



**Technical Documentation Version 6.2**

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# **System Control Table**

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**C A D S W E S**

**Center for Advanced Decision Support for Water and Environmental Systems**

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# System Control Table

## 1. Introduction

The RiverWare SCT (System Control Table) is a customizable, editable view of slots/data in a RiverWare model. It provides five tabs or views of different types of data:

- **Series Slots:** Series data (series slots, including **Agg Series Slot** columns, and **Table Series Slot** columns) on physical simulation objects and accounting slots can be displayed. The SCT presents series data in a scrollable grid of numeric values. Background colors are used to indicate each slot timestep's flag value—generally an indication of how the numeric value was created. The SCT also allows the user to create lists of other types of slots for easy access.
- **Edit Series Slot List:** A list of series slots can be shown for configuration purposes. Slots can be added/deleted, or re-arranged. Similar sections or groups can be duplicated for other objects. When applied, the organization in this table is used for the **Series Slots** tab.
- **Scalar Slots:** Scalar and 1x1 table slots can be displayed and edited from the **Scalar Slots** tab.
- **Other Slots:** A list of the other types of slots, table, periodic, list, statistical tables, can be displayed on the **Other Slots** tab. These are not editable but allow the user to keep track of different slots without opening each individually.
- **Object Grid:** A grid of objects and containing scalar and table slots can be shown. This view is particularly useful when specifying parameters on objects that interact with one another, like groundwater objects.

The actual data displayed in an SCT is actually in the RiverWare model rather than in the SCT. Therefore, editing data displayed in an SCT does not affect the SCT—it affects only the RiverWare model. The information associated with an SCT—i.e., that which can be saved and reloaded as an SCT—consists essentially of:

1. A list of RiverWare slots.
2. Configurable display properties for each of those slots.
3. A set of general configurable display properties for the overall SCT.
4. An aggregation definition for aggregating multiple timesteps within each slot.
5. Object and slot ordering on the Object Grid tab

The time range displayed by the SCT matches the RiverWare model's **Run Control** configuration—plus a configurable number of pre- and post-simulation timesteps.

Many SCTs may be used simultaneously within a single RiverWare session (i.e., showing distinct views into the same RiverWare Model). A given SCT may be used with distinct, but similar, RiverWare models.

## 2. SCT Tour

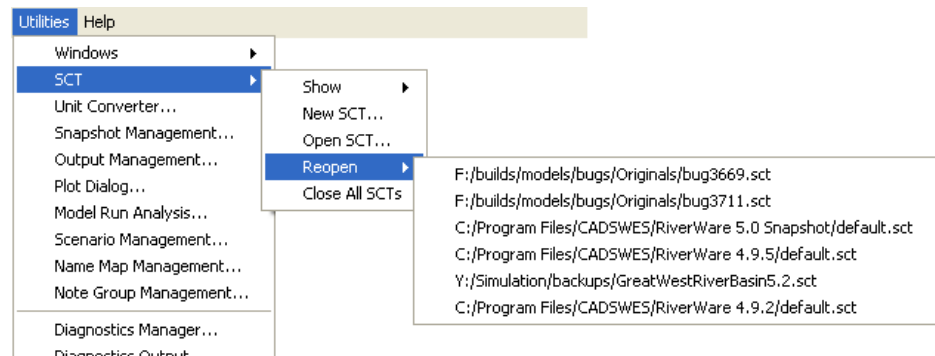
Users can create a new SCT from the **RiverWare Workspace** menu: **Utilities** ➔ **SCT** ➔ **New SCT...** The SCT initially will have the user-defined default configuration.

After creating a new SCT, the **Edit Series Slot List** tab ([HERE \(Section 5\)](#)) is shown. If you are adding slots to the Series Slots tab, you will want to **add Slots and Slot Dividers**. Otherwise, you can cancel and go to the desired tab for to begin configuration.

Submenus in the RiverWare Workspace (**Utilities** ➔ **SCT**) and the SCT File menu allow the user to:

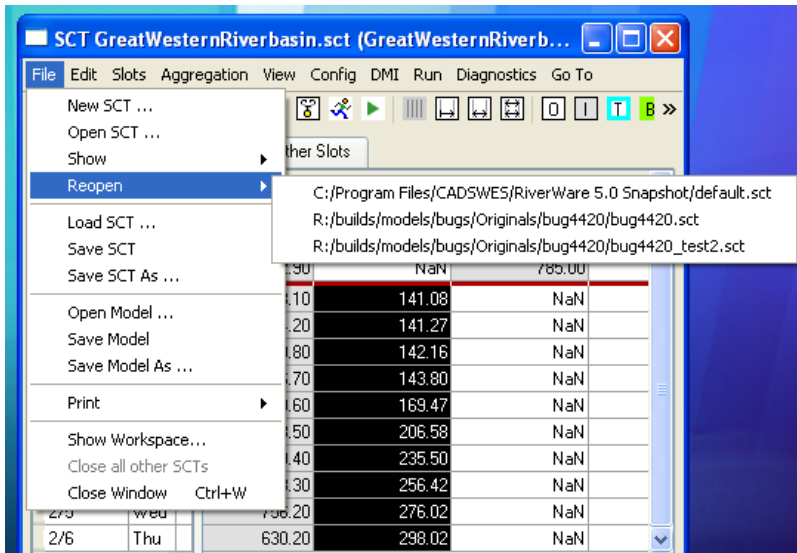
- Create a **New SCT** (an empty SCT in a new SCT window).
- **Open SCT** file using the file chooser.
- **Show** and Raise an open named SCT. Currently, this feature works only for SCTs which have been saved or loaded from an SCT File. (This is because the “Show” menu enumerates SCTs by their full file path).
- **Reopen** a recently-accessed SCT File. Up to six SCT files are remembered from one RiverWare session to the next. SCTs which are already open are excluded from the “Reopen” submenu. (Those appear instead in the “Show” menu).

The following two images show the SCT menus in the RiverWare Workspace and in the SCT file menu:



## SCT Tour

### SCT Menu Bar



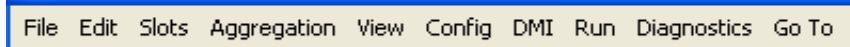
Following is an overview of the SCT and its organization. First the general areas of the SCT are discussed, then each of the tabs—Series Slots, Scalar Slots, and Other Slots—are discussed.

The SCT has the following features as shown, Title Bar, Menu Bar and Toolbar. The Title Bar displays

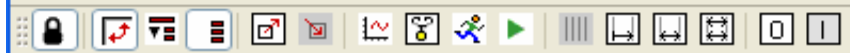
#### Window Title Bar:



#### Menu Bar:



#### Toolbar:



the name of the SCT and the model name in which it is loaded. The Menu Bar provides menu options. The Tool Bar, which is configurable, provides buttons to do common actions. The remainder of the SCT is organized by tabs, one for Series Slots, one for Scalar Slots, and one for Other Slots.

## 2.1 SCT Menu Bar

File  
 Edit  
 Slots  
 Aggregation  
 View  
 Config  
 DMI  
 Run  
 Diagnostics  
 Go To

File Edit Slots Aggregation View Config DMI Run Diagnostics Go To

### 2.1.1 File Menu

The SCT **File** menu supports the following operations:

**New SCT** lets the user create a new SCT.

**Open SCT** lets the user open an additional SCT so there is more than one SCT open for the model.

**Show** lets the user select an opened SCT and brings it to the front.

**Reopen** lets the user select a previously opened SCT and then loads it.

**Load SCT** lets users load a different **SCT** configuration file into the particular SCT. The current SCT is replaced with the loaded one.

**Save SCT** and **Save SCT As...** saves the SCT's current configuration as an SCT file. **Save SCT** is enabled only if the SCT has a name (i.e., if it was opened from an SCT file or if it is a new SCT for which a **Save SCT As...** operation has already been performed).

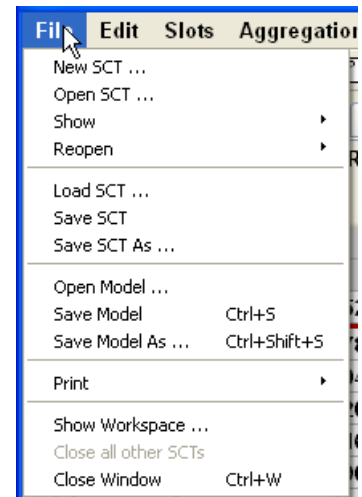
**Open Model**, **Save Model** and **Save Model As...** perform the same operations as the **Save** and **Save As...** operations in the RiverWare workspace. They neither affect the SCT nor cause the SCT configuration to be saved.

**Print** operations are described in the [How to Print](#) section.

**Show Workspace** brings the workspace to the front.

**Close all other SCTs** closes any other SCTs except the given one.

**Close Window** closes the SCT; however, this does not automatically save the SCT's configuration.



## 2.1.2 Edit Menu

Described below are the operations that the SCT **Edit** menu supports.

The behavior of the **Copy** and **Paste** operations depends on the nature of the current selection within the SCT. Read more in these sections:

[Copy a Single Value to One or Many Timesteps...](#) [Copy Multiple Values...](#) [Copy a Timeslice across all Slots...](#) [Copy a Whole Slot.](#)

This **Copy** and **Paste** operation uses the internal clipboard to store data. The **Export Copy...** and **Import Paste...** operations use the system clipboard.

The **Copy and Paste** section describes the difference between the default paste operation and paste as input.

**Export Copy...** is described in the [Copy/Paste Data to/from the Clipboard](#) section [HERE \(Section 9.10\)](#).

**Import Paste...** is described in the [Copy/Paste Data to/from the Clipboard](#) section [HERE \(Section 9.10\)](#).

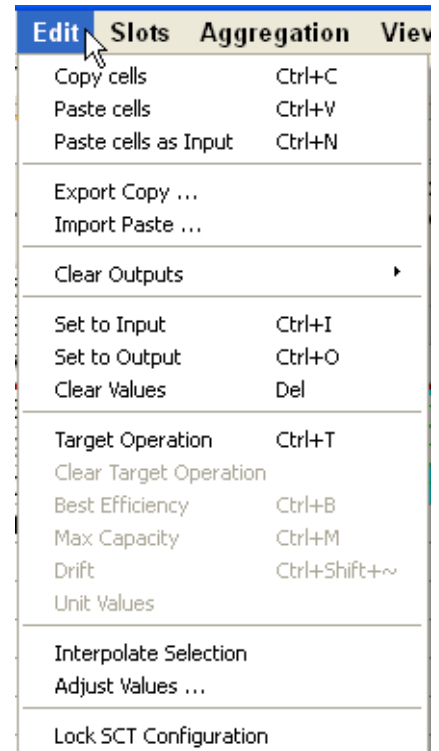
**Clear Outputs** and **Clear Values** are described in the [How to Clear Values](#) section.

The various flag setting operations are described in the [Set a Flag](#) and [Set a Target Operation](#) sections.

**Interpolate Selection** is a special function described in the [Set Multiple Values](#) section.

**Adjust Values** is a special operation described in the [Set Multiple Values](#) section.

The **Lock SCT Configuration** toggle is described in the [Lock or Unlock the SCT Configuration](#) section.



### 2.1.3 Slots Menu

The SCT **Slots** menu supports the following operations:

**Plot Slots...** is described in the [Plotting](#) section.

**Open Slots...** opens the Open Slot dialog for the selected slot(s).

**Enable Dispatching** and **Disable Dispatching** set the dispatching state of the simulation objects containing the current SCT slot selections. Slots on a simulation object with dispatching disabled are indicated with a crosshatch (**of a configurable color**) on slot labels in the row header table (in **Horizontal Timestep Axis Orientation** only).

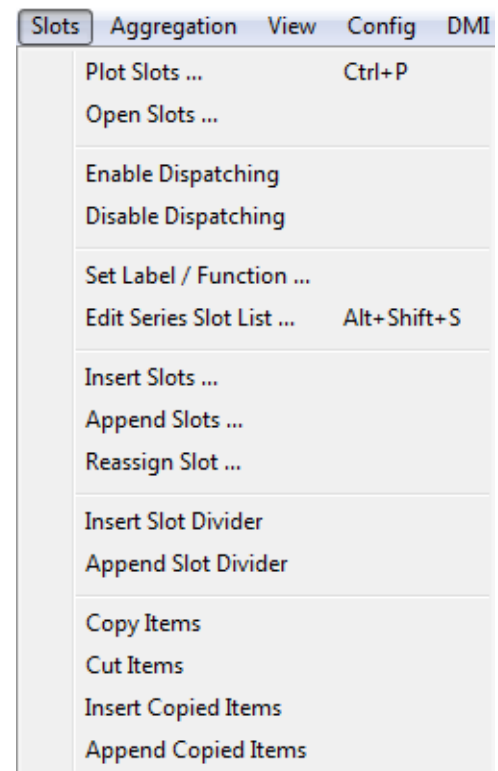
The **Set Label/Function** operation is described [HERE \(Section 4.2\)](#).

The **Edit Series Slot List** takes you to that tab.

**Insert**, **Append**, **Reassign** are described in the [How to Add Slots and Slot Dividers](#) section.

The other copy, cut, insert, and append operations are described in the [Move Slots and Slot Dividers](#) section.

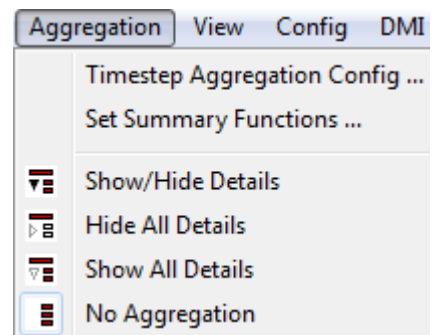
The **Cut Items** operation is described in the [Remove Slots and Slot Dividers](#) section.



### 2.1.4 Aggregation Menu

The SCT **Aggregation** menu supports the following operations:

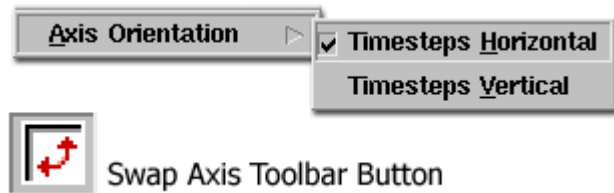
- **Timestep Aggregation Config...** shows the SCT [Timestep Aggregation Dialog](#).
- **Set Summary Functions...** shows the Set SCT Aggregation Summary Functions dialog
- The **Show/Hide Details**, **Hide All Details**, **Show All Details**, and **No Aggregation** exclusive toggle buttons select the SCT's detail mode. The first three choose the aggregated view of the currently selected **Axis Orientation** (see next item), and **No Aggregation** shows the corresponding non-aggregated view. These selections are described in the [Show or Hide \(Aggregation\) Summaries](#) and [Show or Hide Details](#) sections.



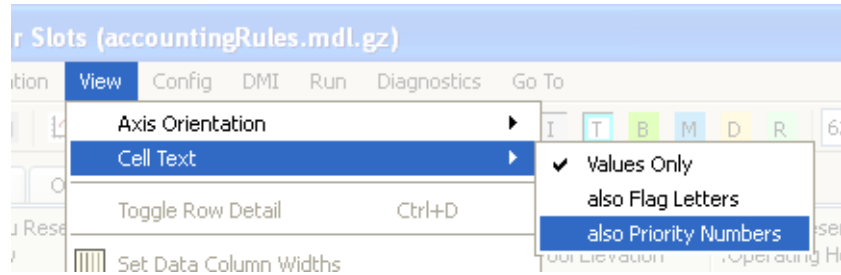
### 2.1.5 View Menu

The SCT **View** menu supports the following operations:

The **Axis Orientation** selections choose between horizontal timestep axis orientation (classic) and vertical timestep axis orientation. These are described in the [Axis Orientation](#) section.



The **Cell Text** menu allows the user to configure whether to show **Values Only**, values and flag letters (**also Flag Letters**), or values, flag letters and priority numbers (**also Priority Numbers**). Priority numbers are only relevant when using rulebased simulation. This is a temporary setting -- it is not currently saved in the SCT file.



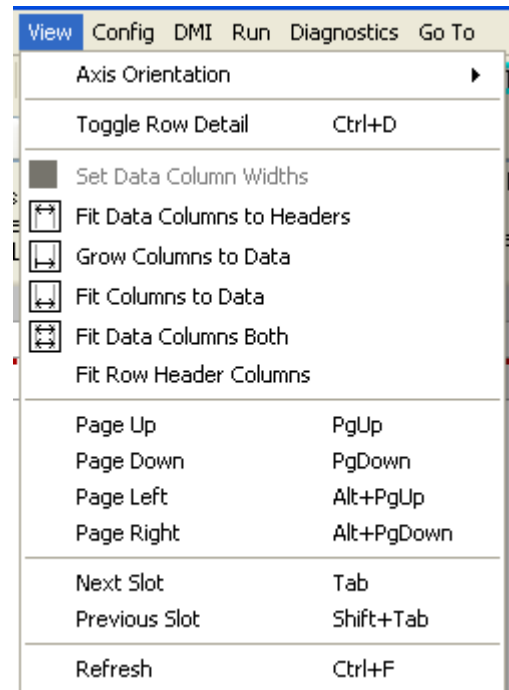
**Toggle Row Detail** is described in the [Show or Hide Details](#) section.

**Set Data Column Widths** and the various “fit column” operations are described in the [Adjust Column Widths](#) section.

The various “page” operations scroll the SCT window in the indicated direction. Although users generally will access these via the indicated keyboard accelerators, these operations are included in this menu to document their implementation.

The **Next Slot** and **Previous Slot** operations move the active cell to the next or previous Slot.

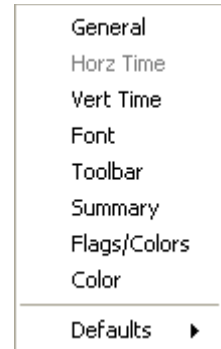
Although selecting **Refresh** shouldn't be necessary if the SCT is implemented correctly, this function is included to help users diagnose refresh problems, etc., should they occur.



## 2.1.6 Config Menu

The SCT Config Menu allows the user to access the configuration dialog. The menu choices open the configuration dialog to the specified tab. Click [HERE \(Section 3\)](#) to go to the section on the configuration dialog.

The **Defaults** operations are described in the [Use the Default Configuration](#) section.



## 2.1.7 DMI menu

The DMI menu includes all defined Input and Output DMIs and DMI Groups, along with “I”, “O”, or “G” icons. The menu has a toggle to switch between the presentation of all items in the single top-level menu (if there aren’t too many items), OR cascaded into three separate submenus. Choosing a DMI or Group item results in that item being invoked. The user can also show the DMI Manager from this menu.

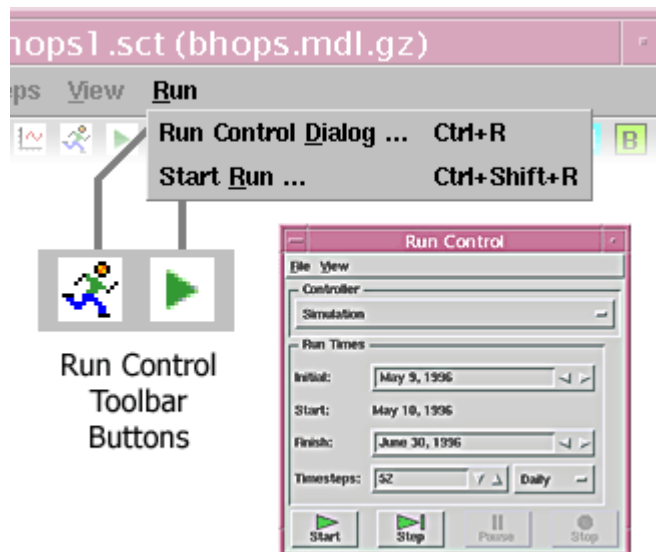
## 2.1.8 Run Menu

The SCT **Run Control** menu supports the following operations:

**Run Control Dialog...** shows the RiverWare Run Control dialog (also pictured here). The time range of the SCT is based on the time range specified in the **Run Times** section of this dialog. Read more in the [Timesteps](#) section.

**Start Run...** initiates a model run using the controller and run times indicated in the **Run Control** dialog.

**Run Analysis...** opens the Model Run Analysis tool.

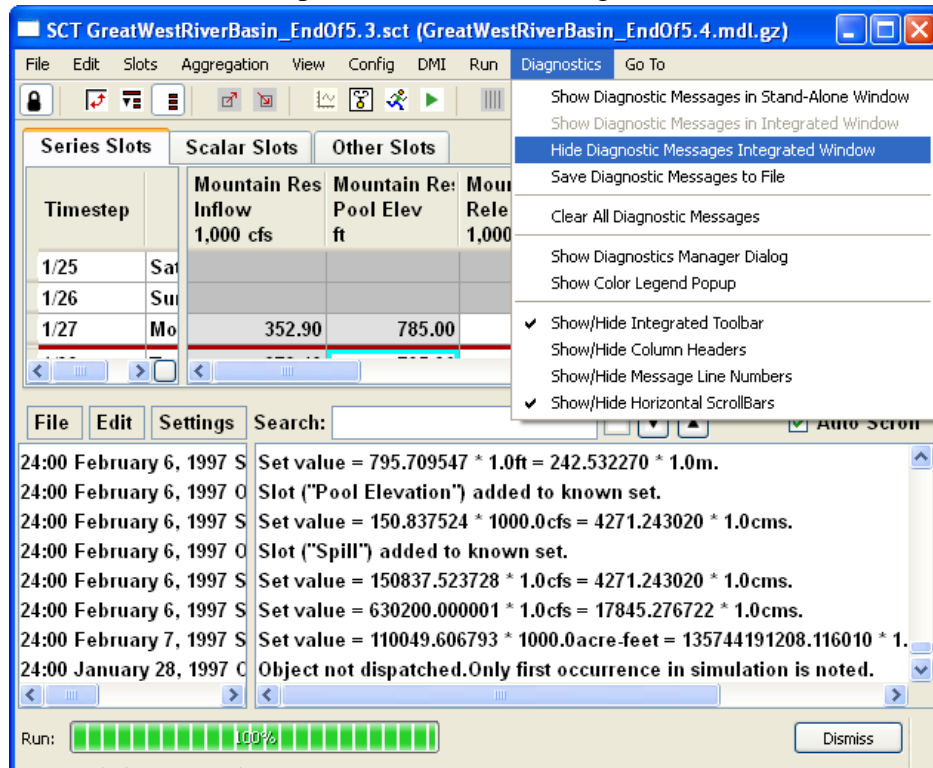


## 2.1.9 Diagnostic Menu

The Diagnostic Output window can be shown as a panel at the bottom of any single SCT or as a stand-alone window. It will appear in only one place at any given time. Diagnostics can be



“toggled” into or out of the SCT using the “stethoscope” icon in the SCT toolbar, and can also be managed from the RiverWare Workspace menu or SCT Diagnostics menu (see below).



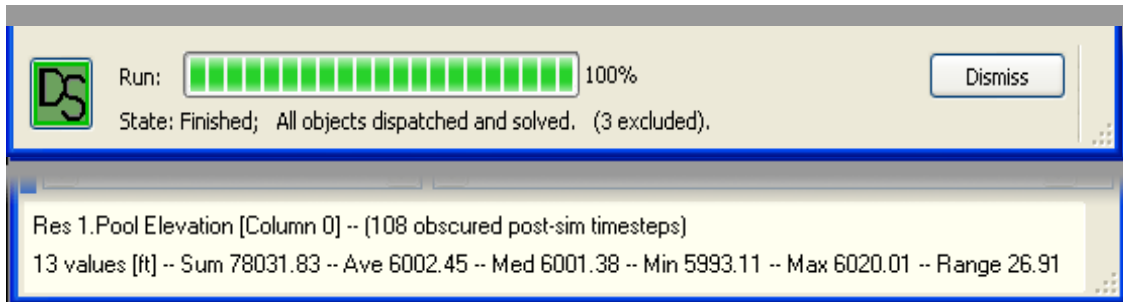
In order to reduce the amount of vertical space taken up by the Diagnostic Output panel, the user has the choice of hiding the Diagnostic Window’s integrated menu/toolbar. The menu operations in integrated menu-/toolbar are also available in the SCT’s new Diagnostics menu. The menu/toolbar is unconditionally shown when the Diagnostic Output panel is shown as a stand-alone window.



### 2.1.10 Status Area

When a Run is started, the selection status area of the SCT is replaced with the a display of the run status (if that is enabled in the SCT’s configuration). This is displayed until the user clicks somewhere in the SCT table or clicks the “Dismiss” button. Unlike the Diagnostic Output, the Run Status will simultaneously be displayed in multiple SCTs and as a stand-alone dialog. However the stand-alone

popup is not automatically raised if the Status can be displayed in an open SCT (i.e. by showing and raising any SCT which is already open).



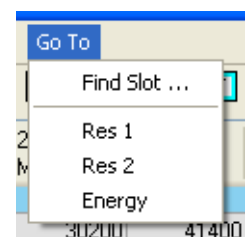
Also shown in the Run Status area is information on the dispatching of objects within the run. An icon is shown that displays the most limiting dispatching of objects within the run. Also displayed are the number of objects that meet the most limiting condition.

Clicking on the icon takes the user to the Model Run Analysis tool [HERE \(ModelRunAnalysis, Section 1\)](#) with the first relevant object at the earliest timestep highlighted. When the user shift-clicks on the icon, a dialog is shown with a summary of the run analysis. Listed are the objects and numbers of objects that have dispatched, dispatched but not solved, and those that have not dispatched.



### 2.1.11 Go To Menu

The SCT “Go To” menu allows the user to go to certain locations in the SCT. This can be useful when an SCT has a large number of slots that do not fit on a single screen. The Find Slot option allows the user to enter a slot name (including wildcards) and the SCT will search for that name. The other options in the Go To menu will take the user to any of the Slot Dividers in the SCT which are referenced by name. The slot dividers names are either a unique label (set using the [Slots ➔ Set Label / Function...](#) menu when the divider is selected) or using the default name which is the slot just to the right of or below the divider.



## 3. SCT Configuration Settings

Most of the properties associated with an SCT are controlled through the **SCT Configuration** dialog, which users can access from the **Config** menu. All options will open the configuration dialog but depending on the menu selected, the appropriate tab will be enabled.

The various properties this dialog supports are described in sections corresponding to each of the tabbed pages (click on an item to go to that section):

[General...](#) [Horizontal Time...](#) [Vertical Time...](#) [Font...](#) [Toolbar...](#) [Summary...](#) [Flags...](#) [Color](#)

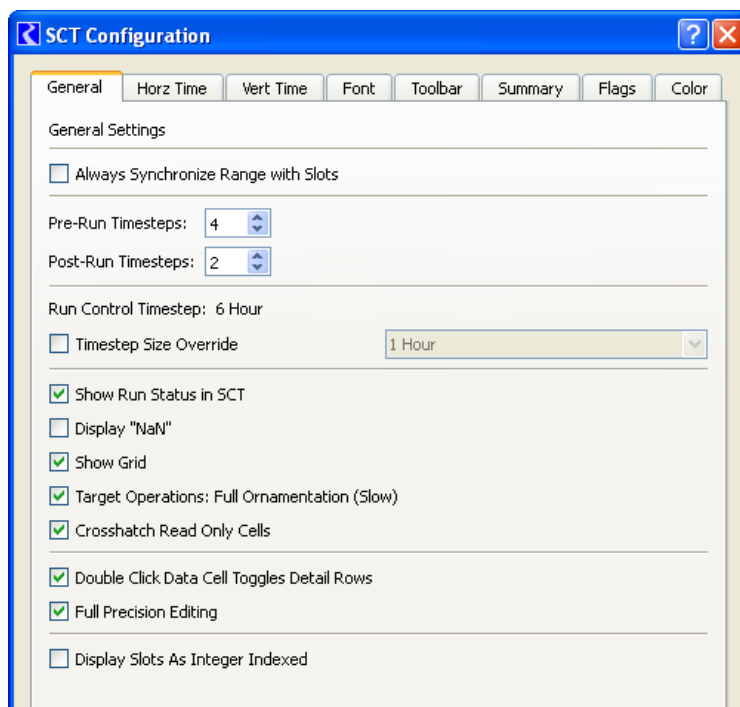
### 3.1 General Tab

Users can display the **SCT Configuration** dialog by accessing the SCT Config ➔ General.

The **Always Synchronize Range with Slots** option disables user specified timestep settings in the SCT. The SCT timesteps will be the same as the timesteps of the slots shown in the SCT.

The **Pre-Run Timesteps** and **Post-Run Timesteps** integer spinner values are used in the determination of the SCT's time range. The indicated timesteps number is added to the RiverWare model's **Run Control** time range. Read more about this operation in the [Timesteps](#) section.

The **Timestep Size Override** lets the user configure the timestep to use for the given SCT. It also presents the Run Control Timestep.



The various display options in the middle area of the **SCT Configuration** dialog are described in the [Change Ornamentations](#) section.

The **Double Click Data Cell Toggles Detail Rows** setting determines the behavior of double clicking in the SCT data table. Turning this option on replaces the default behavior of double clicking (i.e., initiating an in-cell modification-edit) with an open/close details operation. Although the latter functionality is relevant only for the aggregated views, for consistency the disabling of edit initiation is applied to the non-aggregated views anyway. Read more in the [Show or Hide Details](#) and [Set Single Value](#) sections.

### 3.2 Horizontal Time Tab

Users can display the **SCT Configuration** dialog by accessing the SCT Config ➔ Horz Time.

These settings affect the appearance of only the horizontal timestep axis orientation views. The SCT supports optional automatic divider rows and columns for days and years. Each of these four types of time dividers can be independently enabled or disabled, and can be shown with independently configurable colors.

The following sections include explanations of these settings:

- [Configure Row and Column Headers](#)
- [Change Ornamentations](#)

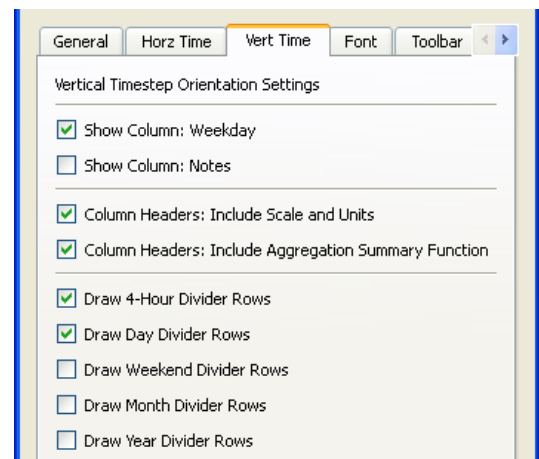
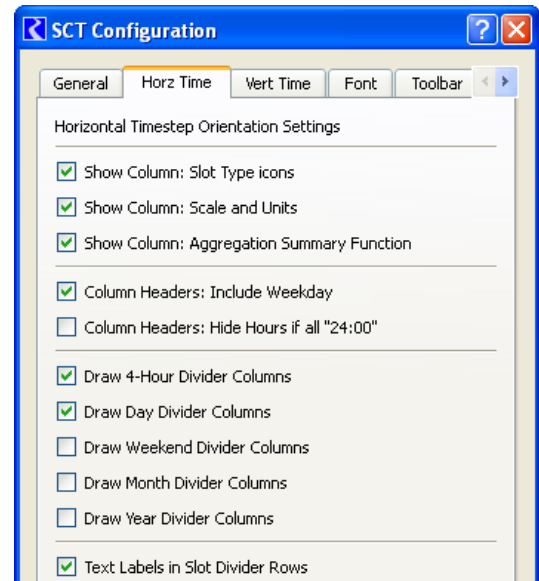
### 3.3 Vertical Time Tab

Users can display the **SCT Configuration** dialog by accessing the SCT Config ➔ Vert Time.

These settings affect the appearance of only the vertical timestep axis orientation views. On this tab, you can specify whether to see a column containing the Weekday (i.e. Sunday, Monday, etc) and/or a column containing Notes. Showing Notes on the SCT is further described [HERE \(Section 4.4\)](#).

The following sections include explanations of the remaining settings:

- [Configure Row and Column Headers](#)
- [Change Ornamentations](#)



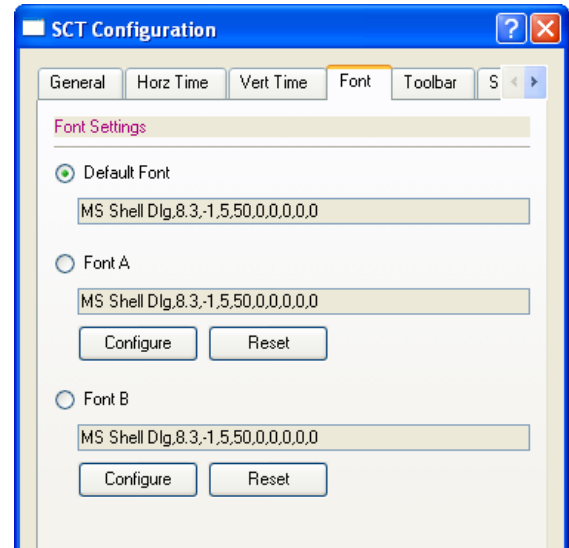
### 3.4 User Settable Fonts

Users can display the **SCT Configuration** dialog by accessing the SCT Config ➔ Font.

The user can choose the SCT's font. Only one font can be displayed at any given time, and that font is used for both screen display and printing.

Two custom font specifications can be saved with each SCT, and with the default SCT configuration. The user can choose to use either of those two custom font specification, or the default font.

To choose between those three options (Default Font, Font A and Font B), and to configure the font specification for the latter two options, open up the SCT Configuration dialog box by selecting the **View ➔ SCT Configuration...** menu item, and click on the "Font" tab. (See image to the right).



Click one of the three radio buttons to indicate the font specification to be used by the SCT.

Click either of the "Configure" buttons to change the corresponding custom font specification. This brings up a font selector which allows the user to select a different font face (font family), font size, font weight (e.g. normal or bold), and other font properties.

Click either of the "Reset" buttons associated with either the Font A or Font B item to restore that font specification to the default font. Applying a font specification to the SCT (with either the "OK" or "Apply" button) may take a moment to complete since the SCT's geometry needs to be readjusted.

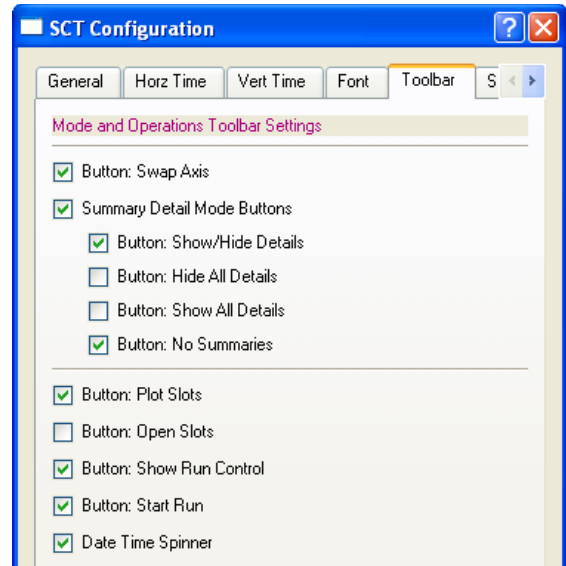
### 3.5 Toolbar Tab

Users can display the **SCT Configuration** dialog by accessing the SCT Config ➔ Toolbar.

These settings determine whether individual toolbar buttons display in the **SCT Toolbar**.

The operations associated with each of the configurable toolbar buttons are also represented in the **SCT menus**.

To display the flag setting buttons within the SCT toolbar, users need to set this through the **Flags Tab** rather than through the **Toolbar** tab.



### 3.6 Summary Tab

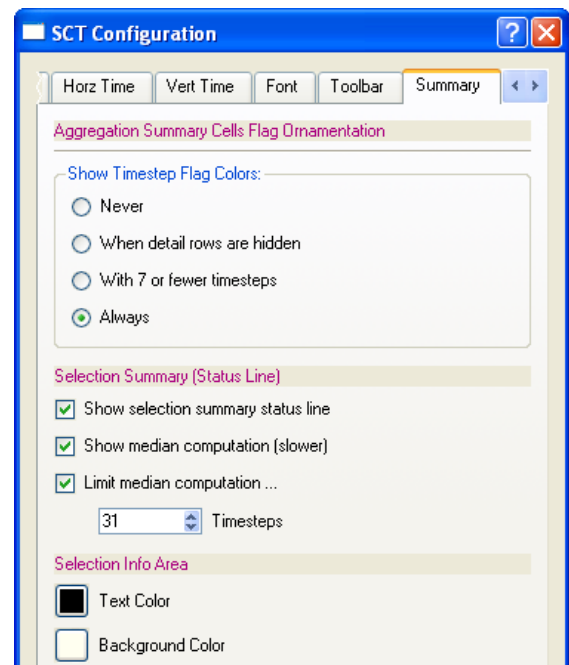
Users can display the **SCT Configuration** dialog by accessing the SCT Config ➔ Summary.

The settings on this tabbed pane were introduced mainly to experiment with ways of speeding up screen refreshes in very large models or in SCT configurations using a large aggregation (relative to the model timestep).

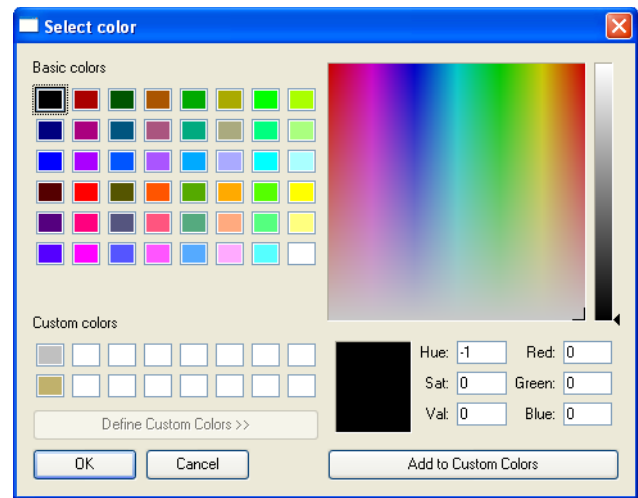
With typically sized models and aggregations, the benefit of disabling full functionality seems not to be significant.

The **Show Timestep Flag Colors** options are described in the **Change Ornamentations** section.

The **Selection Summary (Status Line)** options disable or limit the second status line displayed at the bottom of the SCT. The three components are used for limiting the median computation, which is the only statistic that requires a set of values to be sorted.



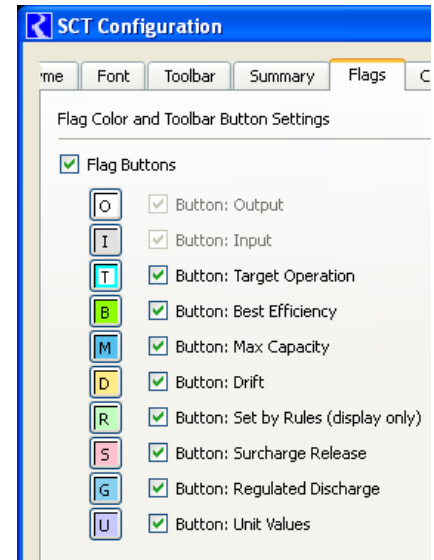
The user can configure the colors for the Background and the Text displayed in the Area at the bottom of the SCT. See image to the right. Pressing either of these buttons brings up a Color Chooser:



### 3.7 Flags Tab

The **Flags** tab is used for two distinct types of settings related to the support of slot timestep flags in the SCT.

1. The various checkbox controls are used to determine the presence of the flag toolbar buttons in the **SCT Toolbar**. If the **Flag Buttons** toggle is on, the **Input** and **Output** flag toolbar buttons are displayed unconditionally. The other flags can be toggled on and off as desired.
2. The colored buttons on the **Flags** tab illustrate the appearance of the flag toolbar buttons. Clicking on the colored buttons brings up a color chooser, allowing users to select a different color for that flag.

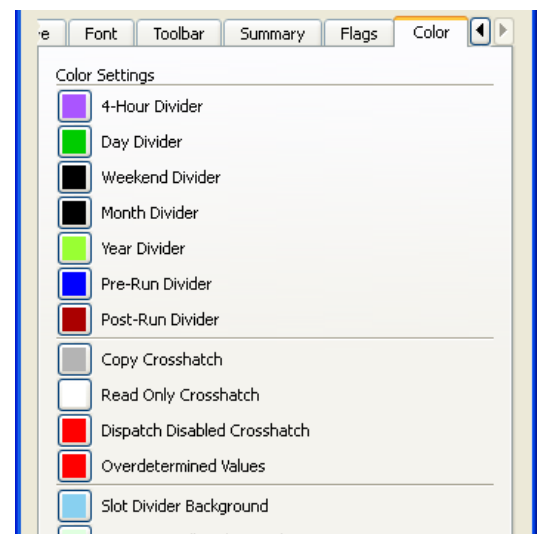


### 3.8 Color Tab

The **Color** settings tab lets users configure colors used in the SCT (other than flag colors that are set on the **Flags Tab**).

For an explanation of these settings, refer to the following sections:

- [Change Ornamentations](#)
- [Change Colors](#)



## 4. Series Slots Tab

Series data is represented in “spreadsheet” view on the Series Slots tab of the SCT. The conventional SCT displays spreadsheet like data showing series data for Series Slots and Table Series Slots. This table supports swappable axis (slots vs. timesteps) and optional timestep aggregation. The following screenshot shows the areas of the **Series Slots** tab. Row Headers and Column Headers provide the slot label, units, aggregation information, and timestep information. Columns and rows are swappable so this information is displayed differently depending on the orientation.

At the bottom of the SCT is the Selection Info Area also called the Summary area. This displays information on the selected cells in the SCT including the name or number of slots and then statistics on the selection. Statistics include Sum, Average, Median, Min, Max, Range, and Difference. All, some or none of these may be shown depending on the number of cells selected and the units of those cells. Following is a screenshot displaying the areas of the Series Slots tab of the SCT.

**Row Header Table :**

Slot Label	Units
Lake Mead Hoover Dam	
▼ Hoover Energy	1000 MWH
Mon 24:00	1000 MWH
Tue 24:00	1000 MWH
Wed 24:00	1000 MWH
Thu 24:00	1000 MWH
Fri 24:00	1000 MWH
Sat 24:00	1000 MWH
Sun 24:00	1000 MWH
▶ Hoover Evaporation	1000 m3
Lake Havasu Parker Dar	

**SCT Data Table / Column Headers :**

	5/12 24:00 Sun	5/19 24:00 Sun	5/26 24:00 Sun	6/2 24:00 Sun
Lake Mead Hoover Dam				
Hoover Energy	128.42	125.19	118.87	120.76
Mon 24:00	21.20	19.30	16.98	16.98
Tue 24:00	17.97	19.30	16.98	16.97
Wed 24:00	22.11	19.30	16.98	16.97
Thu 24:00	21.43	19.29	16.98	16.97
Fri 24:00	21.31	19.29	16.98	16.97
Sat 24:00	12.20	14.35	16.98	17.95
Sun 24:00	12.20	14.36	16.98	17.95
Hoover Evaporation	2836.92	2832.53	2828.78	2824.54
Lake Havasu Parker Dar				

**Selection Info Area :**

LakeMeadHooverDam.Energy [Column 0] [@ 5/14 24:00]  
1 value [1000 MWH] -- Value 19.30

### 4.1 Slots and Slot Dividers

Either rows or columns (depending on the current **axis orientation**) correspond to RiverWare slots and slot dividers.

RiverWare slots are identified with a **fully qualified name** (including the name of the simulation object, account, or other entity the slot is on) and an optional column number with which the SCT attempts to match up an actual slot in the currently loaded RiverWare model. SCT slot items for which

a match cannot be found are indicated as disabled—no data is shown, and users can not provide data for such slots. Properties associated with slot items (within the SCT configuration) include:

1. Single-line Slot Text Label (used when slots are shown as rows).
2. Multiple-line Slot Text Label (used when slots are shown as columns).
3. Slot Column Width (in pixels) (used when slots are shown as columns).
4. **Summary Function** for computing the value shown for aggregates of timesteps within the particular slot.

**Slot Dividers** are rows or columns (depending on the current **axis orientation**) that users can place between (or above the first or after the last) slot row or column. The user can **choose one particular background fill color** for all slot dividers.

1. When slot dividers display as rows, they are tall enough for a line of text. In this orientation, users can place text in the **Slot Label** field of the slot divider (row). When the SCT is unlocked, users can edit slot divider row text by double-clicking in that field.
2. When slot dividers display as columns, they are drawn as thick lines. In this orientation, users cannot place text within the slot divider (columns).

In the next two graphics, listed below, slot dividers display as bright blue. Each graphic shows two slot dividers:

- **Picture: Vertical Timestep Axis Orientation** (slots and slot dividers are columns)
- **Picture: Horizontal Timestep Axis Orientation** (slots and slot dividers are rows)

How To:

- **Add or Remove Slots and Slot Dividers**
- **Move Slots and Slot Dividers**

## 4.2 Slot Names and Slot Labels

**Slot Names** are what RiverWare uses to refer to a particular slot symbolically. Generally, the slot name includes the simulation object or account that the slot is on. Users cannot change a slot's name within the SCT. (In general, slots cannot be renamed. One exception is slots defined on a data object.) In the SCT, users do not enter a slot name (text) to refer to a slot. Instead, slots are picked using one of two different slot selectors. **Read more about Adding Slots and Slot Dividers to the SCT.**

**Slot Labels** are arbitrary text strings that users can use to label a slot within a particular SCT. Two slot labels text strings are associated with a slot item: (1) a single-line text string for use when slots are shown as rows, and (2) a (potentially) multiple-line text string for use when slots are shown as columns. In the horizontal timestep axis orientation (where slots are rows), if the SCT is unlocked, users can edit a slot label in-line. In either orientation, users can edit a slot label by selecting the slot (e.g., by

selecting a data cell within the slot) and by choosing the SCT menu operation: **Slots** ➤ **Set Label / Function...** (Again, the SCT must be unlocked).

**Slot Labels** are always visible within the SCT as either row or column headers. If the current SCT selection includes only a single slot, the name for a slot displays in the **Selection Info** area (at the bottom of the SCT).

In these **two examples**, one slot is selected (by virtue of one of its timesteps being selected).

1. Its **Slot Label** is **Hoover Energy**.
2. Its **Slot Name** is **LakeMeadHooverDam.Energy** (see bottom of SCT).

### 4.3 Numeric Values

Although numeric slot (time series) values are stored internally as double-precision floating point numbers, values are presented in the SCT (and elsewhere in the RiverWare user interface) with a display precision set on each slot. Display precision is a non-negative integer that specifies the number of fractional decimal digits (to which the internal value is rounded). The SCT uses a slot's display precision for all data cells. Currently, the SCT does not provide the ability to alter a slot's display precision value. (A slot's display precision can be changed in the slot's **Open Slot** dialog).

The values displayed in a slot are in the units configured by the user, i.e. user units. The SCT does not provide the ability to change user units of slots. (These can, however, be changed in the slot's **Open Slot** dialog).

If users select a single value, it is redundantly displayed with model precision in the **Toolbar Value Edit** field, where it can also be edited. Model precision is not necessarily the full precision of the internal value (which may be represented in units that differ from the user units). Model precision is defined as having six (6) fractional decimal digits (and expressed in user units).

Slot values can be in an undefined state. Depending on an SCT Configuration, undefined values can be displayed as "NaN" (which stands for "Not a Number") or as blanks (**General Tab**).

---

**Note: Show Commas in Numbers** - In the SCT, commas are shown by default as a thousands separator. This is a global setting that is specified from the **Workspace** ➤ **Show Commas in Numbers** menu on the workspace. More information is provided [HERE \(Workspace.pdf, Section 5.7\)](#).

---

### 4.4 Notes on Series

The SCT supports timestep annotations on the Series Slots tab. Operations on Notes are performed via the right-click context menu -- with the same operations as those available in the Open Slot dialog. Additional information on notes can be found [HERE \(Slots.pdf, Section 5\)](#).

If a single SCT cell is selected, the note text associated with that cell are displayed in the SCT's selection status bar, at the bottom of the SCT. As with the series data shown in an SCT, the notes are associated with the SeriesSlots shown in the SCT, and not with the SCT itself.

Timestep	Notes column	Muddy Reservoir .Outflow cfs	Gage Above Bartlet .Gage Outflow cfs	Bartlett Reservoir .Outflow cfs	IC Delivery .Gage Inflow cfs	
12/31/95	Sun	19.95	32.29	41.83	35.49	
1/1/96	Mon	16.93	29.28	38.81	32.47	
1/2/96	Tue	15.77	28.11	37.64	31.31	
1/3/96	Wed	21.29	33.63	43.17	36.83	
1/4/96	Thu	24.61	36.96	46.49	40.16	
1/5/96	Fri	House Pets	51.68	31.09	40.63	34.29
1/6/96	Sat	House Pets	44.93	54.58	44.11	37.78
1/7/96	Sun	House Pets	42.00	48.50	58.03	41.69
1/8/96	Mon	House Pets	42.45	44.61	54.15	57.81
1/9/96	Tue	Kayak Races; House Pets	42.90	42.31	51.84	45.51
1/10/96	Wed	House Pets	39.18	51.53	61.06	44.73
1/11/96	Thu	Conserve	34.57	44.92	56.45	40.12
1/12/96	Fri			31	51.84	45.51
1/13/96	Sat			09	42.62	36.29

Muddy Reservoir.Outflow [@ 1/11/96] -- Volume: 2.98724428  
1 value: 34.57 [cfs] -- Conserve

When the SCT is in the Non-Aggregated Vertical Timestep view (shown above), the text for all of the notes in each timestep row can be shown in a row header column, depending on the setting on the “Vert Time” tab of the SCT configuration as described [HERE \(Section 3.3\)](#).

## 4.5 Timesteps

The SCT supports series slots (including **Agg Series Slots** and **Table Series Slots**). These represent time series data—an array of values representing measurements of one particular quantity at approximately equally spaced time intervals. (Technically, however, although monthly timesteps are not equally spaced, these are also supported.)

An SCT can be configured to show a timestep interval matching the RiverWare Model’s **Run Control** or any other timestep supported in RiverWare. This feature is configured using a “SCT Timestep Size Override property” which is configured on the General tab of the SCT configuration dialog.

In addition, the timestep range of slots in an SCT do not have to match **Run Control**: SCT cells corresponding to a timestep on a slot that is out of that slot’s defined range display merely as blank. (The timestep range of slots in an SCT is the contiguous range of timesteps for which values are defined on a particular slot defined by the slot’s begin time and end time.) A slot’s timestep range automatically extends when users enter a numeric value in a data cell that is out of that slot’s timestep range.

Conversely, the displayed timestep range of the SCT—the model’s current run control timestep range plus the indicated number of pre-simulation and post-simulation timesteps—may not cover the complete timestep range of slots displayed in the SCT. When this occurs, a special ornamentation (an upper-left or lower-right corner triangle) on the slot’s first and/or last cells indicate the presence of obscured (hidden) timestep values for that slot. **Read about How to Display Obscured Pre- and Post-Simulation Timesteps.**

Within the SCT, timesteps are generally laid out in the opposite axis as slots. The only exception to this is the **Aggregated View** (see next section) in **Horizontal Timestep Axis Orientation**, where timesteps within a single aggregation are laid out vertically but the overall arrangement of timesteps is horizontal.

## 4.6 Timestep Aggregation

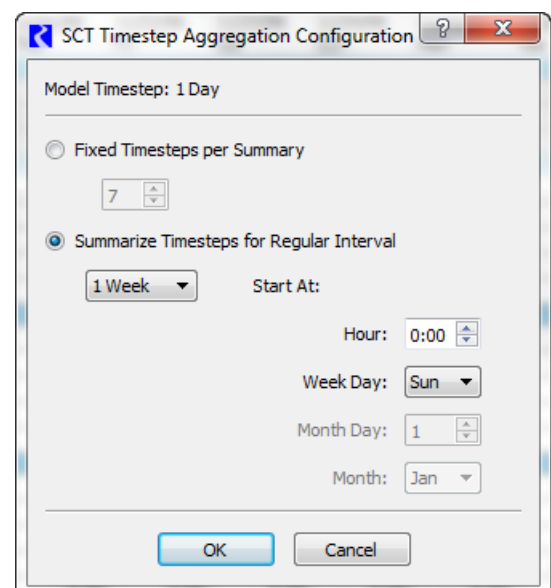
For display (and certain data export) purposes only, groups of **timesteps** within each Slot can be aggregated and summarized as single numeric values within an SCT. Aggregation is done by choosing an aggregation interval size larger than the timestep interval size—for example, a weekly aggregation of a daily timestep model. It’s also possible to select a constant number of timesteps for each aggregation.

When in an **Aggregated View**, each slot displays only the summary cells.

To set the number of timesteps displayed as a single value (e.g., as the Sum or Average of the aggregated timesteps) for aggregations, access the **SCT Timestep Aggregation Configuration** dialog using the **Aggregation** ➔ **Timestep Aggregation Config...** menu.

Within the dialog choose either:

- **Fixed Timesteps Per Summary:** A specified constant number of timesteps is used for each aggregation. Aggregations start with the first timestep displayed in the SCT.



- **Summarize Timesteps for Regular Interval:** A specified interval of time with a start offset is used. You select the aggregation interval size—which must be larger than the timestep interval size—and **Start At:** (offset) settings. The accompanying graphic shows a weekly aggregation starting on Sunday at 0:00. This indicates it will summarize the following 7 days (daily timestep model) Monday to Sunday.

With interval aggregation, the number of timesteps per aggregation can vary for the following reasons:

- Monthly aggregations will have various numbers of timesteps. Other irregular relationships between aggregation and timestep intervals are also possible.
- The first aggregation will have fewer timesteps if the first timestep displayed in the SCT isn't at the beginning of a regular interval aggregation (with respect to the selected offset).
- The last aggregation will have fewer timesteps if the last timestep displayed in the SCT does not fall at the end of a regular interval aggregation (with respect to the selected offset).

The SCT supports both non-aggregated and aggregated views. In non-aggregated views, every data cell displays the value of exactly one timestep (of one slot). Aggregated views have two types of data cells: **Detail** cells and (aggregation) **Summary** cells. (See the next section.)

#### 4.6.1 Detail Cells and (Aggregation) Summary Cells

Aggregated SCT views (see [Timestep Aggregation](#)) display two types of data cells:

1. **Detail** cells display the value of exactly one timestep (of one slot), as do all cells in non-aggregated views.
2. **Summary** cells display the result of a particular **Summary Function** on the timesteps that make up a single timestep aggregation (on one slot).

In both **axis orientations**, summary cells and detail cells have the same relative arrangement: an aggregation's detail cells (showing each of the individual timesteps within the aggregation) are laid out immediately below the aggregation's single summary cell. Also, the two types of cells are laid out in rows—i.e., **Summary Rows** and **Detail Rows**—though the correspondence of those rows to the same slots versus the same timesteps differs in the two axis orientations.

In the aggregated views, summaries are always displayed while detail cells can be displayed or hidden. The non-aggregated views display only details without summaries.

#### 4.6.2 Summary Functions

You can select a **Summary Function** for slots in the model based on the unit type, slot name or individually for each slot in an SCT. Once configured, this selection is part of the **SCT Configuration** (i.e., not stored with the slot in the RiverWare model). The function is applied to the set of timesteps within each **timestep aggregation** and displayed in a **Summary cell**.

The following **Summary Functions** are supported:

- **1st**

- **Last**
- **Sum**
- **Ave**: Mean
- **Med**: Median, Since **Median** requires a sorting of values, this can slow down the speed of SCT refreshes. If there is an even number of non-**NaN** values, the **Median** is defined as the average of the middle two values.
- **Min**: Minimum
- **Max**: Maximum
- **Nth** (particular 'n'—e.g., 5th)

For the arithmetic functions, undefined values (NaNs) are ignored.

How To:

- **Change a Slot's Summary Function**

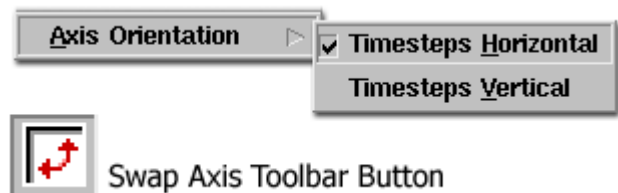
## 4.7 Axis Orientation

Users can swap the two SCT axes by clicking on the **Swap Axis Toolbar Button**. (See graphic.)

Also, users can select the axis orientation by clicking on the **View** ➔ **Axis Orientation** menu radio buttons. The two axes are slot items (**Slots and Slot Dividers**) and time (**TimeSteps**).

Users can display both axis orientations as

**Aggregated** or **Non-Aggregated** views. (See **TimeStep Aggregation**). The axis orientations are referred to in the user interface and in SCT documentation as:



### 4.7.1 Vertical Timestep Axis Orientation

- Slots are Columns
- Timesteps or Timestep Aggregate Summaries are Rows

SCT bhops1.sct (bhops.mdl.gz)							
File Edit Slots TimeSteps View Run							
19.298461 1000 MWH O I T B M D R							
Timestep	Hoover .Energy 1000 MWH	Hoover .Evaporation 1000 m3	Parker .Diversion cms	Parker .Energy 1000 MWH	Parker .Evaporation 1000 m3	Park .Info cfs	
▶ 5/12 24:00 Sun	126.42	2836.92	137.90	1.81	3920.88	184	
▼ 5/19 24:00 Sun	125.19	2832.53	137.90	1.80	9802.89	186	
5/13 24:00 Mon	19.30	2836.68	137.90	1.84	965.70	177	
5/14 24:00 Tue	19.30	2835.76	137.90	1.80	1370.36	181	
5/15 24:00 Wed	19.30	2834.84	137.90	1.61	1964.66	186	
5/16 24:00 Thu	19.29	2833.92	137.90	1.42	1373.55	186	
5/17 24:00 Fri	19.29	2833.00	137.90	1.68	1376.91	186	
5/18 24:00 Sat	14.35	2832.53	137.90	1.81	1376.61	186	
5/19 24:00 Sun	14.36	2832.53	137.90	1.80	1375.10	186	
▶ 5/26 24:00 Sun	118.87	2828.78	137.90	1.62	9613.23	170	

LakeMeadHooverDam.Energy [Column 0]

### 4.7.2 Horizontal Timestep Axis Orientation

- Slots are Rows (or groups of Rows)
- Timesteps or Timestep Aggregates are Columns

#### Aggregated Horizontal Timestep Axis Orientation

is the classic view supported by the original SCT. This is also the most complicated view because (1) overall, timesteps increase to the right (horizontally); (2) however, within a single timestep aggregation (for a set of rows of **detail cells** corresponding to a single slot), timesteps increase downward (vertically).

The screenshot shows the SCT software interface with a table of data. The table has columns for dates and times (5/12 24:00 Sun, 5/19 24:00 Sun, 5/26 24:00 Sun, 6/2 24:00 Sun) and rows for different slots. The 'Hoover Energy' slot is expanded to show detailed data for each day of the week.

Slot Label	Units	5/12 24:00 Sun	5/19 24:00 Sun	5/26 24:00 Sun	6/2 24:00 Sun
Lake Mead Hoover Dam					
Hoover Energy	1000 MWH	128.42	125.19	118.87	120.76
Mon 24:00	1000 MWH	21.20	19.30	16.99	16.98
Tue 24:00	1000 MWH	17.97	19.30	16.98	16.97
Wed 24:00	1000 MWH	22.11	19.30	16.98	16.97
Thu 24:00	1000 MWH	21.43	19.29	16.98	16.97
Fri 24:00	1000 MWH	21.31	19.29	16.98	16.97
Sat 24:00	1000 MWH	12.20	14.35	16.98	17.95
Sun 24:00	1000 MWH	12.20	14.36	16.98	17.95
Hoover Evaporation	1000 m3	2836.92	2832.53	2828.78	2824.54
Lake Havasu Parker Dar					

At the bottom of the screenshot, a status bar shows: LakeMeadHooverDam.Energy [Column 0] [@ 5/14 24:00] 1 value [1000 MWH] -- Value 19.30

### 4.8 Slot Selection

There are two distinct, unrelated ideas of slot selection relative to the SCT.

When users want to **add Slots** that exist in the currently loaded RiverWare model to the SCT, they select such slots via one of the **Slot Selector** dialog boxes. [Read more about Adding Slots and Slot Dividers to the SCT.](#)

Once a slot is represented within the SCT, users will select certain data cells within the slot, or the whole slot row or column, to perform operations on the Slot, such as setting values or flags. This is the more usual way of selecting a slot in the SCT. For users' purpose of referring to a slot in the context of some operation, selecting any number of cells within the slot is sufficient. [Read more about Slot operations in the SCT Slots menu.](#)

### 4.9 Copy and Paste

There are essentially three types of Copy and Paste that can be done to an SCT as described in the following section. See also the "How To" section:

- [Copy a Single Value to Many Timesteps](#)
- [Copy Multiple Values](#)
- [Copy a Timeslice across all Slots](#)
- [Copy a Whole Slot](#)

### 4.9.1 Copy and Paste

The default Copy operation (Ctrl-C) copies the selected cell's values to the **INTERNAL** RiverWare SCT clipboard (i.e. it is available only to the SCT not elsewhere in RiverWare or other applications). The copy action is only available for selection within a single slot or across one or more entire timesteps. The default paste operation (Ctrl-V) (and the **Paste** toolbar button) pastes only **Input** semantics values into the current selection. Values computed as a result of a model run are not pasted. Specifically:

- Input flagged values are pasted to the destination timesteps with the **Input Flag**.
- The final timestep value of a **Target Operation** is copied to the destination with the **Target Flag**, and the **Begin Target** is pasted if an explicit **Begin Target** timestep was defined (but only if the entire **Target Operation** was included in the copied selection).
- **Best Efficiency (B)**, **Max Capacity (M)**, **Drift (D)** and **Unit Values (U)** flagged timesteps in the copied (source) selection are pasted as undefined (NaN) values in the destination timesteps but with the source flag.
- Other timesteps are cleared—that is, set to NaN with an **Output Flag**.

### 4.9.2 Copy and Paste as Input

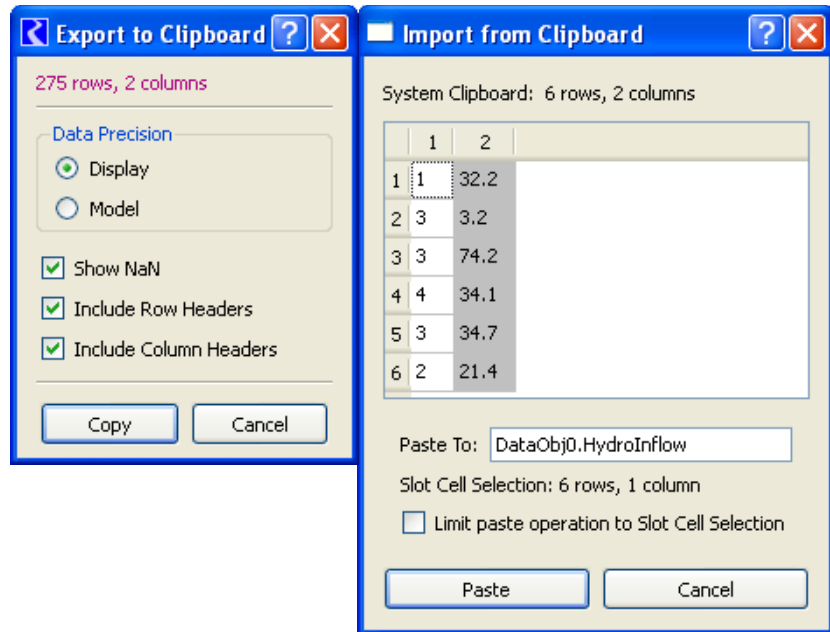
The default Copy operation (Ctrl-C) copies the selected cell's values to the **INTERNAL** RiverWare SCT clipboard (i.e. it is available only to the SCT not elsewhere in RiverWare or other applications). The copy action is only available for selection within a single slot or across one or more entire timesteps. The **Edit ➔ Paste as Input** (Ctrl-N) operation pastes all defined (non-NaN) values from the copied (source) selection to the destination timesteps, assigning the **Input Flag** to those values. Undefined (**NaN**) values from the copied (source) selection are pasted as **NaN / Output Flagged** values in the destination timesteps.

### 4.9.3 Export Copy and Import Paste

The **Export Copy...** operation copies the selected cell's values to the **SYSTEM** clipboard (i.e. it is available for any other application and within RiverWare where an Import Paste is supported). Then the **Edit ➔ Import Paste...** operation pastes all defined (non-NaN) values. Both operations provide the user with a dialog (shown to the right) that gives options on what to export/import.

Also, more information on using Export Copy and Import Paste is provided in the "How To" section:

- [Copy/Paste Data to/from the Clipboard HERE \(Section 9.10\)](#)



### 4.10 Integer Indexed SCT's

Up to this point, we have presented the SCT and assumed that the user is always displaying timeseries data. It is also possible to display integer indexed slots. Click [HERE \(Slots.pdf, Section 3.4\)](#) for more information on Integer Indexed Series Slots. ASCT can show integer indexed slots, but because a SCT must have the same timestep size for all slots displayed, it cannot also show time indexed slot. As a result, the user is prohibited from adding integer indexed slots to a SCT that already has time indexed slots and vice versa. When a SCT is created, if the user adds an integer indexed slot, that SCT becomes fixed using integer indices. An Integer Indexed SCT is slightly different than a normal SCT because certain operations are not allowed. The following describes the differences that the user sees when an SCT is displaying integer indexed series

- SCT dialog - The following controls are disabled as they are not valid:
  - **Aggregation ➔ Aggregation Config**
  - **Aggregation ➔ Show/Hide Details**
  - **Aggregation ➔ Hide All Details**
  - **Aggregation ➔ Show All Details**
  - **Aggregation ➔ No Aggregation**
  - **Config ➔ Save Current Settings as Default**
- SCT dialog - The following controls are relabelled to better indicate the operations
  - **View ➔ Axis Orientation ➔ Timesteps Vertical** becomes **Indices Vertical**
  - **View ➔ Axis Orientation ➔ Timesteps Horizontal** becomes **Indices Horizontal**
- SCT Configuration dialog - **General Tab**: Options have been disabled

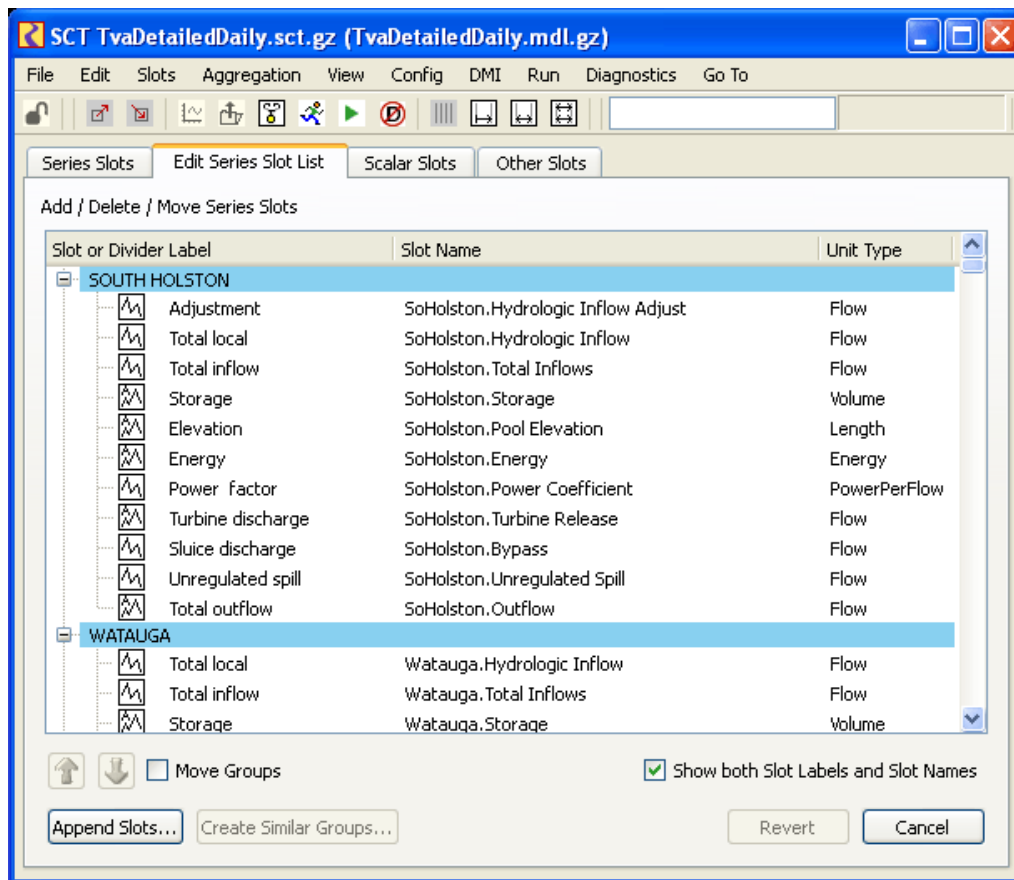
- **Always Synchronize Range to Slots** checked and disabled (Note: checking this item indirectly disables alternative range controls)
- **Double Click Data Cell Toggles Detail Rows** unchecked and disabled
- SCT Configuration dialog - **Horz Time Tab**: Options have been renamed or disabled
  - Tab renamed to **Horz Index**
  - Description becomes **Horizontal Index Orientation Settings**
  - **Column Headers: Include Weekday** unchecked and disabled
  - **Column Headers: Hide Hours if all "24:00"** unchecked and disabled
  - **Show Column: Agg. Summary Function** unchecked and disabled
  - **Draw Day Divider Columns** unchecked and disabled
  - **Draw Weekend Divider Columns** unchecked and disabled
  - **Draw Month Divider Columns** unchecked and disabled
  - **Draw Year Divider Columns** unchecked and disabled
- SCT Configuration dialog - **Vert Time Tab**: Options have been renamed or disabled
  - Tab renamed to **Vert Index**
  - Description becomes **Vertical Index Orientation Settings**
  - **Column Headers: Include Agg. Summary Function** unchecked and disabled
  - **Show Column: Weekday** unchecked and disabled
  - **Draw Day Divider Rows** unchecked and disabled
  - **Draw Weekend Divider Rows** unchecked and disabled
  - **Draw Month Divider Rows** unchecked and disabled
  - **Draw Year Divider Rows** unchecked and disabled
- SCT Configuration dialog - **Toolbar Tab**: Options have been renamed or disabled
  - **Summary Detail Mode Buttons** unchecked and disabled
  - **Button: Show/Hide Details** unchecked and disabled
  - **Button: Hide All Details** unchecked and disabled
  - **Button: Show All Details** unchecked and disabled
  - **Button: No Summaries** checked and disabled
  - **Date Time Spinner** unchecked and disabled
- SCT Configuration dialog - **Summary Tab**: Options have been renamed or disabled
  - **Show Timestep Flag Colors: Never** un-selected and disabled
  - **Show Timestep Flag Colors: When detail rows are hidden** un-selected and disabled
  - **Show Timestep Flag Colors: With 7 or fewer timesteps** un-selected and disabled
  - **Show Timestep Flag Colors: Always** selected and disabled
- SCT Configuration dialog - **Color Tab**: Options have been renamed or disabled
  - **Day Divider** button disabled
  - **Weekend Divider** button disabled
  - **Month Divider** button disabled
  - **YearDivider** button disabled
  - **Simulation Boundary Divider** button disabled

## 5. Edit Series Slot List Tab

The **Edit Series Slot List** tab contains a list of series slot columns shown in the **Series Slots** tab.

The new **Edit Series Slot List** mode shows a two-level “tree view” with dividers as top-level items and subsequent slot items as children of the divider. (Note: Dividers which don't have text are shown with the text of the following slot item when the divider's “tree” is closed).

This view follows the convention used for the SCT's “Go To” menu of defining groups of slots as items separated by dividers. The **Edit Series Slot List** panel ensures that the slot list has an initial divider item. So, there is always at least one group, and all slots are within one group (i.e. the group defined with the preceding divider).

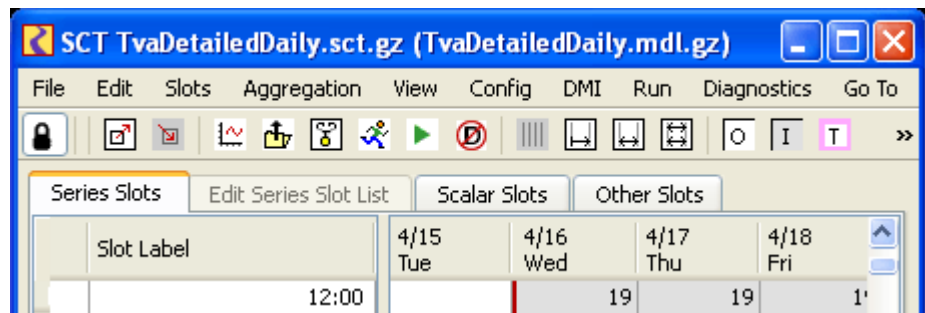


Following is a description of the buttons available on this tab:

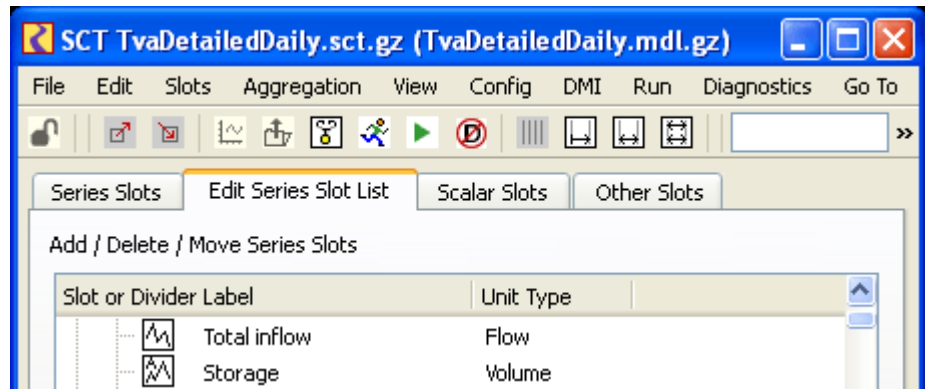
- **Append Slots...** -- brings up the slot selector to add new slots (and dividers) at the end of the list.
- **Create Similar Groups...** -- special operation for groups containing slots on a single simulation object or account -- see below.
- **Revert** -- discards changes made to the series slot list since the series slot list edit mode was started. This button is enabled only if changes have been made.

- **Accept / Cancel** -- takes you to the Series Slot tab. If any changes to the slot list had been made, the button label will be “Accept”, and clicking the button applies those changes to the series slot data table. If no changes had been made (or if changes had been reverted), the button label is “Cancel” and clicking the button has no effect on the series slot data table.

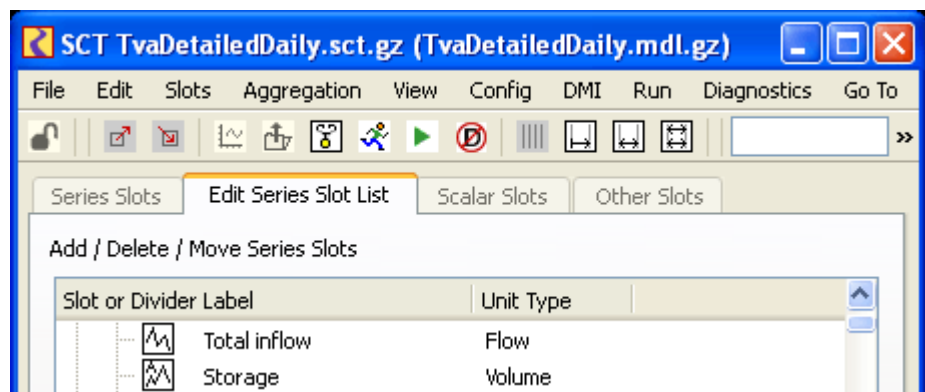
The SCT must be “unlocked” for any operation to be enabled. If the SCT is locked, the Edit Series Slot List tab is disabled.



When showing the **Edit Series Slot List** tab, the SCT Lock controls (toolbar button and menu item) become disabled. The other SCT tabs remain enabled until a change is made to the Series Slot list.



Once a change is made to the Series Slot list, the other tabs become disabled. The user can **Revert** or **Accept** the changes.



## 5.1 Organizing Slots

Two different “move” modes are supported. You can switch between these two modes by toggling the **Move Groups** checkbox. Selected items or groups are moved up or down one logical position (defined by the mode) by clicking the up or down arrow buttons.

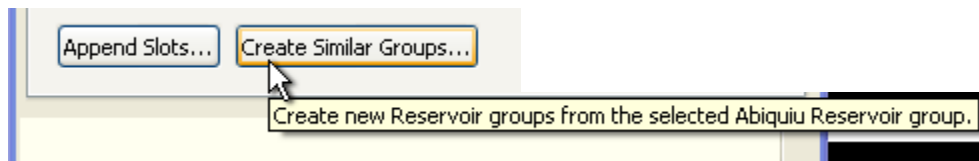
- **Move Groups ON:** The up and down arrow buttons are enabled only when at least one divider is selected (and only when the divider selection doesn't include an item already at the top or bottom, for the two respective move directions). In this mode, the order of the slots within each group is preserved. Note: When all groups are closed, the “Move Groups” checkbox is forced on, and is disabled.

- **Move Groups OFF:** Selected slot and divider items are moved up or down without respect to the grouping defined by the dividers. This is useful for placing dividers at a different position, and for moving slot items within a group, or between different groups.

Since the text label for a slot item does not have to be the name of the slot, the user has the option of showing a **Slot Name** column. This is done by turning on the **Show both Slot Labels and Slot Names** checkbox.

## 5.2 Create Similar Groups Operation

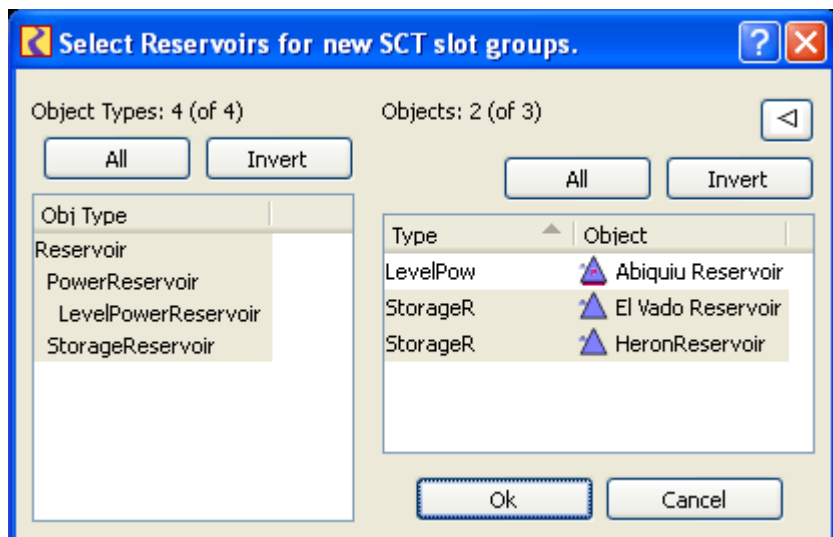
The **Create Similar Groups...** button is enabled when the selection applies to slots on one simulation object or account. Clicking on the **Create Similar Groups...** button brings up a selector that you use to select new objects or accounts.



In the case of simulation objects, the object selector is limited to the type of the object of the originally selected group -- with the exception that all reservoir types can be picked for any reservoir.

After picking one or more simulation objects or accounts, a new group is created for each of those objects (immediately below the originally selected group in the **Edit Series Slot List**) with the same slots as in the original group. The order of the slots in the original group is used for the new groups.

In the illustrated example, the original group has slots from one particular power reservoir (Abiquiu Reservoir). This includes slots not present in the two storage reservoirs subsequently picked with the simulation object selector. The slots from the original group which are not present in the picked reservoirs are not included in the new groups.



Original		With new similar groups	
Slot or Divider Label	Unit Type	Slot or Divider Label	Unit Type
Abiquiu Reservoir Summary		Abiquiu Reservoir Summary	
Abiquiu Reservoir.Storage	Volume	Abiquiu Reservoir.Storage	Volume
Abiquiu Reservoir.Hydro Capacity	Power	Abiquiu Reservoir.Hydro Capacity	Power
Abiquiu Reservoir.Operating Head	Length	Abiquiu Reservoir.Operating Head	Length
Abiquiu Reservoir.Pool Elevation	Length	Abiquiu Reservoir.Pool Elevation	Length
Abiquiu Reservoir.Inflow	Flow	Abiquiu Reservoir.Inflow	Flow
Abiquiu Reservoir.Outflow	Flow	Abiquiu Reservoir.Outflow	Flow
Abiquiu Reservoir.Power	Power	Abiquiu Reservoir.Power	Power
Abiquiu Reservoir.Energy	Energy	Abiquiu Reservoir.Energy	Energy
		El Vado Reservoir Summary	
		El Vado Reservoir.Storage	Volume
		El Vado Reservoir.Pool Elevation	Length
		El Vado Reservoir.Inflow	Flow
		El Vado Reservoir.Outflow	Flow
		HeronReservoir Summary	
		HeronReservoir.Storage	Volume
		HeronReservoir.Pool Elevation	Length
		HeronReservoir.Inflow	Flow
		HeronReservoir.Outflow	Flow

If the original group's divider's text label contains the name of the group's simulation object or account, that name will also be substituted in the divider labels for the new groups.

The **Create Similar Groups** operation is available only when all the slots within the selected group are from one simulation object or one account.

## 6. Scalar and Other Slots Tabs: Slot Lists

The other two tabs on the SCT, **Scalar Slots** and **Other Slots**, display lists of slots. They are used to organize non-series data allowing the user to collect these slots together in a convenient location. For example, instead of opening each reservoir and looking for the Elevation Volume table, these can be grouped together on the **Other Slots** tab.

All slots on the list can be opened and edited from their individual slot dialogs. Also, one or more scalar values can be edited directly from the SCT. The slots are sorted using the same approach used [HERE](#) (Section 6)

Non-series slots are added to the SCT in the same way that series are added. [Read more about Adding Slots to the SCT.](#)

This section describes the two Slot List tabs and their functionality.

## 6.1 Sorting and Reordering Slots

RiverWare Slots enumerated within the Slot List Tabs have a persistent custom order. The user can change this order (if the SCT configuration is unlocked), or temporarily override it by clicking on a column header, which re-sorts, or reverses the sort using data in the clicked column.

The first column of the slot list contains integers representing the “ordinal” of each slot item within the custom order.

If the list is currently sorted by the custom order, then **up and down arrow buttons** are shown to move the selected items up or down. These buttons immediately modify the custom order. (No warning dialog box is shown).

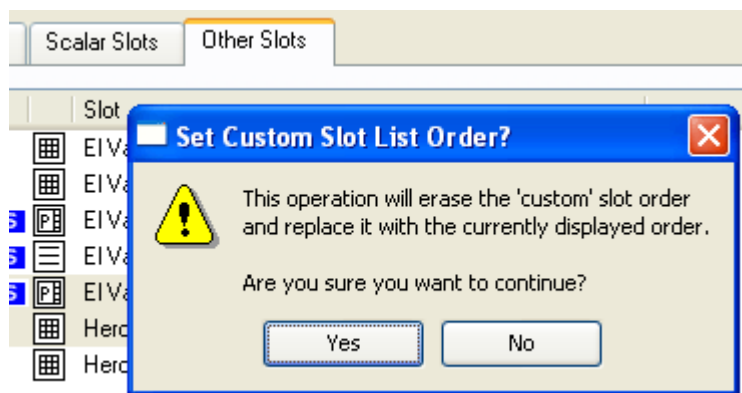
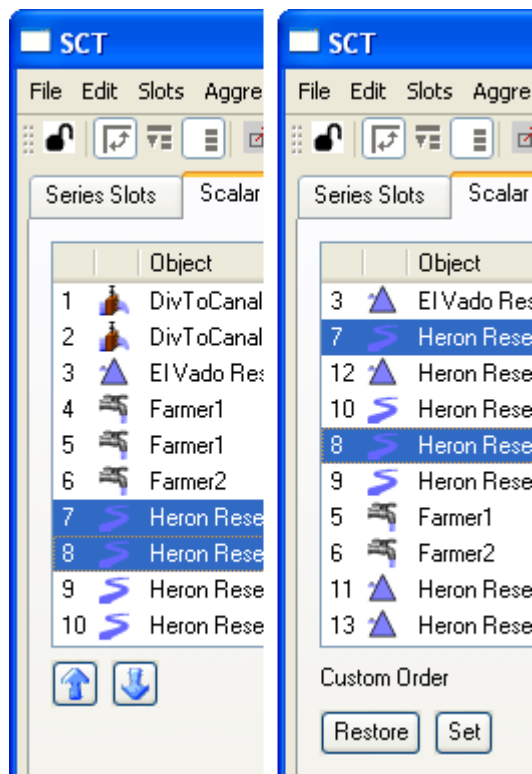
If the list is not currently sorted by the custom order (i.e. after clicking on a column header other than the first column), the following two “**Custom Order**” operations are available (*see image*)...

- **Restore** - Resort by the ordinal column. (This can also be done by clicking on the column header within the first column).
- **Set** - Reassign the custom order from the currently displayed sort order. Before this operation is performed, the user must acknowledge a warning dialog (*see image*).

## 6.2 “Compress Columns” Toggle

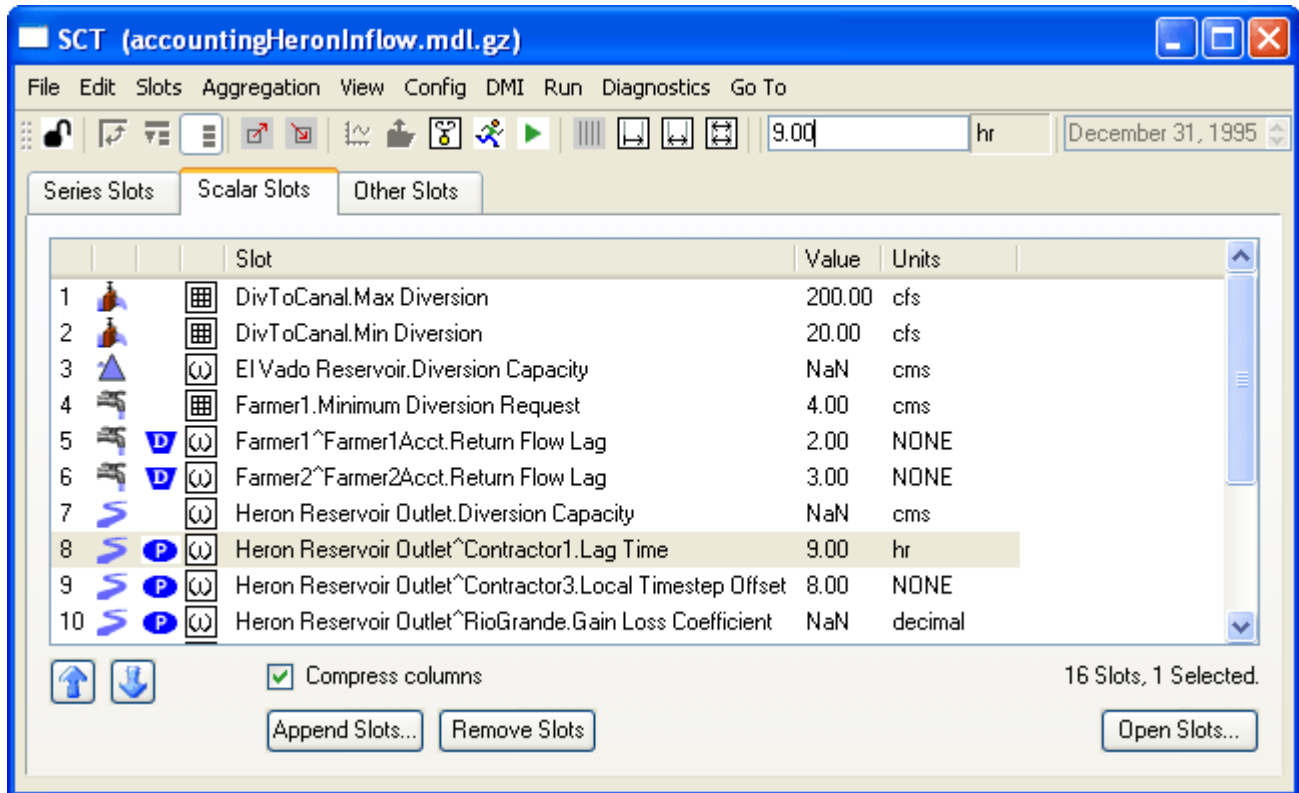
Two user-selectable column layouts are supported for slots on Simulation Objects and on Accounts. This is controlled by a “[X] **Compress Columns**” Check Box at the bottom of each Slot List Panel.

- **Normal** -- Slots are identified with separate names for the Object, the Account (if applicable), and the Slot.



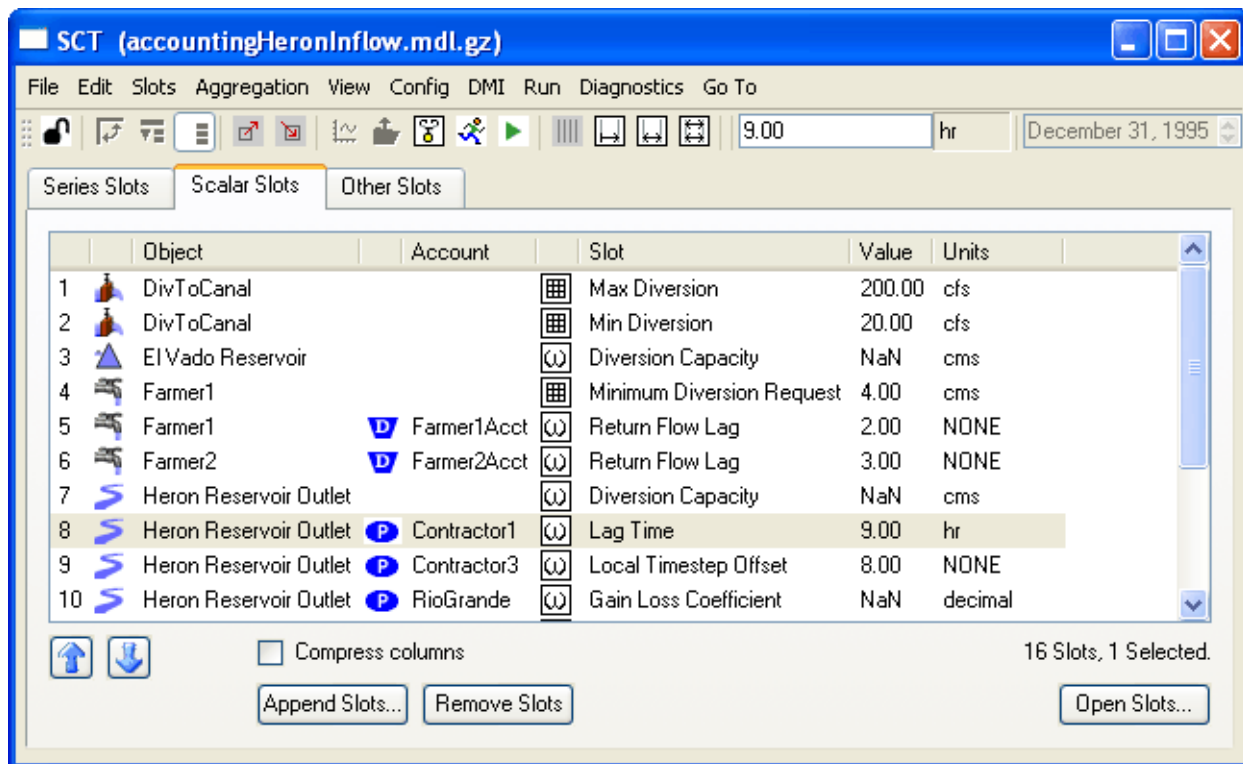
- **Compress Columns** -- Slots are identified with a single “complete” name. This is a single character string which uniquely identifies the Slot within the RiverWare Model. *See below.*

Compare the following “Compress Columns” image with the image [HERE \(Section 6.3\)](#).



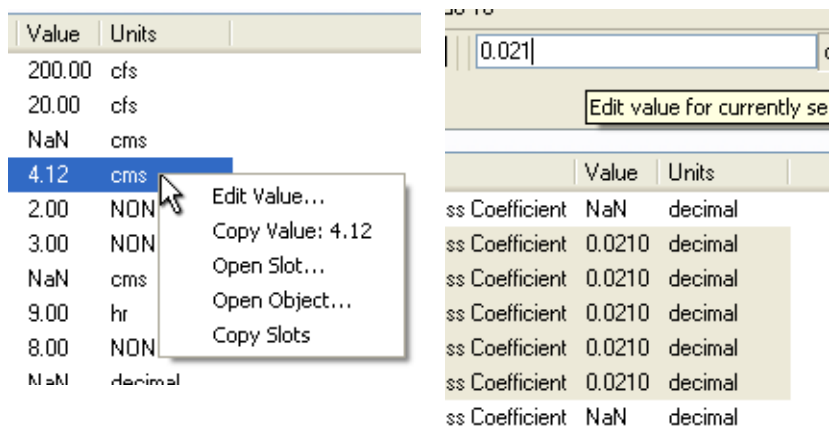
### 6.3 Scalar Slots tab

The **Scalar Slots** tab is used to show a list of Scalar and 1x1 Table Slots. Note, 1x1 table slots were used for scalar values before Scalar Slots were implemented. Following is a screenshot of the **Scalar Slots** tab of an SCT. Additional information on the slot list panel can be found [HERE \(Section 6\)](#).



The values of Scalar Slots and 1x1 Table Slots can be edited from the SCT Scalar Slot List Tab in the following ways.

- An in-cell edit operation can be started by clicking on an already-selected slot item within the Value column. This is sometimes referred to as Click-Wait-Click-Wait sequence.
- An in-cell edit operation can be started from the **context menu's "Edit Value..."** operation on Slot items.
- Multiple selected Scalar and 1x1 Table Slots can be assigned a value in a single operation by selecting the desired Slots and entering a number in the SCT's main edit field (at the top of the SCT). *See image.*

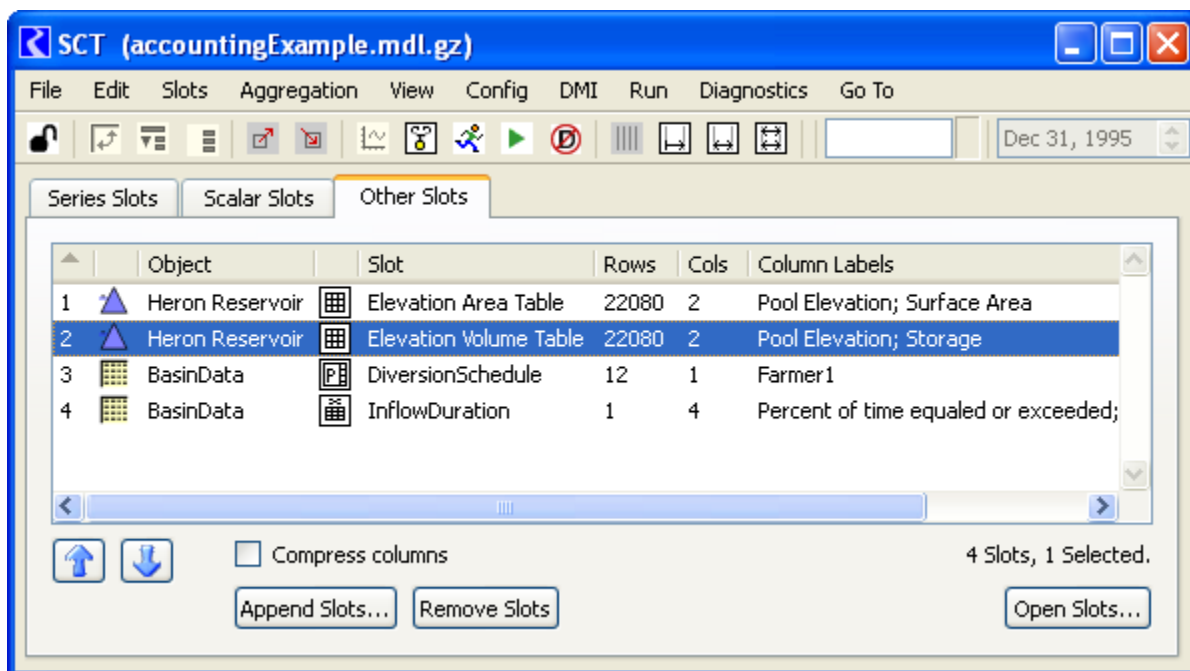


- The user can show the Open Slot dialog for a Slot, and edit the value there. That dialog can be shown by double-clicking on a Slot item, through the context menu, or with the “Open Slots...” Push Button, which operates on the full set of selected slot items.

**Note:** Modifying the number of rows or columns in a 1X1 table slot can lead to unexpected results when editing of that slot from the SCT. Also, upon loading the SCT, a previously displayed 1X1 table slot that now has more rows or columns will not be shown.

## 6.4 Other Slots tab

The **Other Slots** tab can be used to display a list of other types of slots including: Table Slots, Periodic Slots, Statistical Table Slots, and List Slots. These slots are not editable directly from the SCT, but can be easily opened using the **Open Slot** button.



Object Grid Tab  
Other Slots tab

## 7. Object Grid Tab

The SCT's Object Grid Tab presents a user-configured grid of simulation objects. Each **Cell** represents one object. Scalar slots and single-cell table slots are displayed (and are directly editable) as a list of slots within the cell. These are referred to as **Cell Slot Lists**.

The screenshot displays the SCT Object Grid Tab interface. At the top, there are menu options: File, Edit, Slots, Aggregation, View, Config, DMI, Run, Diagnostics, and Go To. Below the menu is a toolbar with various icons. The main area is divided into several sections:

- Configuration options:** Located at the top right, it includes controls for Rows (3), Columns (3), Cell Objects (Set, Clear), and Cell Slot Lists (Add, Edit List, Clear, Copy, Paste).
- Object Grid:** A 3x3 grid of simulation objects. The central cell (row 2, column 2) is highlighted with a blue border and labeled "Opened Cell". It displays a list of simulation parameters for "CochitiToSanFelipeGWArea2River":
 

Conductance Right	149957.18	ft2/day
Conductance Left	18638833.02	ft2/day
Anisotropy Ratio	1.50	NONE
Aquifer Length	20000.00	ft
Aquifer Thickness	50.00	ft
Aquifer Width	200.00	ft
Hydraulic Conductivity	35020.00	ft/day
Conductance Downstream	62868.49	ft2/day
- Cell Slot Lists:** A cell to the right of the "Opened Cell" is highlighted with a red border and labeled "Cell Slot Lists". It displays a list of simulation parameters for "CochitiToSanFelipeGWArea2East":
 

Conductance Right	385443.58	ft2/day
Conductance Left	256962.39	ft2/day
Anisotropy Ratio	1.50	NONE
Aquifer Length	100.00	ft
Aquifer Thickness	50.00	ft
Aquifer Width	1000.00	ft
Hydraulic Conductivity	1535.00	ft/day
Conductance Downstream	312.66	ft2/day
- Display options:** Located at the bottom, it includes checkboxes for Full Precision and Show Units, and a Value Editor Width control set to 8.

In the Object Grid, you can:

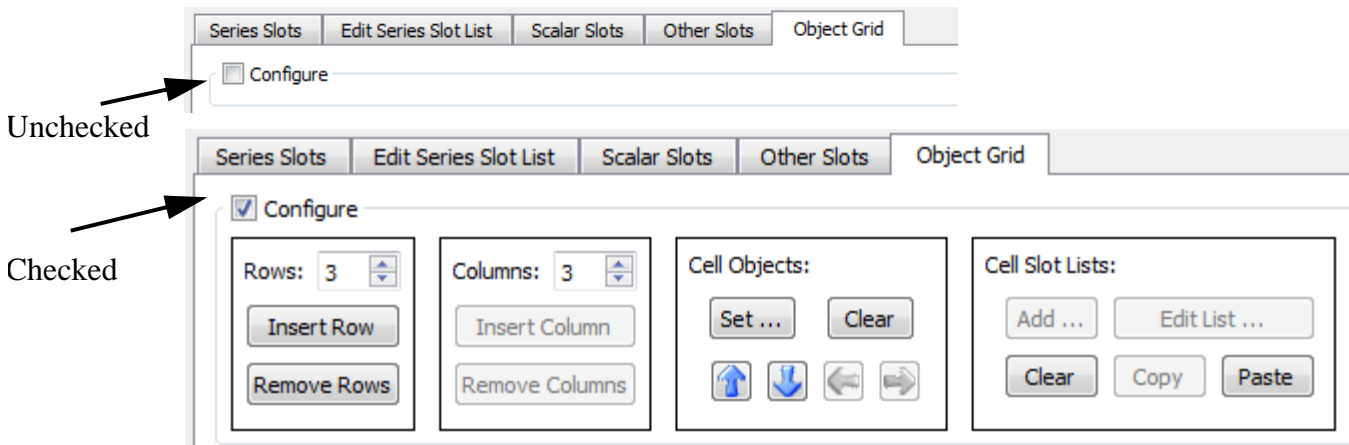
- Configure the number of rows and columns in the grid; insert rows and columns before a cell selection; and delete selected rows and columns.
- Assign existing simulation objects to individual grid cells.

- Move an arbitrary selection of defined cells up, down, left or right within the grid.
- Pick scalar and table slots from a cell's simulation object to display in that cell.
- Show the open object dialog or open slot dialog for included objects or slots.
- Modify the composition and order of a cell's slot list.
- Apply a cell's slot list to an arbitrary selection of other defined cells. The "target" cells are configured with similarly-named slots on the cells' simulation objects. Slots which don't exist on the target cells' objects are shown as inactive (grey).
- Show or hide the slot lists within an arbitrarily large cell selection.
- Directly modify the values of scalar slots and single-cell table slots.
- Display slot values with either configured precision or "full" precision; optionally show slot value *units*; and adjust the width of value editors.
- Export and import the whole object grid configuration to and from external files.

Very few of the SCT's menu bar and toolbar controls operate on the object grid. Currently, the only SCT controls outside of the Object Grid tab which operate on the object grid are **View** ➔ **Fit Data Columns** to auto-adjust grid row and column sizes.

## 7.1 Object Grid Configuration

The configuration controls are enabled only if the SCT is unlocked (using the lock toggle button on the left side of the SCT toolbar). The primary configuration controls are optionally shown at the top of the object grid, based on the "Configure" group box toggle:



### 7.1.1 Row and Column Configuration

Enter a value or use the spinner controls to specify the number of rows and columns in the grid.

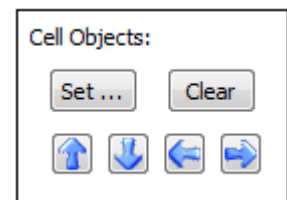
The **Insert Row** and **Insert Column** buttons are enabled when the cell selection is limited to a single row or a single column (including the case of just a single cell being selected). Use those operations to insert an empty row above, or an empty column to the left of the selected row or column.

The **Remove Rows** and **Remove Columns** buttons are enabled when whole rows or whole columns are selected (e.g. by clicking in, or dragging along the row or column headers).

**Note:** When the number of rows or columns is reduced using the integer spinners, the cells are *not deleted* but are just visually excluded. Those cells can become visible again when the number of rows or columns is sufficiently increased. When the SCT configuration is saved, those “out of range” cells are dropped.





### 7.1.2 Cell Object Configuration

When one *or more* cells are selected, use the Cell Object **Set** button to open the Object selector. Each time the selector’s **Apply** button is clicked, the chosen object is assigned to the “first” selected cell, and that cell is deselected. This allows the assignment of objects to multiple cells with a single invocation of the selector. The “first” selected cell is the topmost selected cell in the left-most column containing selected cells. (The assignment sequence proceeds *downward* in the left-most column until all selected cells in that column have been assigned objects).



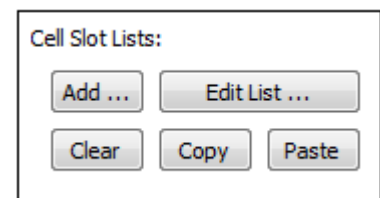
It is valid to assign a particular simulation object to multiple distinct cells. Each of those cells could potentially show different slots from that object.

The Cell Object **Clear** button is enabled when one or more defined cells (having simulation objects) are selected. This operation removes the selected cells’ simulation object (and slots).

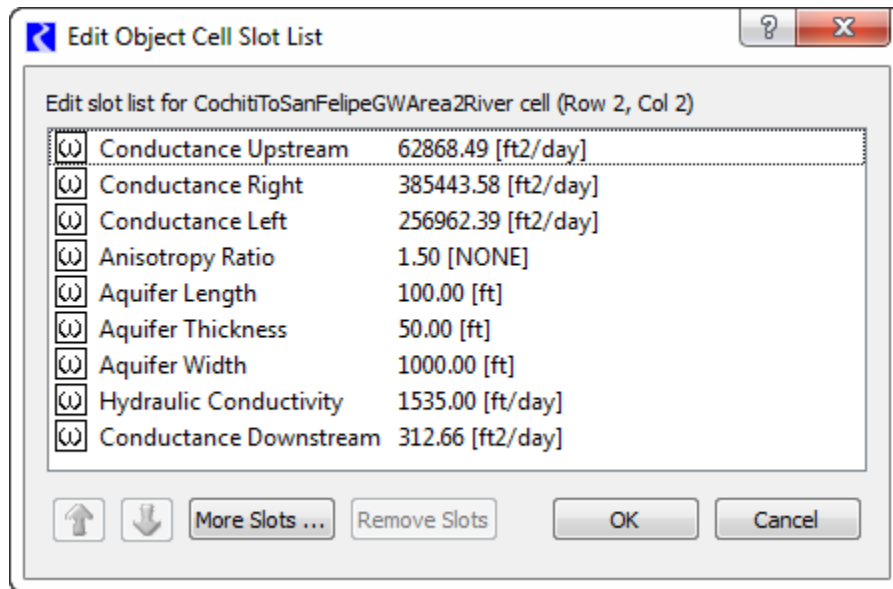
The four arrow buttons     shift the set of selected cells one position in the indicated direction.

### 7.1.3 Cell Slot List Configuration

When the current cell selection contains at least one defined cell (having an associated simulation object), use the **Cell Slot Lists** controls to modify the slots shown for the cell(s). The **Add...**, **Edit List...** and **Copy** buttons are enabled only if *exactly one* defined cell is selected. The **Clear** and **Paste** buttons can be applied to multiple selected cells in a single operation.



The **Add...** (slots) button is actually a shortcut. Clicking it shows the **Edit Object Cell Slot List** dialog (see below) -- as does the **Edit List...** button -- and automatically presses the **More Slots...** button in that dialog to bring up the Slot Selector dialog.



The **Edit Object Cell Slot List** dialog edits the list of slots for a single cell. As mentioned above, this dialog's **More Slots...** button brings up the Slot Selector to pick physical scalar and table slots (including periodic slots) on the cell's simulation object.

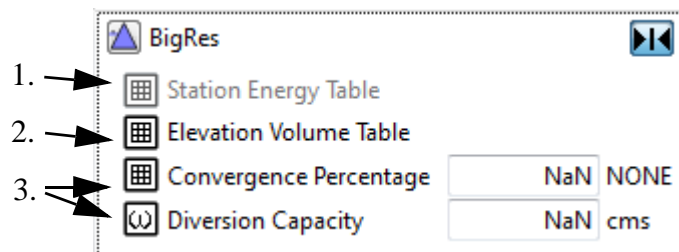
The **Remove Slots** button and the **up and down arrow buttons** operate on the slots selected within the list.

Returning to the SCT object grid configuration controls, the **Clear**, **Copy** and **Paste** buttons operate on the set of selected defined cells.

- **Clear** removes the list of slots from that cell.
- The **Copy** button (enabled when a single defined cell is selected) copies the slot list to the **Slot Clipboard**.
- The **Paste** button opens a dialog showing the number of selected cells and the list of slots in the Slot Clipboard (see above). Clicking **OK** replaces the selected cells' slot lists with the slot list from the Slot Clipboard.

Slots will appear in a cell in basically three different ways.

1. Slots which don't actually exist on the cell's simulation object will be shown as disabled (in grey).
2. Table slots having more than one cell will be shown with an active "slot icon button", but will not be shown with any numeric values.




3. Scalar slots and single-cell table slots will be shown with an active “slot icon button” and with an editable numeric value (and unit specification, if those are turned on in the dialog).


### 7.2 Cell Operations


Each cell has three different types of buttons:

1. **Object Icon buttons:**  shows the Open Object dialog.

2. **Slot Icon button:**  shows the Open Slot dialog. This button will not be enabled if such a slot doesn't actually exist on the object.

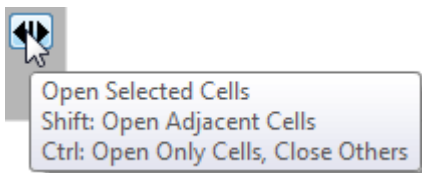
3. **Open / Close toggle button** -- shows or hides the cell's slots. This action is applied to all selected cells -- not just the cell containing the button being clicked.

 Click to open cell, and other selected cells.

 Click to close cell, and other selected cells.

To open and close multiple cells, you can drag the whole row or whole column to select it. Also **all cells in the grid** can be selected by clicking in the square between the row and column headers in the *upper-left corner* of the grid.

**Shift-Click** and **Control-Click** operation of the Open / Close button have special behaviors. Shift-Click opens up the clicked cell and its four immediate neighbors. The Control-Click operation also closes *all other* cells. A tool tip on the button reminds you of this feature.

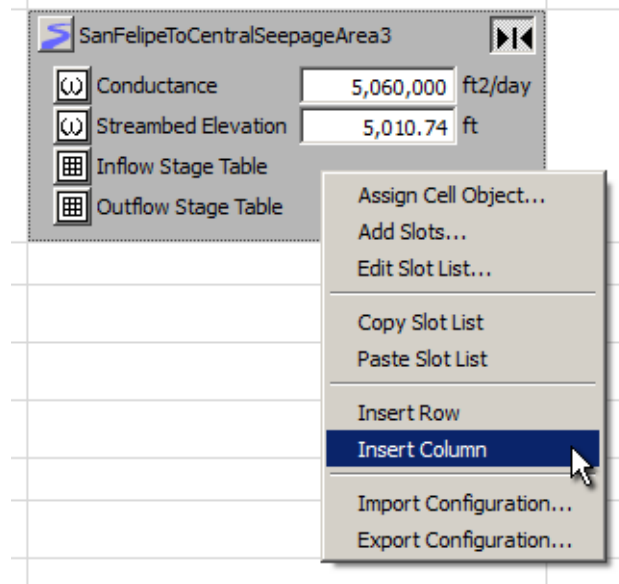


### 7.2.1 Cell Context Menu

Right-clicking in a cell shows the context menu. All of the operations except the last two are redundant with buttons in the **Configure** panel above the grid, described above.

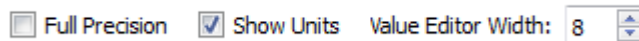
The **Import Configuration...** and **Export Configuration...** operations read or write the whole object grid's configuration from, or to, an external file. (The file is an XML text file). This can be used for moving Object Grid configurations between different SCTs.

Clicking on these two context menu items brings up a file chooser for reading or writing, from which the user may cancel the operation. When *importing*, the current object grid configuration is entirely replaced with the imported configuration.



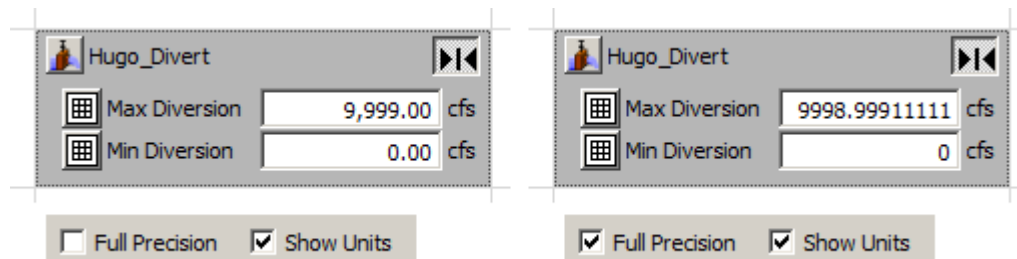
### 7.3 Display Settings

Use the controls along the bottom of the Object Grid to modify the data display.



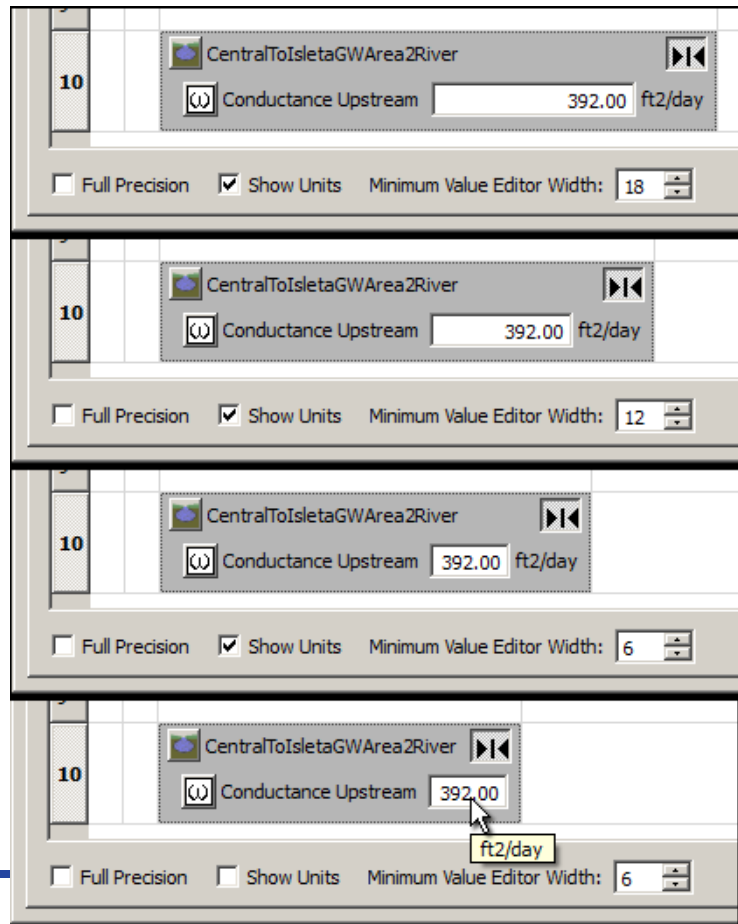
The **Full Precision** checkbox switches between configured display attributes (e.g. a particular number of fractional decimal digits) and “full precision”, showing the number

of fractional digits necessary to precisely represent the internal floating-point numeric value. (Full Precision is also shown automatically when a cell value is edited).



Use the **Show Units** checkbox to show or hide the units. When units are hidden, they are available as a “tool tip” on the value editor (see bottom-right screenshot).

The **Value Editor Width** sets the width of slot value editors to ensure visibility of the specified number of characters. The supported range is 3 to 22. The default is 12.



## 8. How To: Configure the SCT

### 8.1 Lock or Unlock the SCT Configuration

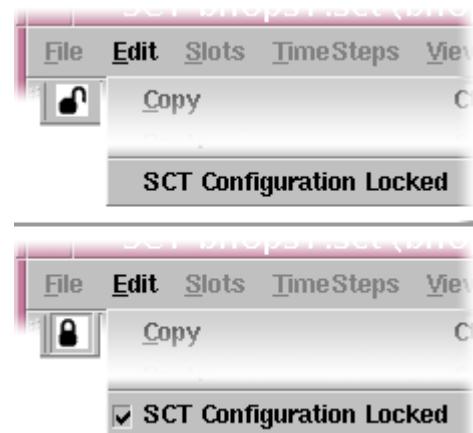
When the SCT is locked, the following components of the SCT configuration cannot be changed:

- Slots and slot dividers cannot be added, removed, or moved.
- **Slot Labels** and **Horizontal Slot Divider Labels**.
- Slots' **Summary Functions** (for the aggregated views).

The SCT can be locked or unlocked by clicking the **Toolbar Locked** toggle button or the **Edit → SCT Configuration Locked** menu toggle button.

### 8.2 Add Slots and Slot Dividers

To add slots or slot dividers, **the SCT must be unlocked**.



On the **Series Slots** and **Edit Series Slot List** tab, the SCT maintains a list of slot items (symbolic references to slots and slot dividers). Depending on the **axis orientation**, these are laid out as rows or as columns. On the other two tabs, the SCT configuration maintains a single ordered symbolic slot reference list for both Slot List Panels (on the “Scalar Slots” and “Other Slots” Tabs). When loading an SCT, and when new non-series slots are added to an SCT, the non-series slots are “sent” to one of the two Slot List Panels depending on each Slot’s Type -- and, in the case of Table Slots, a special case is made for 1x1 Tables which are treated as Scalar Slots)

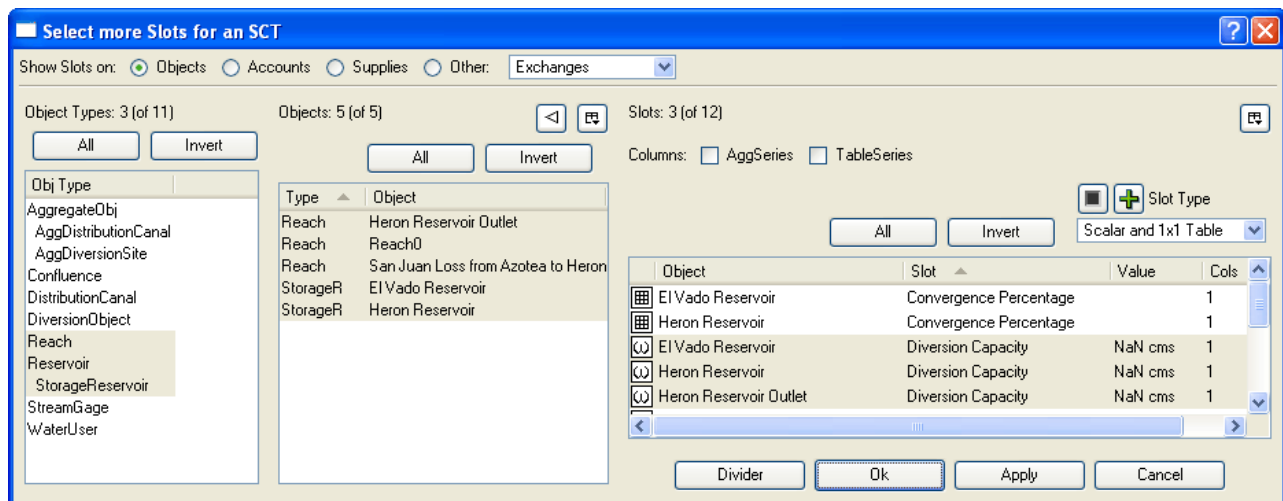
Only actual slots that exist in the currently loaded RiverWare model can be added to an SCT. Slots and slot dividers can be inserted into the SCT using the **Slots menu**:

- before the selected slot.
- at the end of the **Slot / Divider** list.

For the purpose of determining the insertion point for an added slot, a reference slot is regarded as **selected** if one or more timesteps within the slot are selected. The **Insert New Slots** operation is disabled if users select more than one reference slot—unless the SCT is empty, in which case the insertion operations are unconditionally enabled.

Through the RiverWare slot selector, users can select slots they want to add. **Slots are added** to all of the three panels using the slot **Selector**. Click [HERE \(Selector.pdf, Section 1\)](#) for more information on the Selector. Before the implementation of “SCT Slot List Tabs”, the slot selector was limited to the selection of Series Slots and Table Series Slots and Slot Columns. Now, RiverWare Slots of any type can be selected for inclusion into an SCT. The selected slots (picked using the selector) are added to one of the three SCT Tabs, according to slot’s properties.

The slot Selector can be shown from the SCT’s “**Slots ➔ Append New Slots...**” menu operation, or from the new “**Append Slots...**” push button on the two Slot List Tabs.



The SCT / Slot Selector **Slot Type Filter** is now automatically configured for the current SCT Tab. The user can modify or dismiss the Slot Type Filter, and select any Slots. *See the following image.*

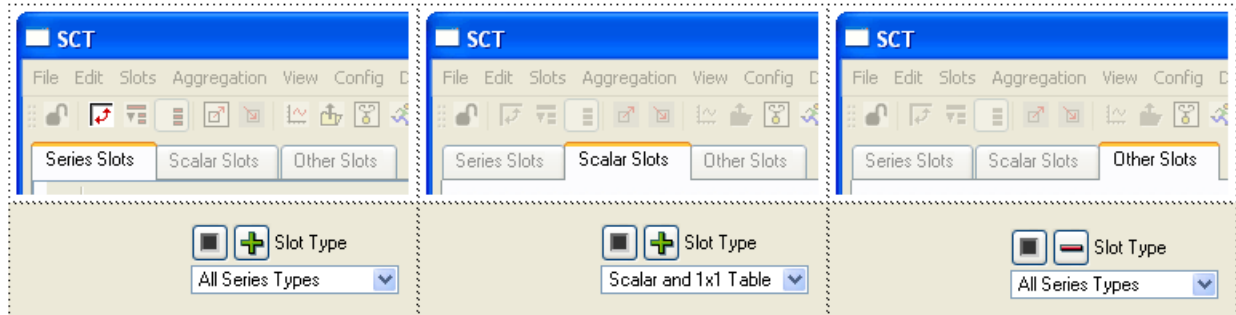
In the selector, the user can choose any type of slot to add to the SCT. The Slot Types filter can be used to filter by the desired type of the slot including

- The “**All Series Types**” filter value includes **Table Series Slots**. (Those are technically not Series Slots, but functionally, they pretty much are).
- A “**Scalar and 1x1 Table**” filter includes Scalar Slots and Table Slots which have exactly one row and one column. (Scalar Slots were added to RiverWare after some Simulation Objects had already implemented scalar values as 1x1 Table Slots).

Once a slot(s) is selected and either the Apply or Ok button is clicked, the slot(s) will be added to the appropriate tab of the SCT, and that tab will become active.

If the user picks (with the selector) only Slots which are shown on SCT Tabs other than the current tab, then the SCT switches to the “receiving” Tab (or, one of them, if there is more than one). Slots sent to either of the Slot List Panels become the selected Slots within those panels. (So, effectively, the user can un-do the Append Slot operation by clicking the Slot List Panel’s “Remove Slots” Push Button).

SCT Tab / GUS Slot Selector Slot Type Filter Initialization:



Dividers can be added directly (not using the selector) using the Slots Add or Append Divider menus.

- **Slots** ➔ **Insert Slot Divider**
- **Slots** ➔ **Append Slot Divider**

### 8.3 Remove Slots and Slot Dividers

To remove slots or slot dividers, **the SCT must be unlocked**.

Removing a slot from the SCT neither removes it from the RiverWare model nor affects the slot’s data.

Users can remove multiple slots and slot dividers at any time. Those **selected** when users operate the **Slots** ➔ **Remove Slots / Dividers** operation are removed from the SCT.

Since slot dividers don’t have any associated data cells, they are a bit more difficult to select than slots are. Therefore, it is necessary to select a slot divider in the **Row** or **Column** header.

Slots can be removed from the SCT Slot List Panels by selecting one or more slot items in the list and clicking the “**Remove**” button.

## 8.4 Move Slots and Slot Dividers

To move slots or slot dividers, **the SCT must be unlocked**.

Series slots can easily be moved from the **Edit Series Slot List** tab as described [HERE \(Section 5\)](#).

Also, slots and slot dividers can be copied, cut, and pasted (inserted or appended) within an SCT or between SCTs. The data copy and paste operations (under the SCT Edit menu) are not related to the slot and slot divider moving operations. Instead, the following operations under the SCT **Slots menu** are used:

<b>Slots ➤ Copy Slots / Dividers</b>	At least one slot item must be selected.
<b>Slots ➤ Cut Slots / Dividers</b>	At least one slot item must be selected.
<b>Slots ➤ Insert Copied Slots / Divs</b>	Exactly one slot item must be selected.
<b>Slots ➤ Append Copied Slots / Divs</b>	No particular selection is required.

The **Cut Slots / Dividers** operation immediately deletes the selected slots. If users don’t perform a subsequent **Insert Copied Slots / Divs** or **Append Copied Slots / Divs** operation, the slot items that were cut no longer exist in the SCT.

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**Note:** The **Copy Slots / Dividers** and **Cut Slots / Dividers** also add the selected slots to the RiverWare Slot Clipboard. Slots in the Slot Clipboard can be copied to other locations in RiverWare such as any Output Device’s slot list.

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The **Insert Copied Slots / Divs** operation inserts the previously copied or cut slot items immediately *before* the single selected slot item.

The **Append Copied Slots / Divs** operation appends the previously copied or cut slot items to the end of the SCT’s slot item list (after the last slot row or after the last slot column, depending on the **axis orientation**).

The cell ornamentation (crosshatch) displayed on the copy data cell set also applies to the **Copy Slots / Dividers** operation.

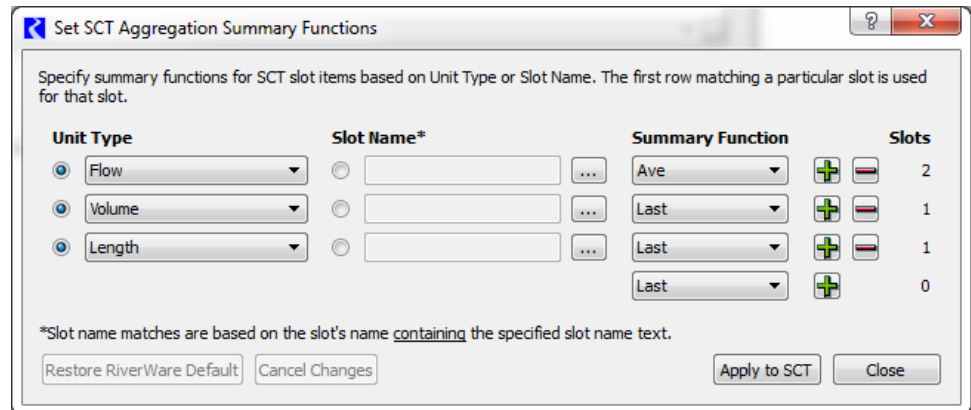
There is no problem with having a slot represented redundantly within an SCT (e.g., as a result of inserting or appending a slot reference into the same SCT from which it was copied). One reason users may want to do this is to see two or more distinct **Summary Functions** (e.g., **Sum** and **Average**) for aggregates of a particular slot.

## 8.5 Change a Slot’s Summary Function

**Summary Functions** are described [HERE \(Section 4.6\)](#)

To change a slot's **Summary Function**, **the SCT must be unlocked**. When the SCT is unlocked, there are three ways to change **Summary Functions**. The first changes the summary functions of all slots in the SCT, the second two ways are for individual slots. If you wish to set most of the slots to use one or more summary functions, then change a few individual slots, use the **Set SCT Aggregation Summary Functions** first, then change specific slots as needed.

1. From the SCT, select the **Aggregation** ➔ **Set Summary Functions...** menu to open the **Set SCT Aggregation Summary Functions** dialog as shown in the following screenshot.



This dialog allows you to specify the Summary Function for all slots in the SCT based on the unit type or the slot name. You create rows that will match one or more slots and then select the Summary Function for that row.

Click on the Unit Type toggle or the Slot Name toggle to specify which component you wish to use:

- **Unit Type:** select the desired type from the pull down menu.
- **Slot Name:** type all or part of a slot name in the text box or use the  button to select a slot name using the selector. As indicated in the note, the entered text must be contained in the Slot's name for a match to occur.

Use the Summary Function to choose one of the items, First, Last,... as described [HERE \(Section 4.6.2\)](#).

Add or remove rows from the dialog using the  and  buttons.

The number of slots matched for each row is displayed in the last column.

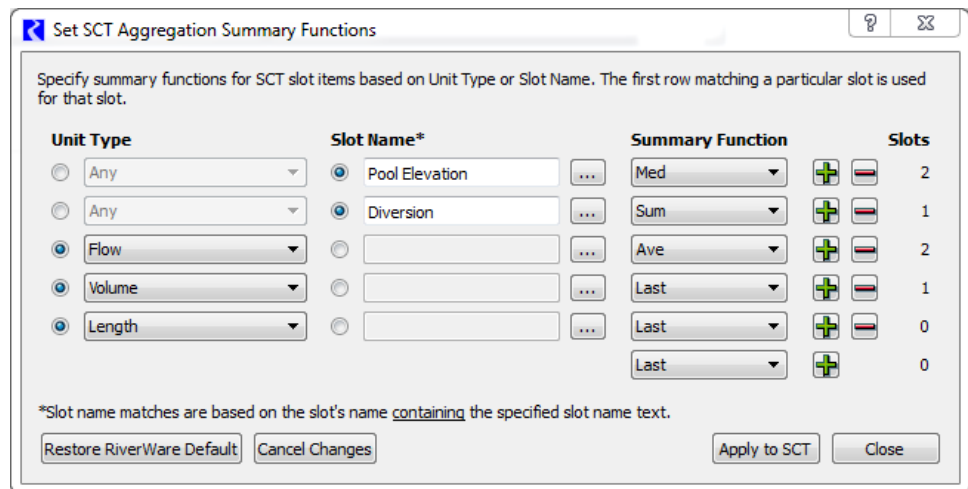
The first matching row is used for the slot, so the order of the rows may matter. For example, in the screenshot, Pool Elevation is the first row using **Med**, and Length is the last row using **Last**. Thus, all Pool Elevations in the SCT will use the **Med** function for aggregation.

When you choose the **Apply to SCT** button, the matched slots are given the appropriate summary function.

Use the **Restore RiverWare Default** to return the dialog to its original state, that is, one row for Flow using the Ave function, one row for Volume using the Last function, and one row for Length using the Last function. There is a final “catch-all” row that uses the Last function as the default.

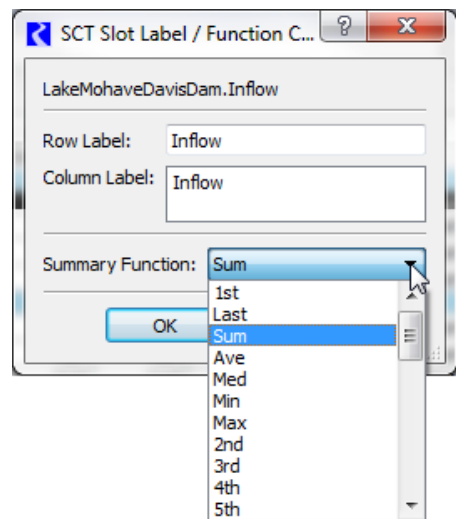
2. In the **Aggregated Horizontal Timestep Axis View**, if the **Summary Function** column in the **Row Header Table** is shown (see the **SCT Configuration Horizontal Time Tab**), users can double click in the slot's **Summary Function** field to show an option menu with the available **Summary Function** choices.

To read more about showing the **Summary Function** column in the **Aggregated Horizontal Timestep Axis View**, also see: [How to Configure Row and Column Headers](#)



	Slot Label	Units		11/30/96 Sat
	In	cfs	Sum	64,600
	Div	cms	1st	0.00
	Energy	1,000 MWH	Last	1.20
	Pow	MW	Ave	50.11
	Sp	cfs	Med	0.00
	LakeHavasuPar		Min	
	In	cfs	Max	70,399
	Energy	1,000 MWH	2nd	NaN
	Div	cms	3rd	NaN
	Pow	MW	4th	NaN
	Sp	cfs	5th	NaN
			Sum	NaN

3. A slot's **Summary Function** can also be changed by **selecting a single slot** and choosing the **Slots** ➔ **Set Label / Function...** menu operation. This displays the dialog box shown here. The user can select a different choice from the **Summary Function:** option menu.



## 8.6 Show or Hide (Aggregation) Summaries

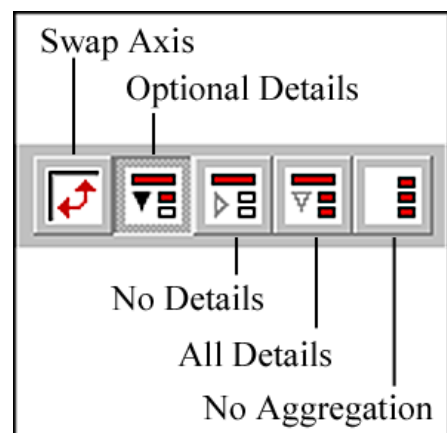
Read about **Timestep Aggregation** or about **Detail Cells and (Aggregation) Summary Cells**.

Summaries (summary cells) always display in the aggregated—not in the non-aggregated—views. To display or hide summaries, users merely need to switch to the appropriate view in either of these ways:

Select one of the detail modes from the SCT **TimeSteps menu**:

- Show/Hide Details**(shows summaries)
- Hide All Details**(shows summaries)
- Show All Details**(shows summaries)
- No Aggregation**(hides summaries)

By accessing the detail mode toolbar buttons, users can display or hide summaries by selecting a detail mode using those buttons.



## 8.7 Show or Hide Details

Read about **Timestep Aggregation** or about **Detail Cells and (Aggregation) Summary Cells**.

All details (detail cells), and only details, display in the non-aggregated views. Thus, users can display all details by selecting the **No Aggregation** detail mode either through the **TimeSteps menu** or by accessing the detail mode toolbar buttons (see above).

In the **Aggregated Horizontal Timestep Axis Orientation View**, each summary row corresponds to one slot. Therefore, showing or hiding the details for a single summary row displays or hides the details for one slot.

In the **Aggregated Vertical Timestep Axis Orientation View**, each summary row corresponds to one timestep aggregation. The detail rows under a summary row represent the individual timesteps within each timestep aggregation. Details for a single summary row that users display or hide correspond to one timestep aggregation across all slots (where each slot is in a separate column).

In the aggregated views in **Show/Hide Details (Optional Details)** detail mode, users can display or hide details (detail cells) independently for each summary row in the following three ways:

1. by using a treeview control (rightward or downward pointing triangle) on the left side of a summary row.
2. by entering Ctrl-D when one or more cells are selected. This sets the detail open/closed state to the opposite of the first slot or timestep aggregation represented in the cell selection.

Note: In this detail mode, users can display or hide all details by selecting a whole column and entering Ctrl-D.

3. If the following toggle on the **General Tab** of the **Configuration Dialog** is on, then double clicking in a cell toggles the detail open/closed state corresponding to the cell. (If this toggle is off, then double clicking in a data cell starts an in-cell modify-edit operation for the value in that data cell).

[x] Double Click Data Cell Toggles Detail Rows

Users can display or hide all details (detail cells) by selecting the **Show All Details** or **Hide All Details** detail modes from the SCT **TimeSteps menu** or by accessing the corresponding toolbar buttons. Selecting these modes does not affect the individual summary row detail open/closed states in the **Show/Hide Details** detail mode.

## 8.8 Configure Row and Column Headers

Since the correspondence between slots and times with rows and columns depends on the **axis orientation**, the types of information that can be shown in row and column headers depends primarily on the selected axis orientation.

The visibility of certain row header columns and types of information in data column headers is controlled separately for the two axis orientations through the use of two corresponding tabbed panes in the **Configuration Dialog**.

- **Horizontal Time Tab**
- **Vertical Time Tab**

Only in the **Horizontal Timestep Axis Orientation** (where rows correspond to slots), the following two in-cell edit operations are supported when the **SCT is unlocked**:

1. Editing a slot row label (by double-clicking).
2. Changing a slot's summary function (by double-clicking on the slot's summary function—if the **Summary Function** column is displayed — **read more**). Since summary functions are relevant only for the aggregated views, this application is available only in the **Aggregated (Horizontal)** view.

## 8.9 Adjust Column Widths

Users can manually resize columns by dragging the dividers between the column headers. The following four operations are also available in the SCT **View menu**. Each is described below.

- View ➤ Set Data Column Widths**
- View ➤ Fit Data Columns to Headers**
- View ➤ Grow Columns to Data**
- View ➤ Fit Columns to Data**
- View ➤ Fit Data Columns to Both**
- View ➤ Fit Row Header Columns**

**View ➤ Set Data Column Widths** is used to set all data columns to the width of the single selected column. The best way to use this is to follow these steps:

- Manually resize one of the data columns to the desired width by dragging the column header divider on the right side of the column.
- Select the column by clicking in the middle of its column header.
- **Select View ➤ Set Data Column Widths.** This resizes all of the data columns to the width of the selected column.

**View ➤ Fit Data Columns to Headers** resizes all of the data columns to fit the text in the corresponding column headers.

**View ➤ Grow Columns to Data** resizes all of the data columns to fit the numeric values in the corresponding column.

**View ➤ Fit Columns to Data** resizes all of the data columns to fit the widest numeric value displayed in the corresponding columns.

**View ➤ Fit Data Columns Both** resizes all of the data columns to fit the widest heading or numeric value displayed in the corresponding columns.

**View ➤ Fit Row Header Column** resizes the columns in the **Row Header Table** to fit the widest content in the corresponding columns. This operation also adjusts the splitter between the **Row Header Table** and the **SCT Data Table** to fit the **Row Header Table** exactly.

Many, though not all, of the column width adjustments are preserved when users save and reload an SCT.

## 8.10 Change Colors

Users can modify colors by selecting the **Flags Tab** or the **Color Tab** of the **SCT Configuration Dialog**:

- From the SCT Menu, select **View ➤ SCT Configuration...**
- Press the **Flags Tab** to modify flag colors.  
or  
Press the **Color Tab** to modify other colors.

Clicking one of the color buttons brings up a **Color Chooser**. Users can change only one color at a time.

- To see the effect of the new chosen colors in the SCT, in the **SCT Configuration** dialog, click on **Apply**.
- To accept the changes, click on **OK**, or
- To cancel all changes since bringing up the **SCT Configuration** dialog, click on **Cancel**.

Read about [saving the new settings as default, or restoring the default color settings](#).

## 8.11 Change Ornamentations

Users can configure the graphical ornamentations through settings in the **SCT Configuration Dialog**. These settings are represented on various tabbed panes in that dialog.

- **General Tab** Toggle: **Display “NaN”**. If this is disabled, undefined numeric values are shown as blanks (empty cells).
- **General Tab** Toggle: **Show Grid**
- **General Tab** Toggle: **Target Operations: Full Ornamentation (Slow)**. This function should generally be enabled. If it is turned off, only the final timestep of **Target Operations** is shaded (solid with the configured **Target color**). This was introduced for very large models in which screen refreshes are slow.
- **General Tab** Toggle: **Crosshatch Read Only Cells** (e.g., expression slots and accounting system slots). Non-editable values are shaded with a crosshatch of a **configurable color**.
- **Horz Time Tab** Toggle: **Draw Weekend Divider Columns**. This function lets users specify the drawing of thick lines between pairs of timesteps that straddle a Friday-to-Saturday or Sunday-to-Monday boundary in the **Horizontal Timestep Axis Orientation Views**. If enabled, **Weekend Divider** columns are drawn with the **configurable Weekend Divider color**.
- **Horz Time Tab** Toggle: **Draw Month Divider Columns**. This function lets users specify the drawing of thick lines between pairs of timesteps that straddle the first and last timesteps of calendar months in the **Horizontal Timestep Axis Orientation Views**. If enabled, **Month Divider** columns are drawn with the **configurable Month Divider color**.
- **Vert Time Tab** Toggle: **Draw Weekend Divider Rows**. This function lets users specify the drawing of thick lines between pairs of rows that straddle a Friday-to-Saturday or Sunday-to-Monday boundary in the **Vertical Timestep Axis Orientation Views**. In the **Aggregated Vertical Time View**, if the weekend boundary falls between detail rows that are hidden, then the divider is drawn as a dotted line immediately below the corresponding summary row. If enabled, **Weekend Divider** rows are drawn with the **configurable Weekend Divider color**.
- **Vert Time Tab** Toggle: **Draw Month Divider Rows**. This function lets users specify the drawing of thick lines between pairs of timesteps that straddle the first and last timesteps of calendar months in the **Vertical Timestep Axis Orientation Views**. In the **Aggregated Vertical Time View**, if the month boundary falls between detail rows that are hidden, then the divider is drawn as a dotted line immediately below the corresponding summary row. If enabled, **Month Divider** rows are drawn with the **configurable Month Divider color**.

- **Summary Tab: Show Timestep Flag Colors** exclusive toggle buttons. This function lets users select the conditions under which flag values are indicated with background shaded regions in summary cells. **Always** is a good choice in most circumstances. This was introduced for two reasons: 1) to experiment with ways of distinguishing **Summary Rows** from **Detail Rows**, and 2) to support quicker screen refreshing with large aggregations—to the extent that turning off this ornamentation supports quicker screen refreshes.
- **Flags Tab:** Custom colors that indicate slot timestep flag values with background color shading. Users should choose flag colors that contrast with the **Foreground Text** color.
- **Color Tab:** Other custom ornamentation colors.

## 8.12 Change the Aggregation Interval

Users can change the **Aggregation Interval** by using the SCT **Timestep Aggregation Dialog**. This dialog is shown through the SCT menu operation: **TimeSteps** ➔ **Aggregation Config...**

## 8.13 Show Obscured Pre- and Post-Run Timesteps

The time range of the SCT depends on:

1. The time range of the loaded RiverWare model's **Run Control**.
2. The number of pre- and post-run timesteps configured for the SCT.

It is quite possible that the time range of any particular slot starts before the first timestep shown in the SCT or ends after the last timestep shown in the SCT. When this occurs, a small corner triangle displays in the first or last **Summary** cell and the first or last **Detail** cell in that slot. If users select such a **Detail** cell, the number of obscured timesteps displays in the **Selection Info Area** at the bottom of the SCT.

The only way to display a slot's obscured timesteps is to extend the time range of the SCT to cover the slot's full time range. This is done by selecting the **General Tab** of the **SCT Configuration Dialog**. Users should observe the number of obscured timesteps (as described above) and increase either the **Pre-Run Timesteps** count or **Post-Run Timesteps** count by the required amount.

Users can also display a series slot's full range in that slot's **Open Slot** dialog (i.e., *instead of* viewing the full slot in the SCT). This is done by selecting the slot's column in the SCT, then selecting **Slots** ➔ **Open Slot**.

## 8.14 Use the Default Configuration

When a new SCT is created, RiverWare looks to see if there is a default.sct file defined. If so, the configuration settings from the default are used in the new SCT. Also, at any time, the user can choose to either save the current settings as default or revert to default settings. Without a **Slot Item** list, users

can save a single SCT configuration as a default SCT configuration. The default configuration is supported with these menu operations (from the SCT **Config menu**)...



**Apply Default Settings** applies the saved default settings to the current SCT. The SCT's **Slot Item** list (slot references and slot dividers) is not affected.

**Save Current Settings as Default** saves the SCT configuration (without the **Slot Item** list) as the default configuration.

**Clear Default Settings** restores the default settings to the factory defaults. This does not affect the current SCT.

The default configuration is used when:

- creating a new SCT (see **Opening an SCT**).
- migrating an old SCT (Previous Version #.#) to the new SCT.
- applying the default settings explicitly to the current SCT (via the **Config** ➔ **Defaults** ➔ **Apply Default Settings** menu operation described **above**).

## 9. How To: Manipulate Data to model operations

### 9.1 Set a Single Value

Generally, users can directly edit data cells merely by beginning to type. The first typed digit keys replace the original value in the cell.

If users want to modify the value (e.g., correct a digit in the middle of a number), there are two options:

- Click in the cell, and then click in the **Toolbar Value Entry** field (at the top of the SCT) and edit the number there.  
or
- If the **Double Click Data Cell Toggles Detail Rows** option is turned off (**see the Configuration Dialog, General Tab**), then to start an in-cell modification edit, double click in the cell.

*Entering n or nan in either upper or lower case causes the value and flag to be cleared (i.e., set to the **Output flag**).*

Note: To abort an edit, press the Escape (**Esc**) key.

As soon as keyboard focus leaves the cell (e.g., when users press the **Enter** key or the **Tab** key, or when users click in another cell), and if the entered text represents a valid number (or is **N** or **NaN**), the program assigns the entered value to the slot timestep. If the text is not valid, then the program restores the cell to its original value.

If users enter a valid, defined (non-**NaN**) value, in addition to the numeric value being assigned to the slot timestep, generally the **Input Flag** is set. An exception: Cells with the **Target** flag initially set will retain that flag.

Even though the displayed precision is generally limited, the full precision that users type in—within the limits of a double precision floating point number (about 13 decimal digits)—is assigned to the underlying slot timestep,

Users cannot edit certain types of slots, including expression slots and certain accounting system slots. Pressing a digit key when a read-only data cell has keyboard focus, has no effect. If users have enabled the **Read-Only** ornamentation (see the [Configuration Dialog, General Tab](#)), read-only data cells will be cross-hatched with a user configurable **Read-Only** color.

Note: The **SCT Lock** does not prevent modifications to slot data.

## 9.2 Set Multiple Values

When users select multiple data cells (e.g., by dragging with the left mouse button, or by Shift- or Control-clicking data cells with the right mouse button), the most recently selected cell is ornamented as the active cell (with normal background shading and a heavy cell border) rather than as selected (with reverse-color background shading). Initiating and completing an edit of the active cell results in setting the entered value on each cell of the entire selection. In all other ways, editing the active cell within a multiple-cell selection behaves similarly to the [setting of a single value](#).

The multiple cell selection can include timesteps from slots having different unit types (e.g., **Flow** and **Area**). It is up to users to insure that the multiple-value setting operation makes sense.

Since selecting a **Summary Cell** is equivalent to selecting all of the corresponding **Detail Cells**, an edit of a **Summary Cell** is implicitly a multiple-value edit operation.

### 9.2.1 Interpolation

A special operation that also sets multiple values is **Edit ➔ Interpolate Selection** (Ctrl-I). Interpolate is available (enabled) if the following are true:

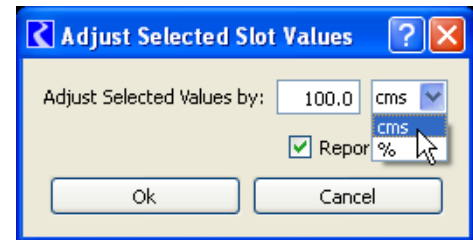
- The slot/timestep cell selection is “rectangular” and contiguous in both slot and timestep dimensions.
- The rectangular selection contains at least three contiguous timesteps.
- All slot values at the first and last timesteps are defined (not **NaN**).

Then an **Edit ➔ Interpolate Selection** operation will linearly interpolate between the first and last value in each slot and change them to input. If they are already inputs, a warning message is posted notifying you that you will overwrite input values.

Note: Since the standard internal units for per-time values (e.g., flow values are cms) are never per month, this avoids the potentially undesirable effect on the interpolation function due to the different amounts of time represented by different months. All interpolation is done within the internal units and then converted to the display units thus taking into account the lengths of different months.

## 9.2.2 Adjust Values

The **Edit** ➔ **Adjust Values** operation can be applied to any arbitrary slot / timestep cell selection in the SCT. Both absolute and relative (percentage) adjustments of values in series slots can be made. Absolute adjustments are available only when all cells in the selection have the same scale and unit. Neither NaN values nor Read-Only (cross-hatched) values are affected. Since slots can appear in an SCT more than once, the adjust value operation is careful to adjust each selected Slot/Timestep value only once. Click the Report Results toggle to see a summary of the slots changed.



## 9.3 Clear Values

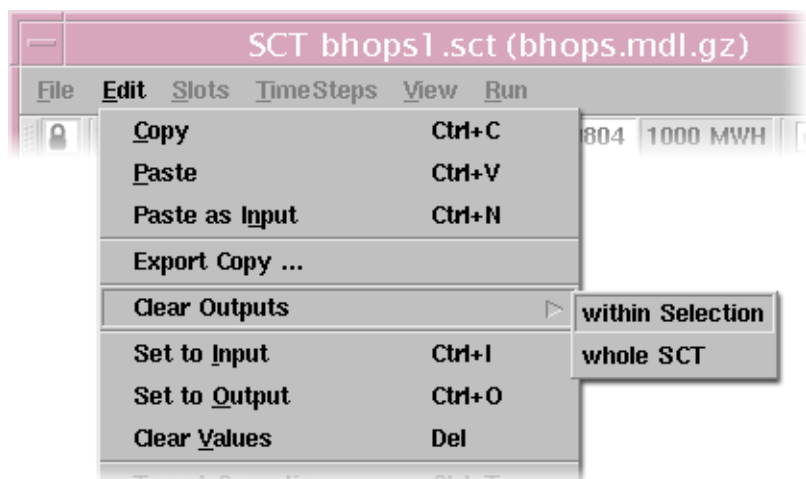
Users can clear all editable values by selecting them and pressing the **Del** (delete) key. This operation is also available as a menu operation: **Edit** ➔ **Clear Values**.

When a value clears:

- Its value is set to NaN.
- Its flag is set to the output flag.

Two variants of a related function also result in the clearing of values:

- Edit** ➔ **Clear Outputs**
  - ➔ within Selection
  - ➔ whole SCT



**Clear Outputs** clears values that would generally be computed during a model run. The application sets to NaN timesteps with the following flags:

**Output (O), Best Efficiency (B), Max Capacity (M), Drift (D) and Unit Values (U)**

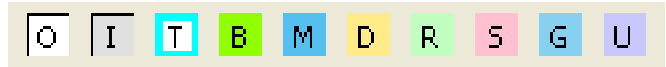
Note: The **SCT Lock** does not prevent the clearing of slot data.

## 9.4 Set a Flag

Flags are properties associated with individual slot timesteps that are generally depicted in the SCT using background color shading.

The user can set the Input (I) and Output (O) flags on all editable slot timesteps, with the provision that the input flag can be set only on timesteps with a defined (non-NaN) value. Other flags can be set only on certain slots. The **Target Operation**—which sometimes involves coordinating pairs of internal flags on different timesteps—is discussed more in the next section.

The Flag Set operations are available in the **Edit menu** and as toolbar buttons that can optionally be shown or hidden, depending on settings in the



**Configuration Dialog, Flags Tab**. These operations are also available as keyboard accelerators:

(I)	Input	Ctrl+I
(O)	Output	Ctrl+O
(T)	Target	Ctrl+T
(B)	Best Efficiency	Ctrl+B
(M)	Max Capacity	Ctrl+M
(D)	Drift	Ctrl+Shift+~
(U)	Unit Values	N/A

If the current cell selection includes any slot that doesn't support a particular flag, the **Flag Set** operation for that flag is disabled. The disabled menu operations are indicated as grayed-out. The active **Flag Set** toolbar buttons are indicated with a black border. (Those buttons lacking a black border are disabled).

Note: The **SCT Lock** does not prevent the setting of flag values on slot timesteps.

## 9.5 Set a Target Operation

Users can apply a **Target Operation** to a single timestep or to a contiguous range of timesteps on the following types of slots:

- Reservoir, Storage
- Reservoir, Pool Elevation

If the **Target Operation** is applied to a single timestep (by **setting the Target Flag** on a single selected timestep), then that timestep is regarded as the final timestep of the **Target Operation**—and the first timestep is implied by the flag values in the preceding timesteps. (This implicit **Target Begin** timestep is determined during the model run). The **Set Target Flag** operation is enabled only if the value for that single timestep is defined (non-NaN).

If the **Target Operation** is applied to a range of timesteps within a slot (by selecting a set of data cells and operating the **set Target Flag operation**), then the earliest timestep is assigned the **Target Begin Flag** and the latest timestep is assigned the **Target (End) Flag**. In this sort of **Target Operation** (with an explicitly defined **Target Begin** timestep), the final target timestep is indicated with a solid background fill color (of the **user configured Target color**), and the previous timesteps have only a thick border of that color.

Target Operations are indicated by a frame around all of the timestep cells within the target range as shown. The TARGET time is also shaded as an INPUT value.

Timestep	Mountain Storage .Inflow 1000 cfs	Mountain Storage .Outflow 1000 cfs	Mountain Storage .Pool Elevation ft	Mountain Storage .Release 1000 cfs	Mountain Storage .Spill 1000 cfs
1/25 24:00 Sat					
1/26 24:00 Sun					
1/27 24:00 Mon	352.90	NaN	785.00	NaN	NaN
1/28 24:00 Tue	378.10	140.40	785.26	140.40	0.00
1/29 24:00 Wed	504.20	140.40	785.65	140.40	0.00
1/30 24:00 Thu	2520.80	140.40	788.22	140.40	0.00
1/31 24:00 Fri	2016.70	143.60	790.21	143.53	0.28
2/1 24:00 Sat	1890.60	169.54	791.86	144.62	24.92

## 9.6 Copy a Single Value to One or Many Timesteps

Through the following four steps, users can copy a single timestep value to one or more timestep values on a slot having the same unit type. This works both within a single SCT or between SCTs. Users can repeat, any number of times, the third and fourth steps (pasting) detailed below.

- Select (click in) the **source cell** (a **detail cell**, or a data cell in a non-aggregated view—see [Note 1](#), below).
- Perform the copy operation in one of three ways:
  - Press Ctrl+C or
  - Select the **Edit** ➔ **Copy** menu operation or
  - Click the **Copy** toolbar button.

*The source cell will be marked with the Copy Set Crosshatch of a user configured color.*
- Select (click in or, optionally, drag) the destination cell(s).
- Perform the paste operation in one of these ways:
  - Press Ctrl+V or Ctrl+N or
  - Select the **Edit** ➔ **Paste** or **Edit** ➔ **Paste as Input** menu operation or
  - Click the **Paste** toolbar button.

All but the **Paste as Input** and Ctrl+N operations perform the default paste operation, which pastes only input semantics values and flags—and clears all the other destination timesteps. [Read more about the copy and paste operations.](#)

The paste operations are enabled only if all of the destination cells are of the same unit type as is the

source cell and if they are all editable (i.e., not read-only). (See [Note 2](#), below, regarding the handling of real values.)

**Note 1:** If the source cell is a **summary cell** (in an aggregated view), then generally this is equivalent to selecting multiple values (multiple timesteps), which would initiate the copy of multiple values—**discussed in the next section**. One exception is a summary cell of the first or last timestep aggregation that happens to have only a single timestep, in which case the type of copying described in this section (“Copy a Single Value”) would apply.

**Note 2:** If the paste operation is enabled, then values that are pasted (**depending on the type of paste operation**) are assigned to the destination timesteps using standard units. This means that if the display units of the source and destination slots are different (e.g., cubic feet per second vs. cubic meters per second), then the pasted values will appear to be different than the source value (in the source cell). However, the quantities that those values represent will be the same.

## 9.7 Copy Multiple Values

Users can copy a set of timesteps within a single slot to another time within the same slot or to a different slot having the same unit type. This works both within a single SCT or between SCTs. Users can repeat, any number of times, the third and fourth options (pasting) detailed below.

- Select (click in and, optionally, drag) the source cells. These can include all sorts of data cells, including summary cells. Timesteps indicated in the selection do not have to be contiguous because the program “remembers” the relative offsets between them.
- Perform the copy operation in one of three ways:
  - Press Ctrl+C or
  - Select the **Edit** ➔ **Copy** menu operation or
  - Click the **Copy** toolbar button.

*The source cells are marked with the Copy Set Crosshatch with a **user configured color**.*

To identify the earliest destination timestep, select (click in) a single cell. This cell can be any sort of data cell, including a summary cell. If users select a summary cell, the implied earliest timestep is the first timestep within the timestep aggregation represented by that summary cell.

**Alternate operation:** Instead of selecting a single cell to identify the earliest destination timestep, if users select a single whole slot, the implied destination timestep is the earliest timestep from the source timestep selection. This is accomplished differently in the two axis orientations:

In **Horizontal Timestep Axis Orientation** (where rows correspond to slots), users select a slot by:

- clicking in a row tab at the extreme left side of a summary row or
- if the SCT is locked, by clicking in any row header field within a summary row or in any row in the non-aggregated view.

In **Vertical Timestep Axis Orientation** (where columns correspond to slots), users select a slot by:

- clicking in a column header.

- Perform the paste operation in one of these ways:
  - Press Ctrl+V or Ctrl+N or
  - Select the **Edit ➤ Paste** or **Edit ➤ Paste as Input** menu operation or
  - Click the **Paste** toolbar button.

All but the **Paste as Input** and Ctrl+N operations perform the default paste operation that pastes only input semantics values and flags and clears all the other destination timesteps. [Read more about the Copy and Paste operations.](#)

If there are timestep gaps in the source timestep selection, those gaps are honored by the paste operation. That is, the corresponding gaps in the destination will not be affected.

The paste operations are enabled only if the selection includes cells from just one slot. Pasting of defined values is performed using standard units. (Read more about this in [Note 2](#), in the [Copy a Single Value](#) section).

## 9.8 Copy a Timeslice across All Slots

Within a single SCT, users can copy a set of contiguous timesteps across all slots to other timesteps. Users can repeat, any number of times, the third and fourth steps (pasting) detailed below.

- Select (click in and, optionally, drag) the source timesteps.

In **Horizontal Timestep Axis Orientation** (where columns are timesteps or timestep aggregations), this is done by clicking and dragging in the column headers.

In **Vertical Timestep Axis Orientation** (where rows correspond to timesteps or timestep aggregations), this is done by clicking or dragging in the row tabs at the far-left side of each row.

- Perform the copy operation in one of three ways:
  - Press Ctrl+C or
  - Select the **Edit ➤ Copy** menu operation or
  - Click the **Copy** toolbar button.

*The source timestep data cells will be marked with the **Copy Set Crosshatch** with a [user configured color](#).*

- To identify the earliest destination timestep, select (click in) a timestep row or column (as in the first step, above).
- Perform the paste operation in one of these ways:
  - Press Ctrl+V or Ctrl+N or
  - Select the **Edit ➤ Paste** or **Edit ➤ Paste as Input** menu operation or
  - Click the **Paste** toolbar button.

All but the **Paste as Input** and Ctrl+N operations perform the default paste operation that pastes only input semantics values and flags—and clears all the other destination timesteps. [Read more about the Copy and Paste operations.](#)

## 9.9 Copy a Whole Slot

Users can copy the series data of a whole slot to another slot in the same SCT or to a different SCT. Users can repeat, any number of times, the third and fourth steps (pasting) detailed below.

- Select a source slot.

In **Horizontal Timestep Axis Orientation** (where rows correspond to slots), this is done by:

- clicking in a row tab at the extreme left side of a summary row, or any data row in the non-aggregated view or
- if the SCT is locked, by clicking in any row Header field within a summary row or in any row in the non-aggregated view.

In **Vertical Timestep Axis Orientation** (where columns correspond to slots), this is done by:

- clicking in a column header.

- Perform the copy operation in one of three ways:

- Press Ctrl+C or
- Select the **Edit ➤ Copy** menu operation or
- Press the **Copy** toolbar button.

*The source timestep data cells will be marked with the copy set crosshatch with a **user configured color**.*

- To identify the destination slot and earliest destination timestep, select (click in) a cell.

Alternate operation: Instead of selecting a single cell to identify the earliest destination timestep, if users select a single whole slot, the implied destination timestep is the earliest timestep defined in the source slot (regardless of the time range shown in the SCT). This is accomplished differently in the two axis orientations, as described in the first step, above.

- Perform the paste operation in one of these ways:

- Press Ctrl+V or Ctrl+N or
- Select the **Edit ➤ Paste** or **Edit ➤ Paste as Input** menu operation or
- Press the **Paste** toolbar button.

All but the **Paste as Input** and Ctrl+N operations perform the default paste operation that pastes only input semantics values and flags—and clears all the other destination timesteps. [Read more about the Copy and Paste operations.](#)

## 9.10 Copy/Paste Data to/from the Clipboard (e.g., to Excel).

It is possible to copy to the system clipboard the numeric values displayed in an SCT—and, subsequently, to paste those values into another application (e.g., Microsoft Excel or other spreadsheet).

Data is copied with the displayed units and without reference to units (but, optionally, with greater precision).

To copy data to the system clipboard:

- Make any data cell selection in the SCT.

For the purposes of this operation, the minimum enclosing geometric (not chronological) rectangle around the selection is implied. In the aggregated views, summary rows are included only if all of their subordinate detail rows are included.

- Select the menu operation **Edit** ➔ **Export Copy...** The **Export to Clipboard** dialog box displays. (See graphic, above right.)
- Select **Display** or **Model** data precision, and whether undefined values should be pasted as NaN (or as a blank). Also specify if you wish to include row headers or column headers. Depending on the axis orientation, the headers include:
  - The complete label and the units (if enabled for display in the SCT) OR
  - The timestep Date/Time (sufficient to identify the timestep) and the timestep weekday (if enabled for display in the SCT)
- Click on the **Copy** button.

In the other application (e.g., Excel), perform a paste operation (from the system clipboard).

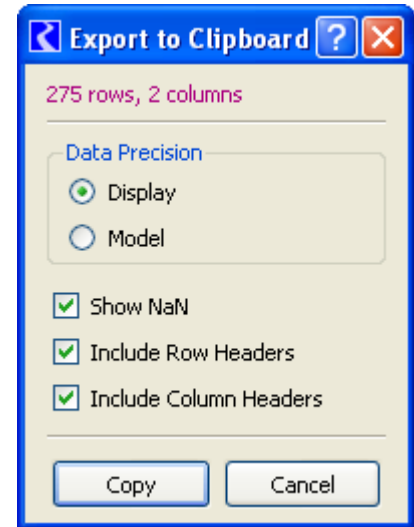
To paste data from the system clipboard:

- Copy the data from the other application (Excel)
- Make a cell selection in the SCT.

For the purposes of this operation, the minimum enclosing geometric (not chronological) rectangle around the selection is implied. Aggregated views are not allowed.

- Select the menu operation **Edit** ➔ **Import Paste...** or right click on the SCT and choose **Import Paste...** The **Import from Clipboard** dialog box displays. Make any desired adjustments to the options.
- Click on the **Paste** button.

Clipboard data format: ASCII-encoded decimal numeric values (or “NaN” for undefined values—if selected) within a row are separated with Tab characters. Rows are separated with New Line characters.



## 10. How To: Print, Plot, and Export Data

### 10.1 Printing

Users can print a graphical depiction of the SCT, or a subset of the SCT. From the SCT, only the **Row Header Table** and **SCT Data Table** (with column headers) are included. The printed-page header and footer contains some information about the SCT and RiverWare model.

There are three **File** ➤ **Print** menu operations:

1. **File** ➤ **Print** ➤ **Selection**
2. **File** ➤ **Print** ➤ **Page**
3. **File** ➤ **Print** ➤ **Full SCT**

The **Print** ➤ **Selection** operation prints the minimum enclosing rectangle around the selection. In the aggregated views, summary rows are included only if all of their subordinate detail rows are included.

The selection ornamentation (reverse colors) prints only through the **Print** ➤ **Page** and **Print** ➤ **Full SCT** operations.

### 10.2 Plotting

When users select the plot operation, the full, defined time range of the selected slots is plotted (on the screen), even if the slot selection is indicated with just one or a few cells (timesteps) within slots. Plotting is enabled only if no more than two unit types are represented within the selection.

Users can display a plot of the selected slots either by:

- selecting the **Slots** ➤ **Plot Slots...** menu item or
- clicking the **Plot** toolbar button.

### 10.3 Exporting Data

The SCT does not support directly exporting data to files. However, see the **Copy/Paste Data to/from Clipboard** operation. Data can also be exported to text files from the individual slots. Use the **Slots** ➤ **Open Slots menu** to open the slot. Then use the **File** ➤ **Export...** menu to export the data.