#### RiverWare 7.2 Features: LBAO 1.4 SCT Tasks, July-Sept 2017

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This document describes the following new features developed for RiverWare 7.2:

- 1. Time scrolling SCTs and other series data displays to a user-specified Symbolic DateTime:
  - (a) When the model opens, and
  - (b) As a script action: Global Time Scroll.
- 2. Support full editing of the new Text Series Slots in SCTs.
- 3. New SCT Operation Dialog: "Set Slot Values over Time Range", including Interpolation Function.
- 4. Operations to set SCT slot labels to the slots' name or slot column name.

# (1) Time scrolling SCTs and other Series data displays to a Symbolic DateTime: (a) when the model opens, and (b) as a script action.

RiverWare 7.2 has two new provisions for time scrolling series data displays. These operations are implemented using the existing **"Global Time Scroll"** mechanism which sets the value of all "time navigation" DateTime Spinners in open dialogs and is subsequently applied to such dialogs (e.g. Open Object dialogs, and SCTs) when they are first opened.

The two new provisions, described in the subsequent sections, support the specification of DateTime using a Symbolic DateTime. Note that a Symbolic DateTime specification can be the name of a **Global RPL Function** (a RPL Function in a Global RPL Set). And such a Global RPL Function *can* refer to a **DateTime-unit Scalar Slot** (which itself *could be* a **Scalar Slot with RPL Expression**, possibly involving a Symbolic DateTime). Note also that, in the contexts of the features proposed below, "**Current Timestep**" in a Symbolic DateTime expression refers to the timestep containing the current "**wall clock**" time.

# (1A) Option in the Initial Workspace Appearance dialog to set the Global Time Scroll to a specified Symbolic DateTime.

The **Initial Workspace Appearance** dialog now contains a checkable "Initial Workspace Timestep" panel. *See the highlighted area of that dialog in the following image, below, to the left.* This dialog is accessible from the RiverWare workspace menubar: "<u>Workspace</u> >> <u>Initial Appearance...</u>".

If the Initial Workspace Timestep panel is checked, the user can provide a Symbolic DateTime formula. This Symbolic DateTime is saved with the model, in the RiverWare model file. When checked, the Symbolic DateTime is used in two distinct ways:

- a. When the model is loaded, a Global Time Scroll to the Symbolic DateTime value is effected. Navigation DateTime Spinners in RiverWare dialogs (e.g. the Object Viewer) are initialized to the most recent Global Time Scrolled DateTime.
- b. The "Global" drop down menu shown with Time-Navigation DateTime Spinners includes the Symbolic DateTime value. (*This is illustrated at the end of this section*).

pen Model in View:	Constant Datetime Editor HH:00 MMM DD, YYYY
Specified View:	Current Timestep
Simulation View 🔻	Current Timestep + N Timesteps
7	Current Timestep - N Timesteps
200m: 100% •	Start Timestep
Location:	Start Timestep + N Timesteps
Lower Lett Corner	Start Timestep - N Timesteps
Last Save Location     Center-Most Object	Finish Timestep
Center on Object	Finish Timestep + N Timesteps
	Finish Timestep - N Timesteps
	00:00 Jan 1, Start Year
	00:00 Jan 1, Start Year + N Timesteps
Start Timestep	00:00 Jan 1, Start Year - N Timesteps
24:00 September 6, 2017	Dec 31. Finish Year
et from Current View OK	Dec 31, Finish Year + N Timesteps
	Dec 31 Finish Year - N Timestens

In the Initial Workspace Appearance dialog, a drop-down menu, *shown above, to the right,* provides access to the following options:

- a DateTime spinner for the specification of a specific (constant) DateTime (the first item, see below),
- a Global RPL Function selector (*the last item*), and
- many Symbolic DateTime formula *templates* which can be edited to provide a valid Symbolic DateTime.



If this Initial Workspace Symbolic DateTime is defined and enabled, its value will appear in the **"Global Time Scroll" menu** in **time-navigation DateTime Spinner**, *See below*. (This item is shown only if its value is distinct from the other menu items). Selecting that item sets the DateTime spinner to the indicated DateTime -- this, by itself, doesn't perform a *global* time scroll operation.



## (1B) New RiverWare Script Action to set the Global Time Scroll to a specified Symbolic DateTime.

A new **Global Time Scroll** script action was developed. This has a Symbolic DateTime setting which can optionally be overridden in the Script Dashboard. This action effects a Global Time Scroll which "scrolls" all series data displays to the specified timestep DateTime.

The configuration of the Global Time Scroll script action includes the ability to allow or disallow editing of the Symbolic DateTime in the Script Dashboard. The illustration below shows an "Editable" Global Time Scroll action -- in both the Script Editor and the Script Dashboard:

	Script Editor: Test Script Two
File	Edit
Script Settin	gs
Setting	Value
Name	Test Script Two
Description	
Actions	
Add Action	Clear DMI Values   Move Selected Action:
Text	Туре
Set A S	eries Slot Value Set Series Slot Values
Global	Time Scroll to: Finish Timestep - 4 Timesteps Global Time Scroll
Setting	Value
Setting	Value
Show in Da	shboard Yes
Display Tex	t
Scroll to Da	teTime Finish Timestep - 4 Timesteps
Allow Editin	
	g Yes
	g Yes
	g Yes           C         Script Dashboard: Test Script Two         -
Everytion	g Yes Script Dashboard: Test Script Two
Execution	g Yes C Script Dashboard: Test Script Two
Execution	g Yes Script Dashboard: Test Script Two File Edit Test Script Two Set A Series Slot Value
Execution	g Yes C Script Dashboard: Test Script Two - □ File Edit Test Script Two ✓ Set A Series Slot Value Use: Override default value cms
Execution	g Yes C Script Dashboard: Test Script Two - □ File Edit Test Script Two Set A Series Slot Value Use: Override default value cms ✓ Global Time Scroll to: Einish Timesten - 4 Timestens
Execution  Status: Enc	g Yes C Script Dashboard: Test Script Two - □ File Edit Test Script Two ✓ Set A Series Slot Value Use: Override default value cms ✓ Global Time Scroll to: Finish Timestep - 4 Timesteps Use DateTime: Start Timestep + 2 Timesteps
Execution	g Yes C Script Dashboard: Test Script Two - □ File Edit Test Script Two ✓ Set A Series Slot Value Use: Override default value cms ✓ Global Time Scroll to: Finish Timestep - 4 Timesteps Use DateTime: Start Timestep + 2 Timesteps ▼ ? 24:00 January 2, 2017
Execution  Status: End	g       Yes         Image: Comparison of the second se
Execution  Status: Enc	g Yes C Script Dashboard: Test Script Two - □ File Edit Test Script Two Set A Series Slot Value Use: Override default value cms ✓ Global Time Scroll to: Finish Timestep - 4 Timesteps Use DateTime: Start Timestep + 2 Timesteps ▼? 24:00 January 2, 2017 Execution
Execution  Status: End	g Yes C Script Dashboard: Test Script Two - □ File Edit Test Script Two ✓ Set A Series Slot Value Use: Override default value cms ✓ Global Time Scroll to: Finish Timestep - 4 Timesteps Use DateTime: Start Timestep + 2 Timesteps ▼? 24:00 January 2, 2013 Execution
Execution	g       Yes         Image: Comparison of the second of the se

### (2) Support full editing of the new Text Series Slots in SCTs

Text Series Slots were introduced in the recent RiverWare 7.1 release. The SCT's support for this new slot type (internally, actually a *mostly* hidden *unit type*) lacked these two capabilities. These are now supported.

- 1. Editing of Text Series Slot timestep values and flags.
- 2. Column width operations taking into account the display width of text values.

### (3) New SCT Operation Dialog: Set Values over Time Range

A new SCT "Set Values over Time Range" operation dialog allows the user to specify the end of a selected timestep time range on a slot using either a DateTime Spinner OR a Timestep Count integer spinner to either:

- a. Set all the timesteps in that range to a specified value, or
- b. Interpolate the values over that time range *to* that specified value. ("Interpolate" is available only when the first timestep of the time range has a non-NaN value).

K Set SI	ot Values over Time Range
First Timestep:	Oct 3, 2016
Last Timestep:	Oct 7, 2016
Timestep Count:	þ 🔶
Value:	85840.745098057247 acre-ft
Set Values	Interpolate To Cancel

In this initial implementation, only numeric value series slots are supported -- not DateTme or Text series slots.

As the time range is edited -- by adjusting either the "Last Timestep" DateTime spinner, or the "Timestep Count" integer spinner -- SCT series display table selection is dynamically updated to depict the edited time range, along with the computed "Selection Statistics" (at the bottom of the SCT). The end of the time range can be a timestep which is *beyond* the SCT's current time display range or the Slot's current time range. (Note that an SCT's series data display's time range can be configured to either match the run period, or the full extent of the displayed series slots).

The numeric value entered by the user is in the current display units of the selected series slot. The Set Values function assigns values to each timestep using *user units* (so, 100 acre/feet per month would represent a higher flow rate in February than in would in March). Conversely the "Interpolate To" function applies values in *standard unit* (with the entered value being applied to the last timestep in the time range).

The dialog is dismissed when either "Set Values" or "Interpolate To" is performed, or the "Cancel" button, or Red-X button is clicked.

To show this operation dialog, the user first clicks in a slot/timestep cell (or selects a provisional time range starting at the desired initial timestep) and selects the "Set Values over Time Range" either from the SCT's "Edit" menu, or the "context" (right-click) menu:

<			SCT Sr	nallN	/lode		S	CT SmallModel1a.s	ct
File	Edit	Slots Aggregation	View Config	DMI	Run	gation	n View C	onfig DMI Run Scri	pts Diagnostics
•		Copy cells	Ctrl+C		III E	1	🗠 👸 💸	🕨 🕖 🔟 🖌	😫 이 I
Seri		Paste cells	Ctrl+V		ner Slo	s Slot I	.ist Scalar	Slots Other Slots	Object Grid
Tim		Paste cells as Input	Ctrl+N			ow.	AggSeries .Huey NONE	AggSeries .Dewey FullDateTime	AggSeries .Louie NONE
9/3		Import Paste				1.09	NaN	Nal	NaN
10/		Import Paste				1.08	NaN	NaN	4
10/		Clear Outputs		•		1.08	NaN	NaN	4
10/						1.08	10.00	NaN	1
10/		Set to Input	Ctrl+I		ober :	1.08	10.00	24:00 October 1, 2016	5
10/		Set to Output	Ctrl+O		ober :	1.08	10	Set to Input	
10/		Clear Values	Del		ober :	1.08	10	Set to Output	H
10/					ober :	1.08	10		
10/		Target Operation	Ctrl+T		ober :	1.08	10	Clear Outputs	
10/		Clear Target Operation			ober :	0.14	10	Export Copy	
10/		Best Efficiency	Ctrl+B		ober :	0.14	10	Import Dacto	-
10/		Max Capacity	Ctrl+M			0.14	10	Import Paste	H
10/		Diff	Childhift			0.28	10	Copy Time	H
10/		Drift	Curtonin	+~		0.28	10		
<		Unit Values						Add Note	
Stam		Interpolate Selection	Ctrl+L			[@ 10	/5/16]	Set Values over Time R	ange 💦
7 valı		Adjust Values			Max				
		Set Values over Time Ra	inge						
		Lock SCT Configuration		~					

### (4) Operations to set SCT slot labels to the slots' name or slot column name

Added to the SCT's Edit Series Slot List are the following four operations. These are applied to the *selected* slot items.

- Set Labels to
  - Full Slot Names
  - Slot Names
  - Slot Column Names
  - Slot and Column Names.

R	SCT Small	Nodel1a.s	sct	- 🗆	×
File       Edit       Slots       Aggregation       View         Image: Slots       Image: Slots	Config DMI	Run Scr	ipts Diagnostics Go To		>>
Slot or Divider Label	Unit Type	Step Size			
✓ Stampede.AggSeries.Hue ✓ Stampede.AggSeries.Dew ✓ Stampede.AggSeries.Dew ✓ Stampede.AggSeries.Loui	y NONE vey NONE e NONE	1 Day 1 Day 1 Day 1 Day	Set Labels to  Close All Groups Insert Slots Insert Slot Divider Insert Sheet Divider		Full Slot Names Slot Names Slot Column Names Slot and Column Names
Insert     ▼     Append     ▼     Create S	imilar Groups	]	Reassign Slot Remove Slot Copy Slot Cut Slot Insert Copied Slots	Slot N Accep	ames
			Append Copied Slots Open Slot Open Slot Description		

The following screenshot illustrates the effect of each of these four operations on all four presented slots.

Note that it wouldn't make sense to use the "Slot Column Names" option on a normal single-column series slot. Also, its important to mention here that the use case presented by the sponsor of this development was an SCT with slot items showing the <u>Slot Column Name</u> (the third choice). The slot names were provided as text on the higher-level divider items for each group of slot items -- columns in a single multiple-column slot.

Slot	or D	Divid	er La	abel	Unit Type	Step Size	
⊿	Seri	es S	lot S	heet			
	⊿						
			M	Stampede.Inflow	Flow	1 Day	
	⊿						
			之	Stampede.AggSeries.Huey	NONE	1 Day	Full
			44	Stampede.AggSeries.Dewey	NONE	1 Day	Slot
			M	Stampede.AggSeries.Louie	NONE	1 Day	Names



Slo	ot or [	Divider L	abel	Unit Type	Step Size
⊿	Seri	ies Slot S	Sheet		
	⊿	MA		Flow	1 Day
	⊿	1000			1007
		Å∧	Huey	NONE	1 Day
		M	Dewey	NONE	1 Day
		M	Louie	NONE	1 Day

Slot or Divid	der Label	Unit Type	Step Size	
Series 3	Slot Sheet			
4	()			
	M Inflow	Flow	1 Day	
4				Slot and
	AggSeries.Huey	NONE	1 Day	
	AggSeries.Dewey	NONE	1 Day	Column
	AggSeries.Louie	NONE	1 Day	Names
	AggSeries.Louie	NONE	1 Day	Name

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