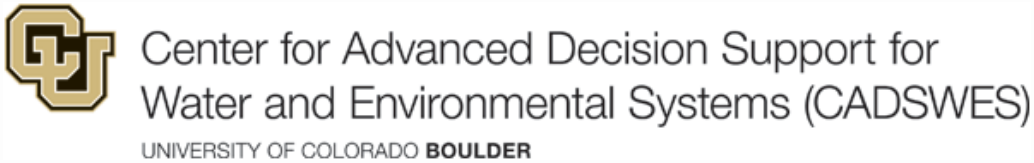


Assorted Features

2019 RiverWare User Group Meeting
David Neumann

Assorted Features

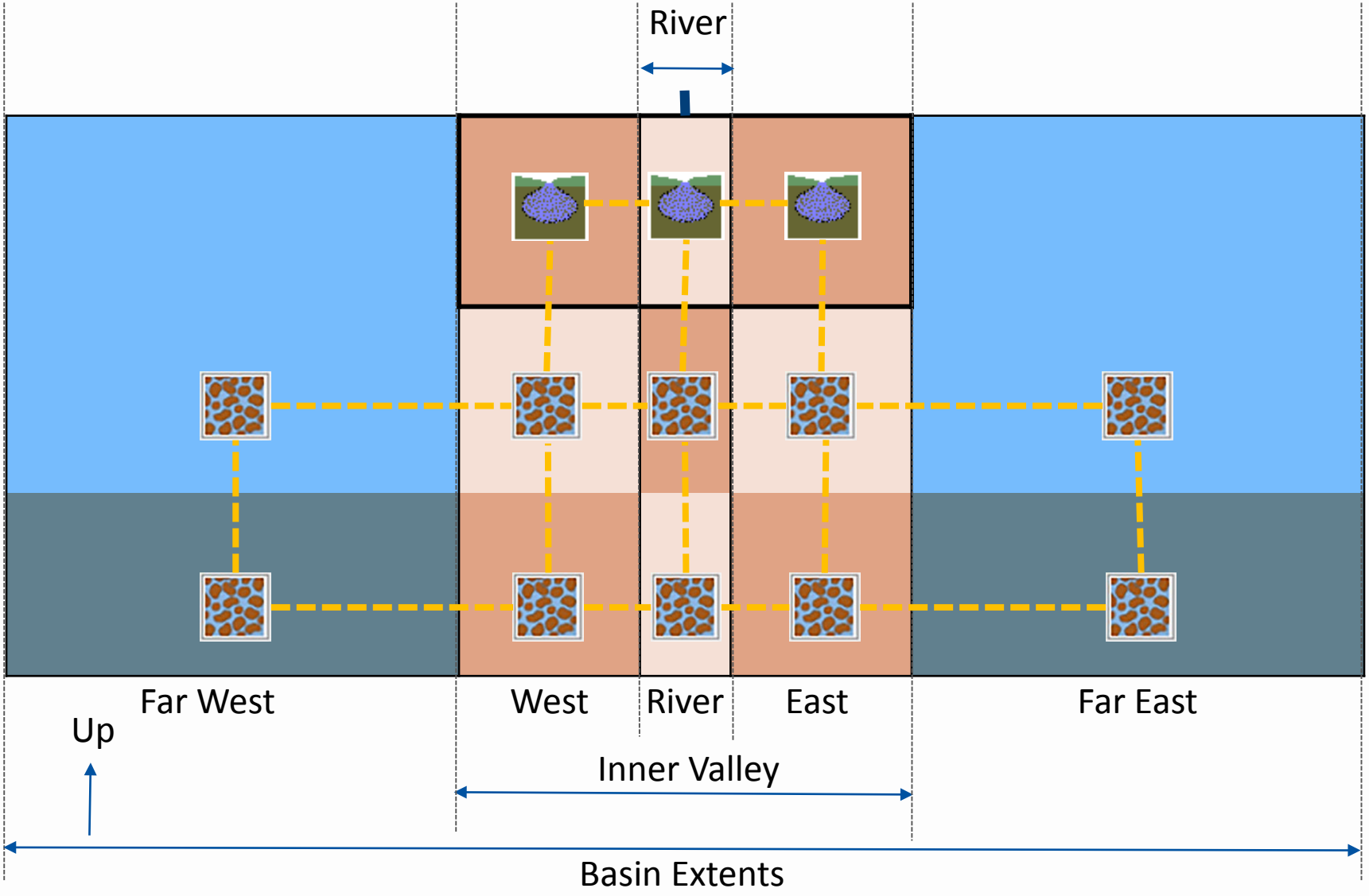
1. Physical Process Modeling
2. New Timestep Sizes
3. Slot Displays for Flow/Volumes
4. Plotting
5. Output Canvas
6. RPL Enhancements

Physical Process Modeling

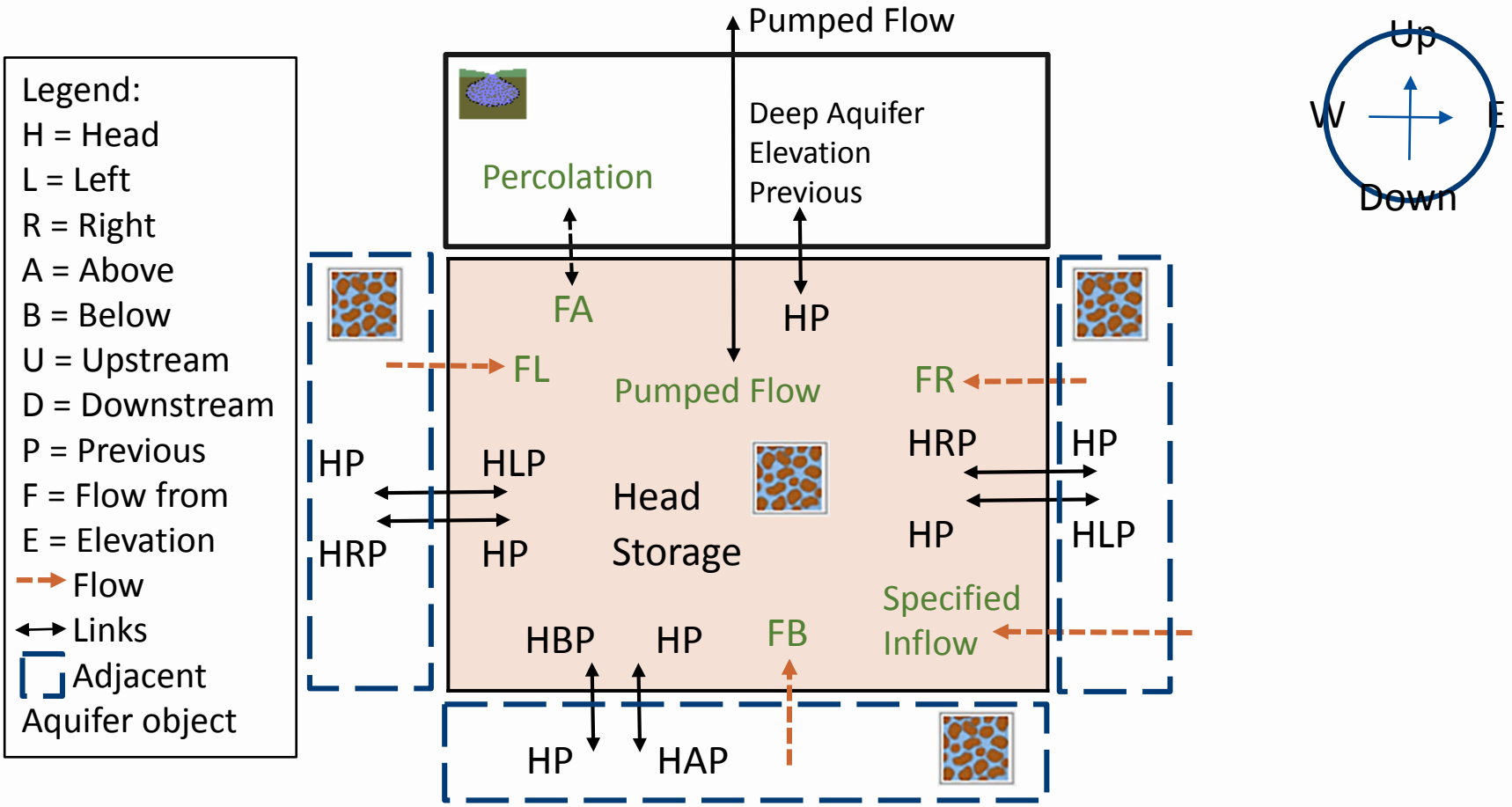
New Aquifer Object

- Models deep saturated groundwater flow
- Connect in up to 6 directions (upstream, downstream, left, right, above, below)
- Solves at
  - Run Timestep or
  - Larger Timestep
- Larger spatial extent than GW objects

Aquifer Setup – Cross Section



Aquifer below Groundwater



Aquifer Equations

$$Flow\ LRUDB = Conductance\ LRUDB \times (Head\ LRUDB\ Previous - Head\ Previous)$$

$$Flow\ Above\ Aggregated = aggregation\ of\ (Flow\ Above)$$

$$\begin{aligned} Storage(t) = Storage(t\text{-}1) + (&Flow\ Upstream + Flow\ Downstream \\ &+ Flow\ Left + Flow\ Right + Flow\ Above\ Aggregated \\ &+ Flow\ Below - Pumped\ Flow + Specified\ Inflow) \times \Delta t \end{aligned}$$

$$Head\ (t) = Head\ (t\text{-}1) + \frac{Storage\ (t) - Storage\ (t\text{-}1)}{Storativity \times Area}$$

Aquifer / Groundwater Timestep Interaction

Aquifer Object 

Date	Head	Day	Head Previous (ft)
Month 1	4321	30	4320
		1	4321
		2	4321
		3	4321
		4	4321
		5	4321
		6	4321
		7	4321
		…	…
		30	4321
Month 2	4322	31	4321
		1	

Groundwater Object 

Day	Deep Aquifer Elevation Previous	Elevation Previous
30	4320	4345
1	4321	4345.1
2	4321	4345.2
3	4321	4345.2
4	4321	4345.2
5	4321	4345.2
6	4321	4345.2
7	4321	4345.2
…	…	…
30	4321	4345.4
31	4321	4345.5
1	4322	4345.5

New Timestep Sizes

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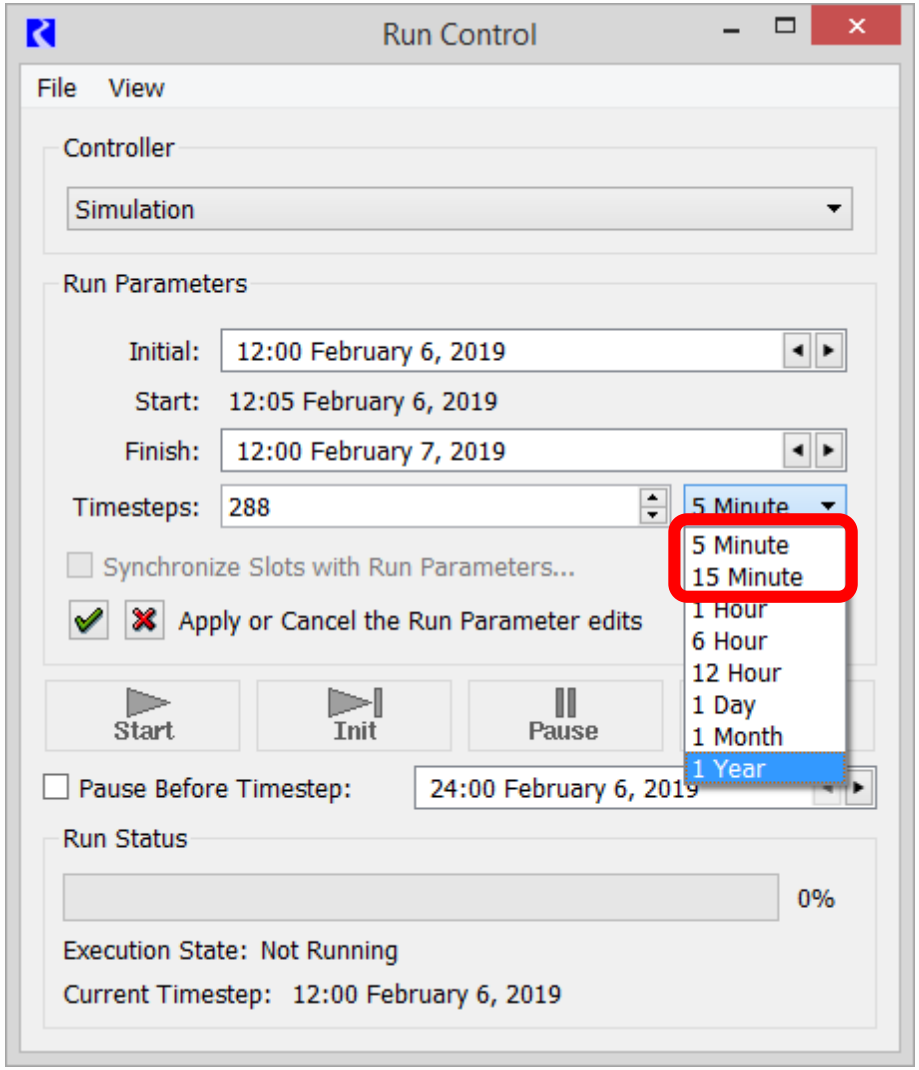
New Timestep Sizes

- 5 and 15 Minute Timesteps
- Modification to names of other timestep sizes for consistency
- Was: Hourly, Annual
- Now: 1 Hour, 1 Year



Slot Displays for Alt Units

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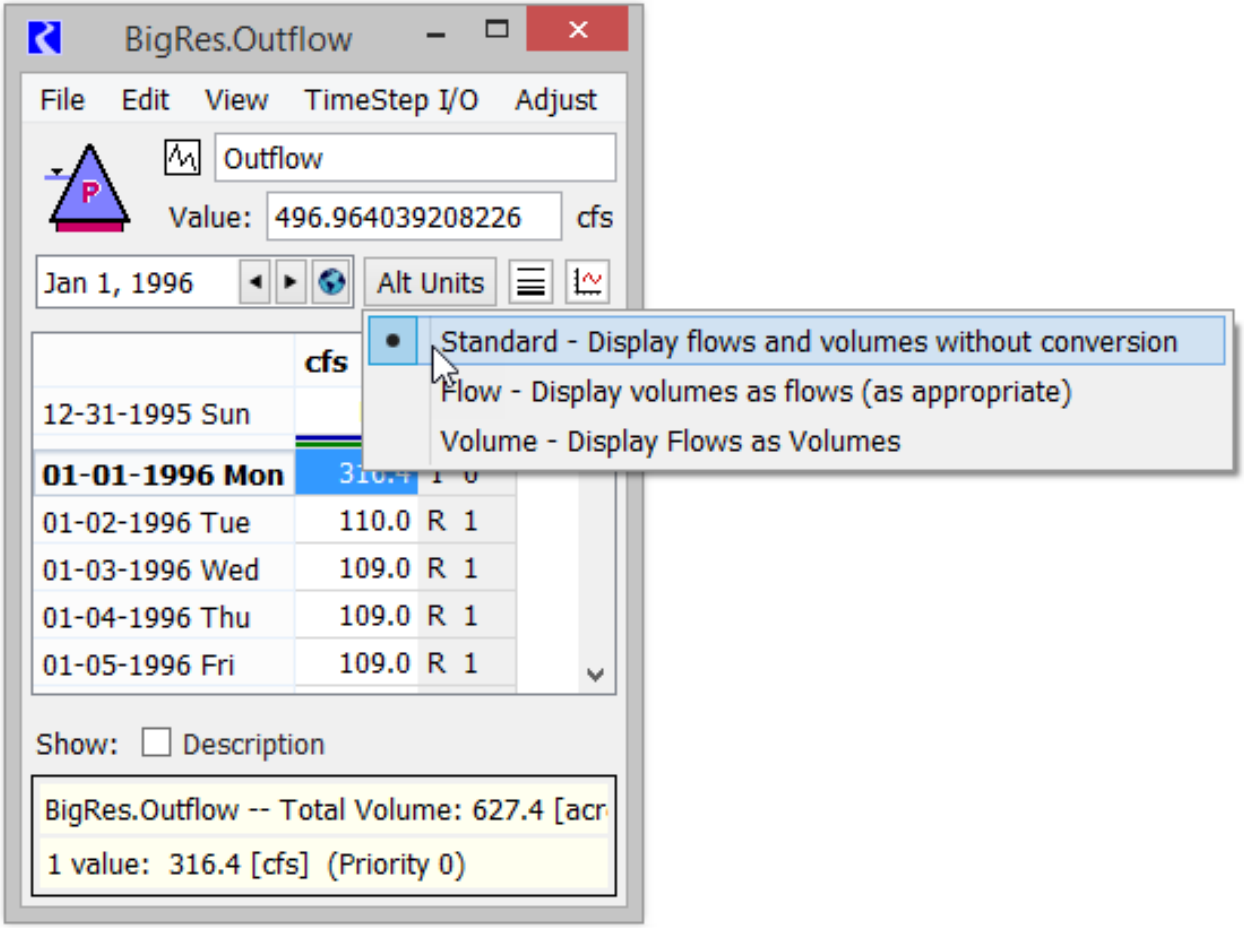
Slot Displays for Alt Units

- Slot and Slot Viewer
- SCT
- Accounting Dialogs
- RiverWISE (7.6)



Plotting

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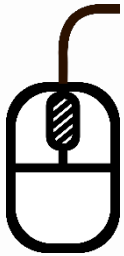
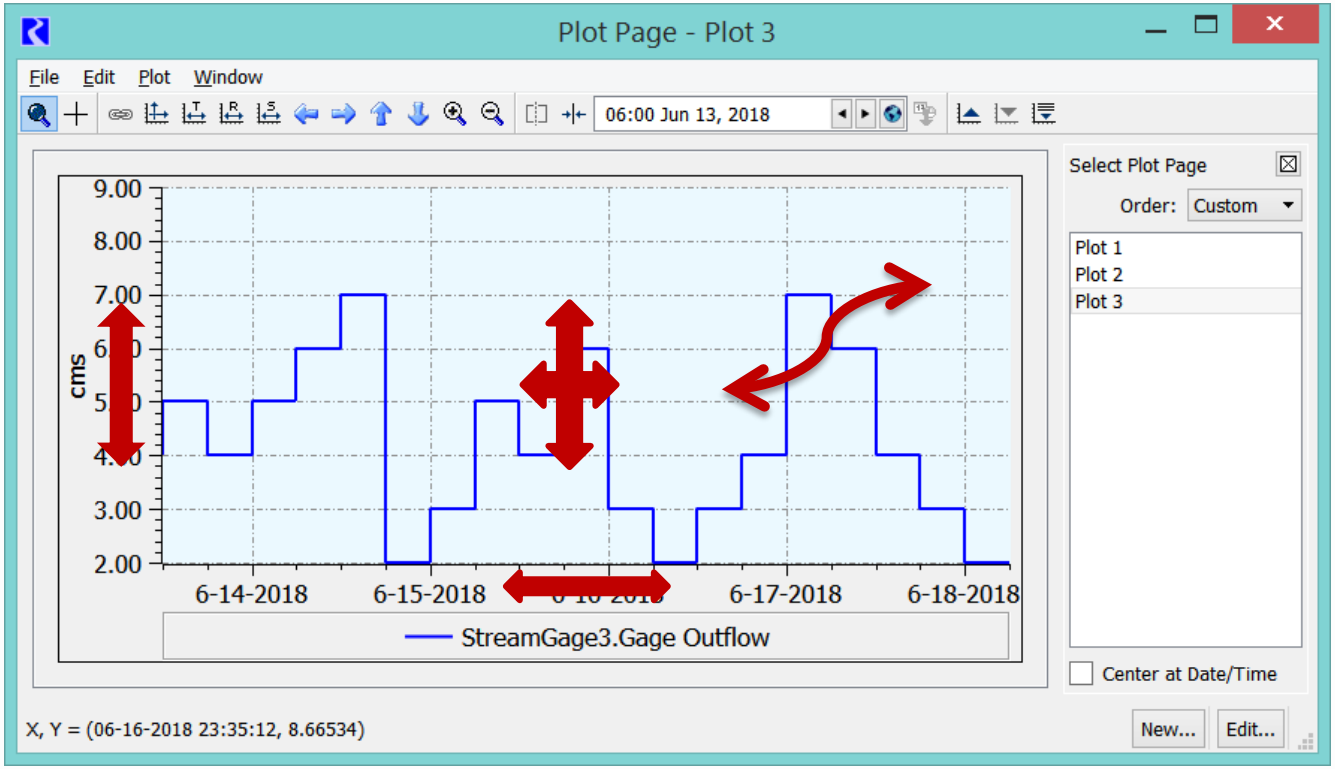
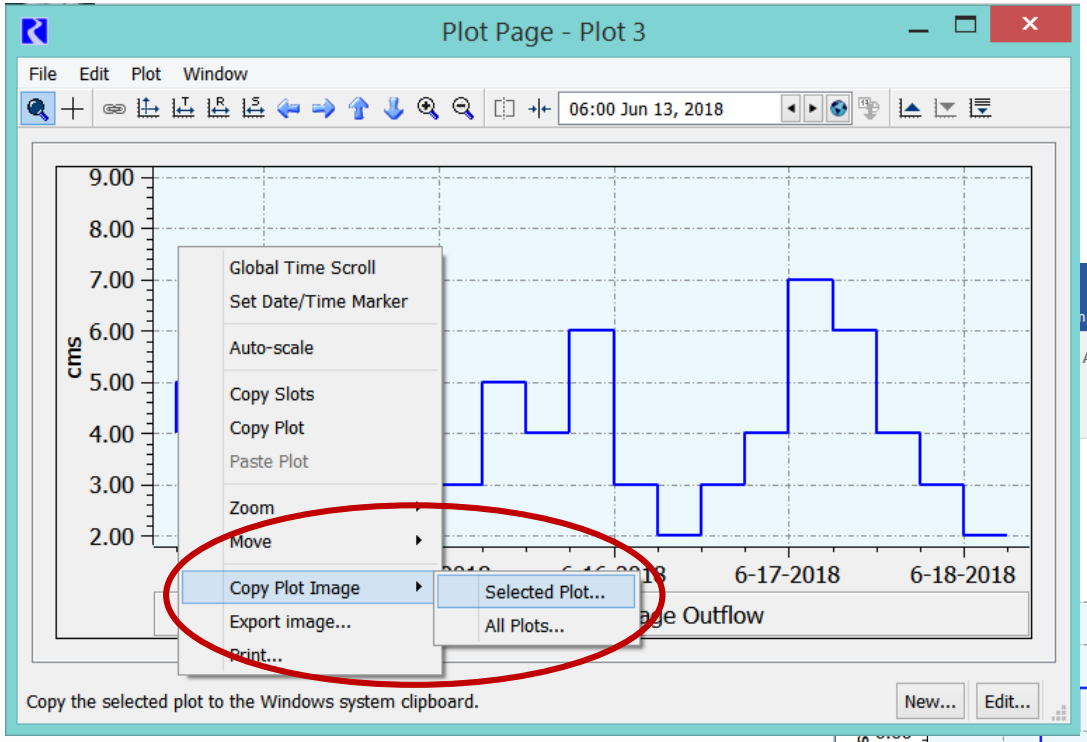
Plotting – New Mouse Actions

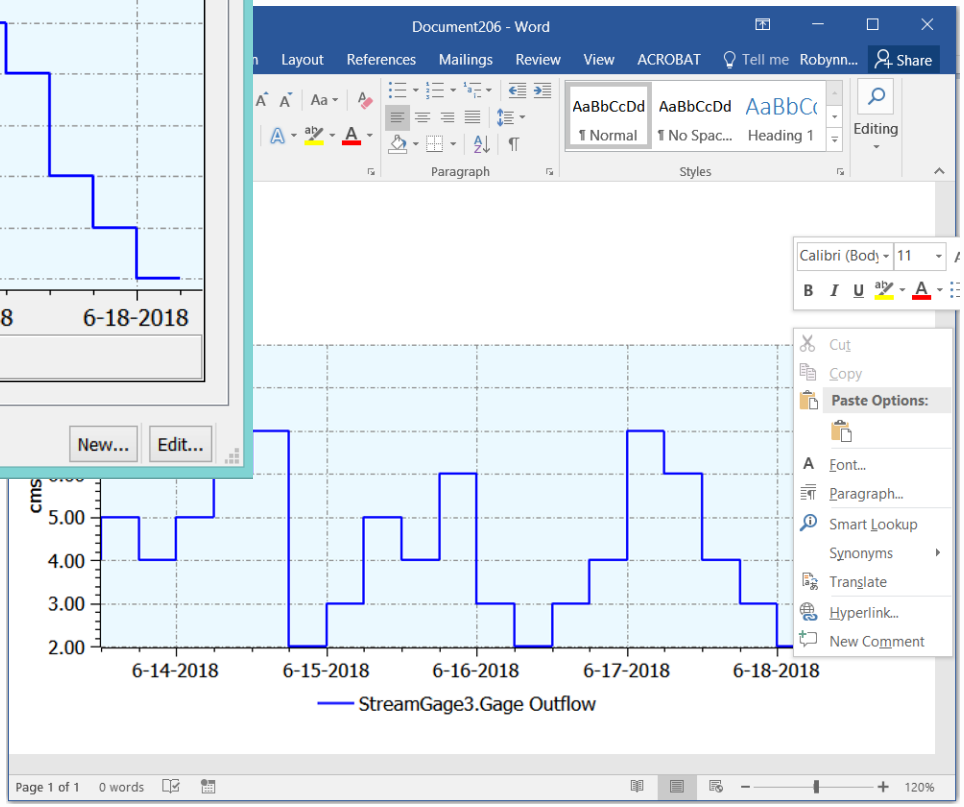




- Scroll the mouse wheel to zoom a single axis or both.
- Hold the middle mouse button (or the wheel) and drag in any direction to pan.

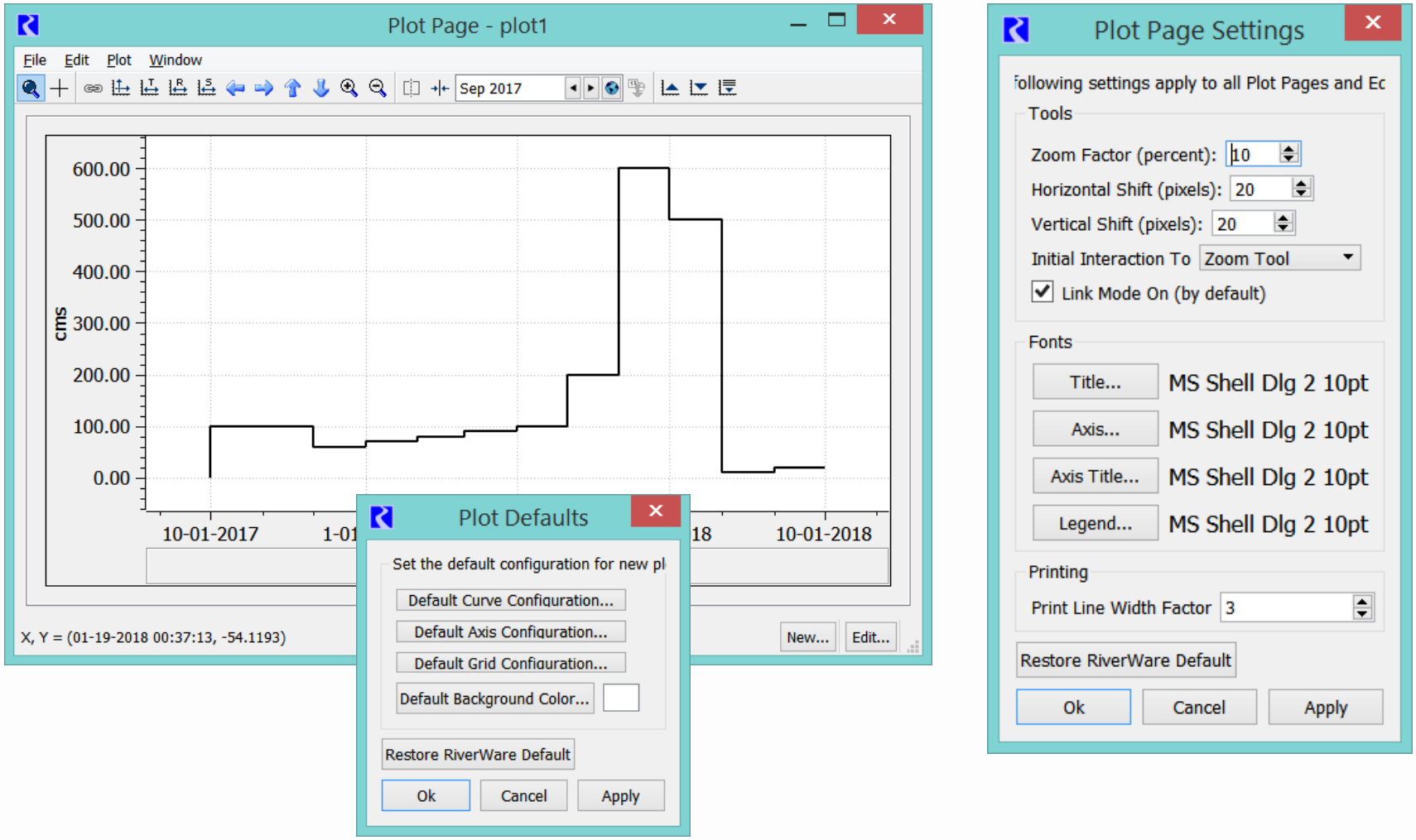
Plotting – Copy and Paste



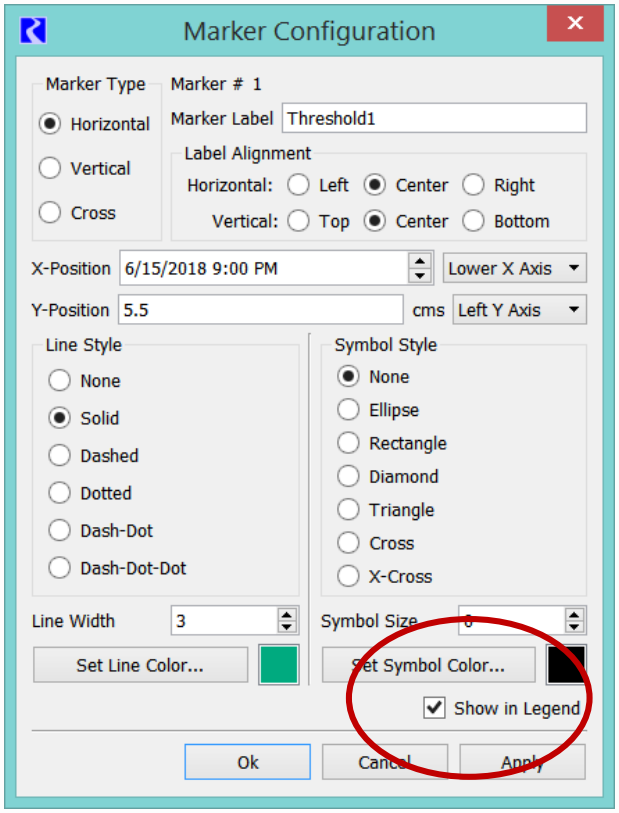


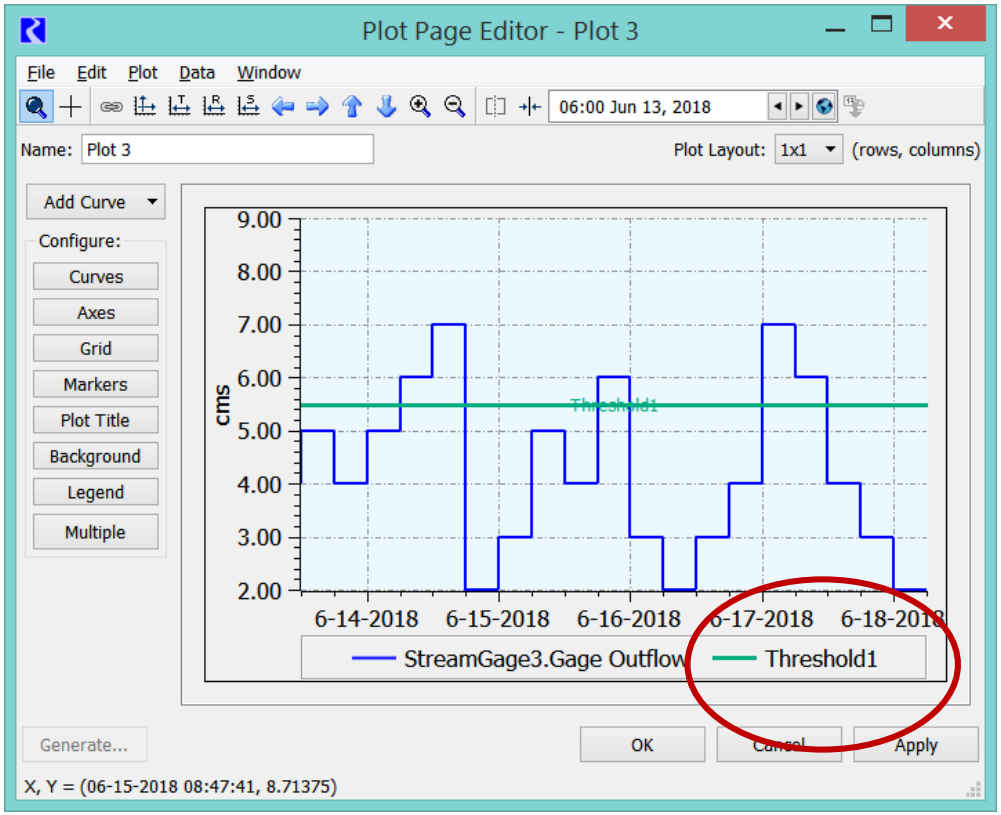
Right-click to copy plot.
Paste in Word, for example.

Plotting – Better Defaults



Plotting – Markers in Legend





Plotting - Upcoming

1. Markers: Allow references to scalar slots
2. Set Y-axis time range via RPL Function

Output Canvas

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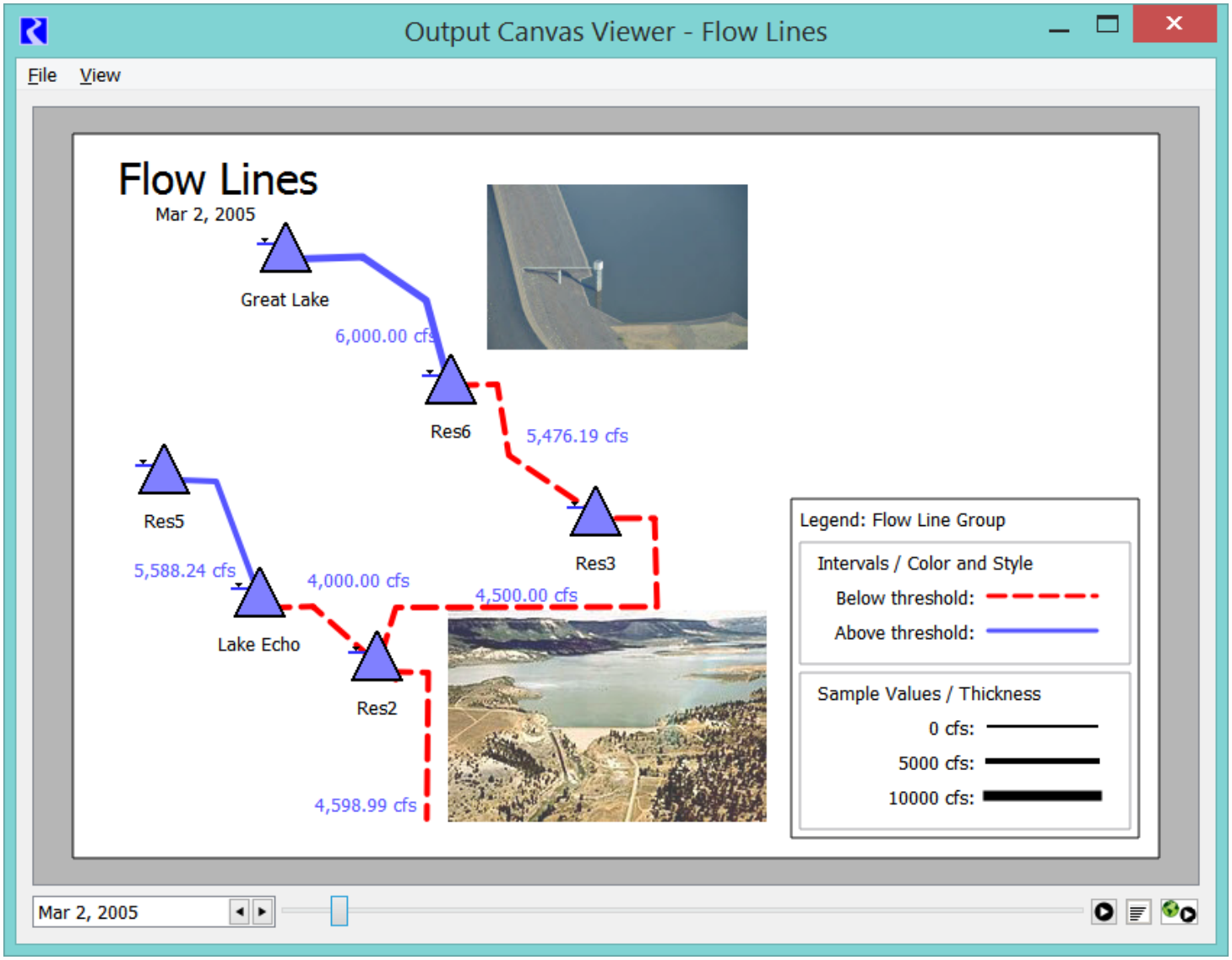
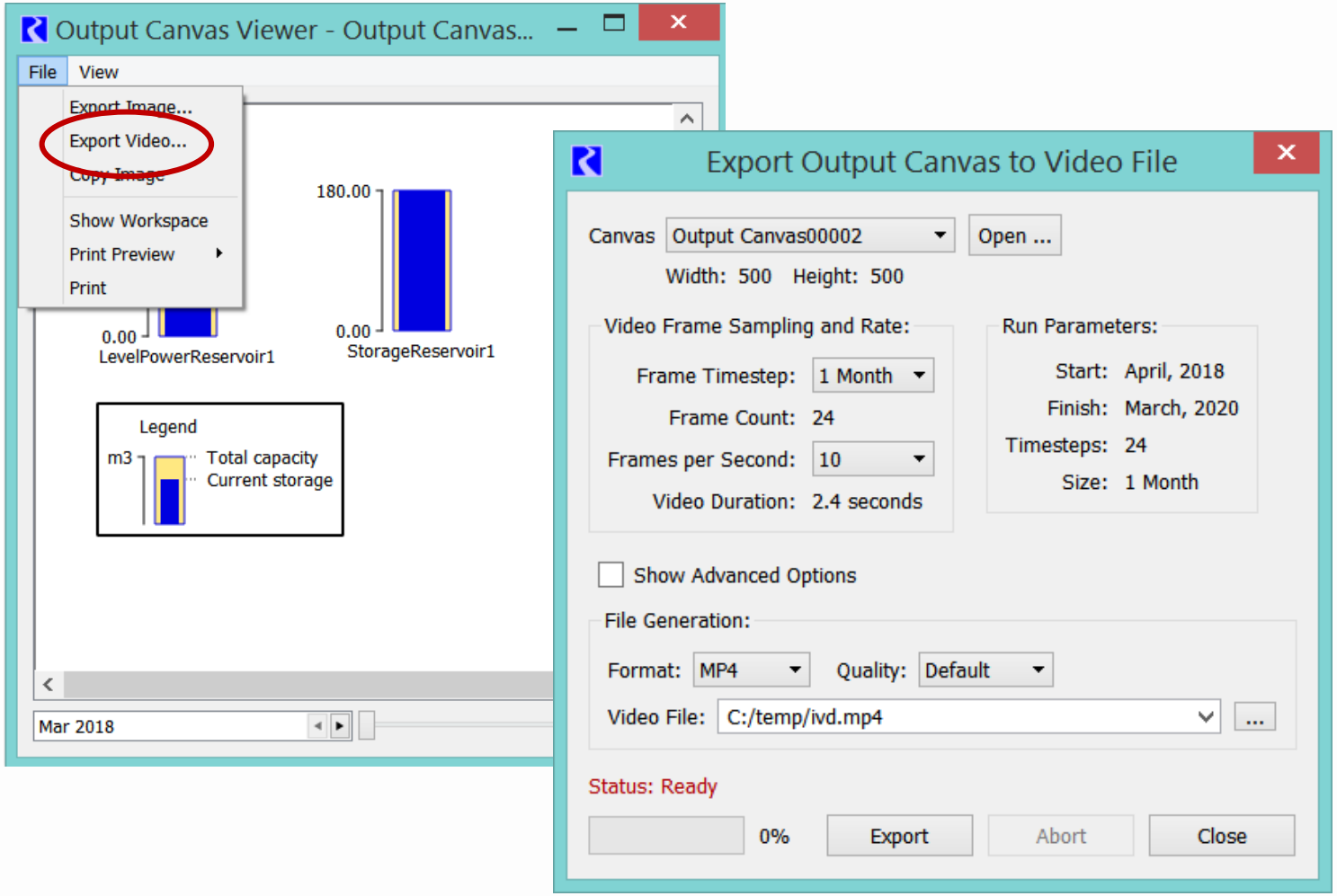
Output Canvas – Flow Line Legend



Output Canvas – Export to Video



RPL Enhancements

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Read / Write Text Series Slots

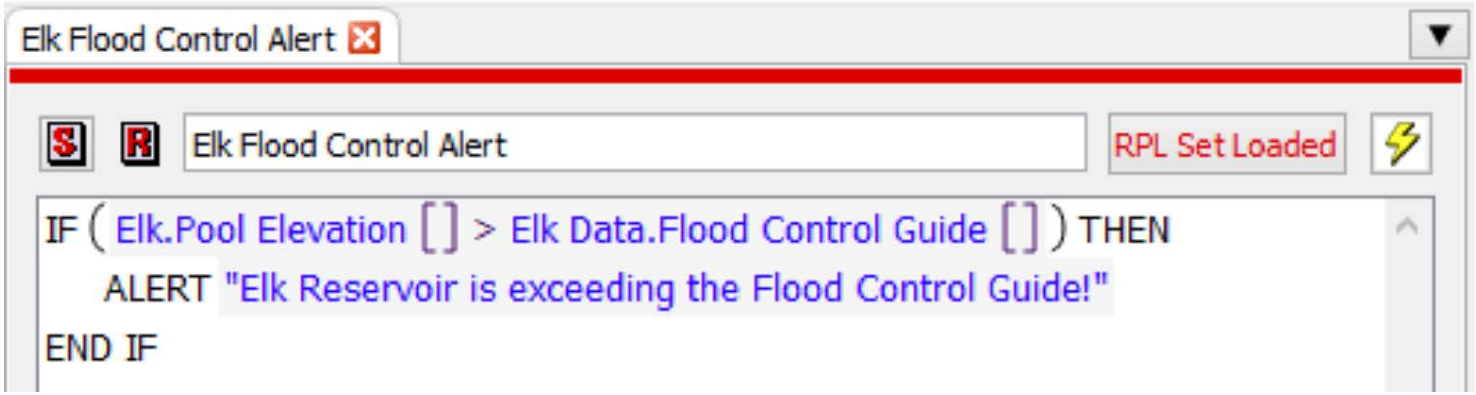
- Read/write text series slots
- Conversion functions:
  - StringToTextSlotNumeric
  - GetTextSlotValueAsString
  - TextSlotNumericToString

	Big Res Data .Release Reason Text	
10-26-2018 Fri	Irrigation Season	R 1
10-27-2018 Sat	Irrigation Season	R 1
10-28-2018 Sun	Irrigation Season	R 1
10-29-2018 Mon	Irrigation Season	R 1
10-30-2018 Tue	Irrigation Season	R 1
10-31-2018 Wed	Start of Flood Control	R 1
11-01-2018 Thu	In Flood Control	R 1
11-02-2018 Fri	In Flood Control	R 1
11-03-2018 Sat	In Flood Control	R 1

Set Info Slot — RPL Set Loaded

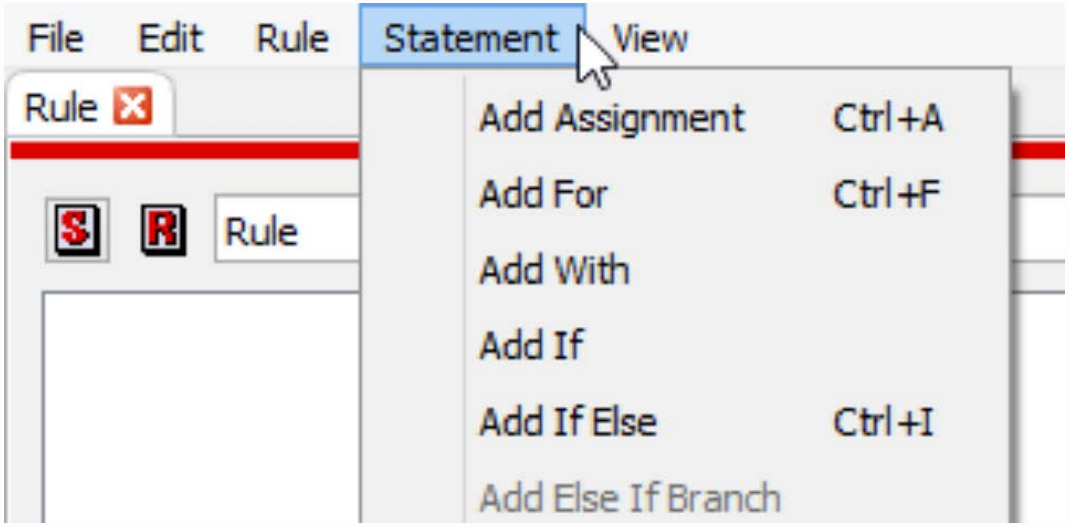
```
Big Res Data.Release Reason [] = IF ( Start of Flood Season ( ) ) THEN
    StringToTextSlotNumeric ( "Start of Flood Control" )
ELSE IF ( In Flood Season ( ) ) THEN
    StringToTextSlotNumeric ( "In Flood Control" )
ELSE
    StringToTextSlotNumeric ( "Irrigation Season" )
END IF
```

New Alert and Notice Statements



	Context	Diagnostics Message
1:		------ Rulebased Simulation RUN STARTED ------
2:		"BighornBasin.mdl.gz at 15:38:59 November 20, 2018"
3:		----------
4:	24:00 December 31, 2017; RULE: (2) Elk Flood Control Alert	Elk Reservoir is exceeding the Flood Control Guide!
5:		------ Rulebased Simulation RUN FINISHED ------

New Statement Menu



New RPL Predefined Functions

- Get3DTableValsSkipNaN
- MemoryUsage
- OptDualPrice
- OptReducedCost
- GetTextSlotValueAsString
- GetSlotNameAndCol
- StringToTextSlotNumeric,
- TextSlotNumericToString
- RoundToFactor
- TableLookupDefaultTol