



CADSWES University of Colorado

Center for Advanced Decision Support for Water and Environmental Systems

New RiverWare GUI and I/O Features


RiverWare User Group Meeting
February 10-11th, 2010

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GUI and I/O – Outline

- Overview: New GUI features in RiverWare 5.1
- Overview: GUI and I/O in RiverWare 5.2
 - Slot dialog enhancements: RPL Expression / List Slot
- Demos
 - Find Inputs dialog ... SCT
 - Notes on Series Slots (redesigned)
 - Plotting enhancements ... Tabular Series Slot Report
 - Background Images
- Upcoming: Geo-referencing Simulation Objects ... GIS Integration Features

Overview: New GUI in RiverWare 5.1

- May 2009 Release of RiverWare:
 - New Qt4 Simulation Workspace:
 - ... Hand Drag ... Locator Modes
 - ... Support for a Background Image
 - ... Close All Dialogs function 
 - New Dialog: Find Series Slots with Inputs
 - Plot Page Selection List, other plotting enhancements
 - SCT Run Status Panel
 - Open Series Slots: Optionally shows Rule Priorities
 - Improved Model Run Analysis Dialog

Overview: GUI and I/O in RiverWare 5.2

- Redesign of Notes on Series Slots
- SCT Enhancements, various
- Slot Dialog Enhancements
 - Expression Slot Dialog reimplementaion
 - Periodic Slot: Row (time) Headers for Regular Intervals
 - List Slot Dialog
- New Output Device: Tabular Series Slot Report
- User Settable Font (for all of RiverWare)
... experimental / not persistent.

Expression Slot Dialogs

Reimplementation using standard Slot dialog classes.

Supports:

- Copy Functions
- Series Annotations
- Time Navigation
- Series Display Compression

Rio Grande Compact Monthly SJ Release From Storage

File Edit view Expression Adjust

SJReleaseFromStorageInAbiquiu

Value: -200 acre-feet

Evaluation Time: End of timestep, current timestep only

Evaluation Range: Run start to run finish (Step: 1 DAY)

RoundVolume

```
( SumTableSeriesSlotByColumn
  ( Abiquiu.Reservoir Summary ,
    StartOfMonthOrRun ( ) ,
    @"1" ,
    "SJC Release From Storage" ) )
```

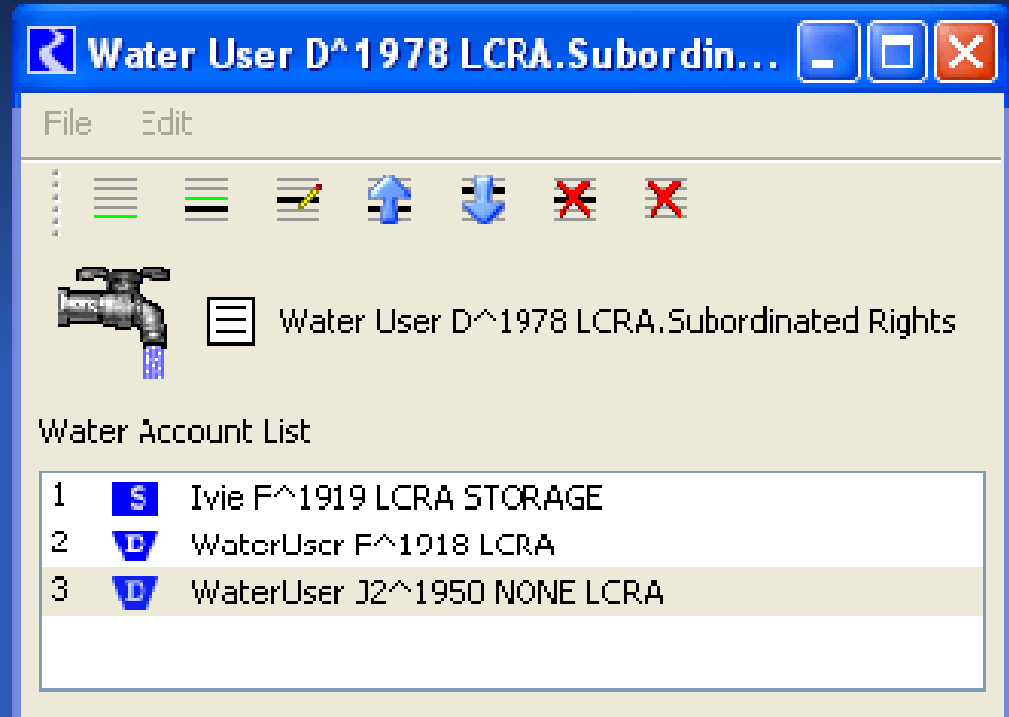
Scroll: Jan 2, 2003

acre-feet		
01-01-2003 Wed	0.00	0
01-02-2003 Thu	-200.00	0
01-03-2003 Fri	-800.00	0
01-04-2003 Sat	-1400.00	0
01-05-2003 Sun	-2000.00	0
01-06-2003 Mon	-2600.00	0
01-07-2003 Tue	-3200.00	0
01-08-2003 Wed	-3800.00	0
01-09-2003 Thu	-4400.00	0
01-10-2003 Fri	-5000.00	0
01-11-2003 Sat	-5600.00	0
01-12-2003 Sun	-6200.00	0
01-13-2003 Mon	-6700.00	0
01-14-2003 Tue	-7300.00	0

- Set to Input
- Set to Output
- Clear Outputs
- Clear All Outputs
- Copy Time
- Global Time Scroll
- No Linked Slots ▶
- Copy
- Export Copy...
- Add Note...
- Paste Note: Begin Reconcil
- Begin Reconcil ▶

List Slot Dialog (RiverWare 5.2.1)

- Added type icons for the overall Slot and for Slot Items.
- Double clicking Slot Item opens that Item's dialog.
- Removal of Apply / Cancel paradigm (from Scalar Slot dialog too).



Demo: Find Series Slots with Inputs

RiverWare 5.2.2 - urgwomPlanning.mdl.gz

Find Series Slots with Inputs

Search model for Series Slots with Inputs.

Physical Slots Initialization Timesteps
 Account Slots Run Period Timesteps
 Supply Slots
 Exchange Slots

Search 64 of 2602 Series Slots have Initialization Inputs.

Slot	Rows	Cols	Unit Type	Step Size
2 Indian.OtowiForecast	12	1	Volume	1 Year
3 ElVado.Storage	32	1	Volume	1 Day
4 ElVado.Outflow	32	1	Flow	1 Day
5 SanMarcialToElephantButteLosses.Pan Evaporation	3657	1	Velocity	1 Day
6 BernardoToSanAcaciaSeepageLag.Inflow	3658	1	Flow	1 Day
7 Caballo.Storage	32	1	Volume	1 Day
8 Caballo.Outflow	32	1	Flow	1 Day
9 LeasburgToMesilla.Inflow	3657	1	Flow	1 Day
10 MesillaToElPaso.Inflow	3657	1	Flow	1 Day

Compress columns 64 Slots, 1 Selected.

Open Slots ... Show All Slots in SCT... Show Selected Slots in SCT... Cancel

Demo: SCT Enhancements

- Flag Letters and Rule Priorities
- Table Slots tab shows Slot Column Labels
- Copy Slots (e.g. to Output Device)
- Copy / Paste Notes
- Import Paste
- Export Copy *enhancement*

The screenshot shows the SCT software interface with a data table. The table has columns for 'Timestep', 'Day', and several hydrological parameters. The 'ElVado .Outflow cfs' column is highlighted in green for the dates 1/1/03, 1/2/03, 1/3/03, and 1/4/03. The value for 1/3/03 is 302.38, which is also highlighted with a black box. The interface includes a menu bar, a toolbar, and a status bar at the bottom showing 'Run: 83%' and 'State: Running; Timestep: January 26, 2003'.

Timestep	Day	LFCCSanAcaciaToS. .Local Inflow Adjust cfs	ElVado .Storage acre-feet	ElVado .Outflow cfs	SanMarcialToElepha .Pan Evaporation in/day	BernardoToSanAca .Inflow cfs	Caballo .Storage acre-feet	Caballo .Outflow cfs
12/31/02	Tue	0.00 I 0	16199.00 I 0	263.00 I 0	0.09 I 0	80.00 I 0	15573.00 I 0	0.00 I 0
1/1/03	Wed	0.00 I 0	16506.28 O 109	122.91 R 109	0.09 I 0	88.49 O 52	15551.59 O 11	0.00 R 11
1/2/03	Thu	0.00 I 0	16858.93 O 109	301.70 R 109	0.03 I 0	89.54 O 52	16010.32 O 11	0.00 R 11
1/3/03	Fri	0.00 I 0	17200.47 O 109	302.38 R 109	0.04 I 0	89.88 O 52	16607.42 O 11	0.00 R 11
1/4/03	Sat	0.00 I 0	17521.18 O 109	303.09 R 109	0.04 I 0	87.78 O 52	17260.30 O 11	0.00 R 11

Demo: Series Notes Redesign

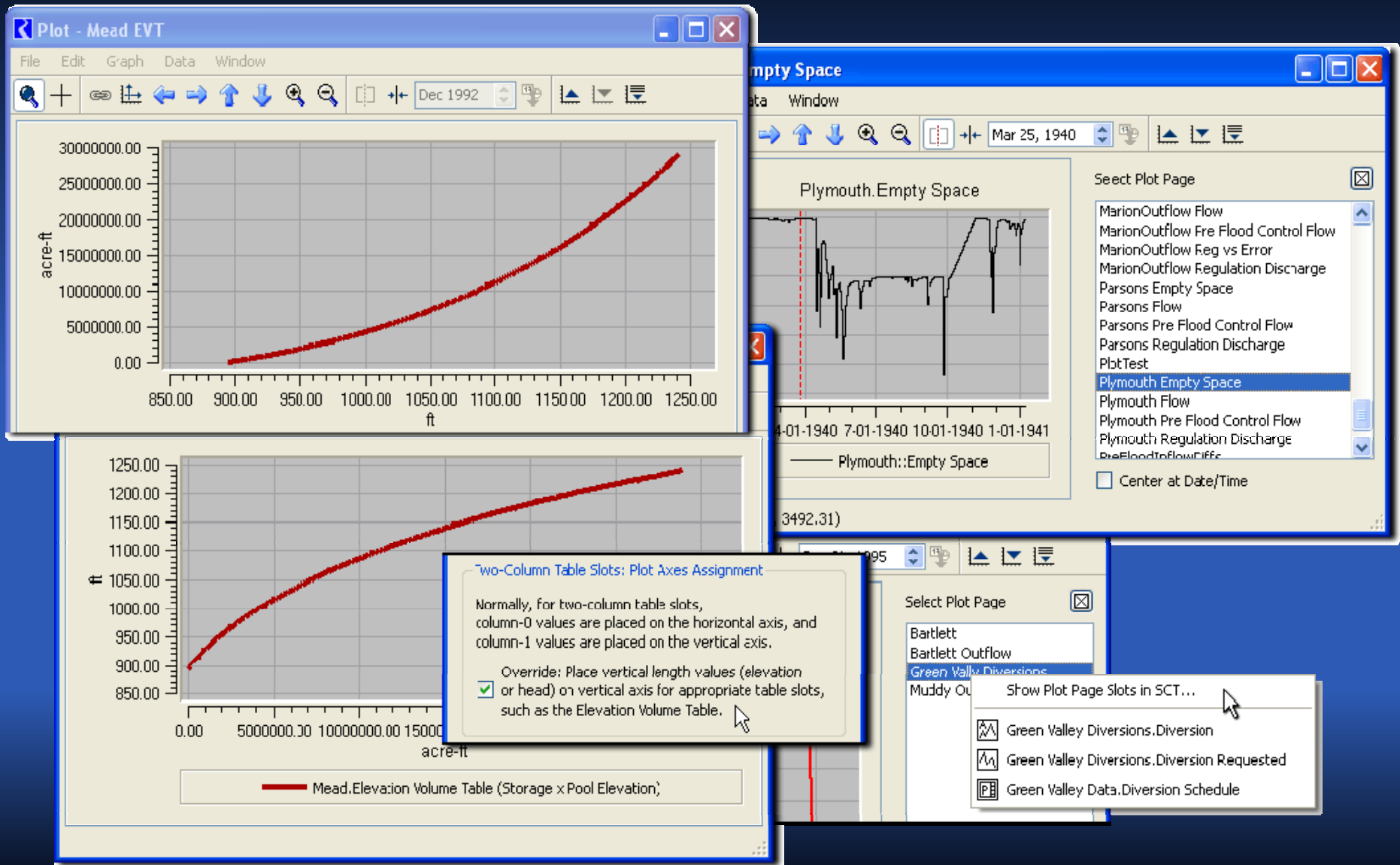
The screenshot displays the RiverWare software interface for 'SCT BartlettBasin.sct.gz (BartlettBasin.mdl.gz)'. The main window shows a 'Series Slots' table with columns for 'Timestep', 'Day', 'Note', and four data series: 'Muddy Reservoir .Outflow rfs', 'Gage Above Bartlet .Gage Outflow rfs', 'Bartlett Reservoir .Outflow rfs', and 'IC Delivery .Gage Inflow rfs'. A tooltip for the value 44.73 on 1/10/96 lists 'House Pets' and 'Kayak Races'.

The 'Note Group Manager' on the left shows a list of note groups: 'Guide', 'Recreation Events', and 'Storm Events'. Under 'Notes', it lists various events like 'Camp Red Tent Races', 'Kayak Races', 'Million Duck Race', and 'Waterfront Festival', all associated with the 'Recreation Events' group.

The 'Slots' section at the bottom left shows a table with columns for 'Slot', 'Timestep', 'Note', and 'Group'. It lists two slots: 'Bartlett Reservoir.Outflow' and 'IC Delivery.Gage Inflow', both with a timestep of '24:00 Jan 9 1996'. The 'IC Delivery.Gage Inflow' slot is associated with 'Kayak Races' and 'Recreation Events'.

The detailed view on the right shows a list of dates from 01-07-1996 to 01-12-1996. A tooltip for the date 01-10-1996 Wed shows the value 44.73 and lists 'Kayak Races' and 'House Pets' as associated notes.

Demo: New Plotting Features



Demo: Tabular Series Slot Report

Tabular Series Slot Report: BigRes Accounts

File Output Slots

Titles Settings Slots Output

Ordered Series Slots

Add Slots... Remove Selected Slots

Move Selected Slots: ↑ ↓

Slot	Step Size	User Column Label	Sum	Mean	Min	Max	Start	End
1	1 Day	EAllocIn	✓	✓				
2	1 Day	EAllocOut	✓	✓				
3	1 Day	E36Accr	✓	✓	✓	✓		
4	1 Day	E36InitReq	✓	✓				
5	1 Day	E36Stor	✓	✓	✓	✓		
6	1 Day	E36Loss	✓	✓	✓	✓		
7	1 Day	E36TranIn	✓	✓				

Save Generate and View... View Existing Report... Close

B36Accr acre-ft	B36InitReq acre-ft/day	B36Stor
813.61	87247.14	2196
1162.70	87233.54	2199
1518.35	86871.39	2203
1862.28	86522.30	2206
2173.59	86166.65	2209
2490.20	85822.72	2212
3010.39	85511.41	2215
3498.69	85194.80	2218
3794.94	84674.61	2221
4017.78	84186.31	2224
4389.65	83890.06	2227
4675.07	83667.23	2230

Show notes in series as follows

- At Page Breaks
- At End of Report

HTML Report

BigRes Account Summary Report

Run #37, Policy set #3.
Non-iterative.

	BAllocIn	BAllocOut	B36Accr	B36InitReq
01-04-1996	578.36	216.20	813.61	87247.14
01-05-1996	565.29	216.20	1162.70	87233.54
01-06-1996	571.84	216.20	1518.35	86871.39
Sum:	1715.49	648.60		261352.06

[1]: Minimum Requested

Sum:	2594.38
------	---------

[1]: Minimum Requested
[2]: Wygillian Request

Text Report

	BAllocOut acre-ft/day	B36Accr acre-ft	B36InitReq acre-ft/day
01-04-1996	216.20	813.61	87247.14
01-05-1996	216.20	1162.70	87233.54
01-06-1996	216.20	1518.35	86871.39
01-07-1996	216.20	1862.28	86522.30
01-08-1996	216.20	2173.59	86166.65
01-09-1996	216.20	2490.20	85822.72
01-10-1996	216.20	3010.39	85511.41
01-11-1996	216.20	3498.69	85194.80
01-12-1996	216.20	3794.94	84674.61
01-13-1996	216.20	4017.78	84186.31
01-14-1996	216.20	4389.65	83890.06
01-15-1996	216.20	4675.07	83667.23
Sum:	2594.38		1026988.13

[1] Minimum Requested
[2] Wygillian Request

Demo: Background Image

The screenshot displays the RiverWare 5.2.2 interface for the TCBasin model. The main window shows a map with various hydrological features and objects. A 'Background Image Configuration' dialog box is open in the foreground, allowing users to set the workspace background image.

RiverWare 5.2.2 - TCBasin.mdl.gz

File Control Workspace Policy DMI Accounting Utilities Test Help

Simulation O...
Objects
DataObj1
DataObj2
Donner
DonnerConf
Lake Tahoe
LTConf
Stampede
Gage
Truckee

Workspace Background Image
(JPG or PNG file in or under the model file directory):
Directory: Z:/public_html/2010/ugm/2010/Models
File: TCBasin3.png
Select Image File... Clear Image File
Reload

Width: 611 Height: 518
Left Offset: 20 Bottom Offset: 20
Horz Scale: 100 % Vert Scale: 100 %
Opacity: 43 %

Show Background Image in Workspace

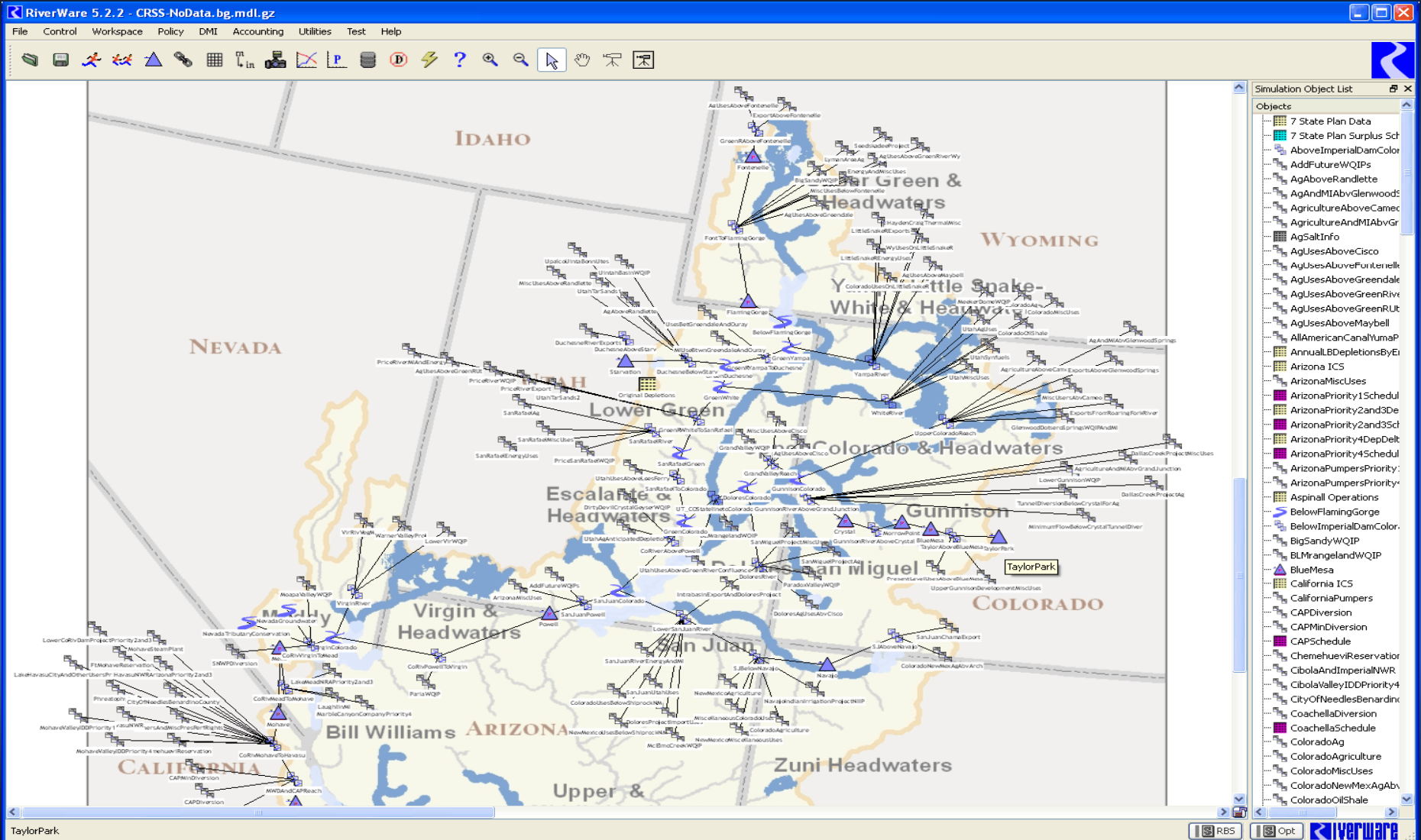
OK Apply Restore Defaults Cancel

Map labels: Stampede, Truckee, Gage, Donner, DonnerConf, Lake Tahoe, LTConf.

Legend: DataObj1, DataObj2.

Background Image: Actual Use

Courtesy of USBR / CADSWES office



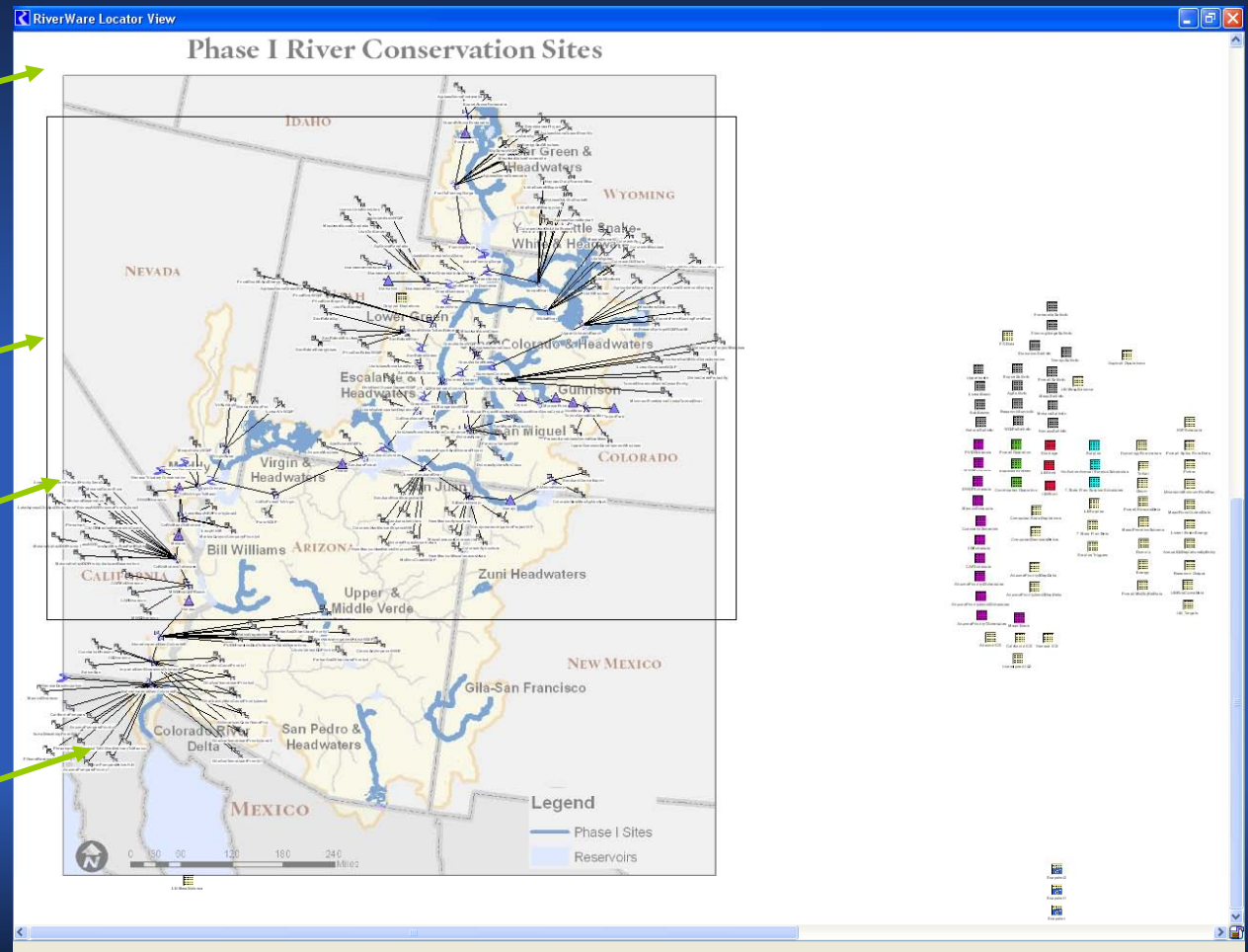
Components of a Workspace View

Canvas

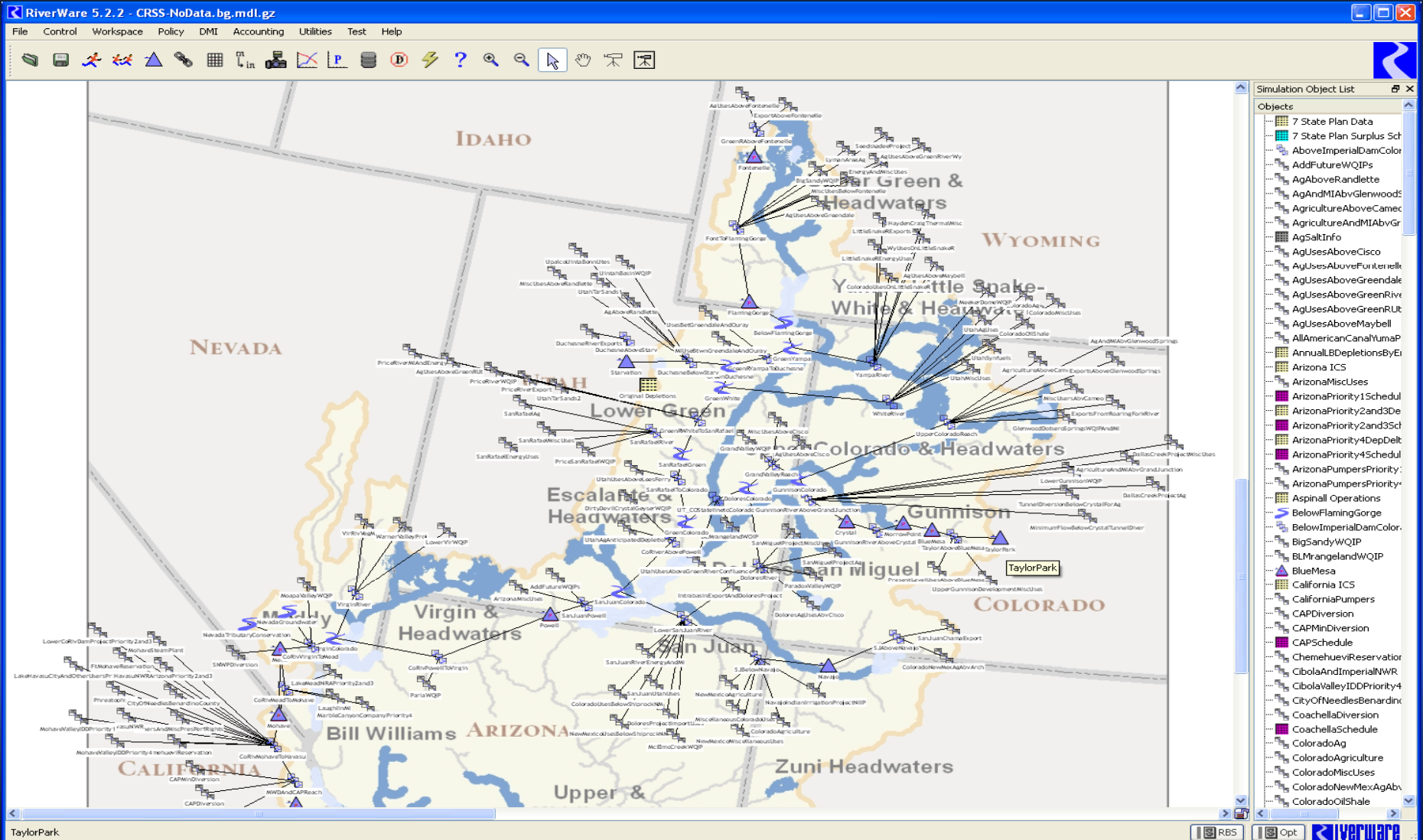
Display Area

Image

Objects



Limitations of the Simulation View



Upcoming: New Geospatial View

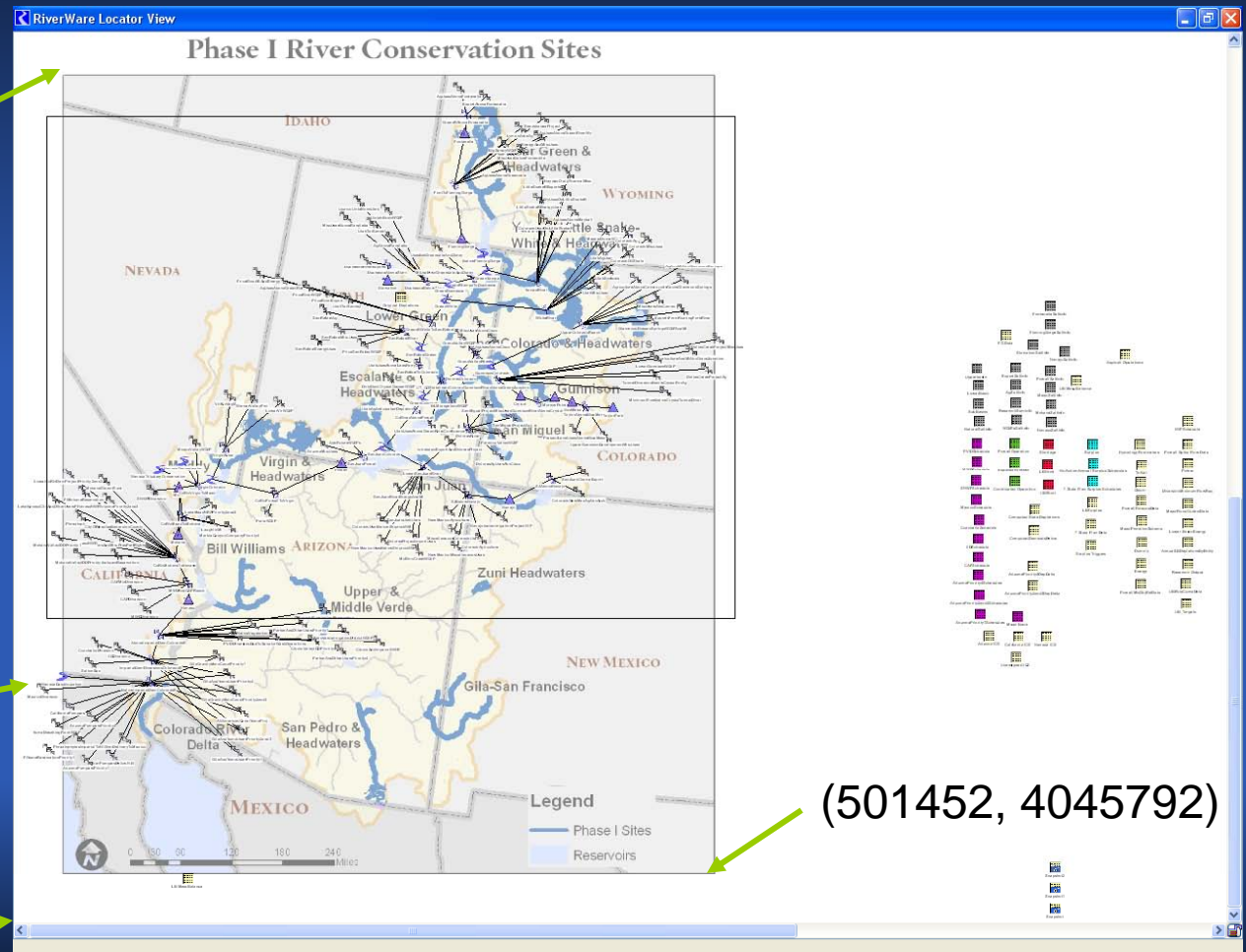
- Coordinate system defined by projection
- Projection locations known for:
 - Canvas
 - Map
 - Objects
- Import/Export of object spatial coordinates

Adding Spatial Information to the Geospatial View

(375223, 4289922)

(374501, 4108823)

(373452, 4045792)



Additional Possibilities for GIS Integration

- Geospatial View Enhancements
 - Layers
 - Visualization of spatial data
 - Custom legend
- Spatial Analysis
 - Catchment delineation
- Additional GIS database support
 - Name mapping
 - Tabular view of data
 - Direct connection