



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

UNIVERSITY OF COLORADO **BOULDER**

New Features III

2023 RiverWare User Group Meeting
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Outline

1. Quick Start Window
2. RiverWare Policy Language (RPL)
3. Data Management Interface (DMI)
4. Model Comparison
5. Plotting

Quick Start

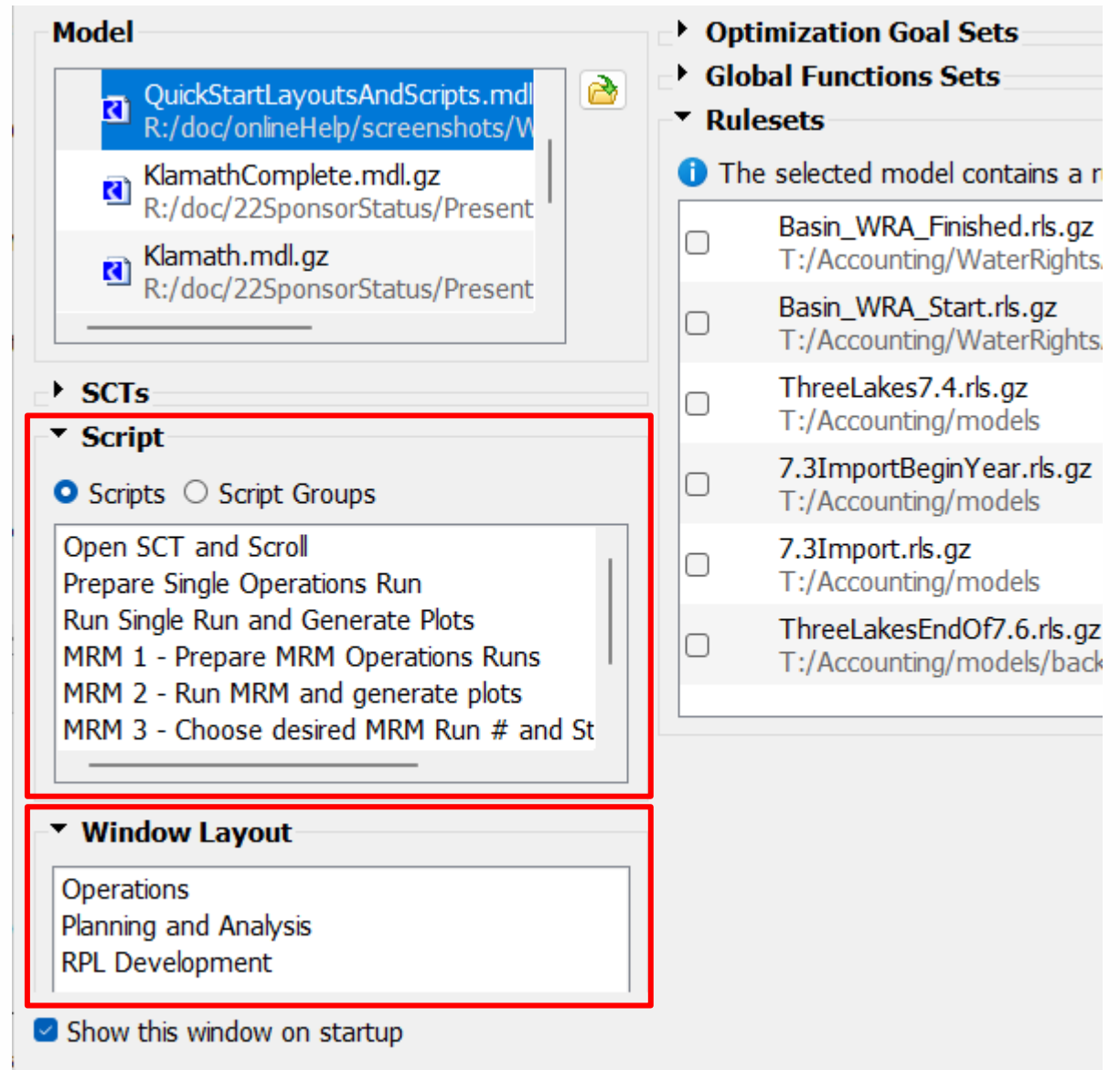


Motivation

- Provide options when RiverWare opens
- What do you want to do?
 - Load a model
 - Load RPL sets
 - Open SCTs
 - Run Scripts
 - Apply Layouts

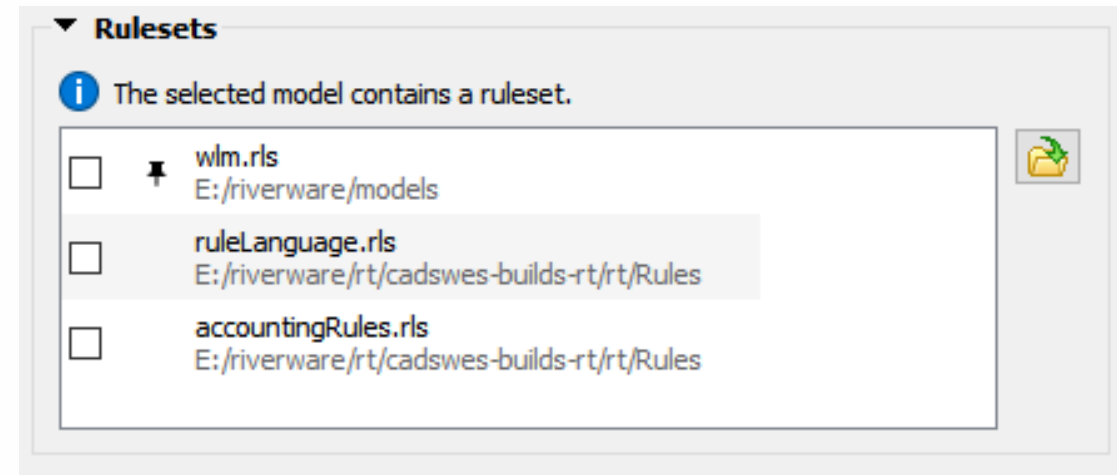
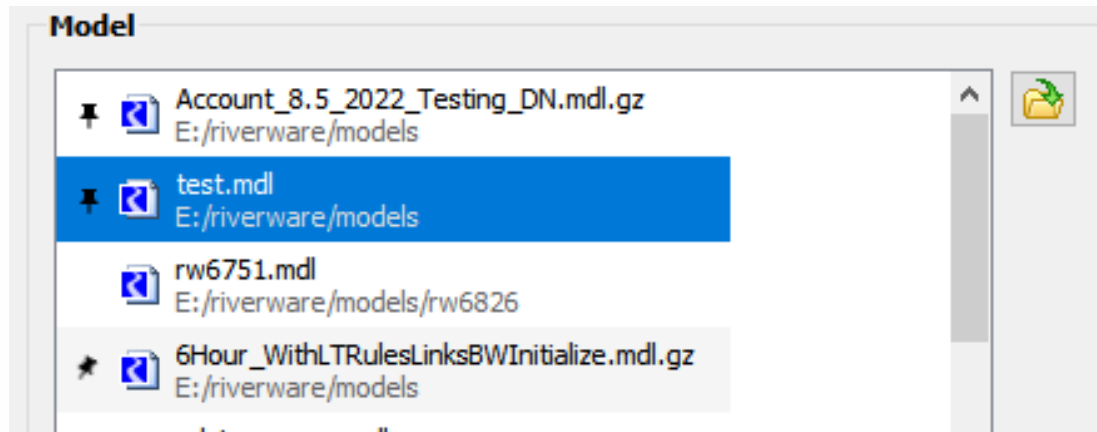
Demo of Options

- Execute Scripts:
 - One Script, or
 - One Script Group
- Apply one Window Layout



Quick Start – In 9.1

- Pin frequently used items to the top of the lists
- Improved display, using two rows to show the file and path



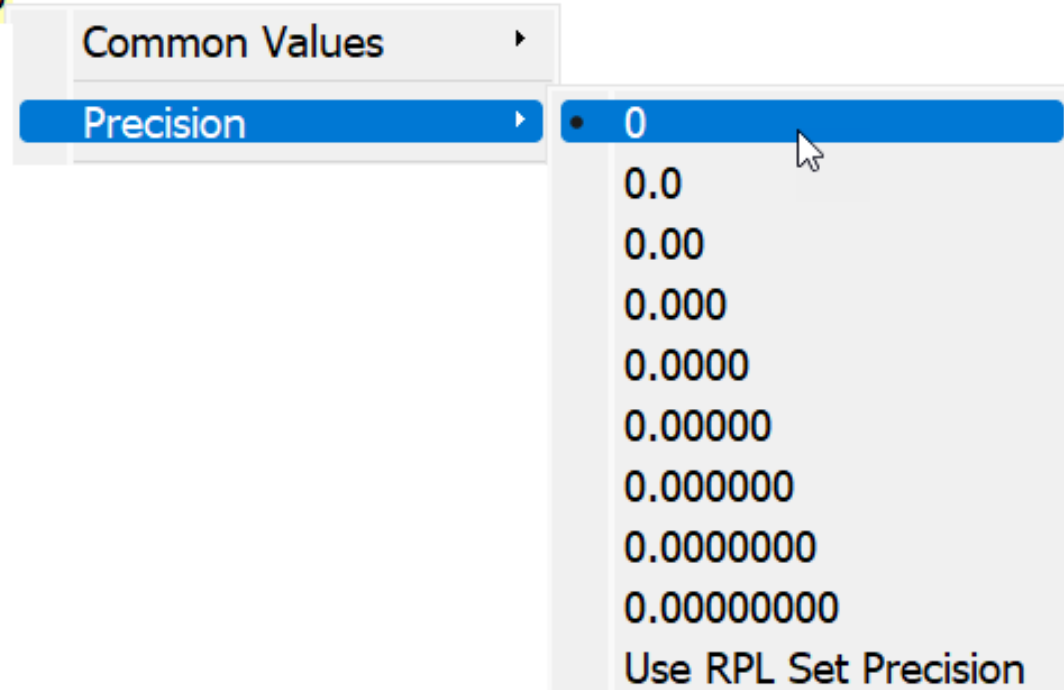
RPL



RPL Enhancements 1 - Precision

- Specify the precision of individual numbers

```
IF ( @"t" == @"October 1" ) THEN  
  Flushing Flow.Compliance [ @"t" ]  
    = 0.00  
  Flushing Flow.Day Count [ @"t" ]  
    = 0
```



RPL Enhancements 2 – Set Periodic Slots

- Set Periodic Slot with Initialization Rules
 - Values
 - Row Dates
 - Column Headers

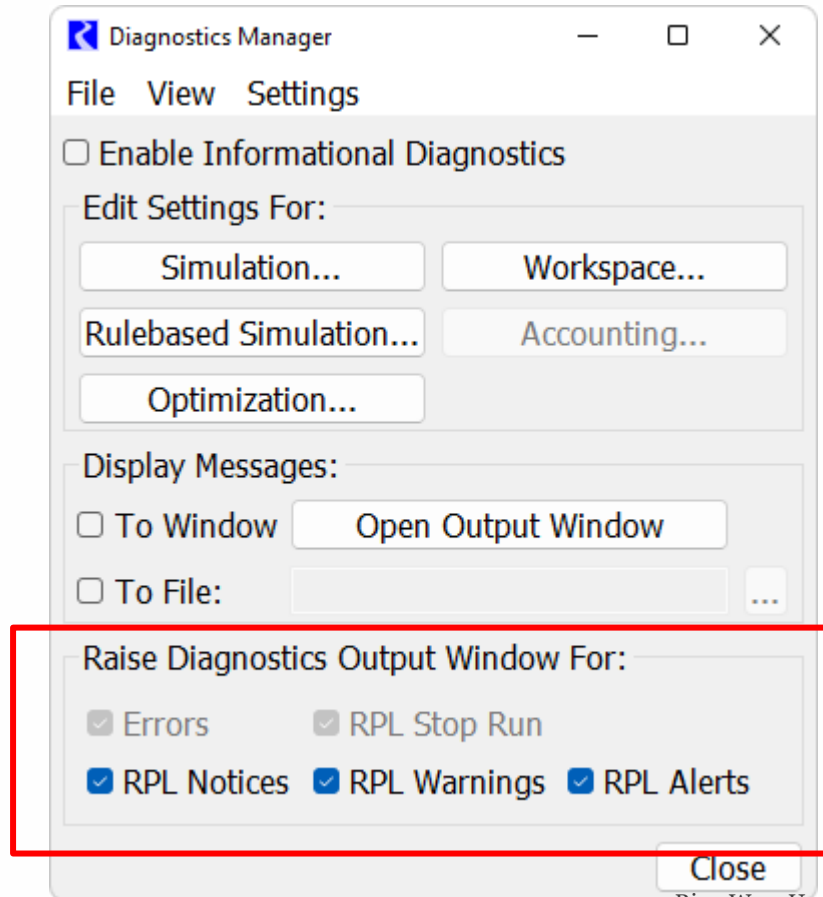
```
S R 9 Set Periodic Slots
Set Value Flag: Rules (R)
# Set a value of a Periodic Slot
Data.PeriodicSlot Regular [ @"March" , 1 ] = 222 "cfs"
# Change the Periodic Slot Row date
SET Data.PeriodicSlot ROW @"12:00:00 March 28" TO @"0:00:00 June 5"
# Change the Periodic Slot Column Header Text
SET Data.PeriodicSlot COLUMN 1 TO "Dry"
```

RPL Enhancements 3

- Copy / Paste RPL across RiverWare sessions



- Diagnostic expressions raise output window (9.2)

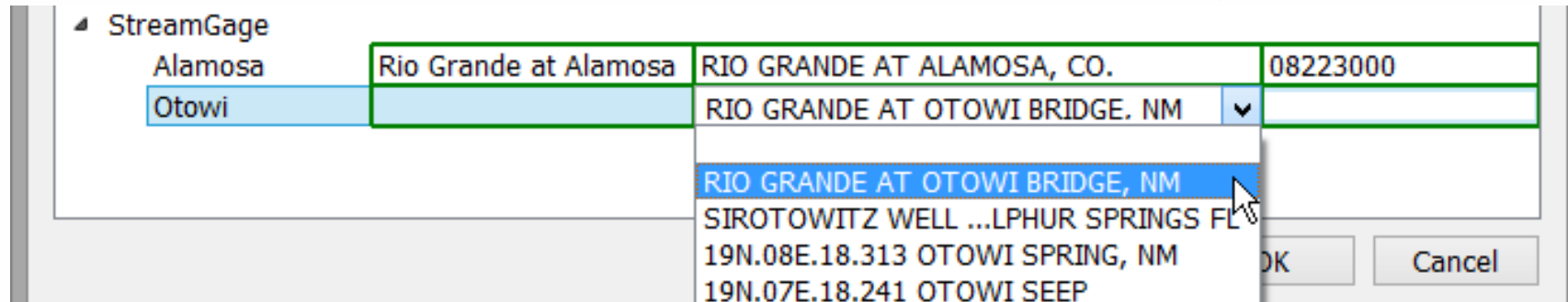


Data Management Interface (DMI)



Web Service DMIs


- Web Service DMIs: Import data to RiverWare from the web
 - CDSS Surface Water - Daily
 - CWMS Radar Web Service
 - HDB Web Service
 - Reclamation Hydromet
 - USGS Daily Values
- CDSS and USGS provide Site Maps to query for site names



- What other services should be added?

Excel Clear Dates and Values (9.1)

- The first time series written establishes the Dataset's time range.
- All subsequent time series must be within its time range, making it difficult for a DMI to move forward in time.
- Solution – the “Clear Dates and Values for Output” feature:

- Use Begin Timestep Time Instead of End of Timestep
- Clear Dates and Values for Output 
- Use Unit Name with Slot Name

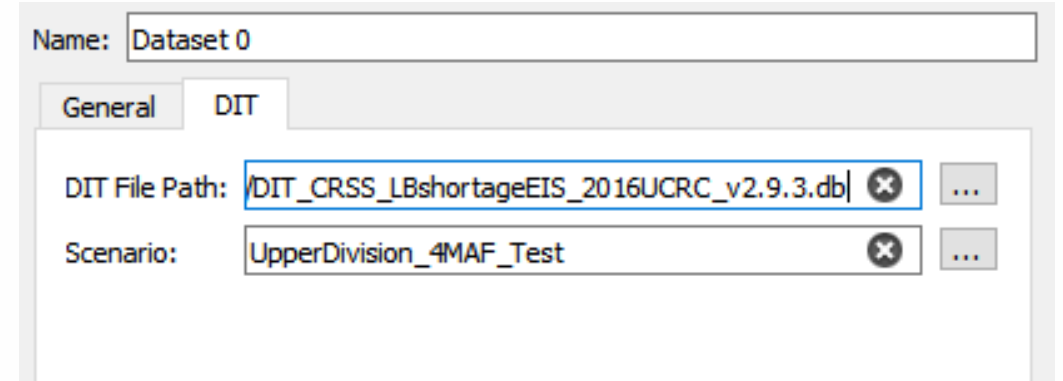
- If checked, the Excel Dataset clears its time range and the values within the time range before writing the first time series, re-establishing its time range

Demand Input Tool (DIT)

- An application to compute water user demands:
 - Enter baseline demand data
 - Create alternative demand scenarios
 - Plot and visualize differences between the baseline and scenarios
 - Export calculated data to RiverWare
- Data is stored in a lightweight, serverless relational SQLite database

DIT DMI

- New DIT Dataset imports aggregate diversion and water user data from the SQLite database
- Defined SQLite schema and name maps translate database to slots
- First time RiverWare is interacting **directly** with SQLite relational database



The screenshot shows a configuration window for a NameMap. The 'Name' field is set to 'NameMap 0'. Below the field is a table with columns 'Group' and 'Name'. The table lists several groups and their corresponding names, with green checkmarks indicating successful mapping.


Group	Name
▼ MiscUsesAbvGlenwoodSprings:Agriculture.Diversion Requ...	DiversionValue
✓ MiscUsesAbvGlenwoodSprings:Agriculture.Diversi...	
▼ MiscUsesAbvGlenwoodSprings:Agriculture.Depletion Requ...	DepletionValue
✓ MiscUsesAbvGlenwoodSprings:Agriculture.Deplet...	
▼ MiscUsesAbvGlenwoodSprings:ZeroTest.Depletion	DepletionValue
✓ MiscUsesAbvGlenwoodSprings:ZeroTest.Depletion	
▼ MiscUsesAbvGlenwoodSprings:ZeroTest.Diversion	DiversionValue
✓ MiscUsesAbvGlenwoodSprings:ZeroTest.Diversion	
▼ (AgUsesAbvCameo.RFSPM, ExportsUsesAbvCameo.DSC)	AggDivSalinityValue
✓ AgUsesAbvCameo.RFSPM	
✓ ExportsUsesAbvCameo.DSC	

Model Comparison




Models








A: KPOM.mdl Source: Open Model Path: E:\riverware\staff\neumannnd\KPOM\Models\KPOM.mdl
 B: KPOM.mdl Source: Git Repository Path: 4b7bd1e - E:\riverware\staff\neumannnd\KPOM\Models\KPOM.mdl

 Select Models

Comparison Results

Search and Filter Results

▼ ▲ Name ▼ Contains ▼ Ignore Case Filter ...  Filter applied: displaying only the 1173 items that differ between the two models

Name	Status
▼  Planning - Set Hydrolo...	← B
* Name	A ≠ B
▼  Inflow Processing	A ≠ B
▼  Set UKL Inflow and Sm...	A →
* Name	A ≠ B
* Names Color	A ≠ B
* Statements	A ≠ B
▼  Compute Smoothed Inf...	← B
* Name	A ≠ B
* Names Color	A ≠ B
* Statements	A ≠ B
▼  Klamath 2019PA Global Fu...	A ≠ B
▼  Agricultural Functions	A ≠ B
▼  UKL Agricultural Adj D...	B
* Name	B
* Description	B
* Notes	B
* Is Enabled	B
* Arguments	B
* Return Type	B
* Diagnostic Units	B
* Pre-execution Diagno...	B
* Post-execution Diaqn...	B

Selected Property: Compute Smoothed Inflow - Statements

▼ ▲ Synchronize Views When Scrolling

A: KPOM.mdl

B: KPOM.mdl

Located 2 differences

Located 2 differences

```

26      IsMRMRun_WithHistoricalHydro
27      ("Inflow")
28      # For Operations Period, also set the Inflow
29      # For the Observed Period, Inflow is not set
30      # mass balance.
31      UKL.Inflow []
32      = UKL.Raw Inflow [@"t"]
33      END IF
34      ELSE
35      IF ( NOT IsInput
36          ( UKL.Smoothed Inflow ,
37            @"t" ) ) THEN
38      # Planning: set both Smoothed and actual
39      UKL.Smoothed Inflow []
40      = Historic Data.Historic Smoothed UKL I
41      = Historic Data.Historic Smoothed UKL I
42      = Historic Data.Historic Smoothed UKL I

```

```

26      IsMRMRun_WithHistoricalHyd
27      ("Inflow")
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32      = UKL.Raw Inflow [@"t"]
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38      UKL.Inflow []
39      = Historic Data.Historic Smoothed UKL I
40      = Historic Data.Historic Smoothed UKL I
41      = Historic Data.Historic Smoothed UKL I
42      END IF

```

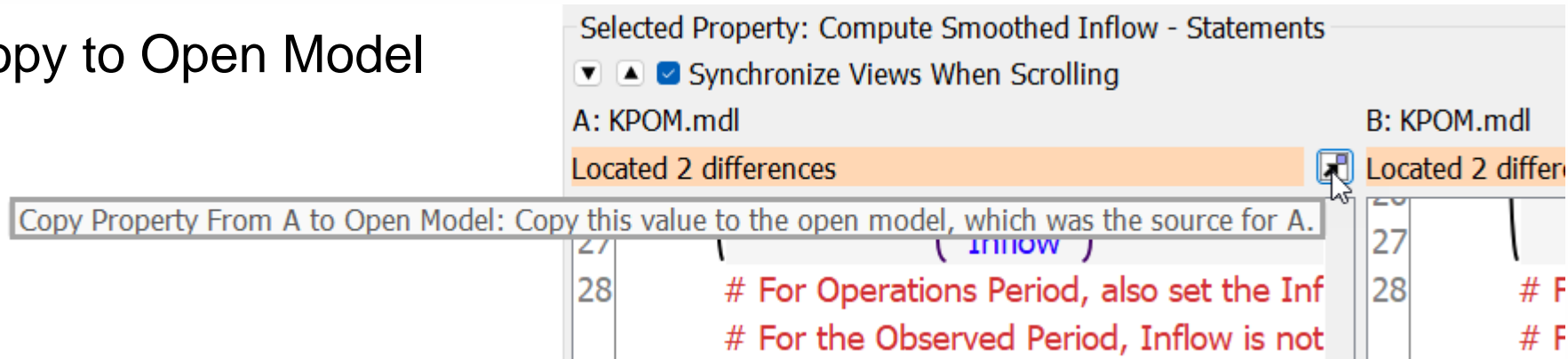
Comparison Settings

Series Values Comparison: Compare Value and Flag Together, For Specific Flags Numeric Tolerance: 1e-10 internal units

Close

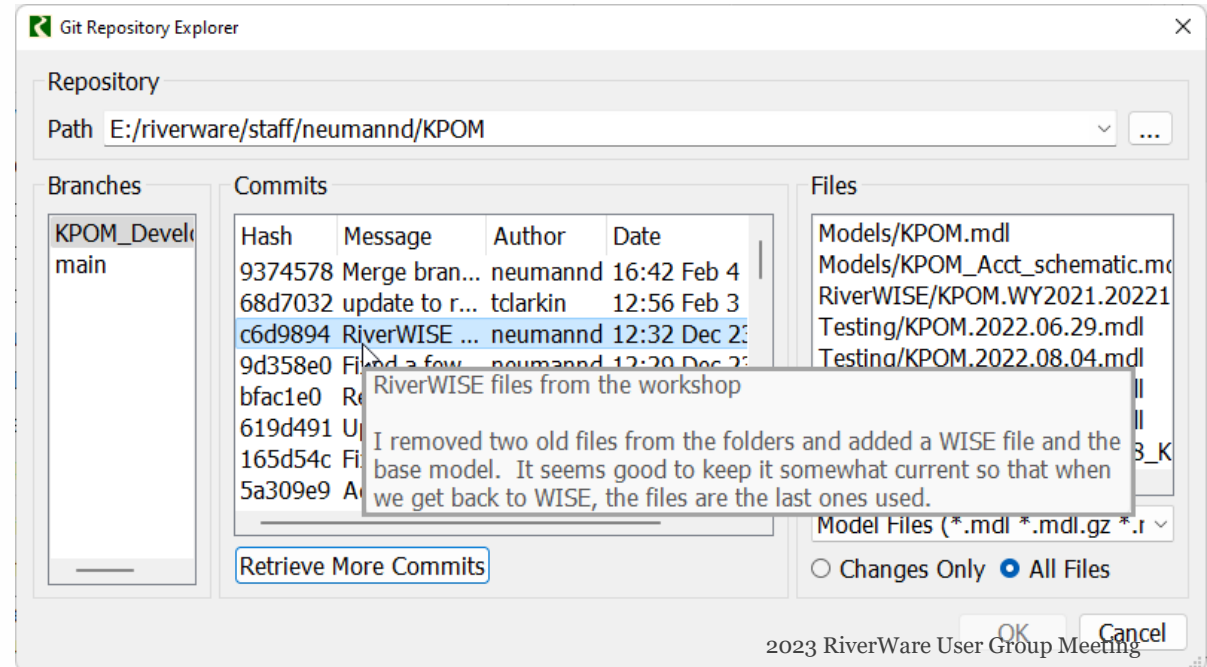
Model/RPL Set Comparison Tool

- Copy to Open Model



- Git Repository Explorer

- Access files directly from Git Repo
- See messages and list of files

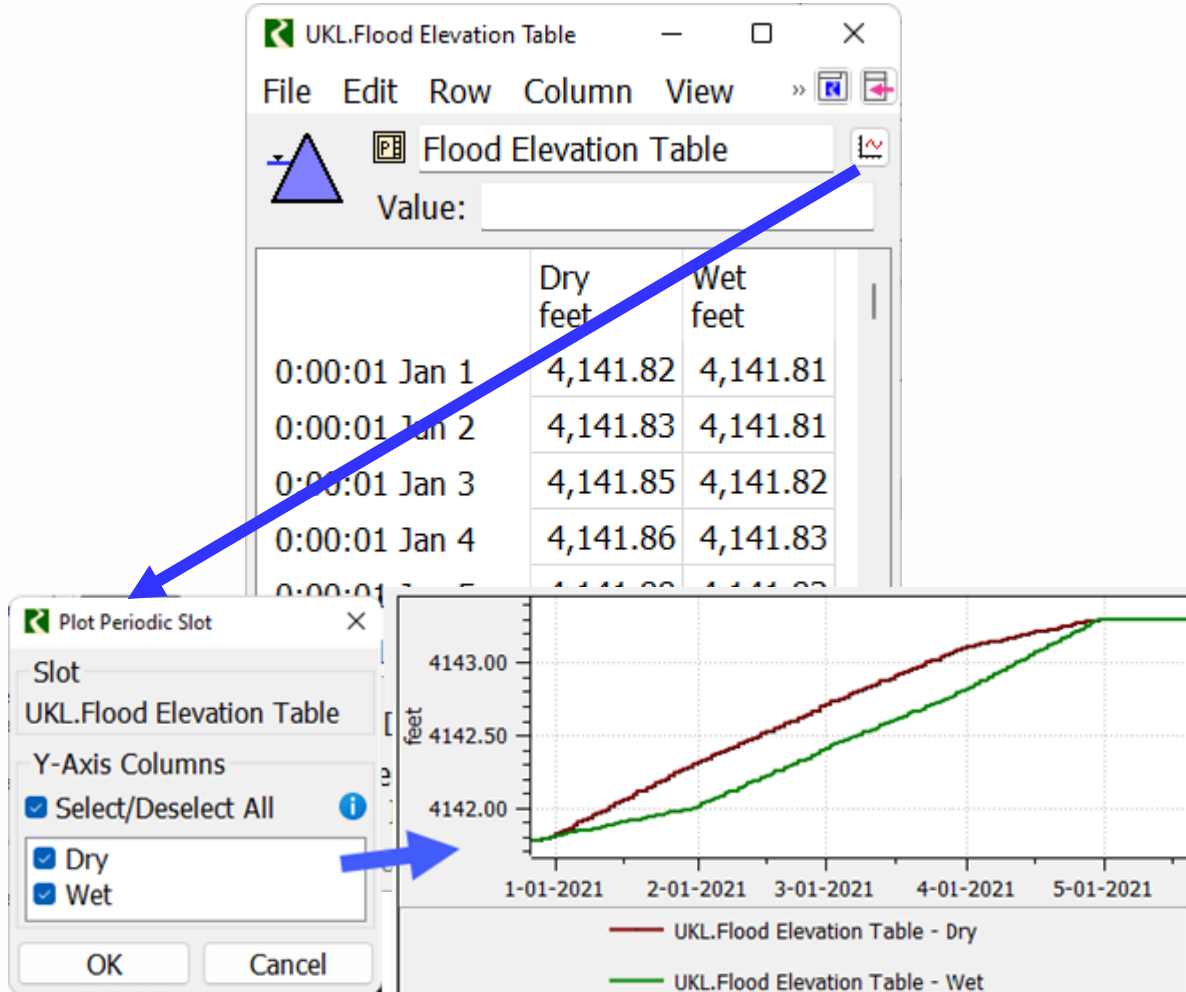


Plotting

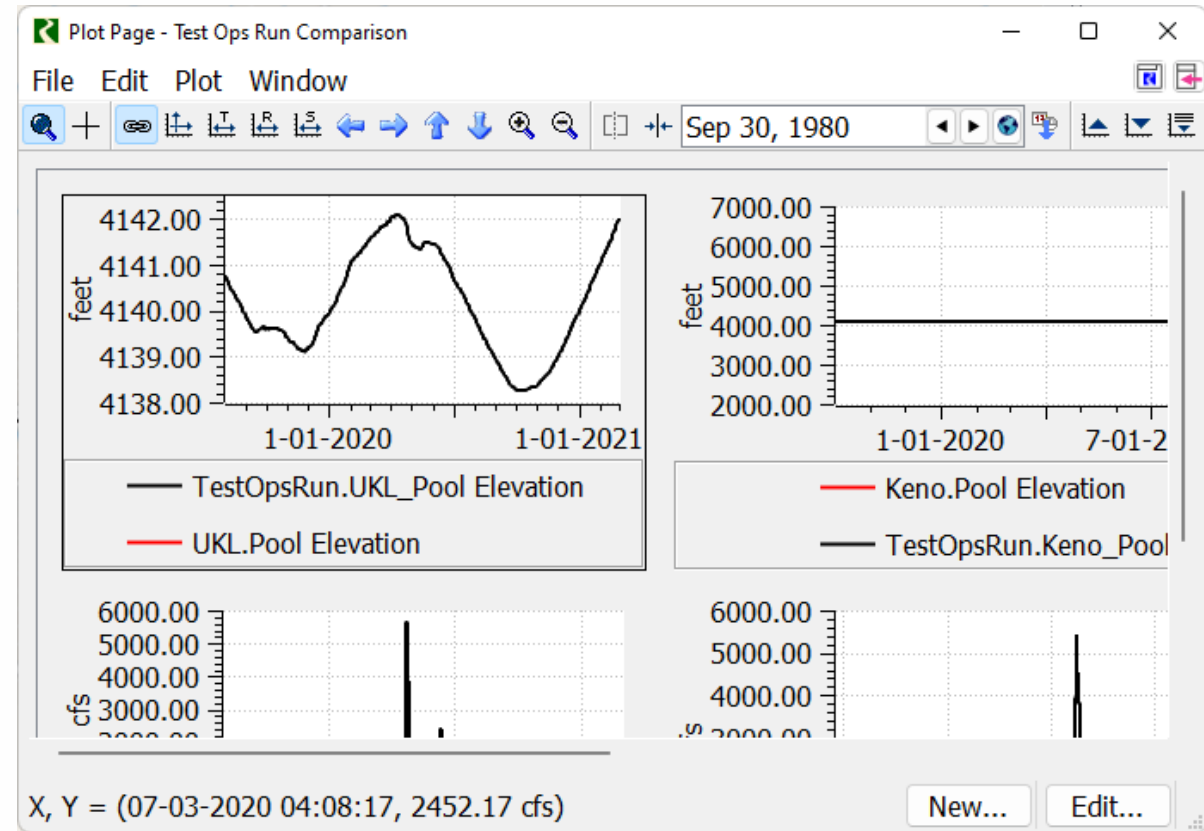


Plotting Improvements

Improved Plotting of Periodic Slots



Scrollable Plot Area

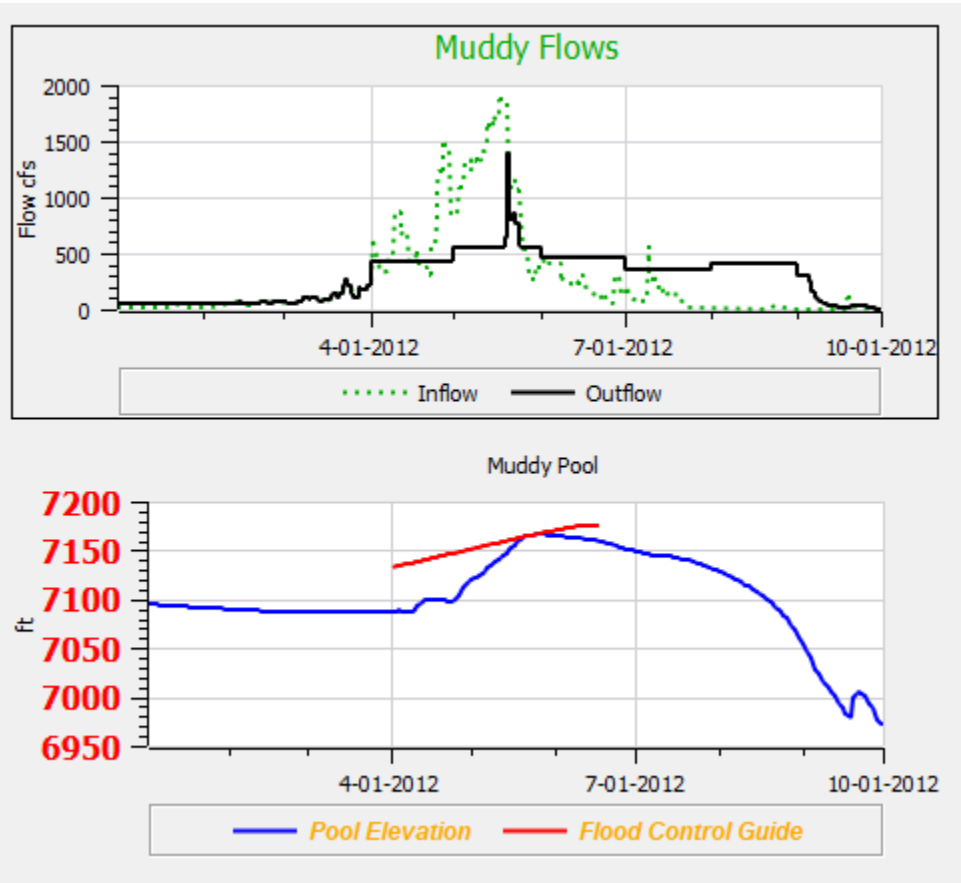


Plotting Improvements

Specify Fonts and text color per plot (9.2)

Video Tutorial

<https://riverware.org/tutorials/Plotting/index.html>



Questions and Feedback?

