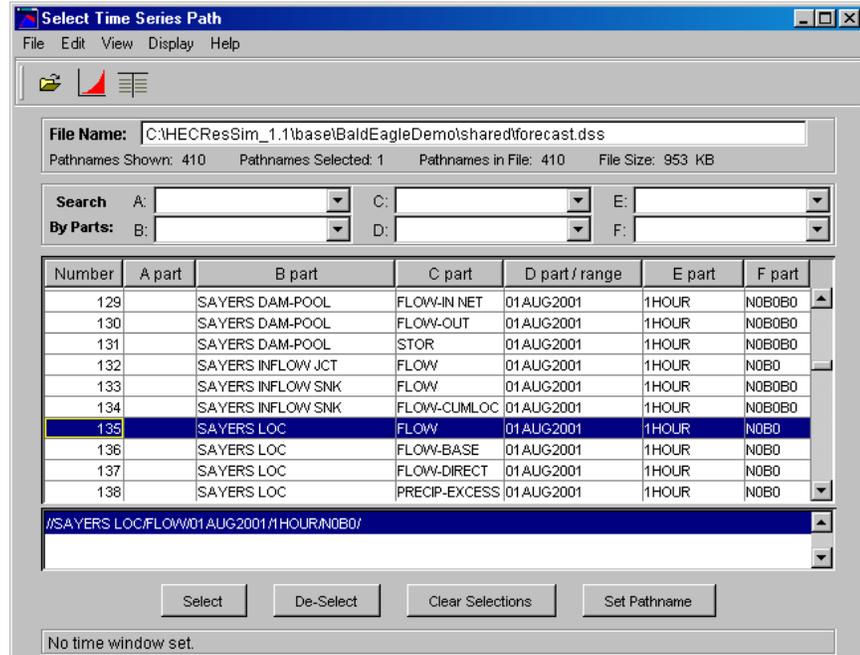


Figure 13.8 Select Time-Series Path Dialog Box

The **Select Time-Series Path** dialog box allows you to select records from a list of pathnames (or *catalog*) in the database. From the **View** menu, you can choose to display a straight list of pathnames or a list of pathnames separated into parts, and you can refine the list by searching for either a string in the pathnames or for specific pathname parts. For detailed information about working with DSS files, refer to the discussion of **Hec-DssVue** in Appendix E.

- To select time-series records for a location or element/parameter in your alternative, open the DSS file you wish to browse. If you know the name of the file, you can type the file name (including the path) directly into the **File Name** box to open the DSS file. Otherwise, choose **Open** from the **File** menu or click the  button to select the DSS database file you want.
- Once you have selected a file, the **Select Time-Series Path** dialog box displays the filename, the number of pathnames in the list, the number of pathnames selected, the total number of pathnames in

the database file, and the size of the database file. The individual pathnames display in a table beneath the search area.

5. Use the **Search** feature to “filter” and locate individual records in the DSS file or scroll through the list of pathnames with the vertical scrollbar.
6. Select a record by double clicking on its name in the list. The selected pathname will appear in the box on the bottom of the Select Time-Series Path dialog box (as previously shown in Figure 13.8). You can also highlight a pathname in the list and click the **Select** button. Until you select a pathname, the **Select** button remains inactive.



*Unlike in Hec-DssVue, you may select **only one record** at a time in the **Select Time-Series Path** dialog box.*

7. If you would like to view the DSS data, select **Plot** or **Tabulate** from the **Display** menu, or you can click on the **Plot**  button or the **Tabulate**  button.
8. When you are satisfied with the DSS record you have chosen for a location or element/parameter, click on the **Set Pathname** button and the selected pathname will appear in the Time-Series tab of the Alternative editor.

13.8 Defining Observed Data

While defining your reservoir network, if you have specified (by checking the appropriate box or boxes in the Observed tab within each element's editor in the Network module) that observed data is available for individual reservoirs, junctions, reaches, diversions, and diverted outlets, the **Observed Data** tab of the Alternative Editor will list these locations in a table along with the DSS path information associated with them, as shown in Figure 13.9.

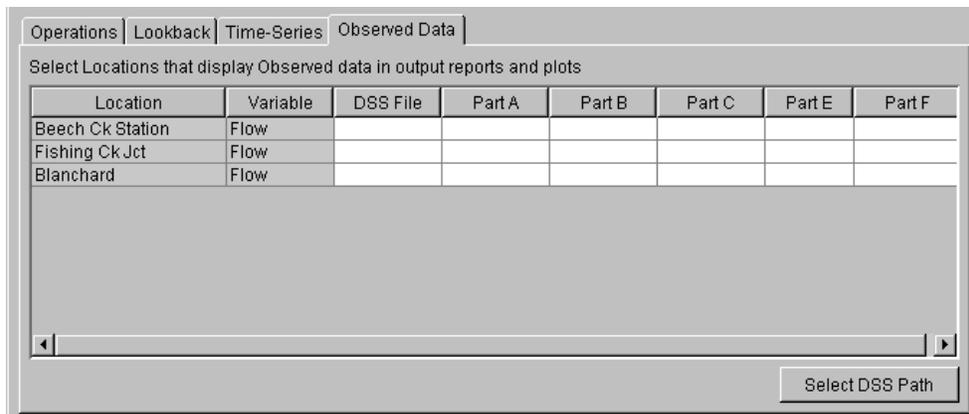


Figure 13.9 Alternative Editor--Observed Data Tab

13.9 Saving an Alternative

When you have finished defining an alternative, save it by selecting **Save** from the **Alternative** menu of the **Alternative Editor**, as shown in Figure 13.10. You may then close the Alternative Editor.

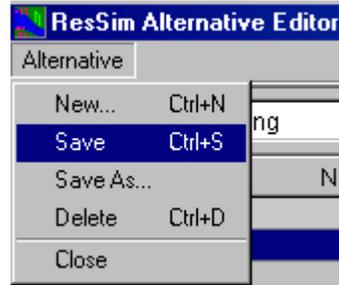


Figure 13.10 Alternative Editor--Save Alternative

It is a good idea to save your **Network** and **Watershed** after creating a new Alternative. To do this, select **Save** from the **Network** menu (Figure 13.11), and then select **Save Watershed** from the **File** menu (Figure 13.12).

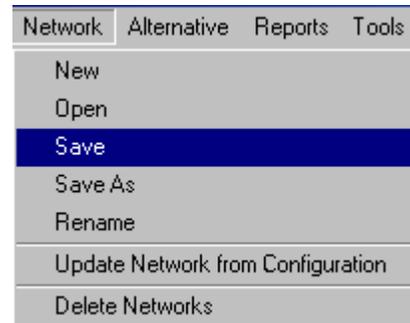


Figure 13.11 Reservoir Network Module--Network Menu, Save Network

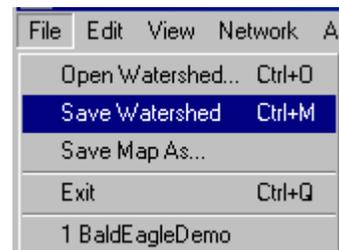


Figure 13.12 File Menu--Save Watershed