



Technical Documentation Version 7.5

Release Notes



Center for Advanced Decision Support for
Water and Environmental Systems (CADSWES)

UNIVERSITY OF COLORADO **BOULDER**

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Chapter 1

What's New in Version 7.5?

This document describes new features, enhancements, and changes in RiverWare Version 7.5.

Special Attention Notes

The section describes special attention notes, which indicate that functionality has changed that requires you to update models, that results may differ, or you might get a warning message when you first load a model in Version 7.5. If you have any questions, contact RiverWare-Support@Colorado.edu.

- **Excel DMI Connection process:** A Database DMI with an Excel Dataset is now able to read or write directly to the Excel file without opening the Excel application in the background. This improves performance and allows the DMIs to work when Excel isn't installed, in the cloud for example. In RiverWare 7.5, the default is the new connection process. In most cases, this is preferred, but if you rely on Excel opening the workbook and evaluating formulas, then you should select the **Open Excel in the background** option.
- **RoundToFactor RPL Predefined function:** A new RoundToFactor RPL Predefined function was created. If you have a user defined function also named RoundToFactor, you will need to change the name or delete the user defined function.
- **Modifications to Passthrough Account Solution:** Within water accounting, the approach to solve a chain of passthrough accounts and supplies was modified to allow more passthrough accounts in the chain. This change affects all passthrough accounts, but no numerical or behavioral differences are expected. We strongly recommend that you test your accounting models with the 7.4.3 patch or 7.5 before using it in production.
- **Object Redispatching:** In rare circumstances, object redispatching did not work correctly in Rulebased Simulation when there were Input flags (I or Z) on the governing slots. Now, the algorithm to determine the method to redispatch always chooses the previous method if no other method can be found, guaranteeing that the object will redispatch a method. This change could cause some objects to redispatch when previously they did not, leading to different behavior.

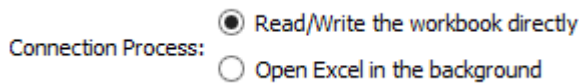
Accounting - Passthrough Account Solution

Within water accounting, the approach to solve a chain of passthrough accounts and supplies was modified to allow more passthrough accounts in the chain. This change affects all passthrough accounts, but no numerical or behavioral differences are expected. We strongly recommend that you test your accounting models with the 7.4.3 patch or 7.5 before using it in production.

Data Management Interface - Excel Connection

A Database DMI with an Excel Dataset is now able to read or write directly to the Excel file without opening the Excel application in the background. This improves performance and allows the DMIs to work when Excel isn't installed, in the cloud for example. [Figure 1.1](#) shows a screenshot of the configuration in the Excel dataset. The default is the new connection process. In most cases, this is preferred, but if you rely on Excel opening the workbook and evaluating formulas, then you should select the **Open Excel in the background** option.

Figure 1.1 Screenshot of the Excel Dataset Connection process option



For more information, see [“Connection Process”](#) in *Data Management Interface (DMI)*.

Documentation

The RiverWare documentation (this file you are viewing right now) is presented by default in a browser (i.e. HTML based). You can still access the traditional PDF files from RiverWare using the **Help** menu, and then **Documentation PDFs** menu.

Model Comparison Tool

The Model Comparison Tool compares two models and presents the differences in a hierarchical tree. The tree allows you to identify and explore the differences between two models. For more information on this tool, see [“Model Comparison Tool”](#) in *User Interface*.

Additional Content Compared

The Model Comparison Tool was extended to compare the following model content:

- **Links:** A new property, **Linked Slots**, represent each slot to which the selected slot is linked.
- **DMI configurations:** The DMI configurations are now compared. Each comparable item can have properties and children items. For example, the database DMI item has properties and child dataset items, and the dataset items have properties and child slot selection items. When two items are compared their properties are compared and then their child items are compared.

Recognition of Renamed Items

The Model Comparison Tool now recognize when an item has been renamed from model A to model B. When that is the case, the item appears twice in the results tree, one for each model. The item corresponding to the item in model A has status "A ->" (the item exists here in A and elsewhere in B), and conversely the model B item has status "<- B" (the item exists here in B and elsewhere in A). Items that have been renamed show in a light orange

color. When an item's name has changed, selecting the item's Name property in the results tree allows you to identify how the name changed. Because of this rename functionality, model file sizes grew about 1-2%.

Note: This change does not impact comparison when one of the models was saved prior to RiverWare 7.5. For older models and sets, renaming an item will cause the comparison tool to treat the item as two distinct items, one reported as existing in model A but not in model B and one existing in model B and not in model A.

Model Reports

The Model Report is an output device that generates an HTML document describing the model and/or RPL set. The Model Report is flexible with respect to both the contents and appearance of the report, allowing you to configure both the information contained in the report as well as how that information is formatted. For more information see [“Model Report”](#) in *Output Utilities and Data Visualization*.

Two new report item settings were added:

- **List Rules in Order of Execution:** A new setting, “List Rules in Order of Execution” was added to the RPL Set and RPL Group items. If “Yes”, when the output includes rules that execute, they are listed in order of execution (agenda order), instead of first to last. This setting is useful for Rulebased Simulation and Initialization Rules Sets, which can be executed in “...3,2,1” order.
- **Show Execution Properties:** A new setting “Show Execution Properties” was added to the RPL Set, RPL Group, and RPL Rule/Goal items. If “Yes”, the output will include additional information related to execution, as appropriate. Specifically, this setting controls whether the following properties are shown: Index, Flag, Priority, and On (Yes/No). These properties correspond to columns of the RPL set editor, as applicable to the type of set.

For more information on these two settings, see [“RPL Set”](#) in *Output Utilities and Data Visualization*

Objects and Methods

This section describes changes to RiverWare Objects.

Reach - Periodic and Flow Based Gain Loss method

A new method, **Periodic and Flow based Gain Loss** method was added to the Reach's **Gain Loss** category. This method uses periodic slots with numeric flow headers to lookup the flow rates used in the computations. For more information on this method, see [“Periodic and Flow based Gain Loss”](#) in *Objects and Methods*

Water User

The Water User slot, Maximum Supplement Request is now a linkable dispatch slot.

RPL

This section describes changes to the RiverWare Policy Language (RPL).

New RPL Predefined Function - RoundToFactor

A new RoundToFactor function rounds a numeric value to the nearest multiple of the specified factor, rounding halfway cases away from zero.

See “RoundToFactor” in *RiverWare Policy Language (RPL)* for more information.

RPL Set Comparison Tool

The RPL Set Comparison Tool now recognizes when an item has been renamed from set A to set B. This is similar functionality to that implemented for the Model Comparison Tool described in [Recognition of Renamed Items, page 2](#).

Rulebased Simulation - Object Dispatching

In rare circumstances, object redispaching did not work correctly in Rulebased Simulation when there were Input flags (I or Z) on the governing slots. Now the algorithm to determine the method to redispach always chooses the previous method if no other method can be found, guaranteeing that the object will redispach a method. This change could cause some objects to redispach when previously they did not, leading to different behavior.

Script Management

This section describes changes to Script Management. Scripts allow you to organize and run sequences of actions. This allows you to automate many of the tasks involved in operating a model. For more information see “[Script Management](#)”.

New Script Actions

The following script actions were added:

- **Open File:** A new script action, Open File, was added to the list of available script actions. This new Open File action includes a setting that opens a file selection dialog to locate and specify the file to open during script execution using the configured Microsoft Windows desktop application file association for the file extension. For example, a file with .xlsx would be opened with Microsoft Excel. Files having no extension or an unrecognized extension will launch the Microsoft “Open With...” program selector during script execution. For more information, see “[Open File](#)” in *Automation Tools*
- **Divider:** A new script action, “Divider” was added to the list of available script actions. Although it is in the action list, a divider does not contain or execute any operations during script execution. The purpose of the

divider is solely to provide a visual script section header with configurable text and color on the script dashboard. For more information, see [“Divider” in Automation Tools](#)

Set Slot Value Settings

For the following set slot value actions, new settings were added to specify how the value will be specified:

- [“Set Scalar Slot Value” in Automation Tools](#)
- [“Set Series Slot Values” in Automation Tools](#)
- [“Set Table Slot Value” in Automation Tools](#)

The settings provide the ability to set a slot's value to the value returned by a global RPL function. The function must return a numeric or datetime value and accept only a logical set of arguments (based on the action type) in order to be called during script execution.

For more information, see [“Setting Slot Values using a Global Function” in Automation Tools](#)

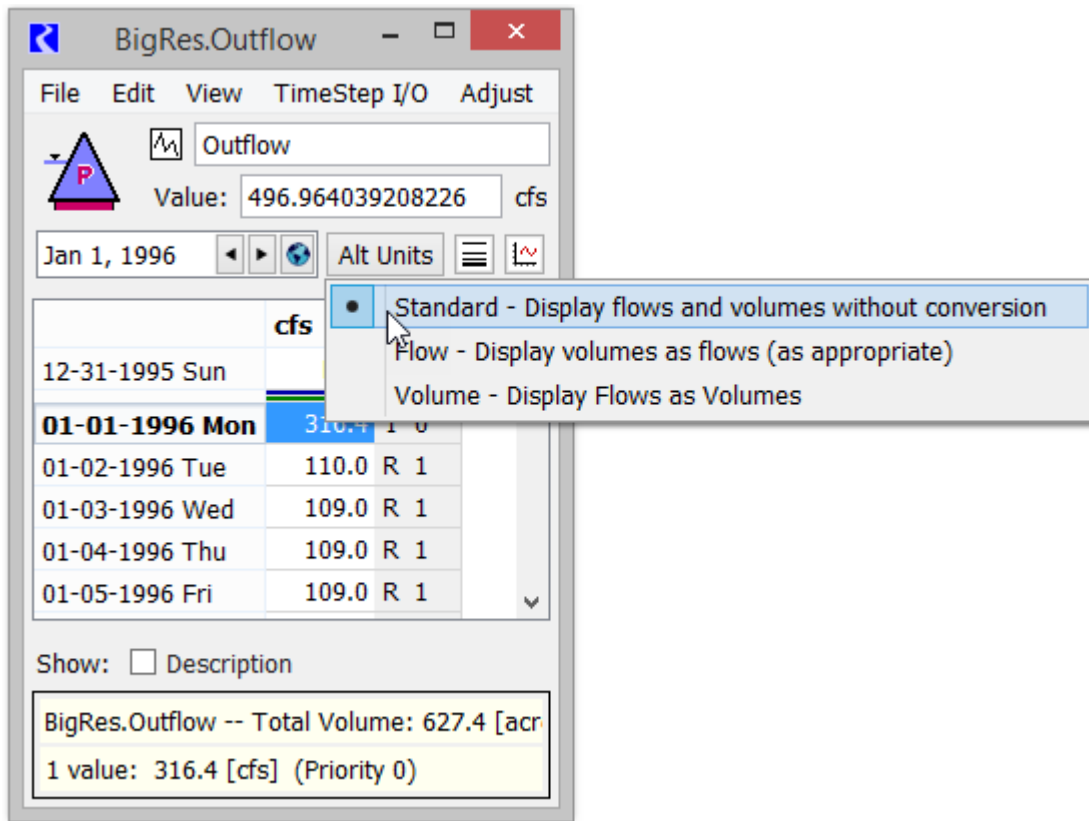
Slots

This section describes changes to slot functionality.

Alt Units Toggle

A new Alt Units button was added to all Slot, Slot Viewer, SCT dialogs and Edit Account dialogs that show flows or volumes. This new button adds the capability to display flow data as volumes or vice versa. Although similar functionality has previously existed on accounting dialogs, the new implementation of the Alt Units button supports an additional **Standard** mode, in which values are displayed using their “native” unit type, without conversion. [Figure 1.2](#) shows a screenshot of the new button on the Slot dialog.

Figure 1.2 Screenshot of a Slot dialog showing the Alt Units button



Statistical table slot - new “Monthly Medians By Year” function

A new function was added to the Statistical Table Slot to compute Monthly Medians by Year. For each year, it computes the monthly median and the yearly median. Min, max, and average statistics are also reported on the monthly medians. For more information, see [“Monthly Medians By Year” in User Interface](#).

Water Quality - Reach Mass Balance Salinity

The Reach Mass Balance Salt methods were modified to relax an error condition. Within the Solve Out Salt Given In Salt dispatch method, when Outflow is zero and there is Diversion that would lead to a negative outflow salt mass, previously the run was aborted with an error. Now, the reach sets Outflow Salt Mass and Outflow Salt Concentration to zero and stores the negative salt mass in the Salt Storage slot. A warning message is posted.

For more information, see [“Solve Out Salt Given In Salt” in Water Quality](#).

Workspace

The following changes were made to the RiverWare Workspace:

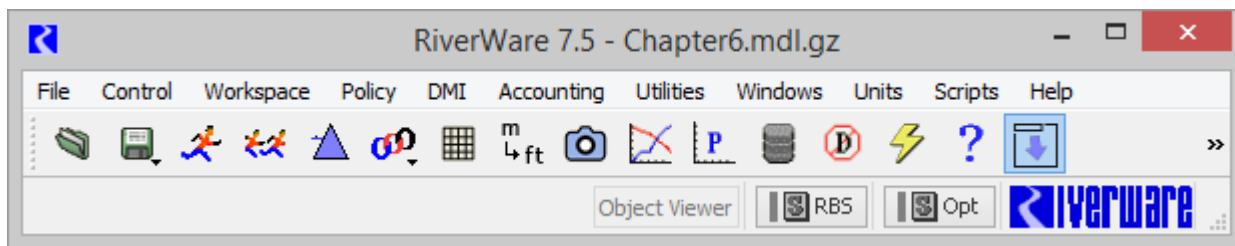
New Windows Menu

The menu, **Utilities** and then **Windows** was moved to a new top level **Windows** menu.

Toggle Workspace Display Mode

A new **Toggle Workspace Display Mode** operation was added to the **Windows** menu. This operation toggles the workspace display between the standard “Full” mode and a “Compact” display mode, in which space is minimized by hiding the Canvas/View, Simulation Object List (if shown and docked within the workspace), and Animation controls (if shown and docked within the workspace). A sample is shown in [Figure 1.3](#).

Figure 1.3 Screenshot of a workspace in Compact mode.



The action is available in the following ways:

- **Windows** and then **Toggle Workspace Display Mode** menu operation
- The keyboard shortcut: Ctrl-T
- Clicking on a new toolbar button.



For more information see [“Workspace Display Mode”](#) in *User Interface*

Send Workspace to Back

A new **Send Workspace to Back** operation was added. This operation causes the Workspace window to be displayed behind any other overlapping window. The action is available in the following ways:

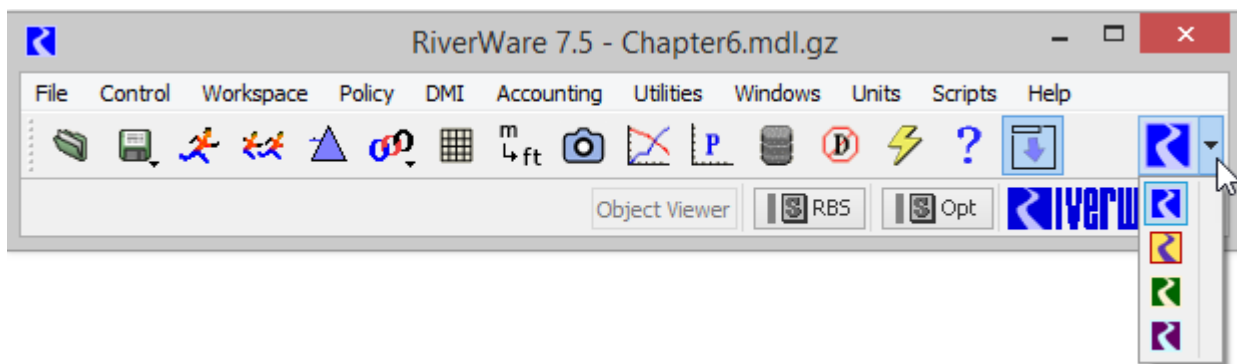
- The **Windows** menu, and then **Send Workspace to Back**
- The keyboard shortcut: Ctrl+B

Icon Colors

Improved access to and appearance of the Window Icon menus. See “[Icon Colors](#)” in *User Interface* for more information. There are two ways in which to select a new icon for the title bar of the RiverWare icons, variations on the standard RiverWare logo:

- The **Windows** menu, and then **Window Icon** menu
- A new RiverWare logo button in the Workspace toolbar as shown in [Figure 1.4](#). This change also decreases the height of the toolbar which shows a more compact view.

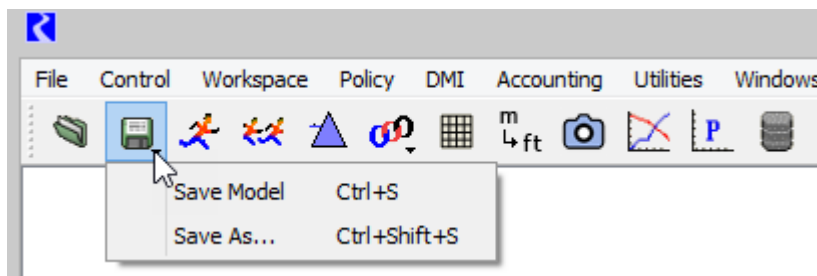
Figure 1.4 Screenshot of toolbar buttons with Icon Color button/menu expanded



Save Button Menu

On the toolbar, the Save Model button was converted to a menu. Now, when the button is pressed, you get an option to either **Save Model** or **Save As**. The purpose of this change is to prevent inadvertent, and often time consuming saves when you accidentally click the Save button, perhaps when you intended to click the Load Model or Run Control button. [Figure 1.5](#) shows the new Save button menu.

Figure 1.5 Screenshot of the toolbar showing the Save button menu.



Windows Task Bar

Previously, Windows created a single taskbar button for all RiverWare applications running. With multiple dialogs, the taskbar buttons for these windows were combined into a single “stacked” button.

This behavior was changed so that now Windows displays a distinct taskbar button for each RiverWare process. In addition, the RiverWare icon used for that button is the same RiverWare icon displayed in the title bar of that process's windows. This icon color can be changed as described in [“Workspace” on Page 7](#) and shown in [Figure 1.4](#).

Chapter 1
What's New in Version 7.5?

Chapter 2

Closed Issue Reports

Table 2.1 summarizes the issues that have been addressed or fixed since the last major release (Version 7.4). Issues are listed in bug number order. For more information on any bug, see the RiverWare.org website.

Table 2.1 Issues addressed since Version 7.4

Number	Summary
5416	diagnostic message is unclear when Anticipated Storage is missing the min/max value
5457	Opt Input Evaporation does not work if model is saved and reloaded after Sim run
5491	Interpolation tolerance for 3-D interpolation too tight
5602	Run parameter <Save Final Optimization Problem> doesn't work
5603	Loading a problem into POSAT loses dual prices
5615	Optimization "Problem Freezing" diagnostics show up when diagnostics disabled
5666	optimization is writing incorrect piecewise ordering cut constraints
6043	RiverWare prints Opt Diagnostics even when diagnostics are not enabled
6121	Date Range Changes in SCT when selecting between Tabs
6149	Database DMI edit dlg with DSS dataset can be shrunk to illegibility
6169	Time scroll in slot viewer doesn't always work
6171	Table slot row indices are inconsistent in interface
6190	Some Input Data Sets are not displayed correctly when sorting by column
6218	SCT units label sometimes goes blank
6221	Editing TableSeriesSlot time range changes row labels from date/time to numeric
6223	Scripts: Set Scalar Slot action no longer sets datetimes to current timestep or RPL function
6224	Plot Up/Down Arrows behave incorrectly when no plot is selected
6228	Single plot in new Plot Editor is not automatically selected
6229	RPL SymbolicDateTime's are not guaranteed to resolve correctly
6232	In 7.5, Scalar slots are read-only
6233	SCT can display incorrect text series slot value in line edit
6235	Model won't load, crashes during the loading of the output device manager
6251	Model Comparison Tool identifies table slot description difference as a row label difference
6252	Output Canvas Flow Line Legend doesn't use unit scheme
6253	Model Comparison Tool font size in Comparison Results panel does not change with Windows font

Chapter 2
 Closed Issue Reports

Table 2.1 Issues addressed since Version 7.4

Number	Summary
6254	RiverWISE number sliders change entered number
6255	New Alert, Notice, and Warning statements don't always post to diag output window
6256	Script action to set scalar value ignores "Show Current Value" setting
6257	Script editor: when editing a date/time setting, the options menu doesn't work properly
6259	Stack overflow crash during a run while accounts are solving
6260	Open to context item not working when validating rule in diag window
6262	Script dashboard beeps when it shouldn't
6263	RW 7.4 Icon Changes after pinning to taskbar
6266	Script execution freezes or is significantly slower when Script Editor is open
6267	Script Global Time Scroll action serialized incorrectly
6268	Model crashes when switching to accounting view
6269	Model comparison tool affects workspace File -> Reopen Model behavior
6270	Failure of GetMaxReleaseGivenInflow
6271	Values are Integers setting in a table slot does not persist
6272	Delete subbasin informational message causes context internal error
6273	Crash changing object name
6274	RPL set comparison: set selection offers the wrong names for sets from a model
6275	Crash executing an optimization run with a model not fully configured
6276	Another crash running an optimization model not fully configured
6277	Optimization Spill error message uses old terminology and needs to be updated
6279	Selected Timestep on SCT varies by selected tab
6280	Diagnostics when using "Global Time Scroll" in Script
6281	Thermal Hydro Block Costs and Hydro Block Use agg series slots always expand to 100 columns on model load
6282	Crash when saving Final Optimization Problem
6284	RPL Set Comparison Tool allows opening of a copied instance of a function